

# Community-based Problem Animal Control



## Proceedings document

Training Course Lupande Game Management Area

South Luangwa, Zambia 19<sup>th</sup>-25<sup>th</sup> March 2003

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## Abbreviations

CBPAC	Community-Based Problem Animal Control
GMA	Game Management Area
HEC	Human-elephant conflict
MZEP	Mid Zambezi Elephant Project
PAC	Problem Animal Control
PRA	Participatory Rural Appraisal
SARPO	Southern African Regional Programme Office
SLAMU	South Luangwa Area Management Unit
SLNP	South Luangwa National Park
VAG	Village Action Groups
WWF	World Wide Fund for Nature
ZAWA	Zambia Wildlife Authority

## **Report summary**

WWF SARPO has contracted MZEP to conduct a training course in Community-Based Problem Animal Control (CBPAC) techniques. The aim of this course is to train a core of 14 trainers in CBPAC techniques, enabling the participants to disseminate the methods to affected communities within Lupande Game Management Area (GMA) on the southern boundary of South Luangwa National Park, Zambia (Map 1).

This report details the proceedings of the 5-day training course held in Lupande GMA. The course comprised a theory and a practical section. The theory component of the training course took place in the CBNRM classroom at SLAMU headquarters in Mfuwe. For one and a half days participants explored the current situation of Human-Wildlife Conflict (HWC) and discussed the problems of current PAC mitigation within Lupande GMA. The participants were then exposed to the CBPAC methods developed by MZEP. Practical training took place over four days during which CBPAC demonstration plots were established in three sites across the GMA.

## **Background**

Human-wildlife conflict (HWC) is a major conservation and management issue where people and wildlife coexist. HWC can take many forms, including the destruction of crops and property, and competition for natural resources. Commonly the people worst affected by conflict are rural farmers. In many areas where community-based conservation schemes such as CAMPFIRE and ADMADE exist, conflict can undermine conservation efforts because the cost of living with wildlife is seen to far outweigh any benefits.

Human-elephant conflict is one of the critical management issues in conservation today. Current Problem Animal Control (PAC) techniques designed to reduce the impact of elephant crop damage are inadequate, either being too expensive for rural farmers to afford, or being logistically unworkable in remote locations. There is consequently a real need to develop new conflict mitigation strategies in communal farming areas.

Mid-Zambezi Elephant Project has developed a series of PAC methods that are designed for use by rural communities. The methods are cheap, and generally utilise locally available equipment. They are designed to reduce the impact of elephants upon the livelihoods of semi-subsistence farmers. This system, termed Community-Based Problem Animal Control (CBPAC) was developed in the Mid-Zambezi Valley of northern Zimbabwe where it is currently being used by seven communities to combat elephant crop-raiding. In 2002 the system was introduced to communities in South Luangwa, Zambia and Niassa Province, Mozambique. This training programme has been initiated by WWF SARPO to enable the wider adoption of CBPAC techniques in Lupande GMA, South Luangwa, Zambia.

## Course proceedings

### Day one

#### Introductions

The training course was opened by Betty Msimuko of WWF and Guy Parker of MZEP. Each participant introduced themselves and their position within their respective organisations, and then gave a brief statement of his or her expectations from the course.

Table 1. Course participants and their expectations from the course

Name	Organisation	Expectations
Martha Sekelani	MACO Community Liaison Officer	Learn current PAC techniques
Mizzi Zulu	ADAPT Coordinator	Wish to be fully equipped with knowledge about PAC
Douglas Mwinga	MACO Field Officer	To have the capacity to educate the community in PAC and agriculture
Kayawe Kayombo	CBNRM College Training Officer	Share techniques on PAC and HWC
Zerks Mwale	CLA-Nsefu	How to solve the HWC problem
Dennis Mwanza	CLA	To learn methods of PAC
Batwell Mwale	CBS-Malama	To learn about cheap wildlife control methods
Ednas Banda	CBS-Malama	How can we use the electric fence in PAC?
Alick Nyawenda	CBS-	Which are the worst problem animals
Lewis Sakala	WCS Community Co-ordinator	Participants being active in search for PAC methods
Timothy Banda	CBS-Nsefu	How to manage PAC
Shadreck Chilumba	CBS-Kaweche	Learn PAC techniques
Malama Ndlovhu	HWC Co-ordinator	To learn about many PAC options
Patrick Sakanga	ZAWA SWPO	How do we solve the problem of conflict with animals?
Misheck Zulu	Community Liaison Officer	Learn more methods for scaring animals.

#### Course agenda

The agenda for the next five days was then explained in full, with 2 days of classroom-based theory and 3 days of practical training in villages within the Lupande GMA. The participatory nature of the course was emphasised, and all course attendees were encouraged to contribute to discussions and practical demonstrations.

#### Course objectives

The specific objectives of this course were explained. During the next 5 days participants would be exposed to, and have understanding of, the following issues:

- 1) conflict between wildlife and people;
- 2) current PAC techniques and their respective strengths and weaknesses;
- 3) the development of community-based PAC techniques;
- 4) the strengths and weaknesses of CBPAC;
- 5) specific tools in the PAC toolbox;
- 6) the construction, maintenance and use of CBPAC techniques.

## Theory training

### CBNRM

The theory component of the course commenced with some background to Community-Based Natural Resource Management (CBNRM). A discussion of the objectives and basic structure of CBNRMs centred on the utilisation of wildlife for the benefit of rural communities. Wildlife-human conflict was identified as a key problem because farmers believed the costs of living with wildlife far outweighed the benefits. There has been no safari hunting for the past 2 years in Zambia and no wildlife revenues have been returned to communities, exacerbating this problem.

### Conflict in Lupande GMA

Participants identified the animals they felt were a problem within the Lupande area. They then detailed the specific problems for each animal in turn, and finally ranked the animals in terms of the severity of their problems. This exercise was designed to focus everyone upon human-wildlife conflict, and to consider the process of ranking problem animals objectively.

Table 2. Problem animals and the problems they cause

Problem animal	Problems caused
Elephant	Crop damage
	Death
	Property damage & grain stores
	Potential risk
Hippos	Habitat destruction
	Crop damage
	Death
	Potential risk
Baboons	Soil erosion
	Crop damage
	Grain stores
	Property damage
Bushpigs	Crop damage
Monkeys	Crop damage
Lions	Death
	Livestock
	Potential risk
Porcupines	Crop damage
Hyenas	Livestock
Crocodiles	Death
	Potential risk
Buffaloes	Potential risk
	Crop damage
	Death
Kudus	Crop damage

Table 3. Problem animals ranked

Problem animal	Rank
Elephant	1
Hippo	2
Baboon	3
Monkey	3
Bush pig	4
Crocodile	5
Lion	7
Hyena	7
Kudu	9
Porcupine	10
Buffalo	11

The management of HWC usually focuses upon the direct impacts of wildlife upon farmers, such as crop destruction and damage to property. However, a far wider range of issues may influence a community's views of HWC. The following case study was selected to demonstrate these wider issues.

**Case study: human-wildlife conflict in Masomo village**

The Mid-Zambezi Valley is a low-lying area of northern Zimbabwe that has historically been rich in wildlife populations. People have only been able to settle in the area in large numbers in recent times, following the control of the Tsetse fly. In the past 30 year there has been a continuous influx of people who have moved from other areas in Zimbabwe, seeking farmland.

Elephants are considered a major problem and are blamed for crop destruction, and endangering the lives of rural farmers. MZEP has been studying HEC within the region for the past 5 years. A crop-damage reporting scheme has revealed the nature and extent of crop damage by elephants and other wildlife species. What it found was that elephants did not always cause the most crop damage. In Masomo village people hardly ever experienced problems with elephants, and baboons and kudus caused most of the crop damage (Figure 1). But the farmers still perceived the elephants to be the greatest problem. When interviewed about wildlife problems they invariably stated elephants to be the greatest wildlife problem they experienced (Figure 2).

Figure 1. Actual crop damage per wild animal in Masomo village, Guruve, Zimbabwe.

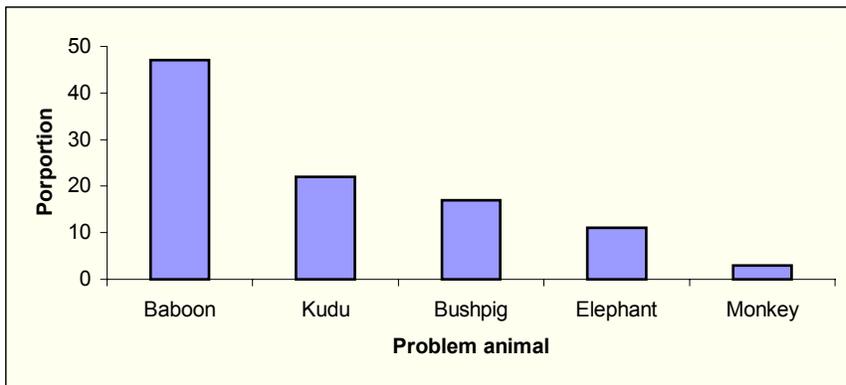
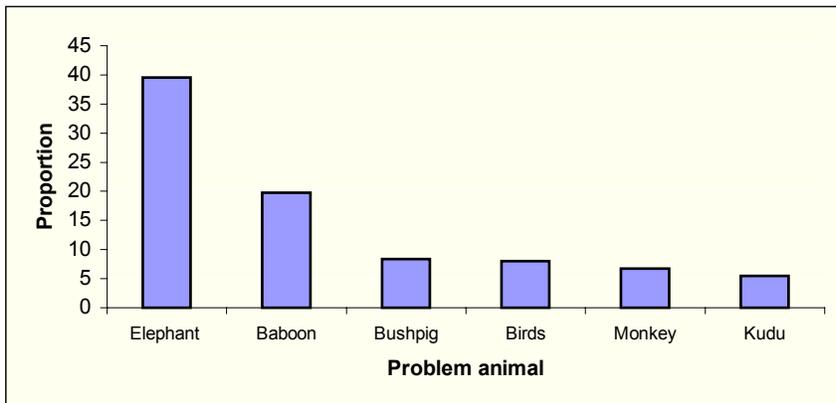


Figure 2. Farmers perceptions of problem animals in Masomo Village, Guruve, Zimbabwe.



The participants agreed that a similar situation occurred within the Lupande GMA. There then followed a discussion of why elephants were perceived as the worst problem, even when not the main perpetrators of crop damage. It was agreed that the potential for conflict, and the potential severity of that conflict, made people fear elephants. People also feared the risk of being killed by elephants. In addition there were a range of indirect impacts that elephants caused, including competing with farmers for natural resources and restricting people's access to woodland areas.

### **Problem Animal Control**

PAC refers to those measures that are used to control problem animals in conflict with people. PAC strategies usually focus upon crop protection and the destruction of individual problem animals. The types of problem animal control used in Lupande GMA included control shooting, disturbance shooting, electric fencing and traditional methods used by farmers. These methods were subjected to a detailed cost-benefit analysis by the participants, who constructed a chart for each (Appendix 3). A list of general problems with current PAC was then compiled from this analysis.

General problems with current PAC techniques in Lupande GMA:

- Expensive or unavailable materials
- Dependence upon outside organisations for help and resources
- Animals adapt to the methods and they become ineffective
- Problems of community ownership, e.g. fencing
- No discussion between the community and decision-makers
- Killing animals is the only acceptable option for the community, as this represents the only tangible benefit
- All animals are considered the property of the state when it comes to problems
- A recent survey of Lupande found that 60% of people don't want elephants, 25% are neutral, and 15% favour elephants within their areas
- All PAC methods generally displace the problem to somewhere else.

### **Community-based PAC**

There followed a description of the development of MZEP's community-based problem animal control (CBPAC). The concept of a community-based system came about from the realisation that current PAC techniques did not effectively assist communities living alongside elephants. There was a need for a system of PAC that the farmers could administer as and when necessary. A key process to developing a new PAC system was identifying what, in the farmers view, were the issues that made guarding their crops difficult.

Prior to developing a PAC system, MZEP conducted a community survey of the problems of elephant crop damage within the Mid-Zambezi Valley. The key findings are listed below:

- Communities interviewed felt the PAC methods being used were ineffective at scaring elephants away.
- The Government wildlife unit responsible for disturbance shooting were considered unreliable, and were generally unavailable.

- Farmers had no warning of elephants approaching the fields at night. Generally they detected the elephants only after they had caused considerable damage to the crops.
- There was no boundary between the edge of the fields and the forest- consequently elephants could walk from the forest straight into the maize crops.
- Elephants appear to habituate to all methods of PAC-even gunfire.

### **The concept**

The concept behind the development of CBPAC was then explained. Bearing in mind the constraints of current PAC systems it was important that community-based PAC would be:

- 1) inexpensive, and therefore affordable to rural farmers;
- 2) effective, employing multiple tools to overcome habituation;
- 3) decentralised, enabling communities to take responsibility for their own conflict issues; and,
- 4) locally available, ensuring that communities are no longer dependent on outside agents.

### **The framework**

The two main components of CBPAC were then explained. Passive methods of PAC are those designed to impede an elephants' access to the fields, including warning systems and simple barriers. Generally passive systems are established at the onset of the wet season. Active methods are designed to chase elephants from the fields once they have entered, and are the last line of defence. Active methods are employed as and when they are needed.

- Passive PAC: the first line of defence, including simple fencing, warning systems and defined boundaries between the woodland and the fields. Passive systems are established at beginning of the wet season.
- Active PAC: the second line of defence, used whenever elephants raid crops. Active deterrents scare elephant away, and include firecrackers and chilli-based products.

### **The methods**

Each of the methods was then explained in detail.

#### *Passive methods*

**Buffer zones:** The buffer zone has two purposes; first, it defines the boundary between the fields and the bush; and second, it enables farmers to sight approaching elephants. This involves clearing secondary forest on the boundary and creating some physical distance between the boundary and cultivation. Farmers clear a five metre wide buffer zone around their fields, or in some cases along the edge of the whole village. (Tools needed: slashers, axes)

**String fences:** Three metre long poles are cut and placed at 10 metre intervals along the buffer zone. Bailing twine is then strung between them. Poles can be of either living trees or cut from

species that will re-grow to make 'live poles'. (Equipment needed: Axes, nylon, sisal or bark string.)

**Watchtowers:** Farmers build watchtowers at approximately half-kilometre intervals to increase their chance of being alerted to the elephants as they approach the fields. These shelters can be very simple, designed to keep a fire and the farmer dry and can be replaced each season. These are usually sited on a termite mound or some vantage point. (Equipment: Axe, poles, thatching grass, string)

**Alarm systems** Alarm systems have a great security value, as they warn farmers of approaching animals. There is often some distance between the homestead or watch tower and the edge of the fields, and without a warning system, farmers would have to stay awake all night to protect their crops. Simple alarm systems can be set up using string and cowbells or tin cans that will be disturbed when an elephant tries to enter a field. (Equipment: cowbells or any other metal objects, string)

**Grease and hot pepper oil** are mixed together and applied to the string. The pepper oil is a concentrate made from hot chillies. The grease acts as a waterproof medium that holds the pepper oil in place. If elephants make contact with the string, the pepper oil and grease causes irritation to the animals. (Equipment: grease, chilli oil.)

#### *Active methods*

**Fires** are kept burning all night in areas where elephants are regular visitors. In some areas firewood is difficult to obtain, so any material that will smoulder can be used.

**Pepper dung:** Elephant dung is mixed with ground chillies, compacted into a brick mould, and then dried in the sun. These bricks are burned in fires along the field boundaries to create a noxious smoke that lasts for 3-4 hours. (Equipment: Elephant dung, dried chillies, mould)

**Firecrackers** are used by farmers to chase elephants from the fields. The firecrackers are currently bought commercially and are far less expensive than ammunition used by wildlife authorities. Many communities know how to make their own gunpowder, and a community-based option is currently being developed. Communities in the Mid-Zambezi Valley use a sealed pipe filled with water that has a bung tapped in to one end. The pipe is placed in the fire and when it heats up the bung bursts out of the pipe with a loud bang. (Equipment: Bangers, or homemade explosives made from gunpowder, fertilizer or simply placing a sealed metal tube filled with water on a fire).

**Pepper spray** is used on occasion in situations where elephants have become habituated to the simpler methods presented (Osborn 2002). Refined pepper oil is pressurised into an aerosol can. When sprayed the can releases a cloud of atomised hot chilli. This method, while effective, is costly but efforts to produce both the pepper oil and the cans in Africa are underway.

**Important points:**

- 1) The CBPAC concept is holistic: all components need to be used to make the system effective. Any single method used in isolation will not be effective.
- 2) The methods in CBPAC are diverse and largely new to elephant management, which reduces the probability of elephants habituating to them. In addition chilli peppers inflict pain upon mammals, and so represents a ‘real’ threat as opposed to an ‘empty’ threat like disturbance shooting.
- 3) The system is not a panacea; it is not 100% effective at preventing crop damage. Rather it is designed to reduce the impact of conflict upon a farmer’s livelihood.
- 4) CBPAC is not designed to replace existing methods. It is complimentary to all current methods and should be employed in addition to present PAC efforts.
- 5) The system is flexible and can be adapted to new situations.

The group were asked their initial reaction to the PAC system that had been presented to them. A table with positive and negative comments was developed from the responses (Table 3).

Table 4. Initial evaluation of CBPAC

<b>Positive</b>	<b>Negative</b>
May work	Pepper spray is expensive
Worth trying	Buffer zone is a loss of potential cropping land
Cheap	Labour intensive
Pepper spray is new	Complex-many components
Fireworks are available	Chillies can cause irritation for people
Good idea	

**Practical demonstration**

In the afternoon participants were exposed to each of the components of CBPAC. They worked together with MZEP staff to construct a small portion of fencing at the ZAWA offices. Each of the active methods was then demonstrated.

## Day two

### Recap

Participants were asked to summarise the information from day one. Each topic was explained by an individual who listed the main points, and where necessary, drew tables and diagrams.

### Sites for demonstration plots

Three demonstration plots were to be constructed in each of Kakumbi, Nsefu and Malama Chiefdoms. The participants selected the villages in which the demonstration plots should be placed, choosing villages that experienced high levels of conflict with animals.

Kakumbi: Kefa village

Nsefu: Katapila village

Malama: Malama village

Initially 2-3 demonstration plots were planned in each chiefdom, but owing to the logistics involved (long distances and poor roads), and to the need for full community meetings to introduce the programme, it was decided that one demonstration plot per chiefdom would be feasible given the time available. Equipment was provided for the construction of a second plot at each site.

### Community extension

We discussed a strategy for introducing CBPAC to each community. The forum would be a community meeting, once permission had been granted from the Chief. Discussions on HEC and current PAC techniques would set the scene for introducing the CBPAC concept.

Four participants would be elected from the group and this team would then present the programme to the community. A willing farmer would be identified, preferably one who had experienced recent problems with elephants. All participants would then work together to construct the demonstration plots with the help of the farmer and other community members. By taking control of the training process participants would have the most effective exposure to the CBPAC system and would additionally gain experience in disseminating the concept to the community.

### Site 1. Kefa village, Kakumbi Chiefdom

The team assembled in the Kefa fields where elephants had recently raided crops. The group discussed the problem with Mr John Zulu and his neighbour, Mr Lameck Mwale. One bull elephant had been habitually raiding the fields for the past 3 days. The farmers had beaten their drums at night, but the elephant had ignored their efforts.

Two participants introduced the CBPAC system. Following a full description of the idea, the farmers agreed to set up an experiment. Everyone then constructed a 100m section of fencing, slashed a 5m wide buffer zone and applied grease and cowbells to the fence under the direction of MZEP staff. Due to limited time we agreed to return the following morning to complete the job.

### **Day three**

The fence was completed in Kefa. Then the active PAC methods, including chilli burning and firecrackers, were demonstrated to the farmers. It was explained that each component of the system must be used if it were to be successful. This system was not designed to replace current methods of PAC, but rather should be considered an additional tool. It would require the farmers to sleep at their fields and actively chase the animals themselves. The farmers asked where they could source mutton cloth, bangers and grease. A discussion of possible local sources then followed.

Several farmers from nearby fields visited the demonstration plot and then proceeded to argue that this idea would not work. They claimed that the only way to stop elephants was to shoot them, a perspective that is indicative of the current revenue situation: people are receiving no hunting revenues at present and there is no remuneration for the conflict they experience.

#### **Site 2. Katapila village, Nsefu**

At Katapila village the chief had been consulted and had agreed to hold a community meeting. Two course participants then led the discussions. Problem animals and current PAC techniques were briefly discussed and farmers expressed their dissatisfaction with the present situation.

In the past farmers used chillies to control problem animals. People had caught baboons and smeared chilli on them, which had driven other baboons away. Chilli had also been used to deter guinea fowl. Elephant dung had been burned to chase off nocturnal crop-raiders. This experimentation with PAC appeared to aid the villagers' acceptance of CBPAC.

The CBPAC system was then introduced in a similar manner to the previous day. A discussion of local sources then ensued, and it was discovered that bangers were available in Chipata, grease could be sourced from ZAWA workshops and string could be locally manufactured. It was then suggested that if the farmers like the system and wanted to extend their demonstration plots, they could apply to use hunting revenues to buy the raw materials in 2004.

### **Day four**

The group constructed a demonstration plot at Mr Samson Banda's field. The course participants were given control of the proceedings, and they explained everything to the community while MZEP staff monitored their progress. The active methods were then demonstrated.

In Mfuwe the group discussed the course activities for the coming two days. A two-day trip to Malama had been scheduled, but due to a lack of vehicles and the poor condition of the roads, it was not possible to take the entire group. It was decided that the best course of action would be to travel with those course participants based in Malama. Following this decision we spent several hours wrapping up and evaluating the course. We discussed monitoring of the demonstration plots, and then identified the way ahead and allocated monitoring duties for those participants living close to the plots in Kakumbi and Nsefu.

### **Day five**

In the morning MZEP staff were tied up with administrative issues. We left for Nyamaluma in the afternoon and spent the early evening discussing our planned programme with the Nyamaluma principal and the training officer.

### **Day six**

At Malama we discussed our programme with the chief. The chief informed us that the CBPAC ideas had been tried here before and that they had not really worked. Elephants had grown accustomed to the chilli fence and used their tusks to snap the wires in the same manner as they would with an electric fence.

The chief explained that the elephants in Malama behaved differently to other areas within the GMA, because poaching in the south of the park and in the hills to the east pushed elephants into this Malama area. The elephants are consequently used to people, and are totally habituated to gunfire. He remained convinced that the only long-term solution was to shoot elephants and to spread their blood around the fields. He claimed this could deter elephants for up to 3 months. However, he accepted the idea of establishing another demonstration plot.

A community meeting was called. We started by discussing current PAC methods, which were far more diverse than in other places. They included burning tyres and maize residues, and erecting electric fences. The community felt certain that elephants had habituated to these methods and that they were now ineffective. When CBPAC was introduced farmers argued that it was too late in the season to implement new PAC ideas. We explained that this was an experiment and if the farmers felt it worked then they would be able to implement it properly for the following season. The community did not feel the idea would work and were dismissive of most interventions, claiming that killing elephants was the only solution. They felt that chillies would not be strong enough to drive the elephants away.

It was decided by MZEP staff that several people would be trained to use the pepper spray, and that this would be left with the community. This decision was reached reluctantly as it was recognised that the pepper spray was expensive and could not be sourced locally. However, the seriousness of the situation in Malama warranted the use of pepper spray as all other interventions had failed. There followed a long discussion about sourcing the raw materials, which would be more difficult to access in Malama than in other areas. As with Nsefu, it was explained that sourcing and paying for the materials would become the community's responsibility (through the VAG) once they were convinced the ideas worked.

A demonstration plot was established in Mr Festo Banda's field 2km to the south of the Chief's Palace, which bore recent evidence of elephant activity. Farmers expected that MZEP and ZAWA staff would construct the fencing, as it is generally perceived that we care for the wildlife more than they do, and indeed, one person mentioned that they thought ZAWA cared more for wildlife than the people. Nevertheless the farmers surrounding Mr Banda's field helped to construct a demonstration plot. Unfortunately the plot was not completed because heavy rains threatened to close the road back to Nyamaluma.

## Course evaluation

### *Self-evaluation*

Table 5 shows the results of the pre-and-post training questionnaire, which is displayed in full in Appendix 2. This questionnaire was filled in at the beginning and at the end of the course to assess how much participants felt they had learnt. Each question was scored on a scale of 1 to 5; 1 being no knowledge, and 5 being excellent knowledge. The mean group score for each question was calculated, and this score was then converted to a percentage (Table 5).

The results indicate that participants feel they learned a significant amount about each of the major topics shown. Participants learnt the most about passive and active methods of CBPAC which was unsurprising as it was a new topic to them; and learnt the least about training others in PAC techniques, perhaps reflecting the strong training component of their daily work.

Table 5. Training Course Evaluation.

Question number	1	2	3	4	5	6	7	8	9	10
Question brief	HWC	Current PAC	Current PAC methods	PAC Strengths weaknesses	CBPAC	CBPAC strengths Weaknesses	Passive active PAC	CBPAC setup	CBPAC maintenance	CBPAC training
Pre Evaluation	55	53.3	36.67	31.67	33.3	38.3	28.3	18.3	50	63.3
Post Evaluation	91.07	91.07	83.92	82.14	78.57	73.21	92.86	67.86	69.64	82.14
<b>Difference</b>	<b>36.07</b>	<b>37.77</b>	<b>47.25</b>	<b>50.47</b>	<b>45.27</b>	<b>34.91</b>	<b>64.56</b>	<b>49.56</b>	<b>19.64</b>	<b>18.84</b>

### *Course evaluation*

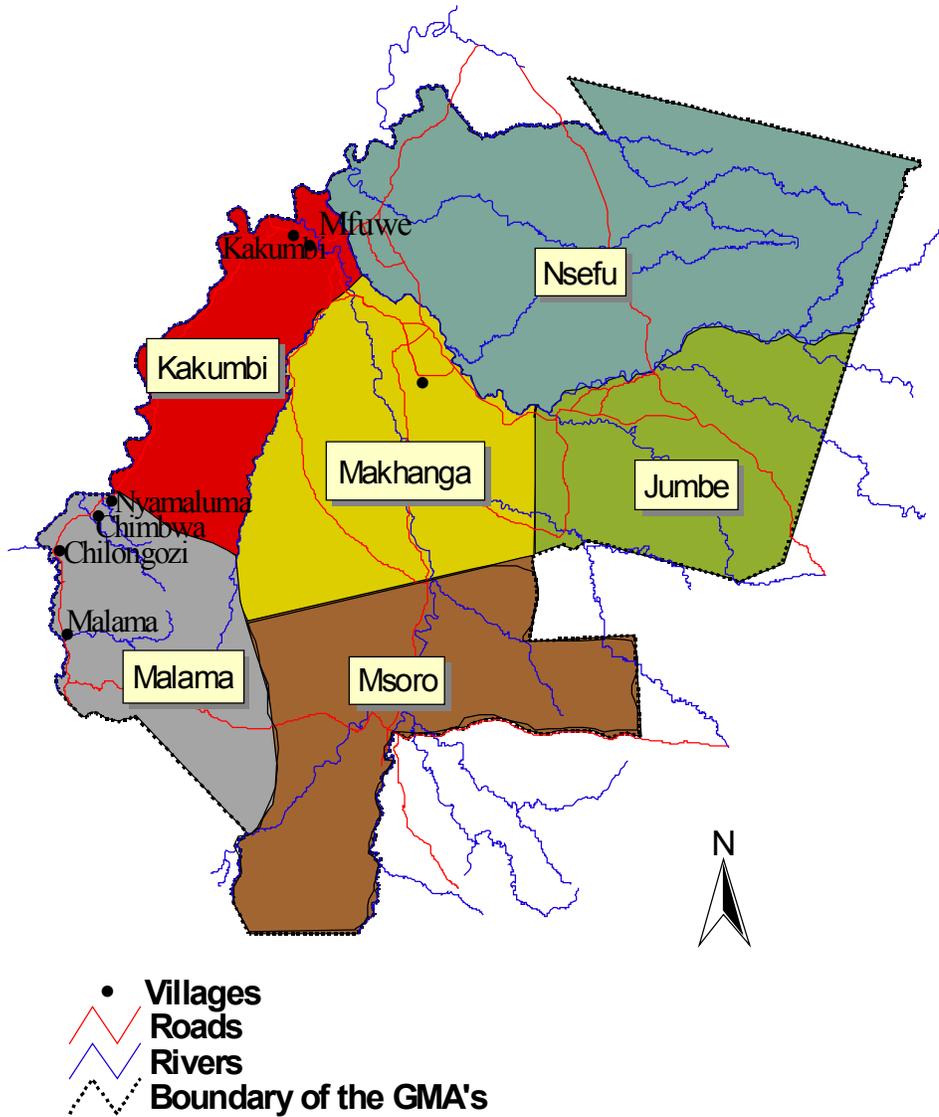
At the end of each day the participants evaluated the course using five different criteria. First came the *organisation* of the course, which included timing, breaks and transport. Second, *facilitation* included all aspects of teaching provided by MZEP; third, *course content* covered the subjects broached each day; fourth, *food and accommodation* assessed the lodgings for participants in Mfuwe; and, fifth participants were asked to score the *course as a whole*, taking all aspects into account. Participants gave a score to each component of the course using a scale from 1 to 5; 1 being very poor and 5 being excellent. In table 6 are the course evaluation results. Scores were converted to percentages and the mean score for the group was calculated for each of the criteria. The highest scores were for course content and facilitation and the lowest were for food and accommodation.

Table 6. Daily Assessment.

Course component	20/03	21/03	22/03	23/03
Organisation	36	25	39	45
Facilitation	84	71	58	78
Course Content	96	74	78	73
Food & Acc.	43	21	46	24
Whole course	75	65	60	86

APPENDIX 1. Map of study area

# Lupande GMA



**APPENDIX 2. Community-Based Problem Animal Control Training schedule**

Day	Time	Activity	Facilitator/s
One	0800	Meet warden, introduce training programme	
	0900	Opening and introductions Expectations	GP/IM
	1000	Course agenda, aims, objectives Background to MZEP	GP
	1030	Tea	
	1100	Theory training: problem animals and control -CBNRMs and conflict -Problem animals in S Luangwa: discuss and rank -Case study: Masomo village	GP
	1200	PAC methods-strengths and weaknesses CBPAC-concept and framework CBPAC-tools and methods	GP
	1400	CBPAC-Practical demonstration	IM/LM
Two	0800	Recap-day one	IM
	1000	Selection of demonstration plots	IM
	1100	Community approach strategy	GP
	1400	Establish demo plot 1 in Kakumbi	GP/IM/LM
Three	0800	Complete demo plot 1 in Kakumbi	GP/IM/LM
	1300	Community meeting in Nsefu	GP/IM/LM
Four	0800	Establish demo plot 2 in Nsefu	GP/IM/LM
	1300	Wrap-up and evaluation	GP/IM/LM
Five	0800	Administration-airport	GP/IM/LM
	1300	Drive to Nyamaluma, discuss programme with principal and training officer	GP/IM/LM
Six	0800	Meeting with Chief Malama	GP/IM/LM
	1000	Meeting with Malama community	GP/IM/LM
	1200	Establish demo plot 3 in Malama	GP/IM/LM
	1500	Return to Mfuwe	GP/IM/LM

### APPENDIX 3. CBPAC Self-assessment Form

This form is designed purely to help us evaluate how effective the training session has been. It is not a test, and there is no need to place your name on the paper. Please answer each question as honestly as possible.

#### Instructions

Answer each question by placing a ring around the number that most suits your present skills or knowledge in that field.

- 1 = no knowledge
- 2 = a little knowledge
- 3 = some knowledge
- 4 = a lot of knowledge
- 5 = excellent knowledge

1. How well do you understand the term “human-wildlife conflict”?  
1                    2                    3                    4                    5
2. How well do you understand the term Problem Animal Control (PAC)?  
1                    2                    3                    4                    5
3. Are you familiar with current methods of PAC?  
1                    2                    3                    4                    5
4. How much do you know about the strengths and weaknesses of current PAC techniques?  
1                    2                    3                    4                    5
5. What do you know about community-based PAC (CBPAC) techniques?  
1                    2                    3                    4                    5
6. How well do you understand the strengths and weaknesses of CBPAC?  
1                    2                    3                    4                    5
7. How well do you understand the terms “passive” and “active” PAC?  
1                    2                    3                    4                    5
8. How well do you know how to set up CBPAC systems?  
1                    2                    3                    4                    5
9. How well do you feel you would be able to maintain CBPAC systems?  
1                    2                    3                    4                    5
10. How well do you feel you would be able to train others in CBPAC techniques?  
1                    2                    3                    4                    5

#### Daily course evaluation

Please give a score that reflects how you feel about today’s course for each of the following:

- Course organisation
- Course facilitation
- Course content
- Food & accommodation
- Whole package

1=poor and 5=excellent

**APPENDIX 4. Evaluation of current Problem Animal Control techniques**

Four current methods of PAC were identified on day one of the course as the main strategies for dealing with problem animals in Lupande GMA. Each of these methods was critically assessed by the participants, giving rise to the tables displayed below.

**Control shooting**

Control shooting is the killing of a problem animal, usually to destroy a problem individual, and to deter other animals associated with it. Control shooting is usually carried out by employees of the wildlife authority who travel to villages where persistent elephant problems have been reported.

<b>Benefits</b>	<b>Problems</b>
Meat to communities	Small share of meat
Effective in the short term (2 weeks)	Not effective for primates
Can destroy problem individual	Delay in getting permission to shoot an animal
	Problem individual often not shot
	Loss of trophy revenues

**Disturbance shooting/blasting**

Disturbance shooting is the firing of shots over a crop-raiding elephants head. The sound of the gun is used to scare the elephants away. Disturbance shooting is usually carried out by employees of the wildlife authority, who travel to villages where elephant problems have been reported.

<b>Benefits</b>	<b>Problems</b>
Short-term effective	Elephants get used to it
Effective on most animals	Expensive
	Difficult to source ammunition
	Communities want animals killed, not scared
	No benefits to community
	Scared animals may endanger people

**Electric fencing**

Electric fencing can be a highly effective means of protecting crops from elephants. A high-voltage electric fence is erected around the perimeter of the fields, preventing elephants from entering the fields.

<b>Benefits</b>	<b>Problems</b>
Almost 100% effective	High maintenance
Creates employment through maintenance	Expensive
Improved food security through effective crop protection	Expels trophy animals-no revenues or meat
Controls the spread of settlement	Displaces the problem to other areas
Safety from dangerous animals	No incentive to maintain in the off-season
	Wire used for snares when not maintained
	Jealousy among community
	Ownership issues
	Top-down approach to HWC problem
	Reduces community access to resources
	Misuse of equipment-battery charging, etc.
	Controls the spread of settlements
	No responsibility within the community for solving the conflict problem

**Traditional methods**

Traditional methods of PAC include burning fires at the edge of the fields, beating drums and flinging stones and burning branches at approaching elephants.

<b>Benefits</b>	<b>Problems</b>
Cheap	High risk-no backup
No maintenance	Labour intensive
Avoids politics-no community ownership issues	Environmentally degrading
Respond to problem immediately	Only short-term effective
People are responsible for problem	Some methods, e.g. trenches, are a danger.
People are available	Some methods, e.g. snaring, are illegal
No technical concerns	Some methods, e.g. skinning baboons, are cruel
	Sleeping in fields increases the risks of Malaria

## **APPENDIX 5. Terms of Reference**

### **Objective**

To provide training to 14 people selected from among SLAMU staff, Agricultural Extension Officers and Community-Based Scouts in a suite of methods that might be adopted by farmers to reduce human-wildlife conflicts.

### **Terms of reference**

1. Meet the area manager (SLAMU) or his deputy and B Msimuko of the SLAMU CBNRM unit and brief them on the purpose, content and duration of the training.
2. Conduct classroom seminars with trainees to develop a mutual understanding of HWC problems (social, ecological, political, economic) in Lupande GMA; current methods employed by SLAMU and farmers to manage conflict. Introduce new methods of mitigating HWC as developed by MZEP.
3. Provide trainees with practical training in the MZEP suite of HWC mitigation methods through the establishment of demonstration sites in VAG areas close to the South Luangwa Park boundary in Jumbe, Kakumbi and Malama chiefdoms. Two demonstration sites per chiefdom, and one in each of six VAGs is desirable, but this may be modified to what is feasible.
4. Through classroom and field site seminars develop a simple system that will enable trainers to monitor and measure the effectiveness of the HWC mitigation methods adopted at the demonstration sites and by other farmers wishing to use the MZEP method.
5. Through classroom and field site seminars determine which items of equipment can be manufactured by farmers and which have to be supplied from external sources.
6. Provide the SLAMU CBNRM unit with sufficient supplies of the raw materials needed to maintain the demonstration sites for 12 months.
7. Discuss and agree with trainees a workplan for monitoring the demonstration plots and disseminating the MZEP method of HWC mitigation over the next 12 months.
8. Meet with SAKA/Malambo Drama Group and agree the script for the HWC play and develop a budget for a total of 6 performances.

### **Outputs**

The following outputs were agreed upon at the beginning of the contract:

1. Detailed description of training delivered.
2. Participant's evaluation of the training.
3. Work plan and budget.
4. Play budget.
5. Recommendations.

## APPENDIX 6. Work plan

### *Immediate actions*

These actions were drawn up by participants and MZEP staff on day four of the course. They represent a straightforward and immediate plan that can be implemented by the participants with little effort.

- The responsibility for monitoring demonstration plots will fall to the following course participants living close to each of the sites:

Lewis Sakala (Kakumbi WCS CC) in Kakumbi;  
Timothy Banda (Nsefu CBS) in Nsefu; and,  
Batwell Mwale (Malama CBS) in Malama.

- Monitors will visit the demonstration sites weekly and will write a detailed report to the specifications displayed in Appendix 7. It was established that monitoring is essential not only for evaluating the effectiveness of the system, but also to ensure it is well maintained and not sabotaged.
- Malama Njobvu will coordinate the monitoring efforts and will store all reports at SLAMU CBNRM offices. He will also be responsible for the remaining PAC equipment.

### *Long term actions*

The long-term actions have been developed by MZEP in discussion with Mike Jones. These relate to the long-term actions of MZEP within Lupande GMA.

- 1) Demonstration plots should be used as test sites for new innovations. The design should be modified to test new ideas.
- 2) Demonstration plots should be provided with equipment necessary to maintain them for the coming season. This material should be sourced locally, but in the meantime MZEP may provide materials for the upkeep of the demonstration plots ONLY.
- 3) All equipment should be sourced locally, and alternatives must be found for any component of the CBPAC method that is not available in Lupande GMA.
- 4) The PAC play developed by the theatre group SEKA should be implemented at all demonstration plots as part of a community field day to promote the concept.
- 5) A chilli-growing programme should be established to encourage farmers to grow PAC chillies. There is a need for a commercial element to act as an incentive. Local markets for dry chillies must be explored and secured at the outset.
- 6) A survey of attitudes of local people towards elephants should be conducted to ascertain public opinion. An extension of this should be to explore the community perceptions of the costs and benefits of living with elephants. This data will be invaluable in monitoring attitude shifts with changes in management, and for influencing policy.

## **Appendix 7. CBPAC Monitoring Report**

**Reporter's name:** Write your name here

**Report date:** indicate the date of the report here

**Incident date:** indicate the date of the incident here

**Location:** Give the name of the village and the Chiefdom

**Farmer:** Write the name of the farmer here

**Problem animal:** Write the type of problem animal here

**Number of animals:** Write the number of problem animals here

**Description of incident:** Describe exactly what happened when the problem animal approached the fields. What time was it? Did the farmer witness it himself? How did the problem animal react to the demonstration plot? Was there any other PAC, e.g. burning chillies? Was there crop damage?

## APPENDIX 8. Photographs

A participant recaps the previous day's activities during the theory session.



Farmers from Nsefu gather for a community meeting to discuss CBPAC.



A course participant explains the procedure for implementing CBPAC methods.



Course participants demonstrate the construction of CBPAC fencing.

