

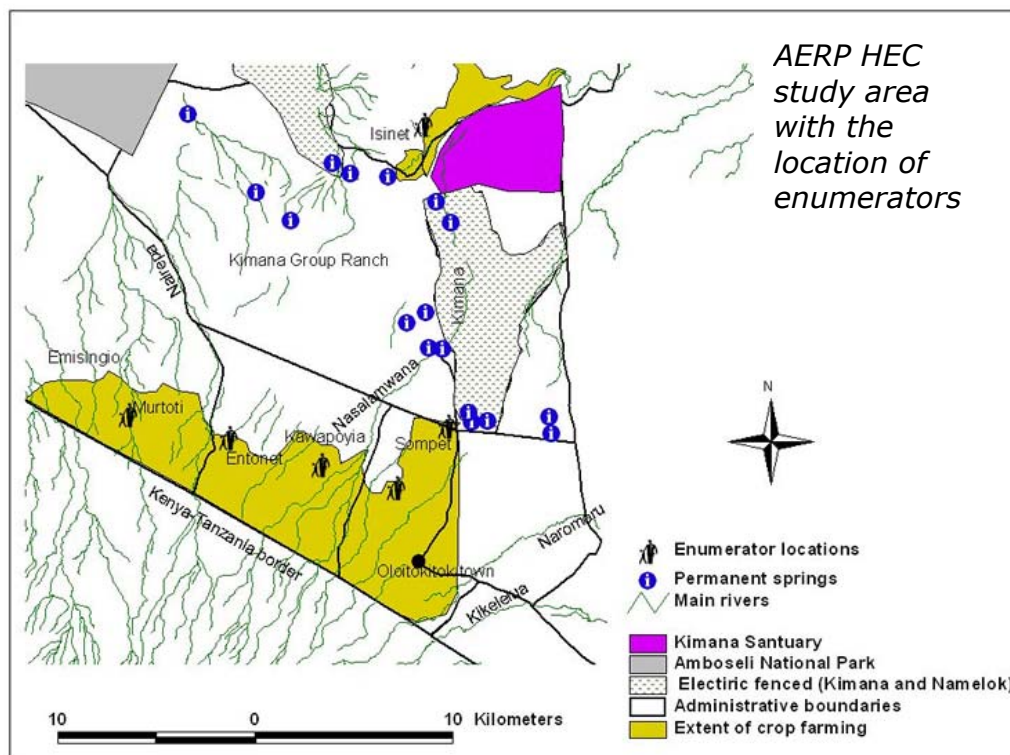
MITIGATING HUMAN-ELEPHANT CONFLICT IN THE AMBOSELI ECOSYSTEM, KENYA SUMMARY TESTING OF DETERRENTS YEAR 1

AERP HEC project, May 2006

In an attempt to reduce the level of elephant crop damage in the Amboseli area, and to further inspire the local community to co-exist with elephants, the Amboseli Elephant Research Project (AERP) initiated the project "Mitigating Human-Elephant Conflict in the Amboseli ecosystem, Kenya", collaborating closely with Kenya Wildlife Service and School for Field Studies. The project was supported by US Fish and Wildlife Service, International Fund for Animal Welfare and Born Free Foundation. The project's core objectives were to develop, test and introduce various deterrents, and to empower community groups to cope better with crop-raiding elephants. Experience from other HEC efforts was systematically integrated into the creative process of introducing inexpensive deterrents and deterrent user regimes.

The project was meant as a 3 year activity, but was terminated after less than 1,5 year because of lack of funding. Statements and conclusions in this summary should therefore be seen as preliminary, meant as basis for the planned comprehensive continuation of the project.

Local ownership and collaboration proved to be vital for the project. Early warning and well-organized mitigation is obviously necessary to surprise, prevent habituation and to possibly "out-smart" the elephants.



1. TEST OF ARRAY OF FIREWORKS

Elephants are sensitive to loud noises, especially when they are taken by surprise. We tested how elephants in crop fields reacted to fireworks that produced both sound and light. Initial tests were so successful that use of firewood to light “elephant bonfires” declined radically. The most efficient types of fireworks were the candle lights (1.2.) and the commando bombs (1.3.).

The farmers, who previously attempted to frighten elephants with burning logs, stated: “We do not need to go and cut firewood for guarding; we can now easily chase elephants using fireworks”. In the crop fields where we tested the use of fireworks, farmers stated that: “We have stayed for a long time without seeing elephants in our farms since we started using fireworks, nowadays we are guaranteed of harvesting crops like maize”.

We do believe, however, that in the long-term, elephants may become habituated to fireworks, and there will be a need to alternate fireworks with other deterrents.

The price for an assortment of fireworks ranged from Kshs 30 (USD 0.40) to 100 (USD 1.33), well within financial reach of farmers in the Amboseli region.



1.1. "Rocket" type firework



1.2. "Candle light" colored shots, ignited and directed towards elephants



1.3.
*"Commando bombs" ignited
and thrown towards attempted
crop raiding elephants.*

2. AIR PRESSURE HORN

The HEC project developed a simple air pressure horn that could be used to surprise or frighten elephants before entering the crop fields. Pressurized air is held in used refrigerator cylinders, parts that would otherwise be thrown away and possibly pollute. The horns were acquired from local garages.

The air pressure horn equipment was used alternately with other deterrents to avoid possible elephant habituation to the sound.

Approx. cost for the first few pilot sound devices were Kshs 4,000 (USD 55), with the air release/handle as the most expensive part.



*Air pressure horn used to deter
elephants from crop fields.*



3. EARLY WARNING TRIP WIRE SYSTEM

Wire triggered alarms were set around or adjacent crop fields and were successful in alerting farmers before elephants entered farmlands. The material for setting up a trip wire as early warning system includes a binding wire, electric wire, bicycle alarm and posts. A toggle switch is attached to the binding wire set along an elephant path or around a farmland. Once an elephant pushes the binding wire in bid to enter a crop field, the toggle switch is pushed and this triggers the alarm. The system was originally developed on Sri Lanka.

The HEC project trained members of the vigilante groups to assemble and manage the trip wires. While it is easy to set up trip wires, and cost for the materials is relatively low, about USD 32 per acre (280 m strip), they are prone to community management deficiencies. Where individual farmers set up own trip wires around their crop fields, the system worked best, as a consequence of "ownership" and thereby better management.

There is need for constant follow-up and maintenance of the trip wire. For instance, re-connecting the wires if detached by elephants, clearing vegetation along the fence-line/wire, and replacing worn out alarm batteries.

We observed that the trip wires at times acted as physiological barriers to elephants, they retreated upon approaching the trip wires and then walked along the wire-line. They may have perceived the trip wire to be electrified.



Farmers in Isinet setting up a trip wire system.



A double trip wire system with the alarms set inside the farmer's house.

4. ELEPHANT OBSERVATION TOWER

Observation towers are vantage points from where farmers can detect approaching elephants. This strategy seemed to work if the tower was set along paths frequented by elephants as they approached farmlands. The farmers need to have powerful torches, normally powered by 4×D size batteries. A network of watchtowers is useful as farmers can send signals to one another e.g. using torches to alert each other of approaching elephants. Such towers proved to be critical in the AERP HEC project since there was a tendency for some elephant groups to move to neighboring farmlands when they were chased away from another. The cost of constructing a watchtower ranged from as low as Kshs 200 (USD 3) if the farmers were able to acquire poles on their land, to about Kshs 1500 (USD 20) if they had to purchase them.



Farmers erect an observation tower near farmlands in Oloitokitok area.

5. CHILI-TOBACCO ROPES

Trials funded by WWF in Mozambique and Kenya's Trans-mara District have shown that a concoction of used vehicle oil, ground chili and tobacco, smeared on ropes surrounding fields, barred elephants from crop raiding. Similar results have been observed in Zimbabwe. We initiated similar trials in the Oloitokitok area near Amboseli. Farmers set the ropes across elephant trails approaching farmlands. On close encounter with the ropes the elephants would either be repelled or would walk round them. Farmers who had surrounded their farms with the ropes successfully kept elephants out of their farms. This method is best suited to cases where the farms are isolated in small parcels or where elephant approach to crop fields is confined to specific trails.

Elephants are known not to eat either chili or tobacco plants and chili is thought to be an irritant to the sensitive nasal tissue. Once confronted with a chili experience, the combined smell from the oil, chili and tobacco on the ropes becomes a psychological barrier.

Setting up a chili-tobacco rope

Nylon ropes (12 mm thick) are recommended since they last relatively long. Sisal ropes are, however, a cheaper substitute. In the Oloitokitok area, we used proportions of 1 kg chili and 1 kg tobacco mixed in 20 litres of used engine oil. The concoction is applied on the ropes on a weekly basis. For the supporting posts, we recommend that farmers plant trees (such as *Commiphora africana*) that will root, this ensures that they don't periodically have to cut trees to replace the poles.



Chili-tobacco rope enclosing a bean farm to keep elephants away.

Approx. cost a of chili-tobacco rope per acre (280 m) crop field

Materials	Cost (USD)
Sisal rope (280m)	24
Posts (14)	Available locally
Tobacco (1 kg)	4
20 litre engine oil	2
Chili powder (1 kg)	2
Total (USD)	32

You will find more about the project on

www.elephantvoices.org/index.php?topic=tools&topic2=tools/hec_aerp.html