

**Project Title:** Reducing Human Elephant Conflict by using a mixture of Tobacco dust and cow dung as an olfactory repellent to deter elephants from crop raiding

**Project location and country:** Kwekwe, Zimbabwe

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**Project Start and Completion Date:** November 2023 to June 2024

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## **Project Summary**

Crop raiding by elephants is the most common form of human-elephant conflict which results in the killing or capture of elephants, devastating economic losses for farmers and even loss of human lives (Hedges and Gunaryadi, 2009). Crop raiding by elephants has become a handicap to the possibility of peaceful coexistence between free-ranging elephants and neighboring human communities around the Midlands Black Rhino Conservancy in Kwekwe, Zimbabwe. Under the frame of this project, work was undertaken to reduce crop raiding by elephants using a mixture of tobacco dust and cow dung mixture as an olfactory repellent. Using the tobacco dust cow dung mixture, 100 farmers from communities surrounding the Midlands Black Rhino Conservancy were supported to establish boundaries between free ranging elephants and crop fields and farmers homesteads. This is a relatively new approach to managing human-elephant conflict with a huge potential to reduce crop raiding incidences and the number of elephants killed or captured during crop raiding as well as mitigate loss of human lives.

## **Conservation issue**

Crop raiding by free ranging elephants from the Midlands Black Rhino Conservancy is accelerating human-elephant conflict with surrounding communities. This has threatened the sustainability of the elephants as the conflict sometimes results in the killing or capture of elephants and devastating economic losses for farmers. At times, there is loss of human lives when farmers retaliate to avoid devastating economic losses. Human-elephant conflicts are becoming more frequent, fatal and widespread as human populations grow and habitats are lost around the Midlands Black Rhino Conservancy. When elephants raid crops, not only are they posing posing a direct threat to their safety and well being, but also to the livelihoods of local farmers. Retaliation against elephant crop raiding poses a serious threat to elephant survival and impedes conservation efforts by the Midlands Black Rhino Conservancy. In view of this, it is vital to support communities around the Midlands Black Rhino Conservancy to reduce Human-elephant conflicts and conserve the elephants through the use of tobacco dust and cow dung mixture as an olfactory repellent.

Below is a picture of an elephant roaming the communities before project intervention (courtesy of Mr Moyo)



## **Project Aim and Objectives**

### AIM

The aim of the project was to mitigate human -elephant conflict and conserve the elephants by using tobacco dust and cow dung mixture as an olfactory repellent to deter elephants from crop raiding.

### Objectives

The objectives of the project were to:

- (i) reduce crop raiding incidences by elephants
- (ii) teach elephants to stay away from farmed crops
- (iii) reduce the number of elephants killed or captured by farmers
- (iii) reduce human elephant conflict thereby decreasing the number of human lives lost from human-elephant conflicts.

### **Activities/Methods**

The project supported 100 farmers from communities surrounding the Midlands Black Rhino Conservancy to establish memory fence dynamics for effective long-term human-elephant conflict mitigation. The farmers were supported on using a mixture of 50% tobacco dust and 50% cow dung to deter elephants at a much further distance from the crop fields and farmers homesteads. Using this mixture, elephants were kept in the president's corridor. Each farmer was provided with 50kg of tobacco dust and taught to prepare the mixture using the locally available cow dung from the farmers. The mixture was kept wet by watering it once a week. Dry tobacco dust smells more when it is moist, making it an effective olfactory repellent. Using cow dung helped to improve moisture retention of the mixture thereby enhancing the quality of the olfactory repellent. 5Kg portions of the mixture were put in sacks and suspended in trees to mark boundaries at distances of at least one kilometer from the crop fields and homesteads.

Before the project intervention, a baseline survey was conducted to establish the frequency of



incidences of crop raids by elephants, number of elephants killed or captured by the farmers and the number of human lives lost due to human-elephant conflicts emanating from crop raiding. The survey also determined the average farmer's crop yields. Results from the survey were used to evaluate the success of the project. After the project intervention, a brief survey involving interviewing local farmers was carried out to establish the frequency of incidences of crop raids by elephants, number of elephants killed or captured by the farmers and the number of human lives lost due to human-elephant conflicts emanating from crop raiding.

**Figure 1:** Heap of Cow Dung at one of the farmers' homesteads



**Figure 2:** Lorry transporting tobacco dust to local farmers' homesteads





**Figure 3:** Local farmers enjoying training proceedings on using tobacco dust cow dung mixture



**Figure 4:** Farmers pointing the route which elephants usually follow when coming to their fields and homesteads





**Figure 5:** Local Farmers at the end of one field where elephants usually pass through en route to homesteads and other fields



**Figure 6:** 5kg portion of the tobacco dust cow dung mixture suspended in a tree in a field near a farmers homestead



## Results

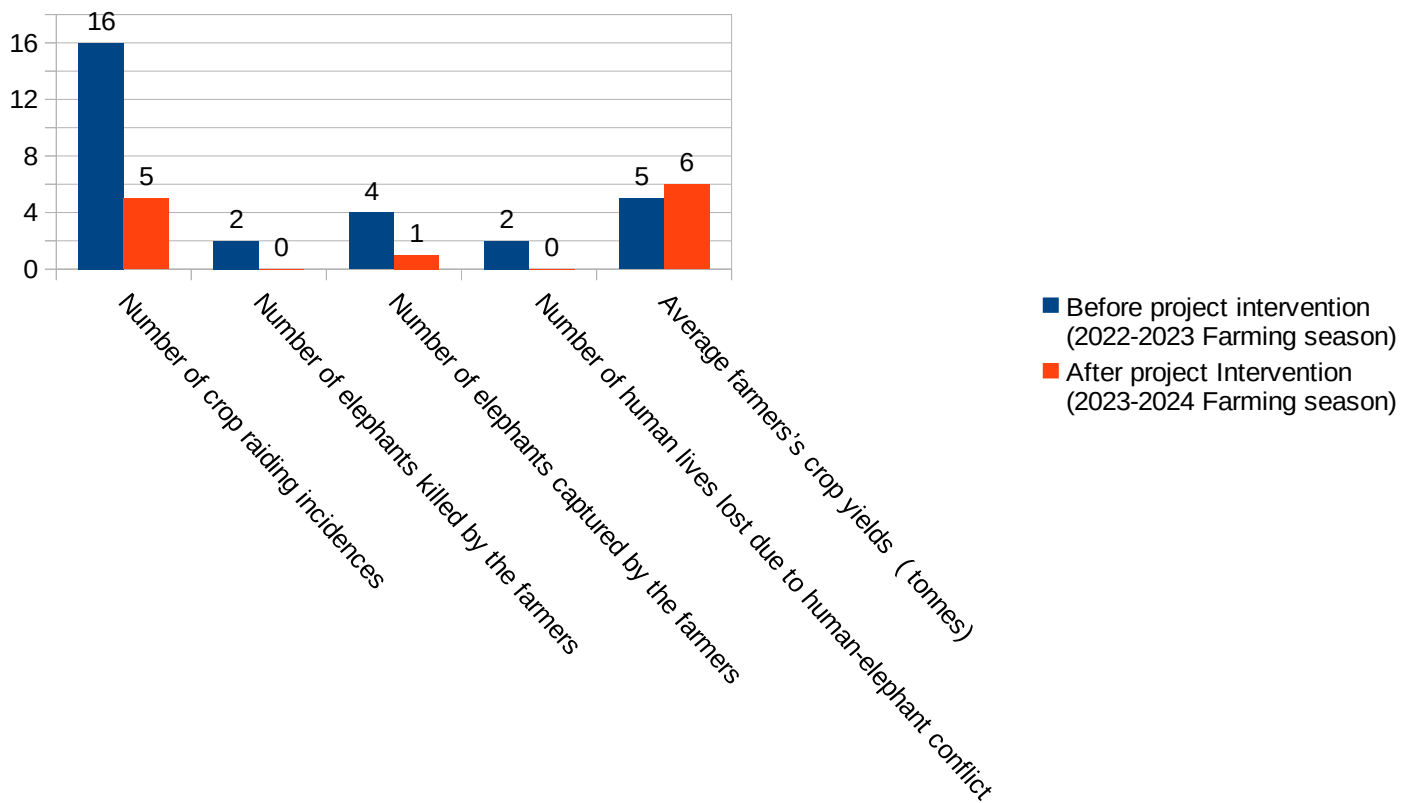
The project results indicate that the mixture of tobacco dust and cow dung is an effective olfactory repellent which considerably reduced crop raiding incidences as elephants stayed away from farmed crops. As indicated in the following table, the number of crop raiding incidences significantly reduced from 16 to 5. This is attributed to the mixture of tobacco dust and cow dung being an effective olfactory repellent that managed to deter elephants from crop raiding and visiting farmers homesteads. Elephants managed to respect the boundaries which were marked by the mixture of tobacco dust and cow dung. The reduction in crop raiding incidences resulted in one elephant being captured by farmers compared to 4 the previous farming season before project intervention. No elephant was killed compared to 2 before the project intervention. After the project intervention, there were no human lives lost compared to 2 that happened before project intervention. The average farmers's crop yields however slightly increased from 5 tonnes to 6. This small reduction is largely attributed to the ravaging drought experienced during the 2023-2024 farming season. Farmers were expecting an average yield of 8 tonnes due to reduced crop raiding incidences, but there was a small increase from 5 to 6 tonnes due to the unexpected drought.

**Table showing frequency of human-elephant conflicts before and after project intervention**

	<b>Before project intervention (2022-2023 Farming season)</b>	<b>After project Intervention (2023-2024 Farming season)</b>
Number of crop raiding incidences	16	5
Number of elephants killed by the farmers	2	0
Number of elephants captured by the farmers	4	1
Number of human lives lost due to human-elephant conflict	2	0
Average farmers's crop yields ( tonnes)	5	6



Frequency of human-elephant conflicts before and after project intervention



### Project Success Evaluation

The success of this project was evaluated by determining the frequency of incidences of crop raids by the elephants after project intervention and compared to data from the baseline survey.

The number of elephants killed or captured by the farmers before and after the intervention showed a considerable decrease which is a good indicator of the success of the project. Additionally, the number of human lives lost due to human-elephant conflict emanating from crop raiding significantly decreased indicating success of the project. Most importantly, the human elephant conflict decreased due to a significant drop in crop raiding incidences.

## **Conclusion**

The mixture of tobacco dust and cow dung is an effective olfactory repellent which can deter elephants from crop raiding. This relatively new approach to managing human-elephant conflict has huge potential to reduce crop raiding incidences and reduce human-elephant conflict. The mixture of tobacco dust and cow dung showed great success in reducing the number of elephants killed or captured during crop raiding as well as mitigate loss of human lives. The project provided a distinctive approach which popularised the use of tobacco dust and locally available cow dung mixture as an olfactory repellent to deter elephants from crop raiding activities. By so doing, the human elephant conflict was reduced, consequently leading to a decline in the number of captured or killed elephants and reduced human life loss. The project promoted the sustainability of the elephants through establishing memory fence dynamics for effective long-term human-elephant conflict mitigation. The project taught elephants to respect established boundaries and to stay away from farmed crops using non lethal methods. Most importantly, the project advanced Jana Robeyst's dream and passion of conserving elephants.

## **Way Forward**

Although the project was highly successful, we suggest that additional tests are needed to evaluate the mixture of tobacco dust and cow dung under a variety of conditions eg changing the percentage contributions of the mixture from 50:50. Such tests should consider things like cost and practicality relative to other crop deterrent mechanisms. Once that has been done, farmers may be taught how to plant tobacco and make their own tobacco crop and make dust in the communities as a sustainability measure. Once farmers are able to grow their own tobacco and make the tobacco dust, the use of the locally available cow dung and tobacco dust mixture as an olfactory repellent can further be popularised across several communities and throughout the country.

## **Acknowledgement**

Environment and Wildlife Hub acknowledges and greatly appreciates the financial support received from Jana Robeyst Trust to successfully implement the project. Once again, thank you to Jana Robeyst for advancing elephant conservation and mitigating human-elephant conflict. This work will be published in a peer reviewed journal and support from Jana Robeyst Trust will be greatly metioned.



**We thank you Jana Robeyst Trust**

**From Professor Phillip Taru and the Environment and Wildlife Hub Team**