

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Elizabeth Naliaka Wakoli
<b>Project Title</b>	Human Wildlife Conflicts in Conservancies Within the Mara Ecosystem, Kenya
<b>Application ID</b>	30057-2
<b>Date of this Report</b>	May 2022

**1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.**

Objective	Not achieved	Partially achieved	Fully achieved	Comments
To establish model predator proof kraal as a mitigation measure for livestock depredation				Two predator proof kraals were set up in Siana conservancy. This was a hands-on activity that community members were involved in to learn about material requirements, costs involved and general procedures of setting up. In the process of setting up the predator proof bomas (PPB) It was realised that the PPBs were cost effective and affordable by most community members, in that the total cost for setting up enhanced kraal was equivalent to price of two mature cows - in simple terms a farmer needed to sell two cattle to get sufficient revenue required to purchase materials for setting up a single PPB that could accommodate several livestock and offer enhanced protection from invasion by carnivores.
To monitor human wildlife conflicts in the selected conservancies: Olkinyei, Naboisho, Olare orok Siana				<p>From analysis of gathered data on human wildlife conflict (HWC), livestock depredation was the most prevalent form of HWC in the four selected conservancies. It was apparent that all livestock species were vulnerable to depredation; however, the most attacked species was sheep, followed by goat and lastly cows resulting to economic losses to the community. In most cases numerous sheep and goats were attacked and either killed or injured in a single depredation incident.</p> <p>Seasonality did not have much influence on livestock depredation patterns within the selected conservancies, implying that livestock depredation was widespread throughout the year irrespective of the season.</p> <p>In terms of conservancy where depredation incidences occurred a slight variation was detected in terms of place of attack. Although in most cases the incidences occurred in the grazing fields and inside</p>

			<p>traditional bomas, a few cases occurred in predator proof bomas, which seemed to be effective in controlling predation, however only few community members in Olkinyei and Siana conservancies had embraced this initiative, whereas none existed in Naboisho and Olare Orok conservancy. Therefore, this subject matter on predator proof bomas could be taken up as an item in education and awareness programme, to inform the larger community members on enhanced preventive measures on livestock depredation.</p>
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**2. Describe the three most important outcomes of your project.**

- a) Establishment of two predator proof bomas as model for mitigating livestock depredation.



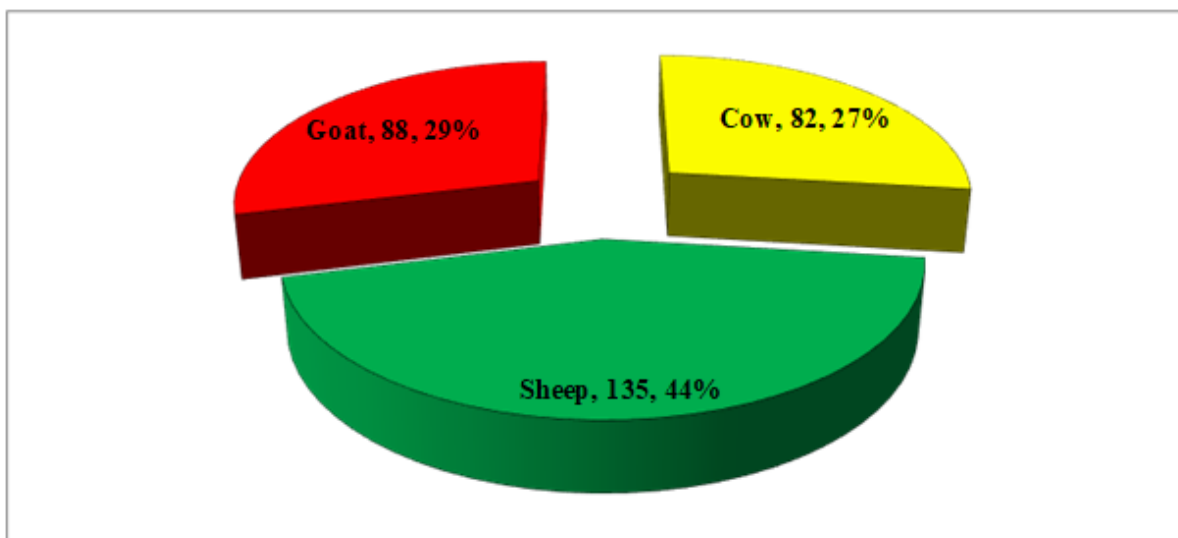
**Figure 1:** Construction of predator proof Kraal/Boma in Siana conservancy



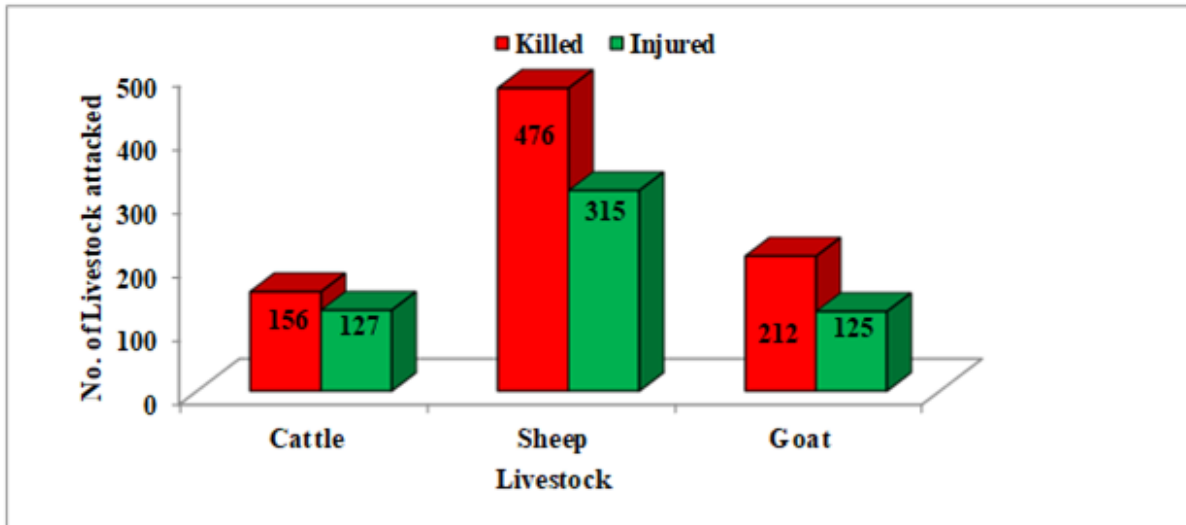
**Figure 2:** A completed predator proof Kraal/Boma in Siana conservancy

**b) Establishment of Livestock depredation pattern:**

A total of 305 cases of livestock depredation were recorded between January and December 2021. Of these incidents 44% involved attacks on sheep, 29% on goats and 27% on cows (Figure 3). In these cases, 1411 animals were documented to have either been killed or injured. This translated to an average of four animals attacked in a single livestock depredation incident, and at least three animals attacked in a single day. Sheep (56%) formed the most attacked livestock, followed by goats (24%) and cattle (20%).



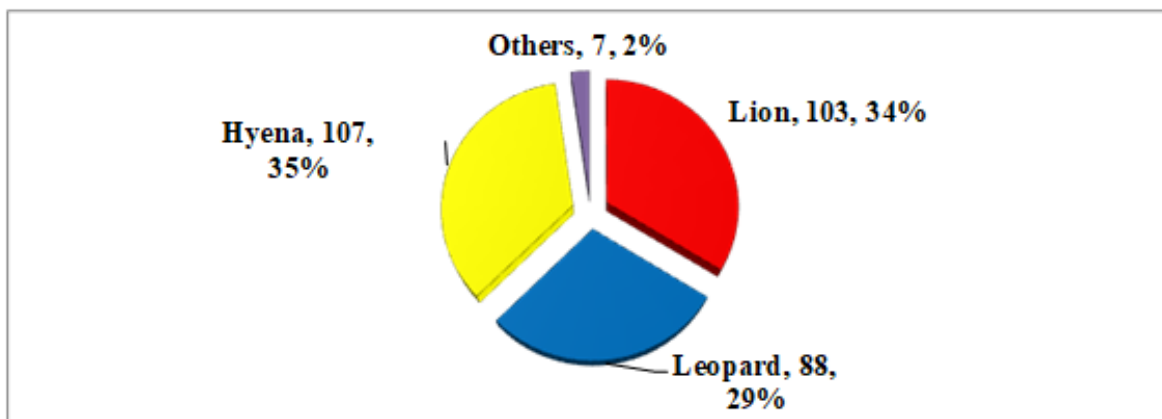
**Figure 3:** Livestock depredation incidences and the livestock attacked.



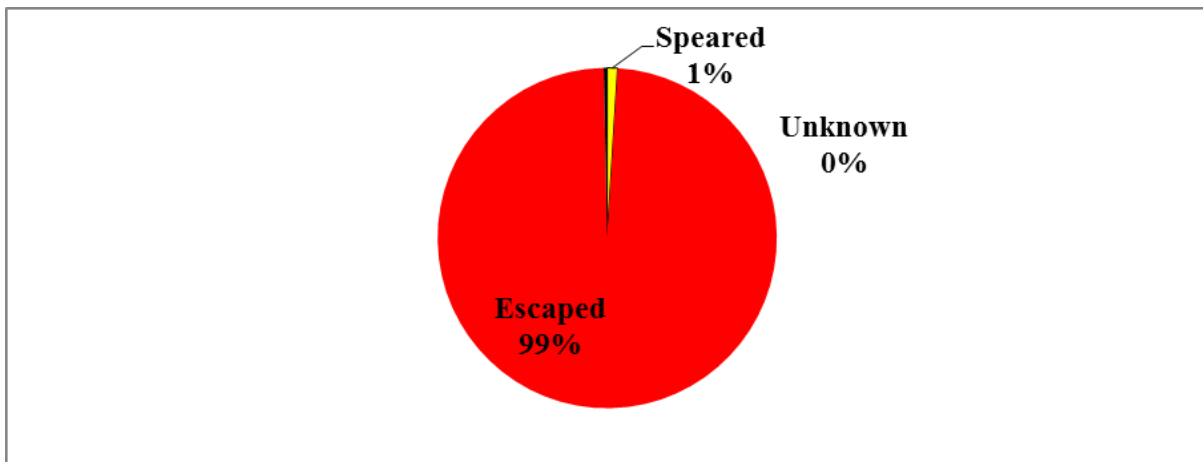
**Figure 4:** Number of livestock attacked during the assessment period

**Carnivore species involved in the attacks and the status**

Hyenas (35.1%) and lions (33.8%) were the most problematic wild animal species involved in livestock depredation. Leopard contributed to 28.9% of the attacks, while other carnivorous species attributed to the remaining 2.3% of the livestock depredation incidences (Figure 5). During the incidences, most predators involved (99%) escaped from attack site, while remaining 1% of depredation incidences the predators were netted and speared by community members in retaliation, leaving them dead or severely injured. Figure 5 & 6.



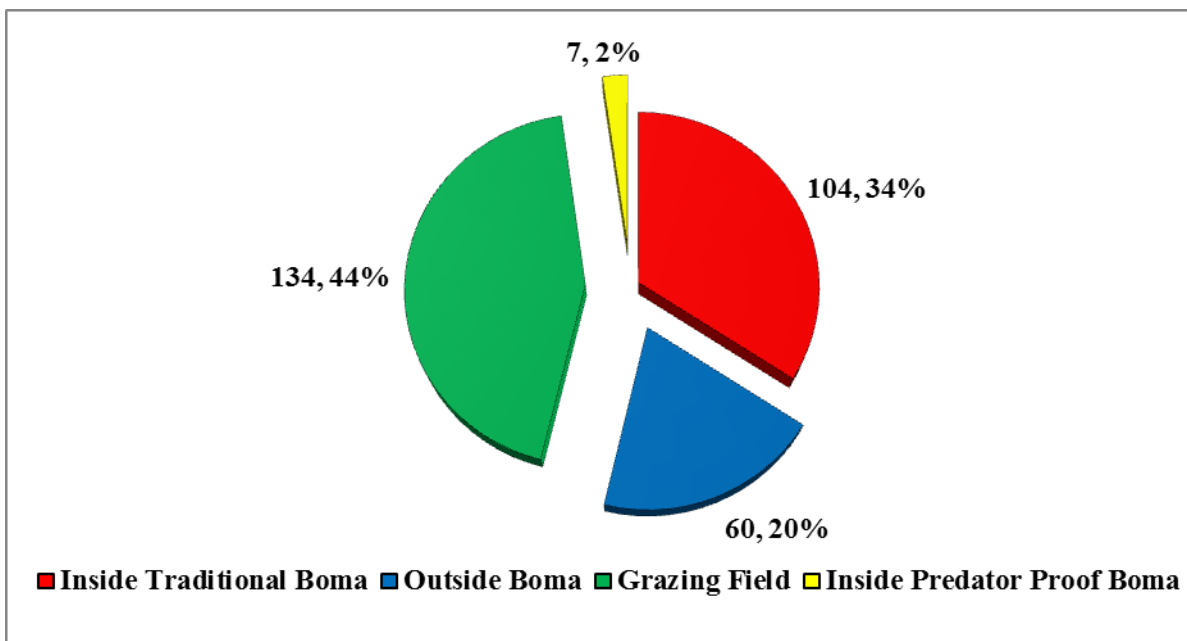
**Figure 51:** Predator species involved in livestock depredation



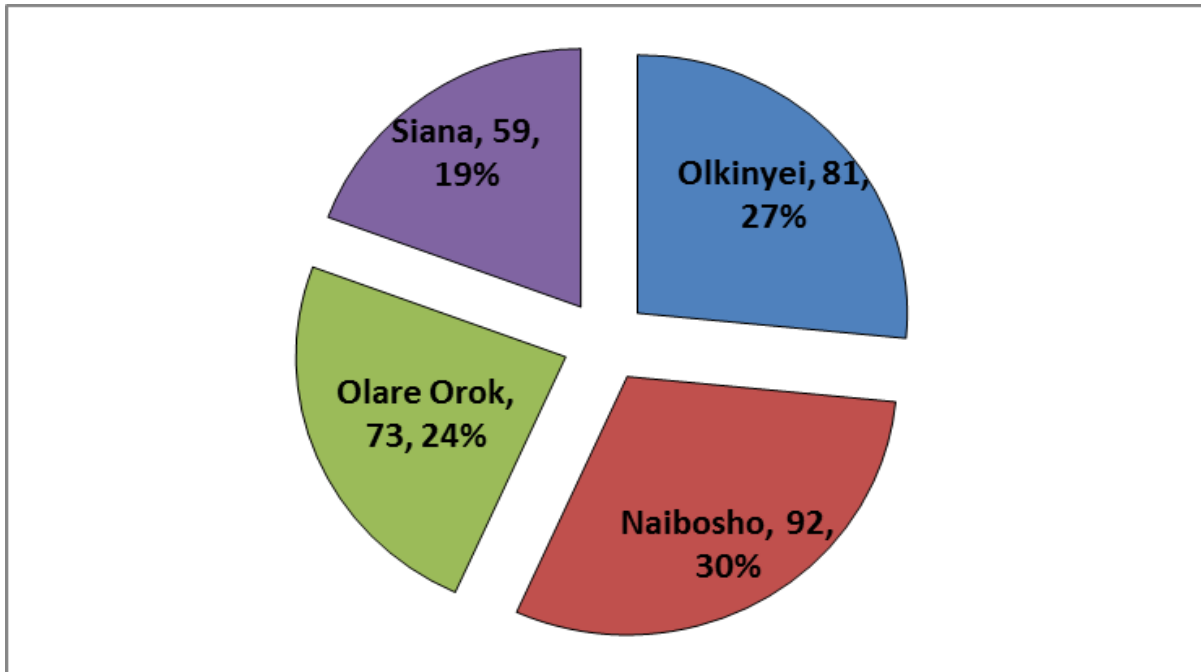
**Figure 62:** Status of predator after attack

### Location of attack

Livestock were more vulnerable to predation while in grazing fields (44%) or while herded inside traditional kraals (34%), as compared to inside predator proof kraals (7%) or those left outside the Kraals (20%) (Figure 7). In terms of incidences in the selected conservancies, Naboisho (30%) and Olkinyei (27%) recorded highest number of attacks compared to Siana (19%) and Olare Orok (24%), (Figure 8). Cases in respective conservancies could be closely associated with the conservancy sizes, whereby the more extensive a conservancy was in size the more the incidences. This could be attributed to the herd size as well as larger concentration of carnivores.



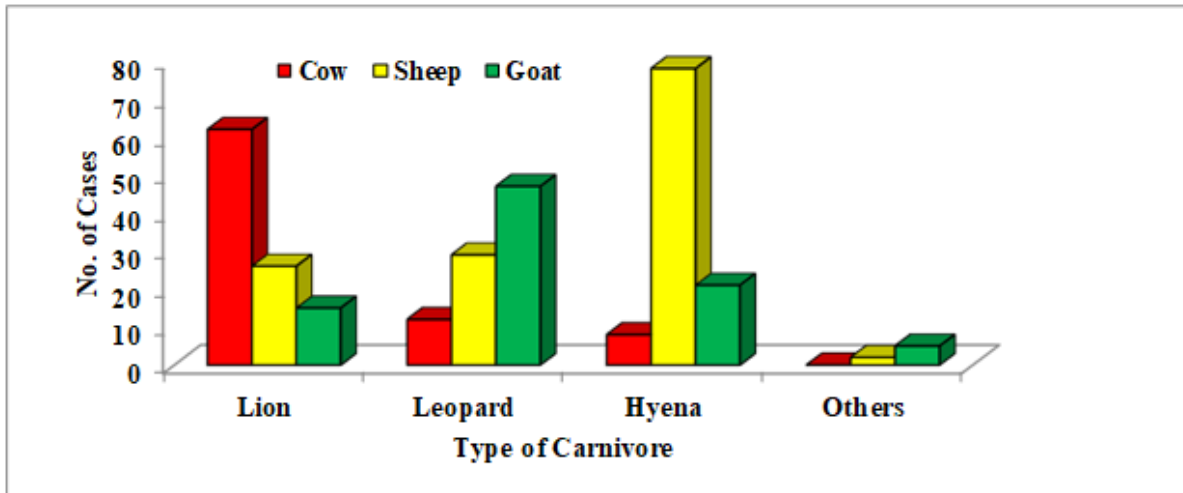
**Figure 7:** Location of attack.



**Figure 83:** Depredation incidences in respective conservancies.

In terms of carnivore species involved in depreddation incidences, seasonality seemed to slightly influence problem carnivore species ( $\chi^2 = 45.972$ ,  $df = 33$ ,  $p < 0.066$ ). Lions and hyaenas tend to be more ferocious in April to June, a period that coincided with rainy/wet seasons compared to leopards and other carnivore species. However, livestock species attacked did not vary with seasons ( $\chi^2 = 21.308$ ,  $df = 22$ ,  $p < 0.502$ ), implying that all livestock were at risk of attack irrespective of the season.

A close association was detected between carnivore species and the livestock it attacked ( $\chi^2 = 129.532$ ,  $df = 6$ ,  $p < 0.000$ ). Lions attacked more cows than sheep and goats; leopards predated more goats than sheep and cows, whereas hyaenas attacked more sheep than goats and cows (Figure 9 and 10). These results could be used to predict carnivore species involved in livestock depreddation events.



**Figure 9:** Type of Carnivore involved

**3. Explain any unforeseen difficulties that arose during the project and how these were tackled.**

**Covid-19 outbreak**

The outbreak and surge of Covid-19 in 2020 delayed commencement of the project activities. Data collection period was deferred by 4 months. However, the research had already liaised with the field assistants to record any incidences of depredation. Primary data collection was therefore backed up by secondary data from conservancy managers and field assistants.

**4. Describe the involvement of local communities and how they have benefitted from the project.**

**Construction of Predator Proof Bomas (PPBs):** The local community members were involved in the entire process of setting up Predator Proof Bomas (Kraal). They participated in identification of suitable sites, in the setting up activity and monitoring of depredation incidences in the bomas.

**Data Collection:** The project selected two local community members to help in data collection through monitoring of HWC incidences and administration of questionnaires. Selected research assistants also helped in mobilising local community members to attend sensitisation meetings. In some conservancies the area chiefs were also involved in organising the Focus Group Discussion (FGDs) meetings since local communities had confidence in them.

**Awareness:** The project team, took the opportunity during Focus Group Discussions to sensitise and create awareness among community members on different ways in which the community could co-exist with wildlife, by highlighting human wildlife conflict mitigation measures to enable them to manage HWC.



## **5. Are there any plans to continue this work?**

Yes, I intend to expand the project to involve five additional conservancies not covered in the current phase, in order to gain better understanding of the dynamics of human-wildlife conflicts. Information obtained from the selected conservancies will provide more insights to causes and patterns of human wildlife conflicts, in the different parts of the Mara ecosystem. Additionally, there is need to upscale interventions/ mitigation measures against specific prevalent forms of human wildlife conflicts, for instance the use of predator proof bomas in mitigating livestock depredation. Not only has the measure proved effective in keeping predators at bay but also affordable to community members in terms of material costs as well as assembling and establishment.

In line with this, there is a general and intense need to sensitise communities about the predator proof bomas as an effective alternative to traditional bomas that are easily accessible by predators.

Furthermore, introduction of relatively new measures such as "eye mark" painting in the hindquarters of cattle to prevent attacks of livestock while in grazing fields has been tried elsewhere and therefore it would be vital to also give an attempt to assess its effectiveness as prevention measures, to address livestock depredation particularly during the day when livestock are grazing fields.

Additionally, measures like breed improvement need to be introduced to community members, to address the need to address issues with herd size and managing other challenges experienced by communities. As matters related to climate change adversely affects the pastoralist community.

## **6. How do you plan to share the results of your work with others?**

- Present findings of the studies in one of the conferences.
- Publish findings of the studies in peer reviewed journals.
- Share general information about HWC in Mara ecosystem in through local radio station programmes to reach out to the public.

## **7. Looking ahead, what do you feel are the important next steps?**

- Expand the project to five more conservancies not covered in the first and second phase.
- Carry out more sensitisation and awareness creation on effectiveness of PPB in mitigating HCC.
- Build two more PPB as to act as model and a way of encouraging more community members to set up PPB, and to rally other partners to embrace PPB as a sustainable mitigation measure compared to other strategies which could be short term and not sustainable.

- Carry out the “eye Mark Painting” on cattle as a way of scaring predators during the day in the grazing field and monitor its effectiveness
- Encourage livestock breed improvement as a way of managing herd quality and size, that would not only address livestock depredation menace but also challenges related to effects climate change, particularly in dry spells, and as a way to conform the dynamics of land ownership and sizes.

**8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?**

Yes, the logo was used on data collection materials like the monitoring forms, attendance list and programmes during sensitisation.

Yes, The Rufford Foundation was given publicity in that the project team underscored and acknowledged support provided by Rufford Foundation by funding the project to enable implementation of activities. This was done in all the community sensitisation and awareness meetings, Focus Group Discussions, Monitoring of the effectiveness of PPBs, PPB construction and questionnaire survey, where the local community and respondents were informed about the funding organisation of the project being The Rufford Foundation.

**9. Provide a full list of all the members of your team and their role in the project.**

Member	Role
Elizabeth Naliaka Wakoli	<ul style="list-style-type: none"> <li>• Team Leader (Principal Researcher)</li> <li>• Carry out Focus Group Discussion</li> <li>• Monitoring of Human Carnivore Conflict (HCC) cases</li> <li>• Report writing</li> <li>• Results dissemination</li> <li>• Coordination during predator proof Boma Construction,</li> <li>• Monitoring of Bomas</li> </ul>
Dorothy Masiga Syallow	<ul style="list-style-type: none"> <li>• Researcher</li> <li>• Community interviews through Questionnaires</li> <li>• Interviews with Key respondents</li> <li>• Mapping of conflicts</li> <li>• Report Writing</li> <li>• Results dissemination</li> <li>• Community Sensitization and awareness creation</li> </ul>
Evans Sitati	Coordination in <ul style="list-style-type: none"> <li>• sourcing of building materials for PPB,</li> <li>• identification of strategic sites for construction of PPB</li> </ul>

	<ul style="list-style-type: none"> <li>• Construction of PPB</li> <li>• Helped in monitoring of HCC cases in PPB</li> </ul>
Elijah Sikona (Research Assistant)	<ul style="list-style-type: none"> <li>• Help in data collection through questionnaires, (in some areas they did translation of the questions from English into Maa Language) interview guides</li> <li>• Guided in the field since they understood the terrain so well Recording of HWC incidences on monitoring sheets</li> <li>• They acted as a link between the researchers and the community members in areas where area chiefs were not readily available thus winning the confidence of the locals</li> <li>• Monitoring cases of Human Carnivore Conflict in Predator proof Bomas</li> </ul>
Nicholus Kaleku (Research Assistant)	
Benjamin Ntaiya (Chief)	<ul style="list-style-type: none"> <li>• They were the link between the researchers and the local communities</li> <li>• Helped in organizing for community barazas for Focus Group Discussion (FDGs),</li> <li>• Organize the meeting with the key respondents (Village Elders) from the community</li> <li>• Participate in identification of sites for PPB construction</li> </ul>
Peter Nakola (Chief)	
Johnson Kulet (Assistant Chief)	

### 10. Any other comments?

We (Elizabeth and Dorothy) would like to sincerely thank The Rufford Foundation for granting funds for the second phase of the research. This enabled us to improve on the first phase research by introducing the Predator Proof Bomas which have proved to be effective in mitigating livestock depredation at night. We are now thinking of the next course of action which can address human carnivore conflict (HCC) cases in the grazing field during the day apart from sensitising the local community to embrace predator proof bomas as a way of enhancing security to their livestock herds at night and establish more on their own.

The research team has also made an appointment with the local radio station (which broadcast in Maa Language) to share the results with the local community at a larger scale. Any further use of information from this research Rufford will be notified prior.