

In partnership with Kenya Wildlife Trust and Save The Elephants – Elephants and Bees Project

**One-acre Beehive Fence Project - Kamungi Conservancy**

**Final Report**

**August 2018**

**Period Covered: March 2018 – August 2018**

*NB This Final report follows the Progress Report which covered the period  
September 2017 – February 2018*

**Due: 04 September 2018**

**Project Title:** One-acre Beehive Fence Project - Kamungi Conservancy

**Grantee:** Forix Foundation

**Total Budget:** \$4,876

**Grant Term:** 1 Year (September of 2017 through August of 2018)

**Project Reporting Dates:** From: March 2018 To: August 2018

**Organization:** Tsavo Trust

**Project Lead:** Vanessa Moller



**Summarize Project** – Include what the deliverable is and who is key in making sure it is achieved

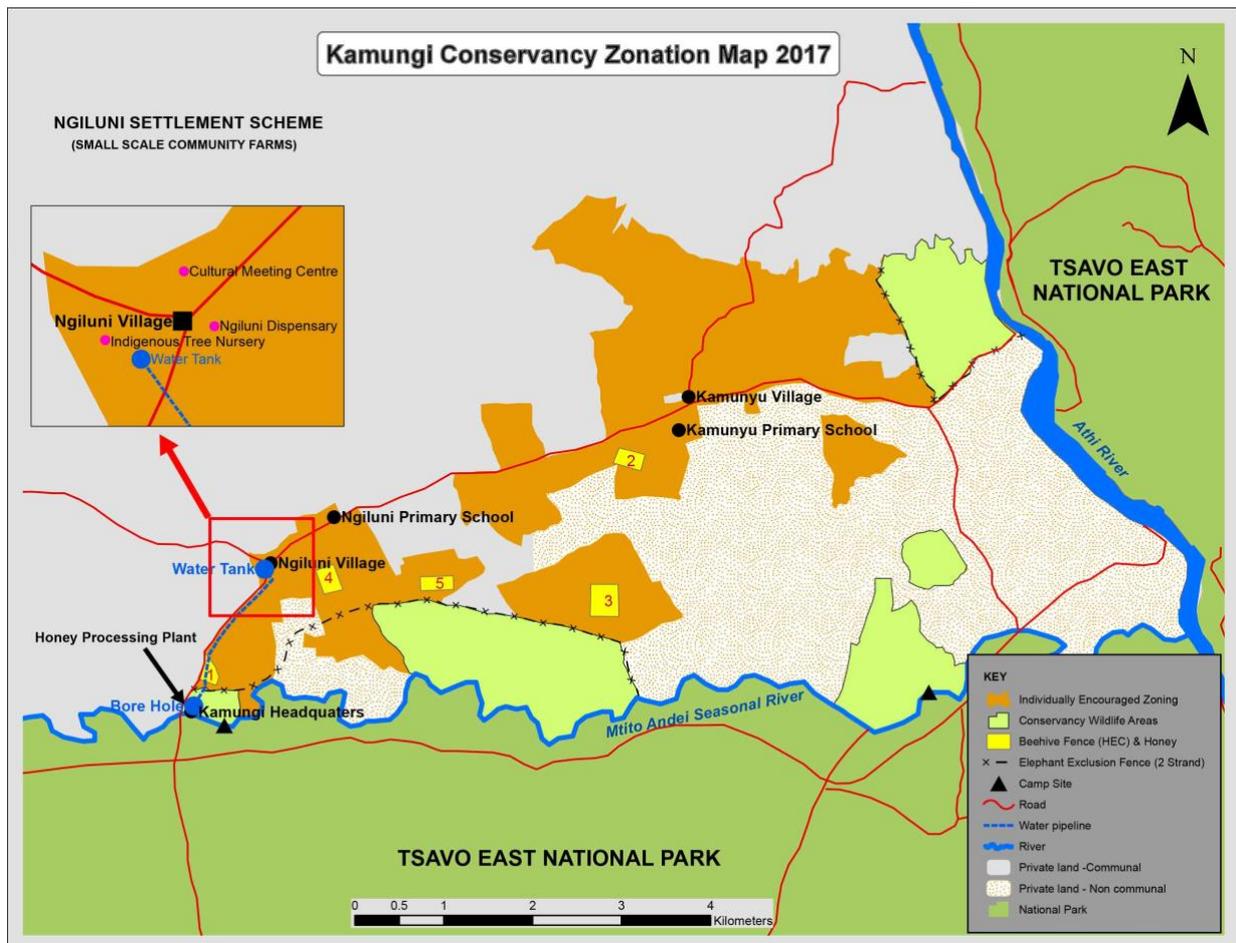
Tsavo Trust in collaboration with Dr. Lucy King and her renowned Elephants and Bees Project (supported by Save The Elephants) and members of the Kamungi Conservancy community installed a Beehive Fence around one acre of farmland in the Kamungi Conservancy bordering Tsavo East National Park.

The outcomes Tsavo Trust hope to achieve are:

- To reduce elephant crop-raiding in Kamungi Conservancy as a result of the fences
- To generate a secondary income from the production of “elephant-friendly honey”
- To improve human tolerance towards elephants in the concession
- To substantially improve the yield from protected crops as well as improved quality of production
- To reduce the number of elephants and people wounded or killed as a result of ‘home made’ deterrents such as throwing rocks, arrows and spears.

In addition to setting up the Beehive Fence, Tsavo Trust are providing ongoing advice, support and maintenance to the recipient farmer for one year.

**Location of Beehive Fenced farms in Kamungi Conservancy – December 2017**



**Work Plan / Progress** - List steps which have been achieved and to what end up to the date of this report. List issues that have arisen which may have (or maybe will occur) which will impact, either positively or negatively the outcome of the project.

**September 2017 to February 2018**

Please see Progress Report

**March 2018 to August 2018**

After the construction of the fence in November 2017 and the first hive occupations, the work plan for the period between March and August 2018 focused on the maintenance of the fence and the monitoring of the bees and the Human-Elephant Conflict, as well as the creation of databases to collect the monitoring information in a more systematic and structured way.

Monitoring of the fence condition and the most important aspects related to the hives, such as: new occupations, abandonment events or the need for a super box, was done approximately every two weeks during the rainy season, when the bees were more active and new occupation events were likely to happen, and once a month in the dry season.

The abundant 2018 April-May rains encouraged the farmer to grow cowpeas and green beans. Both crops reached maturity and could be harvested. However, there were a few elephant visits to the farm that caused damages to the crops.

The data from the monitoring is gathered in the hive occupation and crop raid data bases (see annex 1 and 2).

Save The Elephants (STE) beehive fence experts visited the Kamungi beehive fences to assist Tsavo Trust with all the data collection and the first honey harvesting in June 2018. The 2018 April-May rainy season has been the second rainy season since the fence was constructed. Therefore, as STE had advised us, beehives could be ready to harvest. Out of the 3 beehives with super boxes, one was ready to harvest. It did not have much honey but given that the hives were less than a year old, it was within the expected amount.

- April 2018 - Creation of databases for beehive fence and crop raids monitoring
- June 2018 - Creation of a crop-raid database in ArcGIS.
- 15/07/2018 - Honey harvesting
- 16/07/2018 - Honey processing
- 21/08/2018 – KES 675 (USD 6.75) paid to farmer for 1.5 kilos of raw honey

**June 2018 – Save The Elephants visit**

Dr. Lucy King and her team visited Tsavo Trust and Kamungi Conservancy over three days in June 2018 to visit the beehive Fence farms, offer assistance and training on beehive and fence maintenance, data collection and management, set up of honey processing equipment, and assist in honey harvesting and processing.

- The STE team sat with Igoa and Joseph and looked at through data sheets and lists of beehives occupied

- In June 2018 93% of hives were occupied – a very exciting and promising result. This dropped to 67% in August, which is still good, and a drop in occupancy is expected during the drier weather.
- Two night work events took place, sorting out super boxes, helping with problem hives and harvesting 2 hives (2 full bars and 4 half bars were harvested)
- The team processed the honey showing the Tsavo Trust team how to work all the machines, sterilize the jars and keep everything clean. This resulted in 3 jars of Elephant-Friendly Honey (1.5kg) just using old jam jars sterilized in boiling water and then the oven. It tastes heavenly!
- A full crop-raid assessment was carried out on two farms. Joseph arranged for some farmers to help fix it damaged sections of fences.
- The STE team brought up gloves and boiler suits to wear under the bee-suits for extra protection (so easy to buy and it boosts confidence with no stings getting through).

**Staffing** - Account for staffing which has affected the project: who is involved, what needs are going unmet, if any, and the dollar cost of any additional personnel required.

Project Leader – Vanessa Moller. Oversight of Tsavo Trust’s beehive fence project, Vanessa provides leadership and resolves any major issues experienced with the fence. Vanessa is in regular communications with Save The Elephants beehive fence experts and is currently focusing on implementing the honey processing element of this project.

Community Liaison Officer – Joseph Mutiso. Responsibly for liaison with the farmer, and data collection for Beehive Occupation and Elephant Movement records. Joseph was instrumental in the construction of this fence, having had experience constructing other Beehive fences in Kamungi Conservancy earlier in the year. Joseph regularly reports on the any fence issues and maintenance and submits data records on a regular basis.

Intern – Igoa Gorostola. Igoa joined Tsavo Trust as an intern in April 2018. She has a degree in Environmental Sciences. Igoa been very involved with all aspects of the project, from beehive fence monitoring and maintenance, crop raids assessment, data collection and management, honey harvesting and processing, and ongoing assistance to Joseph Mutiso in communicating with the farmers.

Development Officer –Nic Cahill. Proposal and report writing, assistance to Project Leader, project co-ordination and development.

**Budget** - Attach a copy of the original budget and account for what portion has been used on each item. While the ‘burn rate’ is sometimes heavier at the start of the project, please flag any items which are creating risks for the project or if there has been a need to reallocate funds within the project.

Copy of budget attached. Notes to budget for period March 2018 to August 2018:

**Honey Processing Equipment – Overspend of \$144**

As indicated in the Progress Report, the budget amount of \$50 was exceeded, the cost for this budget line was \$194, an overspend of \$144.

### **Request for re-allocation of funds budgeted for motorcycle purchase - \$475**

In the Progress Report, Tsavo Trust requested that the \$250 funds budgeted for a motorcycle (as well as the budget lines for motorbike insurance (\$100), and fuel and maintenance (\$125)), be re-allocated towards part purchase of a second-hand pick-up estimated at \$10,000, to be purchased instead, whereby Tsavo Trust will pay for the balance to accomplish this purchase. A vehicle is yet to be purchased.

### **Overall Budget underspend – Request for re-allocation of funds budgeted for motorcycle purchase - \$328**

Tsavo Trust request that the balance of the unspent funds \$475 be re-allocated to cover the overspend of **\$144 and \$3** on Honey Processing Equipment, and **\$328** towards transport costs associated with farm visits for beehive fence maintenance and monitoring, honey harvesting and crop raid assessments.

**Other Funding** - If there are any problems with other sources of funding for the project at this time that should also be noted here.

N/a

**Milestones Current** - Discuss milestones and/or actionable items which have been achieved at the writing of this report. Flag issues, if any, which came up in achieving this goal.

#### **Construction:**

November 2017

#### **Activity and event timeline March-August – 2018**

April 2018	Creation of a database for events related to the beehive fence: new occupations, abandonment events, crop-raids, honey harvesting, etc.
16 April 2018	Two elephant visits. Didn't go inside the fence.
21 May 2018	Elephant crop-raid.
26 May 2018	Elephant crop-raid.
27 May 2018	Elephant crop-raid.
June 2018	Farmer harvested cowpeas and green beans.
June 2018	Creation of a crop-raid database in ArcGIS.
06 June 2018	Visit from STE professionals with further training on fence and crop-raid monitoring and honey harvesting.
06 June 2018	New working equipment arrived.
23 June 2018	Elephant crop-raid.
12 July 2018	Honey jars arrived.
15 July 2018	First honey harvesting.

#### **Issues and Maintenance:**

This farmer works hard to keep his fence in good condition. He and two other farmers with beehive fences have agreed to meet regularly and help each other with their fence maintenance.

Water provision is still a challenge, but the farmer is aware of the importance of water supply for the survival of the beehives throughout the dry season.

Interviewing of the farmer to ensure accurate records of crop-raiding needs improvement. Accurate reporting is vital for data and evaluating the effectiveness or shortfalls of the fence. Interviewing techniques and data collection is an area being worked on.

Transport of beehives and beehive equipment can only take place when Tsavo Trust HQ vehicle is not deployed elsewhere. A dedicated Beehive Fence vehicle such as a Suzuki Carry would be ideal as a dedicated vehicle for this project, however, given the relatively small scale of the project, it has possible, but not ideal, to manage transport with an HQ vehicle.

**Crop:**

The farmer has grown cowpeas and green beans, inside and outside the beehive fence. Due to the abundant rainfall it has been possible to harvest both crops.

**Honey Harvesting:**

For the first time, some honey was harvested. One of the three hives with super boxes was ready to harvest in mid-July. The farmer got 1,5 kg of honey, which was sold to Tsavo Trust at a price of KES 450 (\$4.50) per kilo. The two other hives had no honey, but bees have already built the combs so if next rainy season is good, they are expected to be harvested too.



**Extracting honey in a temporary honey room**



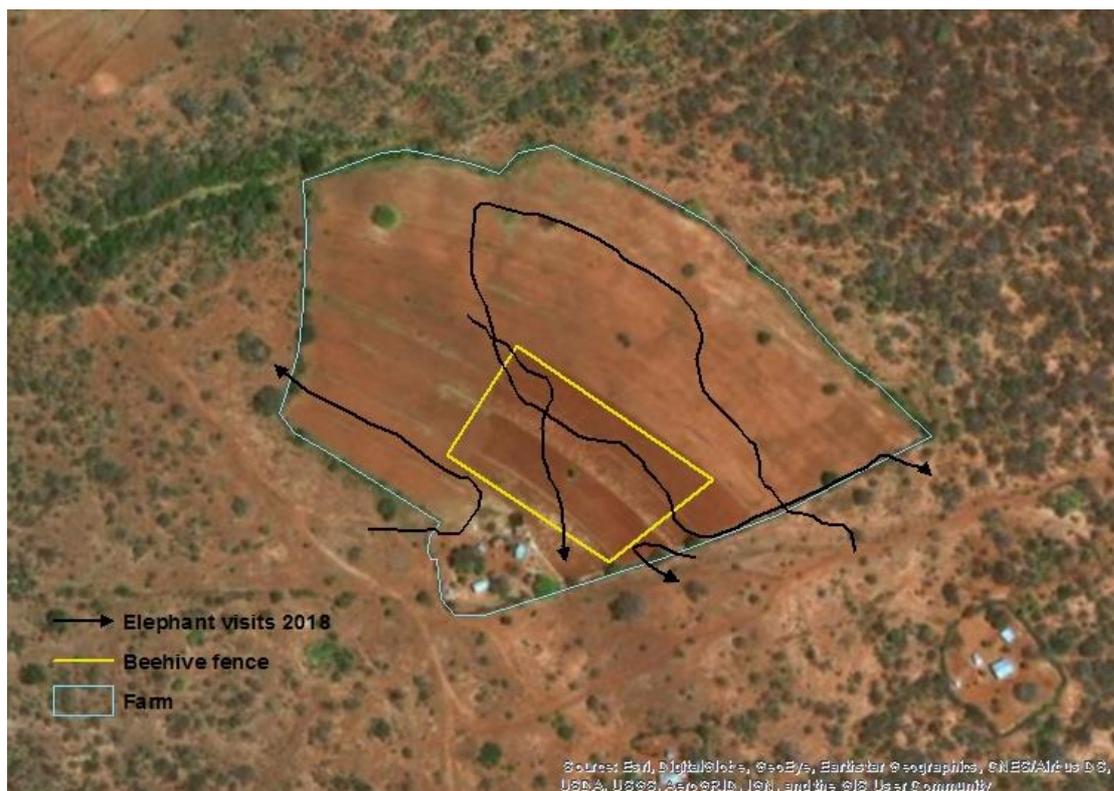
**De-capping a bar of recently harvested honey, and filtering the extracted honey**

### **Beehive Occupation Records:**

In the dry season the weakest colonies left so there were only 3 beehives occupied in March. At the end of April, after the first rains, 5 beehives were occupied, and this number grew to 14 in May. As expected, during July and August some beehives were abandoned, and the farmer has currently 10 active hives.

### **Elephant Movement Records:**

The farmer reported 6 elephant visits to the farm between April and June. In 2 cases, a lone elephant and a group of more than 6 individuals ate crops growing outside the fence but didn't go inside it. The farmer said that both times elephants were looking at the fence but didn't dare to go in. In the other 4 cases elephants did break the fence and eat the crops inside. The tracks of the elephants after one of this crop-raids revealed that 2 of them walked around the fence, from one side to the other, before deciding to break in, which shows they didn't feel comfortable about the bees. It was not possible to follow the elephant tracks of the other crop-raids, given the delay in reporting them to Tsavo Trust. It's important to note that the farmer has notified every elephant crop-raid, but he hasn't been so precise about the elephant visits where the animals didn't cause any damage. Tsavo Trust have again explained about the importance of reporting every elephant approach to his farm and he has promised to report every elephant visit.



**This picture shows only 4 of the 6 elephant visits to the farm. The farmer didn't witness the 2 other crop-raids and he reported them too late to be able to follow the tracks.**



**Elephant crop raid 16/04/2018. One elephant ate crops outside the fence.**

**Milestones Future** - List milestones and/or actionable items expected to be completed by the next reporting period.

**Ongoing:**

- fence maintenance and records
- beehives monitoring, maintenance, and records
- honey collection and processing
- crop raid reporting and assessments

**September 2018:**

- Training new Community Conservancy Administrator on all aspects of Beehive Fence Project
- Training farmer to grow non-palatable crops for elephants around the fence and crops or plants beneficial for bees, such as sunflowers.
- Funding proposal for dedicated Beehive Fence Project vehicle – Suzuki Carry vehicle or similar.

**October/November 2018:**

- Visit by Dr. Lucy King and STE Beehive Fence project specialists for assistance, training and project development.
- Development of records, and data analysis, including more detailed reporting with GIS mapping.
- Purchase of raw honey, processing and sale of processed honey to continue when applicable. Next expected harvest to take place following anticipated October/November 2018 rains.

**December 2018**

- Construction of an insect proof honey processing room complete with water catchment system and one 10,000-liter water tank. Pending approval of funding application. Construction time, approximately 6 weeks.

**Opinion** - The project leader should include his/her analysis on the overall progress of the project, weigh in with any issues or variations which have occurred or are expected to occur. Include the next date of reporting due, if applicable. Photo inclusions are encouraged whenever possible.

After the first rains in March 2018, the hive occupation increased very fast: from the 3 colonies that survived the previous dry season, by the beginning of May 2018 the farmer had 14 active hives. At the end of August 2018, there were still 10 colonies in the fence, which is a promising number.

There have been some elephant approaches to the farm. Sometimes elephants were deterred by the fence and left without causing any serious damage. Other times elephants did go inside the fence, but what we could see by following the tracks is that elephants do think twice before going in.

Despite the high occupation, most of the hives were recently occupied when the crop-raids happened, which means that the colonies were still not strong enough to defend themselves. We expect that next rainy season, when crops are growing, the older and stronger colonies will improve the effectiveness of the fence.

Communication with the farmer has been an issue too. He reported every crop-raid but failed to notify other elephant approaches on time, which resulted in some gaps in the data collection. He's been reminded to call us after any elephant signs in his farm.

We also have plans to organize a meeting with all the farmers to improve communication between Tsavo Trust and the owners of the beehive fences. A new Community Conservancy Administrator will start working on the Beehive Fence Project soon, so this will also help to improve the data collection and monitoring process.

This farmer has kept his fence in good condition since the beginning, but honey harvesting has had a positive impact in his attitude. Getting some income from the beehives, even if it wasn't much, has increased his interest and commitment with the project notably. He's now waiting for the next honey harvesting season with great expectation!

*With sincere appreciation and thanks to Forix Foundation for their generous support of Tsavo Trust and Kamungi Conservancy and our field conservation activities in the Tsavo Conservation Area, Kenya.*

**Richard Moller – TSAVO TRUST Chief Executive Officer**

### Annex 1. Hive occupation records

Beehive	Hive hang date	Colonised date	Event	Event2	Event3	Event4
J1	01-11-17	11.05.18				
J2	01-11-17	11.05.18	Abandoned 29.06.18			
J3	01-11-17	16.04.18	Put on super box 25.04.18	Checked for harvest (not ready) 15.07.18		
J4	01-11-17	17.04.18				
J5	01-11-17	17.04.18				
J6	01-11-17	11.05.18				
J7	01-11-17	11.05.18				
J8	01-11-17	16.04.18	Put on super box 25.04.18	Checked for harvest (not ready) 15.07.18		
J9	01-11-17	17.04.18	Abandoned 20.08.18			
J10	01-11-17					
J11	01-11-17	16.04.18	Put on super box 25.04.18	Harvested (5 bars) 15.07.18		
J12	01-11-17	11.05.18	Abandoned 31.07.18			
J13	01-11-17	11.05.18	Abandoned 31.07.18			
J14	01-11-17	11.05.18				
J15	01-11-17	11.05.18				

## Annex 2. Crop raid database

CR	Date	Day/ Night	Time	Moon Phase	Estimated number of elephants	Bulls/ Family	Mean hive occupatio n on raid night	Hives detering elephant Occupied	No. of Hives entered between occupied	No. Of hives Exited between occupied	Did not enter farm at all & deterred by Beehive Fence	Entered control area of farm but deterred from beehive fence	Broke Beehive Fence but did not enter farm	Initially deterred by Fence but walked along and entered farm	Entered farm through gap in Beehive Fence	Broke Beehive Fence and entered farm	Crops grown on farm	Age of crops	Quality of crops prior to raid	Severity of damage	Plants fed on	Plants left untouched	Additional deterrent methods to beehive fence	Notes
1	16/04/2018	Night	00:00	New moon	1	Bull	20.00%	2 out of 2	N/A	N/A	0	1	0	0	0	0	Cowpeas, green beans	Intermedi ate	Good	Low	Cowpeas	Green beans	None	The elephant ate the cowpeas growing outside the beehive fence
2	16/04/2018	Night	03:00	New moon	> 6	Unknown	20.00%	0 out of 2	N/A	N/A	0	> 6	0	0	0	0	Cowpeas, green beans	Intermedi ate	Good	Low	Cowpeas	Green beans	Yelling	The elephants ate the cowpeas growing outside the beehive fence
3	21/05/2018	Night	Unknown	Waxing	2	Unknown	93.33%	6 out of 7	2 out of 2	2 out of 2	0	0	0	0	0	2	Cowpeas, green beans	Intermedi ate	Good	Low	Cowpeas	Green beans	None	
4	26/05/2018	Night	23:00	Full moon	2	Unknown	93.33%										Cowpeas, green beans	Intermedi ate	Good					
5	27/05/2018	Night	02:00	Full moon	2	Unknown	93.33%										Cowpeas, green beans	Intermedi ate	Good					
6	23/06/2018	Night	Unknown	Waxing	Unknown	Unknown	93.33%		2 out of 2	2 out of 2						Unknown	Cowpeas, green beans	Mature	Good					Elephant enter J12 and J13. Out N° 2