

Title: Human-Wildlife Conflict: A Case Study on the Effectiveness of Beekeeping in the Sagalla Community (Southern Kenya), in Resolving the Human-Elephant Conflict.

Research Question: How effective is beehive fencing in minimizing elephant crop-raiding in the Mwakoma village of Eastern Tsavo?

Subject: World Studies, Environmental and Economic Sustainability, Biology and Geography

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INTRODUCTION

(A) Local Context

Due to the Kenyan ban on elephant hunting and ivory trading in 1973, the Tsavo elephant population has increased by 50% in 23 years (from 6,400 in 1988, to about 12,500 in 2011) (Shadrack “Status” 43). At the same time, the human population in Kenya has also increased by 17% since 1990 (“Population” World Bank). This has resulted in human encroachment into marginal lands inhabited by wildlife, leading to the fragmentation of wildlife areas, as well as the increase in settlements in elephant corridors (King “Beehive” 2). This has caused a series of human-wildlife issues including competition for water and grazing, livestock predation, increased risk of some livestock diseases, and even human and wildlife death (King “Beehive” 2). However, with the average African elephant eating as much as three-hundred kilograms of food per day, an increasing issue is that of elephant crop-raiding in small-rural farms (“Elephant” African Wildlife Foundation). This can be detrimental to impoverished farmers who depend on these crops for their income and livelihoods. According to Lucy King (a biologist and animal conservationist), a single crop-raid could strip a farmer of 20-30 bags of harvest, costing at least 200-500 US dollars (Raja “Busy” 40). To a poor Kenyan farmer, this can lead to poverty or famine. This conflict is also detrimental to elephants, who are sometimes killed or badly injured by farmers in retaliation for the destruction they cause.

Figure 1: Map of Human-Wildlife Conflict Hotspots in Kenya

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As seen in the graph, the Eastern Tsavo province (area of study) is one of the highest human-wildlife conflict zones in Kenya



Source: Makindi, Human-Wildlife Conflict: Causes and Mitigation measures in Tsavo Conservation Area, Kenya

The human-elephant conflict is an ongoing issue, which is necessary to resolve for several reasons. Firstly, elephants play a vital role in the African savanna food chain and maintain ecological harmony by ingesting and distributing seeds. This allows different plants to cross-fertilize. One study suggests that ninety different tree species alone, rely on elephants for propagation (Arceiz “Mega” 546). Elephants also contribute enormously to the Kenyan economy, with a single elephant generating an estimated 23,000 US dollars to the ecotourism industry each year (Platt “Elephants”). Lastly, elephants are essential to Kenyan culture and their heritage, having inhabited this area for millions of years (“Elephant” African Wildlife Foundation). Although the protection and conservation of elephants is crucial for these reasons, providing sufficient housing and development for the growing Kenyan population

(2.5% growth rate) is also necessary, as it can improve their standard of living, and raise many out of poverty (“Population” World Bank). Therefore, it is vital that humans and elephants learn to coexist amicably.

The Elephants and Bees Project is affiliated with Save the Elephants non-profit organization, and attempts to resolve this human-elephant conflict through an in-depth study of elephant behavior. Using the knowledge that elephants are repelled by the African Honey bee, Dr Lucy King was able to design a beehive fence structure in 2008, which is used as a natural elephant deterrent and can also improve the lives of impoverished rural communities through pollination of crops, and through the harvesting and selling of honey (King “Interaction” 31). This leads to the research question **“how effective is beehive fencing in minimizing elephant crop-raiding in the Mwakoma village of Eastern Tsavo?”** In order to tackle this question, this essay will approach the topic from both a biological perspective, focusing on elephant behaviour and crop-raiding prevention, as well as a geographical perspective, focusing on the socio-economic aspects of the beehives. Approaching this topic from both disciplines will allow a deeper understanding as to the impact of the Bees and Elephants Project, on both the elephants, local people and the environment they inhabit.

Figure 2: Beehive Fence Structure Using Kenyan Top Bar Hives

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*Source: King, Lucy. The interaction between the African elephant (*Loxodonta africana africana*) and the African honey bee (*Apis mellifera scutellata*) and its potential application as an elephant deterrent.*

Figure 3: The Beehive Fences in Action

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The beehive fence encloses the crops. When an elephant attempts to enter the farm by walking directly through the wire, it causes the beehives to shake and the bees to flee the hives. This scares the elephant, causing it to leave the farm.

*Source: Lucy. The interaction between the African elephant (*Loxodonta africana*) and the African honey bee (*Apis mellifera scutellata*) and its potential application as an elephant deterrent.*

Area of Study

Although there are hundreds of beehive fences set up in 12 African and Asian countries, this case study will focus on the Sagalla rural farming community in Voi district, southern Kenya (Douglas “Human”). Sagalla is located three kilometres away from the Tsavo East National Park boundary, which inhabits about 6200 elephants (King “Beehive” 3). These communities are especially vulnerable to elephant crop-raiding, as Sagalla is located in an elephant corridor, where elephants migrate out of Tsavo East and into Taita-Taveta county (King “Beehive” 3). More specifically, this study will focus on the Mwakoma village in Sagalla, which contains 150 households, and is on the front-line of the national park boundary (King “Beehive” 3). This area was chosen as elephant crop-raiding is high, and it is also where Lucy’s first beehive fences were set up and therefore contains the most data. It is also located near to the Elephants and Bees Research Centre. This is where research is conducted, the beehives are manufactured, the honey is processed, and the beehive products are made.

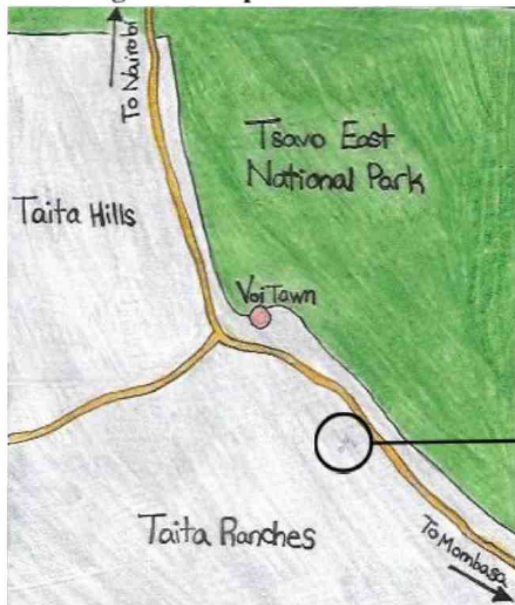
Figure 4: Map of Africa

Figure 5: Map of Kenya

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Source: Google Maps 2017

Figure 6: Map of Voi District



Source: Self Drawn Map by author based on King, The interaction between the African elephant (*Loxodonta africana africana*) and the African honey bee (*Apis mellifera scutellata*) and its potential application as an elephant deterrent.

*Note: Adam, Hesbon and Judith are the three farmers who were interviewed

Source: Google Maps 2017

Figure 7: Map of the Mwakoma Village (Area of Study)



Source: Self Drawn Map by author based on King, The interaction between the African elephant (*Loxodonta africana africana*) and the African honey bee (*Apis mellifera scutellata*) and its potential application as an elephant deterrent.

(B) Global Context

The human-wildlife conflict is a worldwide concern as it occurs in every region of the world. For example, rural villages neighbouring the Sengwa Wildlife Reserve in Zimbabwe lose 12% of their family's total income due to livestock depredation from lions and baboons (Elisa “Human” 6). A similar situation occurs in Karnataka (Southern India), where the Bhadra Tiger is responsible for the loss of 16% of the household income (Elisa “Human” 10). Farmers living near the Tambopata-Candamo Reserve (Peru), also experience an average loss of US\$96 per year due to crop-raiding from the Brazilian Tapir (Elisa “Human” 11). The consequences of the human-wildlife conflict are severe. Not only does it affect human populations by interfering with their livelihood, but it also negatively impacts wildlife. For example, 50% of plant and animal species are projected to become extinct by 2100 (“Mass”).

Although this investigation focuses on the Bees and Elephants Project in Southern Kenya, it extends beyond the small village of Mwakoma. This is due to the prevalence of the human-wildlife conflict worldwide, which makes this investigation of global importance. The beehive fence could therefore be used as an example of how innovation and nature-inspired solutions can help resolve the conflict between people and endangered wildlife.

(C) Research Methodologies

In an attempt to answer the research question thoroughly, both primary and secondary sources were utilized. The primary-source open-ended interviews were given to 3 local farmers on 3 of the 13 total beehive farms located in the Mwakoma village of Eastern Tsavo. These interviews attempted to cover four areas, including the farmers perception of elephants, their knowledge of the Elephants and Bees Project, their sense of ownership towards the beehives, and the farmers attitudes towards the project itself. Various members of the organization such as Emmanuel (a local who manages the beehives) and Lucy King (the founder and head of the project) were also informally interviewed. These interviews provided information on the project's perception towards the beehive fence limitations. This information is important to gather first hand, as it is not often included in the secondary source reports.

The secondary-source scientific publications also provide valuable data on elephant crop-raiding, the biology behind the animal behavior, and the socio-economic effects of the beehives.

BIOLOGICAL PERSPECTIVE

(A) Animal Behaviour

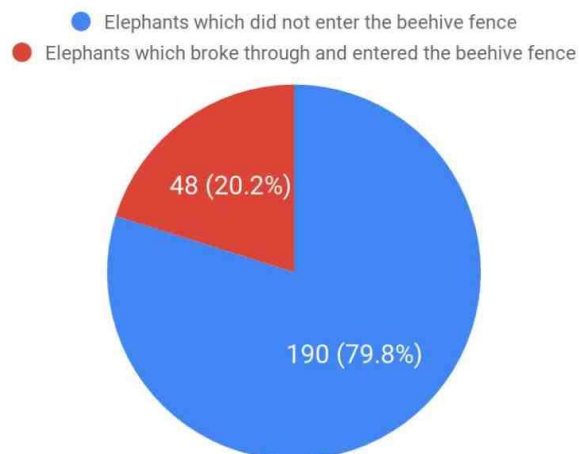
The beehive fence structure was designed after an indepth study on elephant behavior. First, it was noticed by Ian Douglas Hamilton (the founder of Save the Elephants and an iconic figure in Kenyan wildlife conservation), that elephants avoid feeding on acacia trees with natural beehives (King, “Interaction” 25). This led to a series of experiments, in which Lucy King and her team replayed recordings of bee sounds, to which the elephants exhibited distressed behaviours such as headshaking, dusting, and immediate fleeing (King, “Interaction” 32). Later, it was discovered that in response to the bee noises, the elephants also emit low frequency vocalisations which are thought to warn neighbouring elephants of near danger (King “Interaction” 22).

Although it is evident that bees deter elephants, the biological reason behind this behaviour is still unknown. With their skin averaging from two to four centimetres, the African elephant is thought to be incapable of feeling a bee sting on most areas of its body (Fritz “African” 508). This leads Lucy King and other scientists to believe that elephants gain their fear of bees from being stung in their trunks or behind their ears where where skin is much thinner (about 1 mm) (King “Interaction” 80). With the largest brain of all terrestrial species (approximately 5 kg), it is also believed that elephants can recall negative memories of being stung as calves, and therefore flee when in contact with a hive (Fritz “African” 508).

(B) Crop-Raiding Prevention

The research measuring the success of the beehives in deterring elephants was conducted over two and a half years (June 2012 to December 2015). Information was gathered regarding the 238 elephants that directly approached the 13 beehive farms in the Mwakoma village (King “Beehive” 6). Out of these, 80% (190 elephants) did not enter the farms while 20% (48 elephants) did (see figure 8) (King “Beehive” 6). Despite the fact that the fences were not 100% efficient (with one fifth of the elephants managing to break the fences and enter the farms), all of the farmers who were interviewed reported being satisfied with the beehives fences as a mitigation tool. Additionally, other community members requested to join the project during the course of the study, resulting in an extra twenty-two beehive fences in nearby villages by the end of the trial (King “Beehive” 6).

Figure 8: The Effectiveness of the Beehive Fence as an Elephant Deterrent in Mwakoma between June 2012 and December 2015



Source: Graph Generated by Author

Although this research is valuable in providing data on the success of the beehive fences as a whole, it does not give any indication of how many elephants would be deterred from the farm if the hives were not there. In fact, the occupancy of the hives did not play a major role in how effective the fences were as an elephant deterrent. This was seen where a low occupancy of the hives (0-25%) showed both high breakthrough events (with eleven

groups breaking through the fence) and high deterrent events (with fifteen elephants groups approaching and retreating from the fence) (King “Beehive” 8). This suggests that the bees may not be causing the elephants to retreat, but rather another factor such as the bright yellow colour of the hives, their height of 1.5 metres etc. This being said, the farmers who were interviewed were all adamant that the fences played a role in protecting their villages from crop raiding, and Judith¹ (one of the farmers who was interviewed), found that the beehive fence protects her crops even now, when only three of the sixteen hives are occupied. Emmanuel suggested that this is due to the elephants vivid memory, which may allow them to associate the fences with bees and memories of being stung. Therefore the beehives still protect the crops even when not occupied by bees. Nevertheless, this discovery that the occupancy of the hives does not drastically change the effectiveness of them, has led to the implementation of “dummy hives”, which are hung alternately to the beehives, and have cut the cost of the fences by half (King “Interaction” 182).

The study also revealed that abiotic factors play a large role in the beehives effectiveness. For example, 70% of all crop raids occurred during the dry season, suggesting that a lack of food is the main reason why elephants crop-raid (King “Beehive” 8). Hence, a lack of rainfall in the game reserves bordering the Mwakoma village is a major driver in the human-elephant conflict. In fact, during the wettest months (when rainfall is 91+cm), no elephant breakthroughs were experienced, despite 12 different elephants approaching the farms (see figure 9) (King “Beehive” 8). However, it was also found that bee occupancy is lowest during the dry season, making the beehive fences less effective in the time when they are needed the most (King “Beehive” 8). This is believed to be due to the lack of wild flowers available for pollen collection and water, which is necessary in maintaining bee health (King “Beehive” 8). Supplying bees with these nutrients is also critical as they pollinate 75% of of the Mwakoma farmers crops (Mwamba), and are also estimated to contribute US\$150 million to the Kenyan economy (King “Interaction” 20). Additionally, most crop-raids occur during the night (King “Beehive” 7). This is once again interesting to note, as bees are diurnal and tend to be less active during this time (Bradbeer “Bees” 16).

¹ All the farmer’s names were changed for the purpose of confidentiality

Figure 9: Frequency of elephants visiting farms and breaking through beehive fences relative to the rainfall periods

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Source: King, Lucy, et al. Beehive fences as a multidimensional conflict-mitigation tool for farmers coexisting with elephants.

Tsavo is especially prone to drought, as it is a semi-arid savanna which often experiences physical water scarcity. This can be devastating to the farmers (who are unable to grow crops), the elephants (who cannot find food), and the bees (who depend on rain for flowers). The lack of rainfall, particularly during this past year, has caused a significant decrease in the occupancy of the hives. When visiting Judith, one of the farmers in the project, it was evident that only three of her sixteen hives were occupied. Emmanuel (the project manager), stated that the largest issue with the project was the impact of physical water scarcity. However, he also recognised that this was out of the Bees and Elephant's control. This means that in addition to the growing elephant and human populations, global warming and the increasing incidence of drought, will also play a major role in intensifying the human-elephant conflict, with less food and water being available.

GEOGRAPHICAL PERSPECTIVE

(A) Socio-Economic Effect

Even though a single elephant in Tsavo brings an estimated US\$23,000 a year through ecotourism, the majority of this money goes to wealthy lodge owners and government officials, causing economic leakage (Platt “Elephants”). This means that many of the locals, especially if not employed by the hotels, fail to see the benefits in protecting and conserving elephants. This is an issue, as in order to reduce the human-elephant conflict, the local communities must also see benefits from the conservation of endemic wildlife.

The beehive fences, which supposedly not only protect farmers from crop-raiding elephants, also provide them with money and products from the harvesting and selling of honey. This is seen between January 2014 to December 2015, when six farmers alone, produced a total of 206 kilograms of honey, boosting their individual incomes by US\$630 a year (King “Beehive” 6). For Moses, one of the subsistence farmers who was living off a pension of US\$22 a month, this extra money boosted his income by 21.5% (King “Beehive” 6). Judith was also able to build a new brick house using the money she earned from the bee products over the years (Afandi).

The beehive fences in eastern Tsavo not only provide the farmers with an economic incentive, but honey is also culturally significant in this region. In fact, Mosi, a Kenya Wildlife service guard from the Eastern Tsavo province, said that the local medicine men in his village use honey as a method for protection against illness and bad spirits (Kerubo). Hesbon, one of the local farmers, also said that he believed the honey was good for his health, and “important for his community” for this reason (Odongo).

The social benefits gained by the beehives lead to the question as to whether the villager’s positive perceptions of the project is due to the effectiveness of the hives as an elephant deterrent, or rather the free money they gain. However, this was contradicted when Adam, another farmer who was interviewed, stated that the best part of the Elephants and Bees Project in his opinion, is the protection of his crops from raiding elephants, rather than the money he earns from the honey (Kioko). This view may also be influenced by the fact that the income generated from the beehive products is inconsistent, especially during the dry season. In 2016 and 2017 for example, the lack of rainfall led many beehives to become

abandoned, while others reduced in occupancy (Mwamba). This not only means that the fences are perhaps less effective in protecting the farmer's ailing crops, but it also means that the farmers receive less profit from the honey, which has not been harvested since April 2016 (for almost two years). This can be detrimental to the effectiveness of the beehive fences as a mitigation tool, as the profit from the honey is a huge motivation for the farmers in the maintenance of their hives according to Emmanuel.

The socio-economic and cultural benefits that the honey brings, plays a large role in the effectiveness of the beehives in reducing the human-elephant conflict in Eastern Tsavo. This is because the project allows the farmers to benefit from the conservation of elephants. With a lessened threat from crop-raiding elephants and the extra income generated from the honey, the farmers are able to coexist with this endemic species without viewing them as a threat to their livelihood. Hesbon clarified this when he stated that before the fences, he and his community did not like elephants, but now, they are able to “watch and enjoy them without feeling fear” (Odongo). Hence, the Project has made a difference in creating positive perceptions towards elephants within the village of Mwakoma, which is inherently necessary in the long-term protection of this species.

EVALUATION OF THE BEEHIVES

(A) Limitations of the Project

Although the project is effective in protecting farms from crop-raiding elephants, it is limited in its effectiveness by its lack of local involvement. This is clarified by Lucy King, who stated that her goal is to make the Beehive project “completely self sufficient and in the control of the local community”. Ideally, it would be the farmer's responsibility to maintain the hives and take ownership over the day-to-day running of activities. This would allow the project to be a long-term solution rather than a temporary charity give away. However, even though this may be the aim, it is not currently happening as the workers at the research centre oversee and manage most aspects of the project. This includes building the hives, the harvesting of honey, and in many cases, the maintenance of the beehive fences. Cara, who is based in the Nairobi office, explained that the reason for the Project's heavy involvement is due to the scientific research being conducted, which requires consistent and accurate data (Oldenburg). Although it is evident that more community involvement is needed, making the beehive fences completely autonomous to the Sagalla community may also impose challenges. For example, this would allow the locals to ultimately decide where to place the beehive fences which can lead to increased human encroachment into wildlife reserves. The farmers may also take an anthropocentric view regarding environmental and economic sustainability.

Self-sustainability is another issue the project faces. For example, in 2015 the project managed to raise enough funding to cover the production and equipment costs, as well as some of the local salaries (King interview). The recent drought; however, has not only intensified the crop-raiding conflict, it has also meant that there has been less income generated from the honey and beehive products. In recent years the low honey yield has meant that the project no longer pays for itself, and instead requires donations and financial aid in order to keep afloat.

(A) Comparison to Other Deterrent Methods

The effectiveness of the beehive fences as a preventative tool for crop raiding can be better understood by comparing it to other elephant deterrent methods. Indigenous methods include shouting, lighting fires, exploding firecrackers, releasing barking dogs, chilli bombs, chili fences, crashing metal sheets together, and sometimes, if all else fails, using spears or guns to frighten or injure the elephants (Raja “Busy” 41). Although these methods are usually cheap, they are not as effective as the beehive fences, and many are labour intensive, and time-consuming. Electric fences on the other hand, have a 100% deterrent rate, which is 20% more than the beehive fences (King “Interaction” 5). However, these electric fences can cost up to US\$9 per metre, which is too expensive for many rural African and Asian farmers (King “Beehive” 8). For electric fences to work properly, they also require consistent and expensive upkeep and a reliable power source, which is not always available. Electric fences are not only expensive and high maintenance, but they also increase the community's ecological footprint. Beehives on the other hand, are considerably cheaper costing just US\$3.50 per metre (King “Beehive” 8). Although, the beehive fences can also be a lot of work to maintain (including replacing grass shades, posts, or occasionally fixing damage caused by honey badgers), the technology is relatively low tech and the farmers can continue to benefit from honey and other beehive products long after the fence is set up (King “Interaction” 102). Beehive fences also have a lessened ecological footprint, using no electricity and pollinating crops and flowers in the area through bees (Mwamba). This is extremely valuable as the global bee population is in decline, posing many catastrophic concerns such as a lack of food crops to feed the growing population, the loss of economic profit by farmers who use bees to pollinate their farms, and the loss of genetic variation and floral diversity in the wild (Bradbear “Bees” 16). With this in mind, it can be argued that beehive fences are one of the most effective solutions when reducing crop-raiding in the Sagalla area, compared to other methods used.

When talking to Lucy, it was clear that she understood the limitations to her project. She expressed her thoughts that the beehive fences alone, cannot be used to eliminate the human-elephant conflict, which is increasingly becoming a more prominent issue across Kenya and in other parts of the world. As a result, she proposed during the interview that the

best way to reduce crop raiding and to minimise the human-elephant conflict, is to use a combination of elephant deterrent methods including the beehives, night guarding, noise deterrents, crop selection, and more. The combined use of several deterrents will maximise the chances of a poor subsistence farmer receiving a healthy harvest for that year, without damage to the endemic wildlife of the area.

EVALUATION OF THIS INVESTIGATION

This investigation is valuable in understanding the degree to which beehive fences are effective as a mitigation tool. However, there are several limitations which must be taken into account when evaluating the data. Firstly, only three farmers on three of the thirteen farms were interviewed. This was due to a lack of time with Save the Elephant employees, who were concerned that extensive interviews would be too much for the farmers as several other people were conducting surveys of their own. Although all three farmers had very similar views, they represented only a fraction of the Mwakoma villagers, who may have had opposing thoughts. The research centre also lacked raw data that is accessible to the public, making it harder to obtain unfiltered data. The farmers who were interviewed also had a limited education and spoke minimal English. A translator was used from the project and although it seems improbable, it is possible that negative perceptions or other aspects of what the farmers wanted to say, may have been lost in translation. Apart from the language barrier and limited raw data, many of the scientific publications were also written by Lucy King, who may have had an incentive to shine a positive light on her project, as this would encourage donations which the project now depends on. However, the publications were research based and appeared to contain minimal bias or opinion.

CONCLUSION

The Elephants and Bees Project receives millions of dollars in donations per year, and aims to reduce, and ideally eliminate the human-elephant conflict (Witemyer “Save” 32). This is not only in Eastern Tsavo, but in all areas where elephant crop-raiding occurs. Since 2008, the project has spread to nine countries around Southern and Eastern Africa, and to Sri-Lanka, India and Thailand in Asia as well (Douglas “Human”). Its growth within the Mwakoma village demonstrate that the beehive fences have the potential to reduce crop-raiding and create positive perceptions towards elephants. By looking carefully at Mwakoma, there may be transferrable lessons can be passed to any community who is facing the problem of human-wildlife conflict. This being said, it is extremely difficult to say exactly how effective the beehive fences are, as this changes depending on the year, location of the farm, season, and participation of the farmers. However, it can be observed that despite its limitations, the Elephants and Bees non-profit organization is working hard in an attempt to make a change in securing the future of wild elephants and indigenous people around the world. These attitudes are inherently necessary in securing a future, where people and wildlife will more commonly be forced to share the same habitat and hopefully coexist in harmony.

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APPENDIX

Researcher's Process

Growing up in Kenya, I have always been captivated by the natural world, and have spent most of my holidays on safari observing the indigenous wildlife of Kenya. When I heard about the Elephants and Bees Project from my Mum, I was intrigued, and decided to send an email to Lucy King to request an internship.

Hello Lucy,

Ref: Request for Internship. October 2016

My name is _____ and my mum met you a couple of months ago. She told me all about the Elephant and Bees Project because this is exactly the sort of thing I am passionate about. I'm currently studying for my IB diploma at ISK, and after High School, I plan to study Zoology or Biological Science at university level.

Having lived in Kenya all my life, I've always been captivated by animals, wildlife and the way ecosystems work. The work your organisation does, is exactly what I aspire to do in my future.

Although I know that the internship program is highly competitive and designed for people over 18 year olds, I was wondering if you could maybe make an exception for me. This is because I take a deep interest in what your organisation does, and I'll be more than willing to do whatever work is helpful to the project. I assure you I am a very hard worker and will be absolutely delighted if you consider me for the program.

Ideally, I am looking to be able to work during my October holiday which is from the 15th-23rd October 2016. As this is only 10 days, and much shorter than you normally offer, I understand if this is not possible. Even if I'm not included in the work process, I would be more than happy to shadow you for a week and see what inspirational things you achieve. Alternatively, if one week is too short, I could make time during my summer holiday in June and July. This way, I can spend up to a month learning and understanding what amazing work you do.

Thank you so much for your consideration.

Have a wonderful week,

On Fri, Oct 7, 2016 at 3:04 PM, Lucy King <lucy@savetheelephants.org> wrote:

Dear

Many thanks for your letter and so sorry for the slow reply, I have been at the CITES meeting in Johannesburg and am honestly totally behind on about 300 emails!

Thanks for applying for work experience with my project. I completely understand why you want to get field experience, unfortunately we can't have you down in our research center in Tsavo for insurance purposes while you are under 18. That is the main reason that everyone requires students to be over 18 because under 18 you have to legally signed over to someone as a legal guardian and I can't ask any of my team to do that.

I have no problem if you would like to do a week's work experience at our Nairobi office at the Save the Elephants headquarters working on some more lap-top based projects for our Human-Elephant Co-Existence Program. We have a hot desk system which means it is literally a question of squeezing in on any empty desk when different project officers are away so it could be an erratic week! I happen to be in the office at the start of that week so if you came in at 9:30am on Monday morning the 17th and worked with us there that week until Friday I hope that would give you some interesting experience. We work 9am to 5pm and with an hour off for lunch (its often easier to bring your own packed lunch, we have amazing gardens all around us so there is plenty of peace and quiet to go outside for a lunch break). Sorry its not as exciting as being with elephants in the field but hopefully you can work up to that when you graduate and we do need help in the office, particularly on sorting out our amazing project photos and project videos for our media library and content for our website which could be good experience for you.

We are based in Karen at Marula Manor off Marula Lane,

Let me know if that will work for you and Cara and I will come up with some project work you can help me with. You would need a working laptop to use for the week,

Best wishes for now,

Lucy

This led me to spend my spring break holiday at the Elephants and Bees offices in Nairobi, where I was assigned a number of jobs including the creation of a powerpoint for an educational program, investigating cameras to track the elephants in Tsavo, and writing various articles. One of the articles I wrote was about a calendar the project had made to give to the local farmers. Below is my introduction to the article and the cover of the calendar I wrote about.

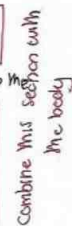
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Welcome to the Elephants' Human-Elephant CoExistence ToolBox Calendar.

This calendar was set up to educate rural farmers about the many methods available that can be used to deter elephants from raiding crops. Although the beehive fences are effective in this purpose, it is important to recognize that elephants are intelligent and inquisitive beings, who are quick to learn and can find ways to escape the system. Due to this, there is no single "perfect solution" or method that will prevent the damage done on farms by elephants. In order to increase a farmer's chances of a healthy harvest, the Elephants and Bees Project recommends that farmers use various techniques. This calendar illustrates twelve of these recommended options, that rural African and Asian farmers can use, rotate, and innovate with, in order to live more peacefully with Elephants.

This experience opened my eyes to how severe the human-elephant conflict is, and how important it is that this issue be resolved. I was inspired by Lucy King and her innovative beehive fence, and was curious to know more. This led me to chose this topic for my extended essay.

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During the summer, I visited the Mwakoma village to see the beehives and farmers first hand. Here I talked with the farmers and several employees who work at the project research centre. Below are some photos from my visit.

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