Final Report

INTERNATIONAL ELEPHANT FOUNDATION.ORG

The Effect of Community Workshops and Elephant Movements on Human Elephant Conflict

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Project Completion Date: Extension to 31 December 2021

AUBURN UNIVERSITY
SCHOOL OF FORESTRY AND WILDLIFE SCIENCES

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
TECHNOLOGY FOR DEVELOPMENT

WKU

WILDLIFE WORKS

Conservation Needs and Progress

Addressing concerns threatening elephant populations is necessary as overall African elephant populations continue to decline with less than 500,000 remaining in the wild. African savannah elephants (*Loxodonta africana*) were up listed to endangered in 2021 and African forest elephants (*Loxodonta cyclotis*) were formally recognized as a third extant elephant species and listed as critically endangered by the IUCN. In the Kasigau Wildlife Corridor (KWC) of Kenya, human elephant conflicts (HEC) continue rising as the country's largest elephant population (now over 14K individuals) moves between Tsavo East and West National Parks. Poverty driven by poor crop yields, climate change, and lack of access to alternative livelihoods are part of the harsh economic reality for many people living in the KWC region, a part of the Greater Tsavo Ecosystem (GTE). These circumstances cause some villagers to lash out at elephants, which they view as a nuisance species. This sets the stage for negative human-elephant interactions (HEI), mostly as a result from crop raiding by elephants. However, elephants can also raid food stores and damage water storage tanks during drought periods. Due to the hard work of conservationists in Kenya, elephant poaching has been minimized. In fact, more elephants have died in the last 3 years from intentional poisonings than poaching, suggesting a shift in conflict and a dire need for mitigation of HEC in local communities.

Our plans for developing mitigation strategies in the KWC took a two-pronged approach. We first wanted to develop a greater comprehension of this complex issue by incorporating local context and developing interventions based on that information. Thus, we designed participatory information gathering sessions followed by community workshop programs that could bring vital information to local farmers that could mitigate the impacts of elephant crop raiding.

The global pandemic prevented some of the project's objectives (see below), and our USA-based researchers were unable to return to Kenya in 2020. This made it impossible to erect deterrent fences and monitor elephant movements, two of the early main goals of the project. However, via a local surrogate, we were able to conduct community meetings in late 2020 in the six selected villages for the project (Figure 1). During the year away from Kenya, we used results from these data to create a curriculum for workshop programs to be delivered in the focal communities. Ms. Von Hagen returned to the project area in May 2021, and after more pandemic delays, the workshops were conducted in September. Since funding was limited, we re-focused on the workshop portion of our original multi-year plan. We created a take-home manual for all workshop attendees that emphasized five key strategies for mitigating crop raiding impacts. Local experts were in attendance and the efforts were well received by the community with high voluntary participation and engagement. Many villagers were observed taking notes, asking questions, and expressing

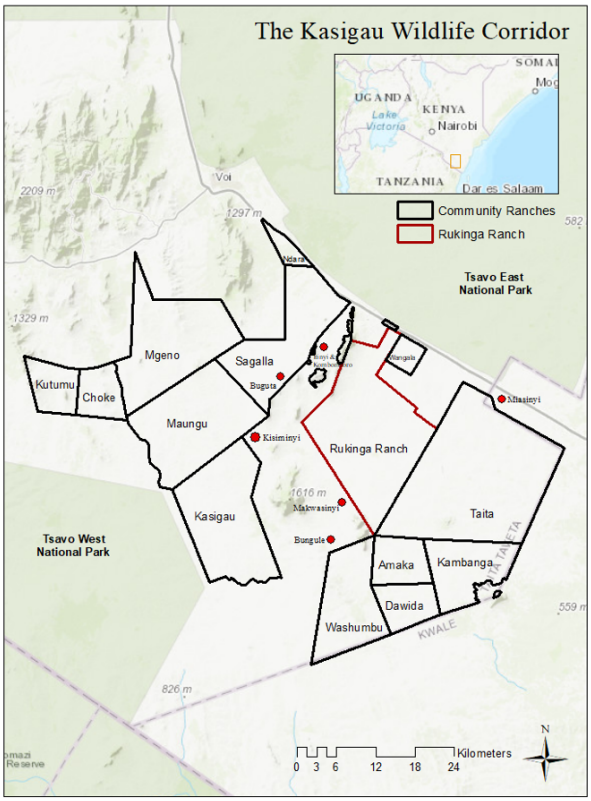

Figure 1. The KWC of Kenya and the six villages selected to participate in the study. The corridor is made up of 14 community ranches. The project's research base and home of Wildlife Works is located on Rukinga Ranch (in red).

their appreciation. Since departure from Kenya in October of 2021, data analysis has continued and we report here many of the interesting findings as the project concludes.

Project Goals and Actions Taken

Original Goal 1: To reduce HEC in the KWC by providing Kasaine fences to select areas

Access to Kenya and a reduction in funding prevented the team from erecting deterrent fences in the six selected villages in 2020. However, GIS and the initial community interviews were used to identify hot spot areas so that fence placement may occur in future years of the project or with Schulte et al.'s larger project *Elephants and Sustainable Agriculture in Kenya (ESAK)*. We also were able to deliver instructional materials and had demonstrations of deterrent methods at the workshops.

Original Goal 2: Work with communities to devise a customized workshop program

Modified Goal 2: Deliver workshop programs in six villages in the KWS focusing on community-based crop raiding mitigation methods.

As the PI was unable to be on-site in Kenya due to the pandemic in 2020, participatory meetings that would inform the workshop program were conducted using a local surrogate. As the pandemic continued, it was necessary to extend the project and funding to include conducting the workshops in 2021. The responses from the community sessions were used to inform the curriculum of the workshops, successfully achieving our original second goal from the proposal. Information from surveys and participatory modeling sessions also provided unique insights into the attitudes, perceptions, and behavior of local villagers concerning elephants. Since funding was reduced and fence building could not occur on site, the focus shifted to delivering workshops on community mitigation methods when it was safe to return. We modified our approval by the Institutional Review Board (IRB) of Auburn University (#20-440 EX 2009) to include Covid-19 protocols to keep participants safe. Once a return was possible to Kenya near the end of May (after having the trip canceled and rescheduled due to a lockdown in Nairobi), we began arranging logistics to conduct the workshops in the six villages. We collaborated with several local organizations to arrange information sessions and demonstrations by experts in those fields (Table 1). We also created a manual for participants that included the information on the five strategies to mitigate crop raiding (See Appendix 1, interim report No. 3), and almost 200 manuals were distributed.

Table 1. A list of our collaborative workshop partners and the topics of their demonstrations that were given at the workshop

Collaborative Partner	Speakers' Topics	Organization Information Links
Wildlife Works	Kasaine Fences, Living safely with elephants	https://www.wildlifeworks.com/kenya
Taita Taveta County Agricultural Extension Office	Climate smart agriculture	Taita Taveta County Government
Zawadisha	Alternative livelihoods, women's small loan program and eco-pesticides	http://www.zawadisha.org/
Save the Elephants	Beehive fences and beekeeping	Elephants and Bees Project
Hadithi	Alternative livelihoods-basket weaving	https://www.hadithikenya.com/

Figure 2. Mr. Benard Mwatate, a ranger from Wildlife Works explains to villagers in Miasenyi the proper way to construct a Kasaine metal strip fence.

As a companion to the manuals, we created a PowerPoint presentation to accompany each workshop with Wildlife Works donating a projector and screen to use (Figure 2). Having visual references such as a manual with lots of graphics, the PowerPoint, and physical demonstrations, provided alternative ways of conveying information for those participants who might be illiterate (estimated at about 15%). Each of the five strategies had associated talks and visual references. As examples, a demonstration on how to build Kasaine metal strip fences (S1-Deterrent fences), how to create and plant zai pits (S2-Climate smart agriculture), beekeeping (S3-Alternative livelihoods), how to behave if meeting elephants in the bush (S4-Elephant safety), and where to access eco-charcoal and free trees (S5-Preserving the environment). The manuals, talks, and presentations were all constructed and delivered in Swahili. Participants were asked to sign consent forms at the beginning of the workshop, wear masks, wash hands, and maintain social distancing. All venues were outdoors or open-air and participants were provided lunch and chai tea midway through the day, with ample portions so they could take fruit home to their families. All six of the scheduled workshops were delivered successfully with high attendance and interest from the communities. Workshops concluded in September with the PI returning to the US in early October. In addition to contributing towards the creation of the workshop curriculum, the original survey and participatory modeling data from 2020 are currently being analyzed, with three manuscripts in preparation for submission this year. The results from the data will contribute to Lynn Von Hagen's PhD dissertation, which will be completed by July of 2022.

Goal 3: Assessing deterrent efforts and elephant movements across the landscape

Due to delays from the pandemic, reduced funding, and other logistical constraints we were unable to undertake this goal of the project. We instead pivoted to focusing on the community meetings and delivering workshop programs in the six focal villages.

Proposal/Activity Changes

Due to the pandemic, there were extensive revisions to the project. IEF granted us an extension to conduct the research over two years since we were unable to be in Kenya during 2020. We contracted a surrogate to conduct community meetings near the end of 2020, but were unable to retain our objectives of deploying fences and monitoring for elephant movements. Instead, we condensed activities originally intended over two years and pivoted to conducting the workshop programs with accompanying manuals. Our timelines were one of the main reasons for the change, as delays prevented us from being able to execute the work in a timely fashion. Though we were unable to deploy fences in the communities, the manuals provide instructions and guidance for doing so; they also include other strategies for coexisting with elephants. The manual will be made available to any other communities. The camera traps purchased for this project have been in use for the companion project (see Schulte et al. complimentary report) and will be available for assessing crop raiding and deterrent effectiveness on a broader geographic scale in the future.

Conservation Outcomes

Despite the challenges of conducting this research during a global pandemic, there have been significant conservation outcomes. The first was the valuable information gained in 2020 from the farmer surveys with 206 participants. Some of the most interesting finding obtained from the farmers:

- 84% blamed elephants for the majority of their crop losses
- 74% had actively chased elephants from their farm (a dangerous practice)
- 5% had attempted to harm elephants at some point
- 78% reported some level of fear of elephants
- 54% used one or more forms of deterrents
- 78% had not received any type of information on deterrents
- 90% had not received any information specifically on deterrent fencing
- 15% used more “modern” types of deterrents (n=114, see below for definition)
- 40% believed they could invest in and build deterrents
- 100% cited economic constraints as a reason they would not be able to build deterrents (n=57)

These results demonstrate a complex profile of the emotions, behavior, and socioeconomic limitations of local farmers. We see that farmers are afraid of elephants and engage with them regularly, some attempting to harm them. This can be dangerous for villagers and has obvious implications for elephant conservation. There appears to be a research-implementation gap as the

vast majority of villagers had never received information from outside sources on deterrent of any kind and even more so specifically for fencing. Very few farmers had implemented more modern and effective types of deterrents (such as beehive, chili, metal, or electric fences, Figure 3). In addition, 100% of those hoping to implement some type of deterrent cited lack of resources as to what would prevent them from doing so. This economic constraint is an important issue for conservation managers attempting interventions. This information has important relevance to conservation because of the need for greater understanding of how dynamics in socioecological systems impact the outcomes of conservation programs and stakeholder engagement.

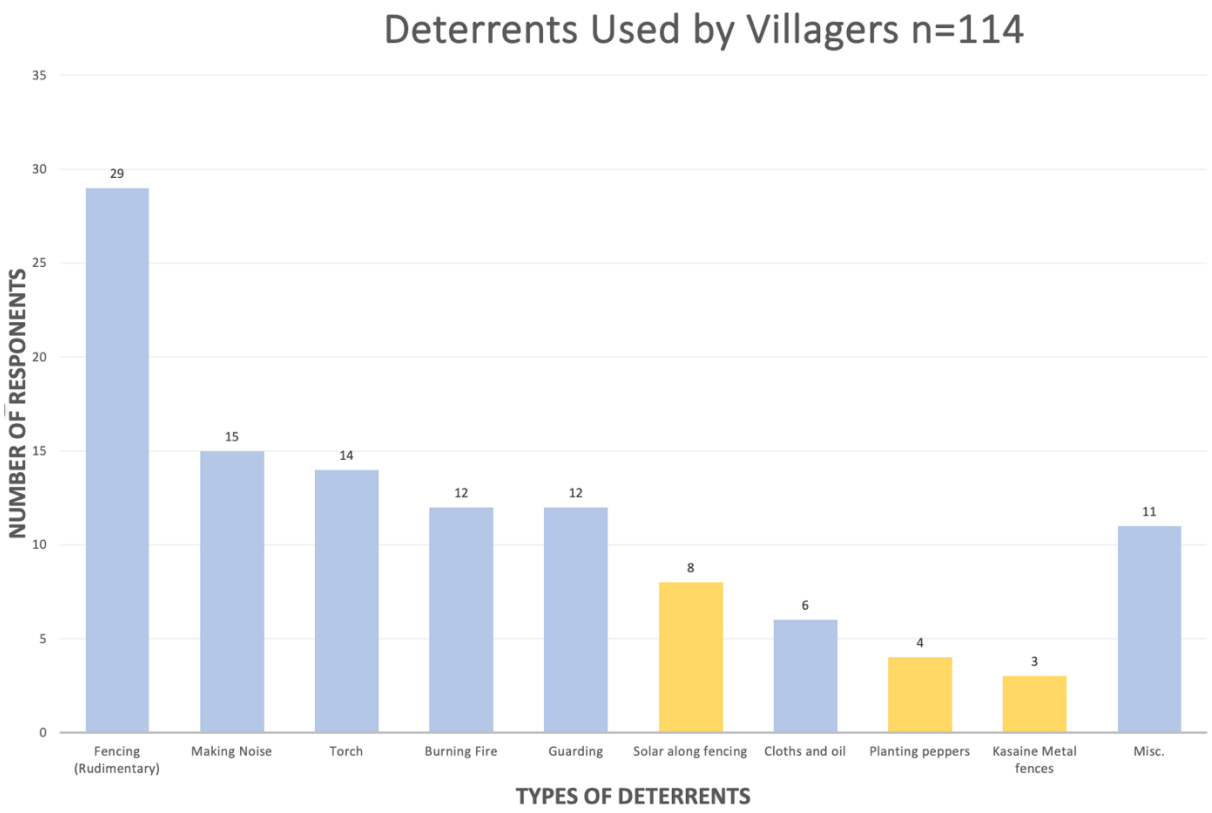

Figure 3. A chart depicting the types of deterrents used by villagers. Yellow denotes modern deterrents, and blue is more traditional or rudimentary deterrents.

The second part of our participatory sessions was creating mental models with stakeholders concerning human-elephant conflict, the drivers of the issue, and the cascading consequences for local people. Mental models are a cognitive perception of how one views the world and its interacting components, elucidated in a diagram. In this diagram, the user draws connections (lines) between the core component (in this case HEC) and the variables affecting it. These can be either positive or negative and each connection is assigned a value from -1 to +1 depending on the strength of the connection and the direction of its influence (Figure 4). For example, in the model collectively created by the participants from the village of Miasenyi below, the variable drought corresponds with decreased crop yields and also increased HEC. We used Mental Modeler software to input these models and quantify the strength of the connections and create comparisons. Each village demonstrated a complex understanding of HEC, and we found 12 variables that were consistent across all the villages: Alternative livelihoods, crop yields, deterrent

fencing, drought, elephant populations, feelings of security, government resources, income levels, officer response time, proximity to ranches, relationship with wildlife officers, and resident mobility. The variables identified as particularly influential across all models were income levels and crop yields, respectively. These two key variables were identified as being the most impacted by HEC. Just two of the more interesting drivers of HEC brought forth by the models were infrastructure and the rearing culture of elephants. Infrastructure was considered to be problematic because when villagers contacted wildlife authorities for assistance with crop raiding elephants present in their farms, the roads were so damaged they could not reach these remote areas. The "rearing culture of elephants" was listed because villagers believed that agencies that rescued elephants made them accustomed to humans, causing the elephants to become unafraid of entering farms or areas with people. These are just two examples of drivers of conflict that are rarely (if at all) mentioned in the conservation literature of things that exacerbate conflicts. Analysis is ongoing on the remainder of the data from these models as we prepare for publication. Deeper understanding of the drivers of these complex issues is important for conservation managers as this information can lead to customized local programs that can reduce conflicts.

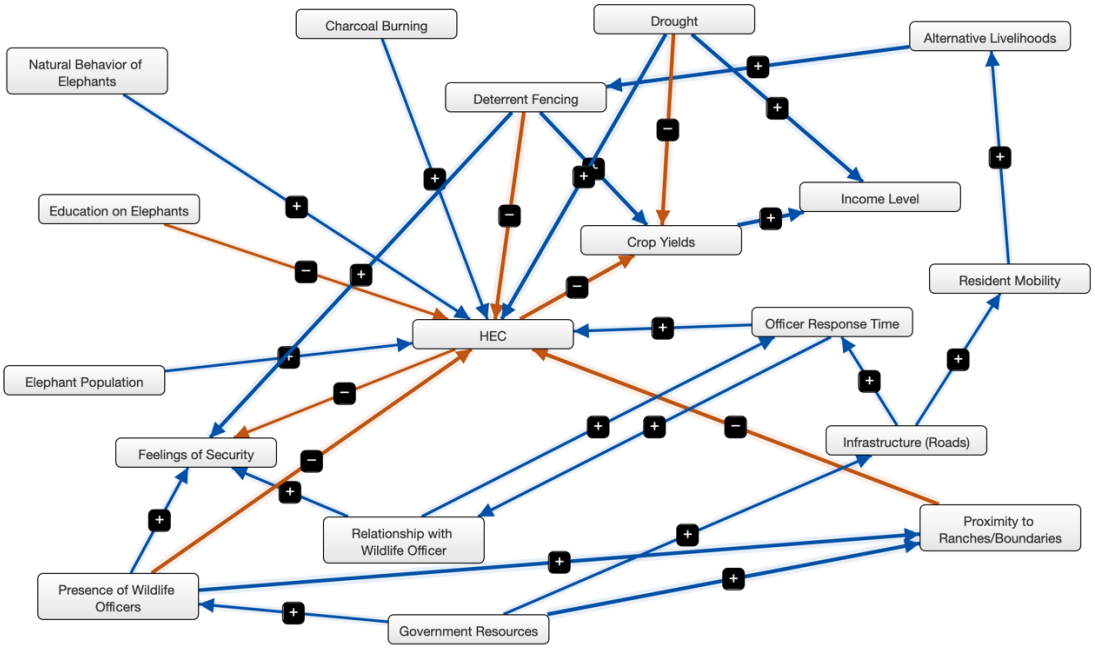

Figure 4. A mental model created by villagers from Miasenyi on the influences of HEC. Connections in red are decreasing impacts, and blue are positive impacts. The width of the line denotes the strength of the association.

The information gathered from the community sessions was invaluable for creating the curriculum for the workshops and articulating the five strategies for mitigating elephant conflict in this locality (See Appendix, previous report). We successfully conducted all six workshops with high attendance and enthusiasm from participants. They were exposed to new techniques that can help mitigate crop raiding, create livelihoods alternatives, feel safer around elephants, and improve crop yields on their farms. We compiled (with permission and credit) many techniques from other projects and our own coping with HEC to create accompanying manuals for participants. We

created a product for other villagers in this area that is adapted to the local context, but can have broad distribution for communities across Africa dealing with elephants.

We anticipate the overall conservation outcomes from our project will be: 1) a reduction in HEC in communities where we conducted the workshop programs if participants are able to institute some of the strategies, 2) an increase in sustainable livelihoods for villagers that participate in and apply the information given in community workshops, and 3) a better understanding of biotic, abiotic, and socioeconomic factors that contribute to HEC obtained from the surveys that can benefit all communities coping with conflict.

Project Impact

Having a surrogate as facilitator was beneficial for keeping the project moving towards its goals and the turnout from the villages in the participatory sessions was excellent. The number of participants for the workshops also was high and feedback from chiefs and villagers has been positive overall. However, they all expressed a deep need for help in addressing consistent crop raiding including funds to build deterrents. Almost 200 individuals attended the workshops and each participant received many forms of specialized training from the local experts. We also established relationships with multiple stakeholder groups and employed an all-Kenyan team. Some of the speakers had limited speaking experience and this was an opportunity to develop those skills in addition to benefitting from honorariums for their expertise. A total of 200 mitigation manuals were distributed across the six communities and will be made available for distribution to communities in need. It is now publicly available at: DOI: 10.13140/RG.2.2.28281.34404

The Greater Tsavo Ecosystem is home to the largest elephant population in Kenya of 14,000+ individuals. We have no way of knowing how many of these individual elephants may be impacted by the work, but we do know that the ca. 200 people attending the workshops represent separate households that regularly interact with multiple elephant groups. Thus, if mitigation methods are employed by the workshop attendees, positive impacts for the safety of many of these elephants are likely to result.

Several presentations related to the project were given at conferences conducted remotely and at least two more are planned in the future. At the most recent IEF conference, Ms. Von Hagen assisted with hosting two different forums related to human-elephant conflict and community-based conservation. Past volunteers continued to stay in touch with the project and our support of Sasenyi primary school has stayed consistent. Committee members for the PI's dissertation were pleased with the progress. Ms. Von Hagen is expected to graduate by August of 2022 and hopes to continue working in conservation. A minimum of three publications are expected from this project, comprising the chapters of Ms. Von Hagen's dissertation.

Problems During the Grant Period & Project Success

The Covid-19 pandemic greatly impacted our ability to perform any in-person activities at the project site in Kenya in 2020. However, the hiring and training of a surrogate was accomplished from the US and data acquisition was successful for most of our planning goals. Ms. Kiute rejoined the team to coordinate the workshops when we were allowed to return and resume interactions in 2021. Despite the issues caused by the pandemic, we are happy to report that the project has been successful and the workshops were conducted!

Project Success

Our revised short-term goals for the project were to: 1) conduct participatory sessions and obtain data on drivers of conflict and attitudes and behaviors of local farmers; 2) create a workshop curriculum customized to local conditions; and 3) deliver workshop programs that focused on community-based mitigation strategies. We successfully achieved these goals during the 2021 field season and continue to analyze data and write up results for publication in early 2022.

Our long-term goals for this project include using the data collected to help inform conservation management and literature on methods for mitigating negative human-elephant interactions within local communities. Our other key goals are reducing HEC and improving livelihoods in our six partner communities. We hope to continue our presence on social media and sharing our work with general and scientific audiences and to present multiple publications showing our findings.

Next Steps

The workshops have been delivered, and unfortunately, we were unable to obtain funding to do follow-up surveys in 2022. However, the cohort across the six villages has been well established, having conducted sessions with them twice, so future projects may stem from this one. We have important questions that remain concerning which of the strategies were able to be implemented by attendees and what barriers exist to uptake. We plan to make the manuals publicly available to conservation practitioners who wish to address HEC in their respective locations. Our data analysis from the surveys and participatory sessions is ongoing and manuscript preparation is underway with a minimum of three expected to be peer-reviewed in 2022. We continue to have a strong social media presence and have multiple general and scientific talks planned. A more holistic understanding of HEC and how it disparately affects local Kenyan communities can be a key part of future conservation actions that work with community-based methods to mitigate threats to farmer livelihoods and elephant conservation.

Human Interest Story

Mr. Joseph Mwanganda (Figure 5a) is the agricultural extension agent for Taita-Taveta county. He has spent most of his working career helping local farmers figure out how to increase their crop yields and was the perfect local expert to give a talk and demonstrations on climate-smart agriculture (CSA). This is one of the five strategies that helps build community resilience by improving crop yields by using unconventional, yet accessible methodologies. Many people already knew Joseph by name as he had visited their farms even though his jurisdiction is wide. He made sure to give all the participants his personal telephone number in case they had any questions on the materials. One of the demonstrations involved learning how to build U-bands. This technique originally was developed in Burkina Faso to help retain water in areas of extreme drought. One must make sure the ground

is level to assure that the water retain is funneled into the right area. So, Mr. Mwanganda demonstrated how to make a rudimentary level using local materials (Figure 5b). His understanding of the economic disparities that local farmers face was on display as he taught them how to make the most of their resources. We appreciate his dedication to helping the rural farmers of the Kasigau Wildlife Corridor.

Figures 5a & 5b. Top left, Mr. Joseph Mwanganda. Bottom right. A level made from sticks, a rock and sisal rope.

Associated Organizations

Auburn University is Lynn Von Hagen's home institution where she is pursuing her PhD and that of Drs. Lepczyk and Zohdy, two of her mentors and Co-PIs.

Western Kentucky University is home to Dr. Bruce Schulte, PI on this and the parent project "Elephants and Sustainable Agriculture in Kenya," which also receives support through the Earthwatch Institute and its cadre of citizen scientists (unfortunately due to the pandemic, no support was offered in 2020 and 2021).

Wildlife Works is our key research partner in Kenya, represented by Dr. Mwangi Githiru and is the world's largest REDD++ carbon offset program. The company provides resources, personnel, and housing for the project.

Jomo Kenyatta University of Agriculture and Technology in Nairobi is home to Dr. Urbanus Mutwiwa, who provides agricultural expertise for the project.

Save the Elephants "Elephants and Bees Project" is a collaborator for both projects, and Mr. Emmanuel Mwambingo was their representative that spoke at the workshops.

Mr. Gibran Mwanganda is an agricultural extension agent for the Taita-Taveta County Government and provided his expertise at the workshops on climate smart agricultural techniques.

Zawadisha is a local micro-loan program that empowers Kenya women. Their trainer Perris Mbeyu assisted with the workshops by giving talks on alternative livelihoods and their micro-loan program.

Hadithi is a local basket-weaving and crafts cooperative that works with local women's groups. Perris Mbeyu also represented the group.

Project Outputs

Most findings in the project will make up a portion of the PhD dissertation of Lynn Von Hagen to be completed by August 2022 . A minimum of three peer-reviewed publications will result. .

Related Publications:

Von Hagen, R.L. Eco Pics Natural History Submission: Elephants and geophagy. Ecology and the Environment. At press. 2021.

Von Hagen, R.L., Kasaine, S., Githiru, M., Mutwiwa, U., Amakobe, B., Schulte, B.A. **2020.** Metal strip fences for preventing African elephant (*Loxodonta africana*) crop foraging in the Kasigau Wildlife Corridor, Kenya. *African Journal of Ecology.* DOI: 10.1111/aje.12821

Von Hagen, R.L. **2020**. Chai, Chapati & Coexistence: The essential role of community engagement in elephant conservation. *Journal of Elephant Managers Association.* (**31**)3, 102-106.

Von Hagen, R.L., Norris, P., Schulte, B.A. **2020**. Quantifying capsaicinoids from chili pepper and motor oil mixtures used in elephant deterrent fences. *Chromatographia*. **83**,1153-1157.

Completed Presentations & Invited Talks:

Von Hagen, R.L., Schulte, B.A., Lepczyk, C.A. Using participatory methods to investigate and support human-elephant coexistence in complex socio-ecological systems. IEF Intl. Elephant Conservation and Research Symposium. November 2021.

Schulte, B.A., Von Hagen, R.L., Githiru, M., Mutwiwa, U.N., Kasaine, S., Amakobe, B., Corde, S. Chemical communication and elephant conservation: Chili pepper fences and other chemo-approaches. Chemical Signals in Vertebrates. November 2021.

Von Hagen, R.L., Schulte, B.A., Githiru, M., Mutwiwa, U., Kasaine, S., Corde, S., Amakobe, B., Lepczyk, C.A. Evaluating the impact of socio-economic drivers on community resilience to human-elephant conflict in the Kasigau Wildlife Corridor of Kenya. Student Conference on Conservation Science-NY. October 2021.

Corde, S., Von Hagen, R.L., Kasaine, S., Githiru, M., Amakobe, B., Mutwiwa, U., Schulte, B.A. The use of deterrent fences and environmental correlates to alleviate human elephant conflict in southern Kenya. IEF Intl. Elephant Conservation and Research Symposium. November 2021.

Von Hagen, R.L., Schulte, B.A., Githiru, M., Mutwiwa, U., Kasaine, S., Corde, S., Amakobe, B., Lepczyk, C.A. Evaluating socioeconomic drivers of human-elephant conflicts in Kenyan communities. American Society of Mammalogists (ASM). 2021.

Corde, S., Von Hagen, R.L., Kasaine, S., Githiru, M., Amakobe, B., Mutwiwa, U., Schulte, B.A. Alleviating human-elephant conflict through deterrent fencing and environmental monitoring in Southern Kenya. ASM. 2021.

Schulte, B.A., Corde, S.C., Von Hagen, R.L., Githiru, M, Kasaine, S, Mutwiwa, U, Amakobe, B. Facilitating cohabitation of humans and elephants through a conservation behavior approach. Animal Behavior Society, Virtual Meeting. August 2021.

Citi e for Education Program via Reach the World. October 2021. R.L. Von Hagen

Golden Triangle Asian Elephant Foundation. Online Conservationist Series. Cross-disciplinary approaches to promoting human elephant coexistence in the Kasigau Wildlife Corridor of Kenya. 2021. You Tube Link

Invited webinar speaker. Reach the World School Program. Sidwell Friends School (K-4). Those amazing elephants! 2021.

Von Hagen, R.L. Holistic approaches to promoting human elephant coexistence in the Kasigau Wildlife Corridor of Kenya. Animal Behavior Society Twitter Conference. 2021.

Von Hagen, R.L., Norris, P., Githiru, M., Kasaine, S., Amakobe, B., Lepczyk, C., Schulte, B. A. Conversations on conservation: The human dimensions of elephant conservation in the Kasigau Wildlife Corridor of Kenya. British Ecological Society On-line Festival of Ecology. December 2020.

Von Hagen, R.L., Norris, P., Githiru, M., Kasaine, S., Amakobe, B. Schulte, B. A.Opportunities for collaborative approaches to crop raiding prevention can advance elephant conservation. Elephant Managers Association Conference (online), October 2020.

Schulte, B.A., Von Hagen, R.L., Kasaine, S., Githiru, M., Amakobe, B.A. comparison of mitigation methods to prevent African elephant (*Loxodonta africana*) crop raiding. Animal Behavior Society, Chicago Illinois. July 2019.

Upcoming Presentations & Invited Talks:

Von Hagen, R.L., Kasaine, S., Githiru, M., Amakobe, B., Schulte, B.A. The path to coexistence: Lessons from human-elephant conflict research and community engagement in the Kasigau Wildlife Corridor (KWC), Kenya. Human Wildlife Conflict & Coexistence Conference. Oxford, England. 2022.

Media Coverage

Ms. Von Hagen was awarded the Ecological Society of America's Katherine S. McCarter's Policy Award in 2011. Web Link

Ms. Von Hagen was awarded the Outstanding Alumni Award from Austin Peay State University in 2021. Media Link Here

Ms. Von Hagen was featured on the One Million Women in Stem Website: https://www.1mwis.com/profile/lynn-von-hagen

Schulte and Von Hagen as part of Earthwatch's Science Matter Series
https://earthwatch.org/science-matters-webinar-series/elephants-sustainable-agriculture

Social Media

This project shares updates with the parent project on Facebook at: Facebook.com/ElesKenya

Ms. Von Hagen now has a personal website that focuses on much of the research conducted on this project: www.lvonhagen.com

Project Photos

Figure 6. Villagers from Kisimenyi display their mitigation manuals and some of the products from the agricultural demonstration.

Figure 7. Villagers from Miasenyi learning about micro-loan programs for women from Perris Mbeyu.

Figure 8. Some of the attendees of the workshops in Makwasinyi. In the GTE, most of the farming is overseen by women.

Figure 9. A male elephant peers from behind one of the watering tanks provided by Wildlife Works. Providing water for wildlife helps to keep them from seeking it in local communities when drought occurs.

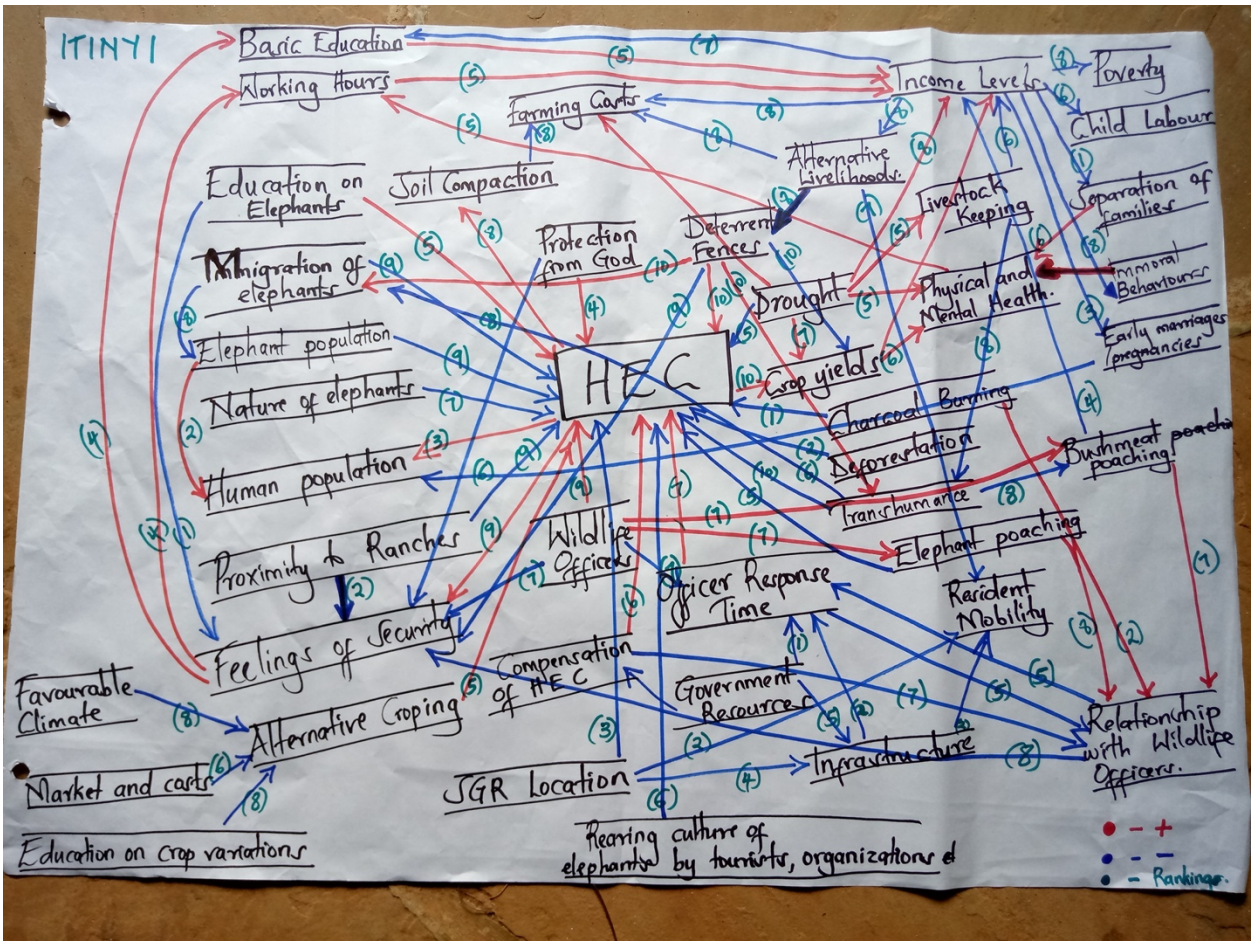

Figure 10. Participants from the workshop in Itinyi created this complex mental model (facilitated by Ms. Helen Kiute) of their perceptions of the interacting variables impacting human elephant conflict.

Budget

Table 2. The approved budget and reallocation for the project

Original Budget Item	Amount Granted from IEF	Reallocated Expense	Change Details
Accommodation per day $20 @ 85 days	$1243	$2646	From 85 days to 126 days
Gasoline for Research Vehicle $10 day @ 85 days or vehicle rental	$425	$200	Reduced usage to 4 tanks
Camera traps for farm monitoring 30 cameras @ $150	$1455	$1288.47	
In-country travel 6 days @ $50 day	$200	$171.45	Slightly reduced travel
In country transit (trains, taxis)	$120	$137.48	Covid Test required
Fencing materials 30 fences @$100 each	$3,000		Objective changed
Ethics committee fee	$300.00	$300.00	
Community Meeting Expenses (prior reallocation)	$1257.00	$1257.00	Prior approval given
Workshop expenses		$1999.60	Objective changed
Totals:	**$8,000.00**	**$8,000.00**	