

## FIELD NOTES

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# Part I: Development of a new Human–Elephant Coexistence Toolbox for communities living with African savannah elephants (*Loxodonta africana*)

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## Introduction

This field note is to invite our colleagues to peer review and test a new illustrated [Human-Elephant Coexistence \(HEC\) Toolbox](#) that is being developed in Kenya by Save the Elephants (STE) under the organizations' mission to secure a future for elephants and to develop a tolerant relationship between humans and elephants. Through presenting the first edition here (Fig. 1), we are inviting our elephant colleagues and community leaders from across the African savannah elephant range States to provide feedback, or any corrections, on the tools, as well as sharing content for additional methods not yet represented. By publishing our process and methods for how we are compiling this encyclopaedia of HEC tools and this novel approach to the peer review process, we hope to provide a transparent process to gauging the validity of the methods presented. This is particularly important because some of the technical advice around the conflict reduction tools presented are not published formally in the scientific literature.

### *Why do we need a new HEC Toolbox?*

Human-elephant conflict is on the rise across much of the African savanna elephant range (Di Minin et al. 2021). Exactly why this is happening

varies between sites but opinions gathered from the field include: a) a reduction in elephant poaching has provided an elevated sense of security for elephants to expand out of protected areas (PAs) and across community boundaries (Stoldt et al. 2020; Foley and Faust 2010); b) reduced budgets for mitigating community conflict due to Covid-19 restrictions on tourist income for PA management (Smith et al. 2021; Ndlovu et al. 2021; Spenceley et al. 2021); c) an increasing human population paired with an increase in infrastructure and development around and between PAs (Schlossberg et al. 2018; Okita-Ouma et al. 2021); and d) a decrease in traditional tolerance for elephants by communities due to food security issues and cultural shifts in attitudes (Salerno et al. 2020).

Although the reasons for an increase in conflict at the grassroots level may vary at the site level, the reality is that some of the poorest people on the continent are often left to deal with elephants on their own with very few material resources or educational support. As conflict escalates through crop damage, or injury/death of people and livestock, there is a tangible increase in political pressure to “deal with the problem of elephants”. This escalating pressure is leading to renewed calls for culling, costly translocations, and sales of wild elephants to zoos. These methods are unlikely to reduce human-elephant conflict in the long term but are being used as short-term schemes

to try to placate an increasingly intolerant voting populace. It is critical that the scientific and wildlife conservation community step up to help communities live in better harmony with elephants so that the worst level of elephant conflict is lowered to a tolerable level.

The perception that there is more than one mitigation method or “tool” to help deter elephants from human structures, food or water resources is widely acknowledged, and there are already various “toolbox” documents available that showcase clusters of methods. The challenge is that information is poor in these compilation documents, which are often either lacking in depth, text-dense, or come with little or no visual aids to guide farmers on how to create or build these deterrents step by step. Our new HEC Toolbox is designed to broaden access to existing and effective methods and to ensure that farmers, community leaders and wildlife managers are implementing the methods correctly and effectively so that the tools can be used with minimal errors creeping in. While in some instances farmers may have the capacity and resources to implement solutions directly from the toolbox, we envisage that it will have the most impact through a training-of-trainers approach.

## Methodology—the process of compilation

In order to develop this toolbox, and for recipients of the document to be reassured of the process that our team has gone through, these are the stages of development we have undertaken:

### *Stage 1—Review of existing literature*

During our research and development period, an extensive review was undertaken to compile as many scientific publications on HEC mitigation methods that we could find, including delving into the grey literature such as field assessment reports, online field blogs, YouTube videos and NGO/wildlife department annual reports. Existing HEC Toolboxes from different organizations were also reviewed and every effort was made to find and allocate credits to individuals or organizations who invented each method to ensure credits were accurately assigned, particularly if a peer review

publication in a scientific journal was not available.

This review includes our own field testing of multiple mitigation ideas from our study site in Sagalla Community, Southern Kenya, where Save the Elephants has been testing various farm-based mitigation tools over the last 13 years (see [www.elephantsandbees.com](http://www.elephantsandbees.com) for more information on this field site).

Additionally, we reviewed some of the HEC literature from Sri Lanka, India and Thailand to find commonly used methods from Asia that could help inform or advise on new techniques being implemented in Asia that *might* contribute some fresh technical ideas for managers of African elephant conflict sites. This [extensive list of over 300 articles from the HEC literature reviewed](#) is available for viewing on the web platform and is hosted in a live format that enables it to be constantly updated.

### *Stage 2—Compilation of methods*

Methods or concepts seen to be effective or helpful were compiled into group themes; for example, four umbrella methods using chilli as a base ingredient were compiled into one document 'Chilli deterrents' and then each of the nine tools within these four methods were broken down into a step by step guide on how to make the individual tool (i.e. barrier crops, chilli rags fence, chilli rope fence, chilli briquettes, chilli balls, tin chilli smoke, chilli bombs, chilli aerosols, chilli beeswax, (Fig. 2, 3). This compilation system proved more space efficient than producing nine separate documents on how chilli can be used in different deterrent techniques.

Additionally, our second tier of compilation took all the farm boundary/barrier tools and compiled them into [grouped deterrent categories](#). For example, chilli deterrent tools were grouped with other farm deterrents such as noise creators, organic repellent, trenches, metal strip fences, safe food storage, night guarding methods, beehive fences, bio fences, and electric fencing. Similarly, in our introductory 'Understanding Elephants' chapter, multiple tips and information on safety around elephants were grouped into one 'Elephant aware behaviour' document.

We developed seven of these chapter categories for the toolbox: 1) Understanding Elephants, 2) Farm and Boundary Protection, 3) Early Warning Systems, 4) Elephant Compatible Farming, 5) Elephant-Compatible Income Generating Activities, 6) Biodiversity, Habitats and Tree protection, and finally 7) Pastoralists/Schools; Living in Shared Spaces with Elephants. We also designed an advice process and a simple decision tree

to help guide the user to choose the right methods within their financial and time constraints.

### Stage 3—Illustrations

To improve on weaknesses identified in past toolboxes, we wanted our toolbox to rely heavily

on illustrations to guide the step-by-step vision we had for explaining how to do each of the methods effectively. Visual information can help aid understanding, and knowledge transfer, dispensing with the need of translation to many different languages across range States, especially in the initial stages of the roll out.



Figure 1. Front and back covers of Save the Elephants' new Human-Elephant Coexistence Toolbox - <https://ste-coexistence-toolbox.info>. The artwork depicts a traditional toolbox that might be found in a vehicle—with the idea that one tool is often not enough to fix a broken car, multiple tools are sometimes needed at different intervals, and/or rotated for the best result. Additionally, a toolbox suggests that constant maintenance is needed for any human–elephant conflict deterrent method to work, just like a vehicle needs constant upkeep and care to run efficiently.

These illustrations were purposefully designed to be as technically accurate as possible, but they also were consciously created to be culturally respectful and visually engaging. Furthermore, we chose a Kenyan illustrator who lived in the country and was able to instinctively incorporate cultural nuances that would be more difficult to articulate to an illustrator living outside of the African context. This illustration strategy includes a library of icons and method drawings that should help guide the understanding of each tool visually and that we hope will aid less literate users, particularly as we move to translate the text into different languages in the future.

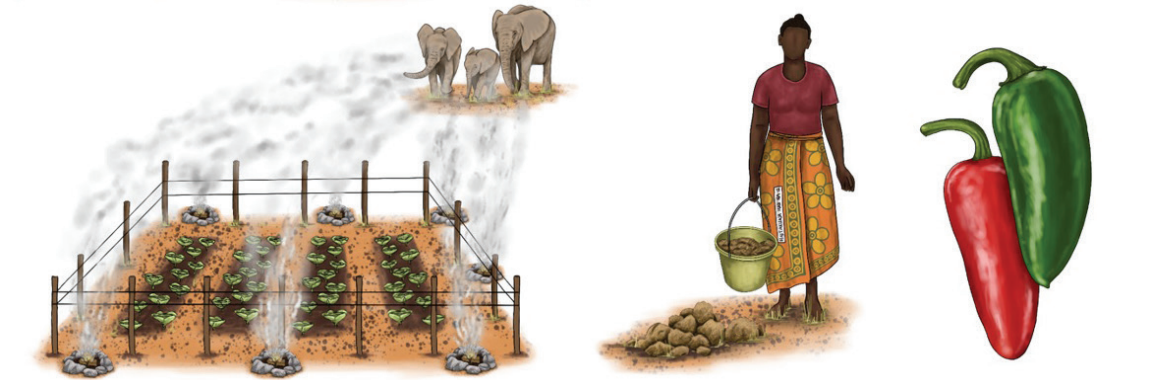
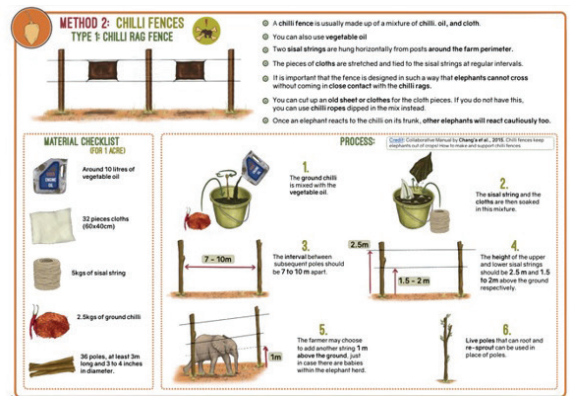
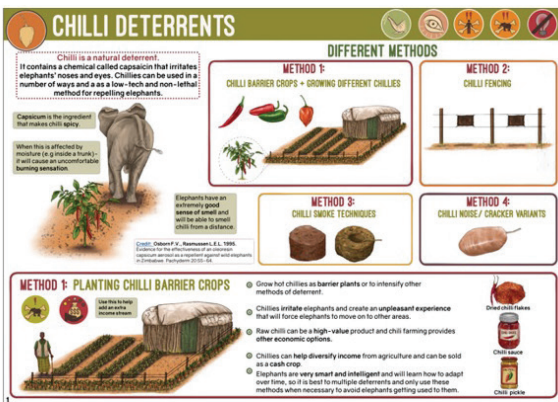
**Stage 4—Internal and external expert review process**

Once illustrated and compiled, the toolbox documents were sent to 14 senior staff members internally within Save the Elephants. Six of these

staff members were also members of IUCN’s African Elephant Specialist Group. This internal review process provided African elephant expert technical advice on content, any errors in technical drawings/scientific accuracy and tweaks to text to ensure the context of certain words matched the description as clearly as possible and to avoid using English words that invited misinterpretation. These edited documents were then sent out for additional feedback and edits to six external NGO partners in east and southern Africa working with elephant conflict and included other individual members of the African Elephant Specialist Group. These helpful, voluntary members helped reassure us that the documents were as accurate as possible and ready for field testing.

**Stage 5—Community and field site review process**

The first edition of the toolbox documents ready for field testing (16 compiled chapters in total) were then



**Above.** Figure 2. Example sheets showing the first two pages of the nine-page chilli deterrent tool chapter. Each tool type has an ingredients list, a step-by-step guide for each method and ends in a list of credits and references used to create each. **Below.** Figure 3. document. Shows some of the details from the chilli chapter that the illustrator was able to showcase in her work.

taken into the field in the Tsavo area between May and June 2022 to sync with an STE field team measuring the impact of showing *The Elephant Queen* Film to community members across the Tsavo and Amboseli ecosystem (see Part II note by Williams et al. 2022 pp. 158–164), in this edition of *Pachyderm*. Both the Impact Assessment team and the Education Team showing the film to communities are experiencing a significant level of feedback from the communities watching the film on the increase in HEC around Tsavo and Amboseli. This team introduced the Toolbox (in print form) to a dozen community leaders, some farmers, and several NGO staff managing conflict and community issues. This response to the toolbox and feedback on the methods has also been woven back into final edits for the toolbox now available on the publicly available (and free) web-hosting platform.

### Next steps

We now welcome our fellow *Pachyderm* readers, scientific colleagues, and wildlife managers to review the Toolbox as a final stage of continental peer review and to send us your suggested edits and experienced advice as we try to finalize the document for full roll out. Once Edition 1 is completed, the toolbox will be translated from English into additional languages (starting with Kiswahili, Shona and French) so it can be further field tested across the African countries needing the most urgent assistance with HEC mitigation methods. We also welcome feedback from our colleagues working with forest elephants (*Loxodonta cyclotis*) to discuss how we might adapt this manual for communities living with conflict in forest elephant range States.

Access to every compiled tool can be found on the website and a full PDF of the entire 150+ page book can be emailed on request to the lead author at [lucy@savetheelephants.org](mailto:lucy@savetheelephants.org). Both the website and the compiled book will be continually updated as edits and recommendations come in, and so it is worth tapping into the site frequently as this process is underway to download the latest versions of each tool.

## References

- All 300+ scientific papers, popular articles, reports, videos and guides that have helped us compile STE's new HEC Toolbox can be found at this website link: <https://docs.google.com/document/d/1sKkhLv4CSV7maTkAVdxqPBND0wRICqd/edit>
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