MANAGEMENT

All aboard the 'Elephant Express', a practical solution for human-elephant coexistence

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Abstract

One of the most significant challenges for elephant conservation is managing negative interactions that occur where people and elephants use the same space and compete for resources. Human–elephant conflict (HEC) incidents often manifest as direct impacts to humans or elephants. However, some HEC situations result in long-term risk and chronic stress among communities living with elephants. Indirect impacts or opportunity costs, such as people being disadvantaged by the presence of elephants are harder to quantify and are not often addressed. In the eastern Okavango Panhandle, in northern Botswana, about 17,500 people share space and resources with 18,000 elephants in an area of 8,700 km^2. Elephants here use distinct, historical corridors on a daily basis, moving from dryland resources to the wetlands of the Okavango Delta. Confrontations with elephants occur most frequently where these elephant corridors cross the main service road in the area, increasing fear among people walking to work, children going to school, parents sending children to school, and the elderly or expectant mothers accessing medical care. This constant fear contributes to chronic stress and can drive negative perceptions towards elephants. A novel intervention has been introduced to help reduce the costs of HEC and foster coexistence, in the Okavango Panhandle area—the 'Elephant Express'. The bus service was established through a multi-stakeholder collaboration to provide primary school children and medical personnel safe transport across elephant corridors to schools and health clinics. The complementary bus service has reduced stress from living with elephants, increased attendance and performance in schools, and facilitated improved access to medical care.

Résumé

La gestion des interactions négatives ayant lieu lorsque les habitants et les éléphants utilisent les mêmes ressources et un espace commun représente l'un des défis les plus importants pour la conservation de l'espèce. Les incidents liés aux conflits humains-éléphants (CHE) se manifestent souvent par des conséquences directes sur le quotidien de chacune des deux populations. Cependant, certaines de ces

situations entraînent des risques sur le long terme, ainsi qu'un stress chronique parmi les communautés qui vivent avec les éléphants. Les impacts indirects ou coûts d'opportunité, tels que les désavantages induits par la présence de ces animaux, sont difficiles à quantifier et ne sont que peu pris en compte. Dans la partie orientale de l'Okavango Panhandle au nord du Botswana, quelque 17 500 personnes partagent l'espace et les ressources avec 18 000 éléphants. Ces derniers utilisent quotidiennement des corridors précis et historiques, se déplaçant sur plus de 8 700 km² depuis les régions arides vers les zones humides du delta de l'Okavango. Les confrontations avec les habitants se produisent le plus souvent à l'intersection entre ces couloirs et la route principale, un axe emprunté par les travailleurs, les enfants se rendant à l'école et leurs parents qui les accompagnent, les personnes âgées et les femmes enceintes se dirigeant vers les centres de santé. Cette peur constante contribue au stress chronique ressenti et peut susciter des perceptions négatives à l'égard des éléphants. Une initiative novatrice nommée « Elephant Express » a été mise en place afin d'atténuer les coûts des CHE et d'encourager la coexistence dans l'Okavango Panhandle. Issu de la collaboration de plusieurs parties prenantes, ce service de bus a été organisé dans l'objectif de fournir un moyen de transport sécurisé aux élèves d'école primaire et au personnel médical, pour traverser les corridors d'éléphants. Ce dispositif gratuit a réduit le stress lié à la vie quotidienne auprès des éléphants, a augmenté la présence et les performances scolaires et a facilité l'accès aux soins médicaux.

Introduction

One of the most significant challenges for elephant conservation is managing situations where people and elephants use the same space and compete for similar resources (Balmford 2001; Sitati et al. 2005; Woodroffe et al. 2005; Dickman 2010; Songhurst 2017). Such competition can lead to increased encounters between people and elephants, which, when negative, can result in human-elephant conflict (HEC). Wherever HEC occurs there are costs involved, which have direct or indirect effects on people and elephants. Direct effects can include loss of crops, damage to property, loss of life, injuries, or loss of livestock; and indirect effects can include competition for natural resources, restricted movement, fear, sleepless nights, or disruption to daily routine, (Conover 1997; Barua et al. 2013). The effects of HEC can consequently lead to decreased food security, interruptions of work activities, decreased physical and psychological well-being, economic hardship, and at times an increase in illegal or dangerous activities (Ogra 2008; Jadhav et al. 2012).

Perceptions of the level of negative interactions people are experiencing living with wildlife are as important as the actual losses from wildlife damage (Naughton-Treves et al. 2005), as they affect the level of antagonism people feel towards a wildlife species and consequently influence what actions people are likely to take in such situations (Dickman 2010). Ogra (2008), argued

that it is essential to acknowledge both the visible and hidden costs associated with human-wildlife conflicts (HWC) and, understanding the social determinants of negative interactions between people and wildlife is critical in order to develop and implement successful, long-term mitigation strategies (Songhurst 2023).

Negative feelings towards some wild animals can be exacerbated by past experiences (O'Connell-Rodwell et al. 2000; Hill 2004; Madden 2004; Dickman 2010) and attitudes towards dangerous animals such as elephants may be influenced by the perceived risks of living near such wildlife species (Knight 2000; Naughton-Treves; Grossberg et al. 2003; Kaltenborn et al. 2006; Songhurst 2023). If people are scared and believe they have little control over a conflict situation or have limited coping strategies, then they are also likely to further inflate perceptions of risk (Hill 2004). Fear of elephants generates safety concerns and restricted mobility for people (Naughton-Treves et al. 2005; Mayberry et al. 2017) and can influence both the temporal (Mayberry et al. 2017; Buchholtz et al. 2019) and spatial behaviour patterns of people (Redmore et al. 2023). Similarly, elephants have been found to adapt their behaviour to avoid risking encounters with people (Douglas-Hamilton et al. 2005; Graham et al. 2009; Songhurst et al. 2015; Buchholtz et al. 2019). It is essential that people feel safe where they are living, both to reduce levels of HEC (SLWCS. 2016, Henley et al. 2023) and to ensure psychological well-being (Maslov 1943; Henley et al. 2023).

The extent to which people accept the presence of wildlife and tolerate interactions with wild animals

is influenced by people's experiences, attitudes and cultural values. A greater understanding of the drivers of these is needed to develop socially acceptable wildlife management strategies (Jonker et al. 2006). In the Okavango Panhandle, Botswana, where people share space with a large population of elephants (Thouless et al. 2016), fear and stress due to encountering elephants contribute significantly to negative perceptions towards them, tolerance levels, and overall perceived levels of conflict (Songhurst 2012). If loss (actual and perceived) is matched by benefit (actual and perceived), then overall conflict can be reduced. However, improving perceived conflict levels is difficult because they are so complex. Songhurst (2023), found that perceived HEC in the Okavango area is affected by a variety of factors including socio-demographic characteristics, cultural beliefs, socio-economic circumstances, past conflict experience, and indirect and direct experiences with elephants. Management strategies that address the complexities of perceived and actual conflicts are therefore needed to reduce HEC.

In the Okavango Panhandle, elephants use distinct corridors to travel from dryland resources to the Delta, moving near fields and settlements and crossing the main road daily to do so (Songhurst et al. 2015). Children in the same area walk across these elephant corridors to attend school, and people also walk through the corridors to reach services such as shops and health clinics. The elephant corridors are essential habitat for elephants to access the resources they need and elephants are increasingly affected by people accessing former historical wilderness areas (Blake et al. 2008). Crossing points form hotspots for direct encounters between people and elephants, which ultimately increase fear in people and opportunity costs for children travelling to school, or people going about their daily lives (Lupton et al. 2015; Songhurst 2023). Fear for children walking to school was expressed most fervently by parents, and reports of children missing school due to elephant encounters was commonly reported by school teachers (Mr Radiposo, Head Teacher, Eretsha Primary School, pers. comm., February 2019). The community highlighted the need to increase the availability of transport, especially for vulnerable members of the community (school children, elderly, and disabled)

(Stakeholder Consultations, pers. comm., February 2019).

This paper describes an innovative practical intervention: the 'Elephant Express' (EEB) that has been implemented as a result of research and consultations led by the NGO Ecoexist Trust, to improve safety for people and reduce fear towards elephants, providing safe passage for school children, medical staff and their patients across elephant corridors to schools and health clinics and, ultimately, helping to foster coexistence between people and elephants in the Okavango Panhandle.

Study Area

The study was conducted between January 2021 and July 2023 on the eastern side of the Okavango Panhandle, where the Okavango River flows into the Okavango Delta (Fig. 1). The Okavango Delta, a Ramsar Wetland and World Heritage site harbours one of the largest populations of elephants in Africa. One-hundred and thirty thousand elephants, a third of Africa's remaining elephants are found in northern Botswana (Thouless et al. 2016), therefore it is of conservation significance (Adams et al. 2021). The eastern Panhandle covers 8,732km^2 and its northern and southern boundaries are delineated by the Namibian border and a veterinary fence, the 'northern buffalo fence', respectively.

The census of 2022 recorded approximately 17,545 people living in the eastern Panhandle (CSO 2022), with 14 villages (population >500), and additional settlements scattered between villages. An estimated 61% of residents in the wider district live in poverty, and 15.8% in severe poverty, relying heavily on subsistence agriculture—a livelihood that directly competes with elephants for resources (OOP 2021). Families in the eastern Panhandle move between villages and crops during planting and harvesting periods to guard their fields.

The elephant population in the eastern Panhandle is estimated to be around 18,000 (Songhurst 2017). Elephants have been observed in the study area to use distinctive pathways to move between the Okavango Delta and foraging areas in dry woodland habitat (Songhurst et al. 2015).These pathways are bisected by the main road (gravel-surfaced) that serves all villages in the eastern Panhandle, which are distributed in a ribbon-type development pattern along the edge of the wetland. Elephants damage crops, break fences,
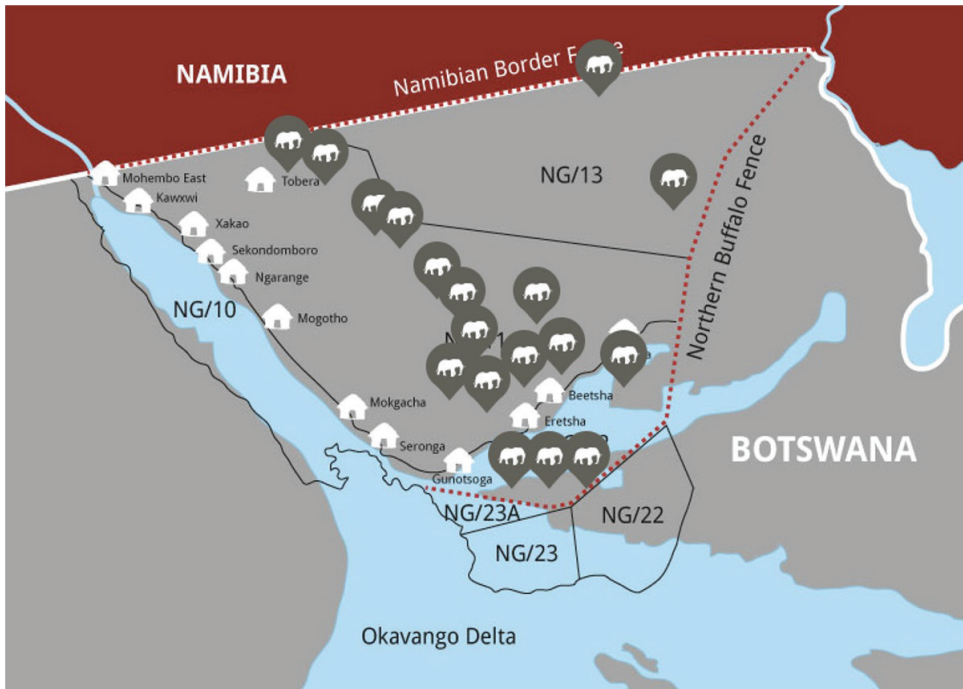
Figure 1. Map of the eastern Okavango Panhandle, Botswana. (*Map drawn by Ecoexist Trust 2023*)

damage property and chase, injure and sometimes kill livestock and people. Meanwhile, people are modifying ancestral elephant habitat by cultivating land and developing new settlements, and they also chase, injure and occasionally kill elephants. Before the implementation of this conflict mitigation programme, there was an average of one person killed per year by elephants in the area and approximately 25 elephants were killed annually through problem animal control (Songhurst 2017).

The EEB initiative is a collaborative effort between the community (Okavango Community Trust who has a jurisdiction covering six villages (Mokatcha, Seronga, Gunotsoga, Eretsha, Beetsha and Gudigwa), an NGO (Ecoexist Trust focused on reducing HEC), the Government of Botswana (Clinics, Schools and the Department of Wildlife and National Parks: DWNP) and the private sector (Natural Selection Safaris, Uncharted Africa, Halfway Toyota, and SATIB insurance company) stakeholders. The aim of EEB is to help reduce negative HEC interactions by providing safe passage for the most vulnerable people who make daily journeys on foot.

Materials and methods
Transport demand assessment

In 2015, a transport demand assessment study was conducted to understand the transportation needs of people living in the eastern Okavango Panhandle in relation to elephant corridors (Lupton et al. 2015). The assessment consisted of focus group discussions and semi-structured interviews with key stakeholders in the Panhandle. Seven focus group discussions, 13 interviews with school heads, nine interviews with clinic nurses, and five private sector interviews were held. Data were collected on: i) village population size; ii) average household size; iii) number of patients serviced at each clinic; iv) number of chronic patients serviced at each clinic; v) number of referral patients at each clinic; vi) number of students per school; vii) number of students walking more than 5 km each way per school; viii) number of students boarding at each school; ix) frequency of shoppers at each village; x) number of farmers selling their produce; and xi) type of produce sold.

The demand for transport per segment was calculated using the formula below to determine the demand for transport from various user segments.

Demand = Users * Frequency of Use

Stakeholder consultations

Semi-structured interviews and focus group discussions were conducted with key community and government stakeholders by the Ecoexist team between November 2018 and March 2019 to determine who the buses should service, the most expedient routes, and to ensure that the EEB service would assist in reducing HEC. Five focus group discussions took place with 47 key stakeholders from five villages in November 2018.

In 2019 two safari companies (Natural Selection Safaris and Uncharted Africa) pledged the provision of two buses and operational funds. A multi-stakeholder workshop took place in February 2019 with 56 participants from five villages. The stakeholders consulted included village chiefs, village development committees, clinic heads, school heads, the DWNP, the district commissioner and the Northwest District Council.

Mapping the elephant corridors and bus routes

The distances of the six villages (including Mokatcha, Seronga, Gunotsoga, Eretsha, Beetsha and Gudigwa) where the buses would operate were measured and mapped. The elephant corridor maps were prepared using data from ground surveys, local information and data from elephant collars based on their movements in the area. These maps were used to identify where the EEB service would be most useful to address HEC and reducing the risk of vulnerable people walking across corridors. A bus route for each EEB was proposed, with two buses in operation.

Management of the buses

A series of meetings between collaborators was held to determine the role and responsibility of each partner. Discussions included topics such as which actors would manage the bus, who the EEB would service, how beneficiaries would be selected, and how the buses would be monitored. This led to the production of two guiding documents (a Memorandum of Understanding (MOU) and Operations Plan (OP)) to outline how the buses would be managed and to define the standard operational procedures.

Two-year assessment: stakeholder feedback

Semi-structured interviews with key stakeholders and beneficiaries were conducted by the Ecoexist team over three days in October 2022 in five villages and six settlements where the buses operated, to gain qualitative feedback on the two years of bus operations and impact on reducing HEC.

Results

Transport demand assessment

In 2015, when the assessment was carried out, there was a human population of approximately 16,400 (CSO 2011) with 13 main villages. Four types of transport users or market segments were identified in the eastern Panhandle. These included: i) chronic patients, those needing access to medical care on a bi-weekly or monthly basis; ii) school children: most children walk <5 km to reach school, however 10% walk >5 km to attend school. Also, some children are weekly boarders; iii) shoppers, people needing to travel from villages to the main district town (Shakawe) to shop; and iv) vendors, who need transport to take produce to market.

Shoppers made up the majority of transport needs in the Panhandle (51% of demand), followed by children commuting to school daily (43% of demand), weekly-boarding school children (3% of demand) and chronic patients (1% of demand); (Tables 1 and 2 below).

Stakeholder consultations

All stakeholders present (100%) agreed that bus transport was needed and would help to reduce some of the HEC. Children getting to school and medical staff and patients were identified as the main people in need of transportation. The number of children and patients

Table 1. Total monthly demand

User type	Monthly demand
Shoppers	35,875
Sellers	3.5
Chronic Patients	542
Referral Patients	94
Daily School Children	31,394
Weekly School Children	2,376
Term School Children	267

*(Demand = Users x Frequency of Use)

Table 2. Market size for transport

Village	Market size						
	Shopping	**Selling (est # loads)**	**Chronic patients >5km**	**Referral patients**	**Daily School >5km**	**Weekly School**	**School Term**
Mohembo East	154	4	38.5	0	188	0	0
Kauxwi	332	3	0	4.5	0	0	0
Xakao	546	3			446.75	0	103
Tobere	143	4	21	0	0	0	177
Sekondomboro	280	4	0	8	100	0	0
Ngarange	349	3	7.5	7.5	276	20	0
Mogotho	400	3	40	10	146	146	0
Mokatcha	231	3	36.68	0	2	8	0
Seronga	2,125	3		40	0	180	500
Gunotsoga	396	3	23	6	65	10	0
Eretsha	201	3	120	0	20	0	0
Beetsha	572	3	120	10	0	200	0
Gudigwa	262	3	86	8	12	30	20

in need of transport was recorded (Table 3) and it was agreed that a multi-stakeholder workshop was needed to determine the best operations and management plan for the buses.

The multi-stakeholder meeting resolved that the two buses should be managed by both the Okavango Community Trust (OCT) and Ecoexist Trust, because the OCT has a responsibility to provide services to the community and Ecoexist Trust can ensure the buses are used for the intended purpose—to reduce HEC. It was also agreed that the first two EEBs needed to focus on the children commuting to and from school on a daily and weekly-boarding basis and between school runs, and to assist clinics with out-patient care for inter-clinic staff transport.

These discussions also emphasized the need to ensure that all stakeholders understood the purpose of the EEB service and that this was communicated through three strategies: a) the buses should be clearly branded as EEB; b) the buses should be launched at a series of village meetings (Kgotla meetings), where the purpose of the buses to reduce HEC would be clearly communicated to the community; c) a stakeholder WhatsApp group should be established to facilitate communications and awareness on operations; d) safety around elephant messages should be created and displayed inside the bus; and e) bus shelters should be erected for children and used to display further educational materials on the environment, elephants and elephant corridors (Fig. 2).

Elephant corridors and bus routes

Songhurst et al. (2015) identified 13 main elephant corridors in the eastern Okavango Panhandle, where most of the elephant-movement occurred. Figure 3 shows these corridors and where priority for transportation needs and assistance were identified to improve human safety. Through stakeholder consultations, it was agreed that the villages between Mokatcha and Gudigwa would be the priority focus for the first two EEBs and the distance between these settlements was recorded and mapped to assist with developing a bus route schedule. (Fig. 4)

Table 3. Summary of beneficiary numbers within and around the five main village service centres during the first community consultations

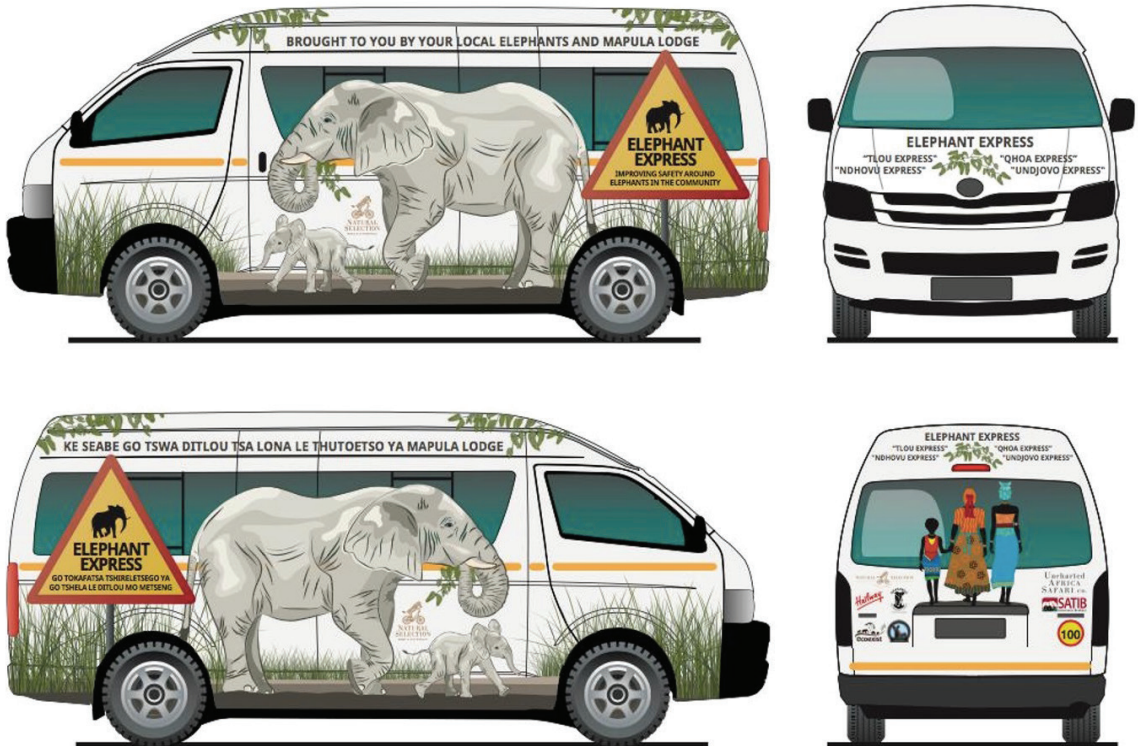| Village	Seronga	Gunotsoga	Eretsha	Beetsha	Gudigwa
Group					
Primary school	50 daily	24 daily	30 daily	149 daily	37 daily
Secondary school	9 daily	Boarding	Boarding	Boarding	Boarding
Clinic	100 monthly	50 monthly	50 monthly	231 monthly	85 monthly
Elderly	No	Yes	22	No	No

Figure 2a. The 'Elephant Express' bus exterior branding designs. (*Illustrations © Natural Selection Safaris*)

Key things to remember

Elephants have moderate eyesight

Elephants have good hearing

Elephants have an excellent sense of smell

In most cases wind direction will be an important element when you come across an elephant. It is best to approach elephants with the wind coming from the elephants to you, that is, downwind from them.

MALE Elephant

FEMALE Elephant

Elephant Warning Signs

⚠ **1. EARS OUT**
The first warning sign an elephant will give, is pushing ears out

⚠ **2. HEAD SHAKE**
The second warning is a head shake

⚠ **3. SECRETION FROM GLANDS**
When elephants are under stress they show signs of wet/dark patches between the ear & eye

Elephant Charge

1. MOCK CHARGE
Before a mock charge, the elephant might shuffle backwards or forwards or make a noise before it charges.

What to do:

Don't run   Stay calm   Clap hands   Stay in a group   Wave your hands in the air and shout

it will usually stop and go back

2. FULL CHARGE
In a serious charge, an elephant simply puts its head down, ears flat against its head and attacks with no hesitation and often with no vocalisation.

What to do:

Get out of the way   Try to get higher than the elephant - climb a termite mound or tree   Make a loud sharp sound   Throw a piece of clothing & run the opposite direction

Figure 2b. The 'Elephant Express' bus interior sticker designs. (*Infographics © Ecoexist Trust*)

It was agreed that EEB 1 would serve the needs of children between Matswii and Eretsha to Beetsha School and the EEB 2 would serve the needs of children between Ndorotsha and Xao to Gunotsoga School and Mbiroba to Seronga Primary School.

Management of the buses

The collaborating partners for the EEBs agreed to some key points under the MOU to assist in managing the buses, define the roles and responsibilities of each partner and outline the commitment pledged for the initiative. These points included service provision; funding; accountability; maintenance and care of the buses; an agreement on who should use the bus; liability; and reporting. The eligibility of bus users was a key discussion point in all meetings, and it was essential to establish clear guidelines on how passengers should be selected and recorded.

An EEB OP was also developed which outlined more specific details on how the buses would operate, including passenger selection,

hygiene, health and safety procedures, daily schedules, bus maintenance schedules, and record keeping. The monitoring of the buses was made the responsibility of all stakeholders to ensure that they would be used for their intended purpose. A co-management arrangement was established between the Okavango Community Trust and Ecoexist Trust to ensure transparency and accountability for daily bus operations. Additionally, each bus was equipped with a GPS spot tracker to monitor location and timings.

Two EEBs have been operating since January 2020 under the co-management arrangement between OCT and Ecoexist Trust (Fig. 5). Eligible children were registered with the school by their parents at the beginning of term and the clinics indicated transport needs for their staff through a monthly schedule (Fig. 6). The buses pick up and drop off children at designated bus stops which are equipped with shelters (Fig. 7). An important role of the EEBs is to provide education and awareness to the beneficiaries of the complimentary service, as well as the wider community. In addition to the buses being branded with information stickers, the bus shelters provided
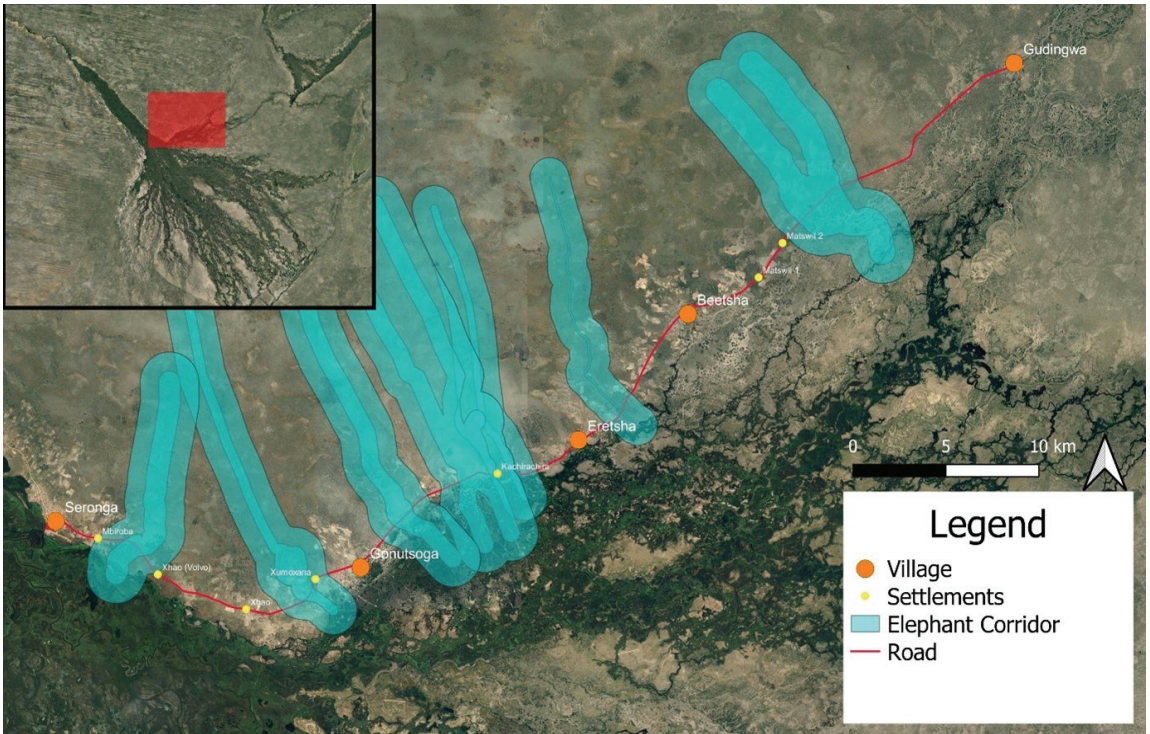

Figure 3. Map indicating villages and settlements (orange and yellow circles) serviced by the 'Elephant Express' bus, with elephant corridors coloured turquoise. (*Map drawn by Ecoexist Trust 2023*)

Figure 4. Map showing the distance between villages. (*Map drawn by Ecoexist Trust*)

information on elephant corridors, safety around elephants, wildlife crime, and a "how-to" on local environment protection (Fig. 7).

Two-year review: stakeholder feedback

A total of 29 interviews were conducted with five stakeholders and beneficiary groups (Table 4), including village chiefs (4), medical personnel (2), school personnel (8), parents (14), and OCT staff (1).

Situation before the introduction of the 'Elephant Express' buses

The responses of the interviews with parents indicated that before the introduction of EEBs parents feared for the lives of their children. Children missed school or arrived at school late after encounters with elephants. School performance was poor, and some children walked long distances, which made it difficult for younger children to attend.

Interviews with teachers also indicated that before receiving help from the EEB service, students were experiencing challenging encounters with elephants that often contributed to tardiness, poor attendance, poor performance, and lack of concentration in class, due to fear

of elephant encounters. It also resulted in truancy as some students took advantage of the situation. Prior to the arrival of the EEB service in 2020, Standards 2 to 5 in some primary schools had a 0% pass rate.

The interview with the clinic midwife in Seronga revealed that women often missed their antenatal check-ups and there were many home births without the presence of a medical professional, due to lack of transport. With the help of the buses, an antenatal outreach programme now sends nurses and midwives to satellite clinics on a more regular basis.

Summary of the situation after the introduction of Elephant Express buses

The monthly records of the bus drivers showed that the transport needs of 228 individual children (on average) and six clinic staff have been helped by the EEB service since September 2020 (Table 5).

Interviews with all stakeholders indicated that the EEB service was making a positive impact for people living in the eastern Okavango Panhandle. Teachers have acknowledged the importance of the buses observing an improvement in student performance, punctuality, and attendance at school. Since the inception of buses, teachers in one school indicated that results have improved from a 0% pass rate to a 20% pass rate, which they attributed to increased attendance

Figure 5. The 'Elephant Express' bus operating across the elephant corridors. (© *Ecoexist Trust*)

Figure 6. Morning pick up at Matswii bus stop. (© *Ecoexist Trust*)

Figure 7. Elephant Express Bus shelters. (© *Ecoexist Trust*)

due to meeting transport needs. A second primary school reported a similar improvement in the pass rate since the introduction of the buses.

Interviews with midwives indicated that there has been an improvement in the delivery of antenatal care services. One interviewee from Seronga clinic estimated that unassisted home births have reduced by 50% since the introduction of the buses due to midwives from Seronga being assisted by the EEB to visit remoter villages. It was revealed that the buses play an active role in enabling midwives to provide emergency care for newborns and mothers.

The interviews did identify some challenges with the current bus operations, including the need for more buses due to the number of children and clinic staff needing assistance; the pick-up/

drop-off schedule needing adjustments to ensure that children arrived at school and returned home on time/safely; communications with all stakeholders on schedule changes, bus breakdowns, and driver unavailability also needs to be improved.

Discussion

The EEB initiative has played an important role in improving the lives of people in the eastern Okavango Panhandle and reducing the fear of living with elephants and the consequent indirect effects of HEC. Stakeholder feedback indicated that since the introduction of the EEB service, school student performance, attendance, and punctuality have improved, as well as antenatal care for expectant

Table 4. Summary of survey participants

Institution/Organization	Informant	Place	Date
Village	Headman	Gudigwa	11/10/2022
	Chief	Eretsha	12/10/2022
	Chief	Gunotsoga	12/10/2022
	Chief	Seronga	13/10/2022
Okavango Community Trust Schools	Accountant	Seronga	13/10/2022
	Head teacher	Beetsha Primary	11/10/2022
	Teacher		
	Acting Head teacher	Eretsha Primary	11/10/2022
	Headteacher	Gunotsoga Primary	12/10/2022
	Teacher (Guidance & Counselling)		
	Head teacher	Seronga Primary	13/10/2022
	Teacher (Guidance & Counselling)		
	Teacher		
Clinic	Midwife	Seronga Clinic	13/10/2022
	Doctor		
Beneficiary of 'Elephant Express' Buses	Parent (2)	Matswii 1	11/10/2022
	Parent (2)	Matswii 2	11/10/2022
	Parent (2)	Moyagogo	11/10/2022
	Parent (1)	Gombo	11/10/2022
	Parent (2)	Kachirachira	12/10/2022
	Parent (3)	Mbiroba	12/10/2022
	Parent (2)	Xumoxana	12/10/2022

Table 5. Number of beneficiaries using the Elephant Express buses

Year	Children	Clinic Staff
2020	335	6
2021	260	6
2022	260	6
2023	208	6

mothers and babies. Responses of interviewees suggest that the fear of elephants and the attitudes towards living with elephants have changed since the implementation of the EEB service. Responses also suggest that there is a greater sense of control and comfort in living alongside elephants, which is fundamental to finding ways to reduce HEC (Henley et al. 2023). In the past, Songhurst (2023) found that negative feelings towards elephants were prevalent in the eastern Okavango Panhandle and many (16%) interviewees identified the issue of elephants killing and injuring people as the biggest problem. In this study, we have found that an intervention like the EEB service, has facilitated positive feelings towards this assistance and reduced the fear of living with elephants through providing safer transport. The Sri Lankan Wildlife Conservation Society (SLWCS) established a similar elephant bus programme in Sri Lanka in 2016 after a field exchange visit to the eastern Okavango Panhandle. Service provision was carried out along an elephant corridor outside the Wasgamuwa NP, with the aim of reducing pedestrian traffic and thus protecting elephants using the corridor. SLWCS (2016) reported that both human and elephant disturbance decreased as a result of the bus service.

Conservation education value

One of the primary goals of the EEB service was positioning the implementation of the project as a benefit of living with elephants. Tolerance of wildlife is strongly linked to awareness, and successful conservation education programmes are those that are multifaceted and provide ongoing points of contact that reinforce learning (Jacobson et al. 2015). The EEBs were designed to provide educational material both inside as well as on the outside of the buses to convey a sense that elephants are part of our environment and can be beneficial. The promotional message reads "Brought to you by your local elephants…" and a photograph of an elephant mother and calf—a relatable image—is displayed on the bus exterior. In essence, the buses serve as mobile billboards, continually advertising the benefits of living with elephants, and the bus shelters are sources of information for both children and adults.

Instruments to measure learning outcomes were not implemented in this study, but there is an opportunity to assess these outcomes in the future, particularly with children who use the buses and shelters.

With conservation education value in mind and the multiple benefits of the buses revealed by this study, there is a call to introduce this conflict mitigation tool in other areas of the Okavango Panhandle, and beyond. Several interviewees commented on the need for more buses in their communities and for the initiative to be rolled-out to those villages that currently do not benefit from the buses.

The further development of this or similar programmes comes with its challenges. The lengthy stakeholder engagement process was an important component of this programme and a pillar of its success; however, this delayed process can also be seen as a barrier to implementation and a risk of losing the interest of funding partners. Furthermore, the long-term nature of this programme can detract funders who prefer one-off donations. In the case of the EEBs the existing relationships held by the local NGO and the involvement of the OCT helped to drive lengthy stakeholder engagements and develop a well-supported programme. The long-term funding requirement was made possible with the involvement of local businesses and a tourism sector that has the ability to attract international donors. Hence the multi-sector partnership was important to the success of this programme and can serve as a model for similar long-term conservation. The success of this project also highlights the power of creating long-standing partnerships and what can be achieved through participatory co-design processes and collaboration among multi-sector stakeholders. Through a different lens, the EEB service of the eastern Okavango Panhandle highlights the need for multi-stakeholder engagement in the design and implementation of practical, lasting solutions to HEC.

Conclusion

Practical interventions that reduce fear among people living with elephants have a large impact on perceptions towards elephants. The lessons learned in the current management and operation of the Elephant Express buses will shape and improve future operations of the buses. The consultation process was a big learning curve that built a solid multi-stakeholder partnership and management framework, to scale up the programme in the area, benefiting from existing collective goodwill and trust among the stakeholders involved. Every situation is context-specific, and this includes context differences between and among villages in the same area—a participatory approach in the co-design of the management and operations of any similar programme is key to reconciling these differences and finding local-specific solutions. The sustainability of any such intervention to reduce conflict is a challenge, and this project has shown that partnerships can overcome such long-term funding challenges. The private sector represents a very strong partner in this regard, being able to sustain such social enterprise interventions, through long-term investment and partnership.

Acknowledgements

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