Wildlife and Indigenous Communities in Kenya: The influence of conservation education in supporting co-existence between wildlife and a Maasai community

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Abstract

Human-wildlife conflict in Kenya is a complex issue with environmental, social, and economic dimensions. Conservation education can raise awareness of environmental issues, by increasing knowledge, promoting positive attitudes, leading to pro-environmental behaviours. Educated youth can become 'conservation ambassadors' who help spread messages through the community. This qualitative study critically examined the extent to which this took place using the Wildlife Warriors Kids education programme, in areas of human-wildlife conflict in Kenya. Data were collected on students' knowledge, attitudes and practice in three primary schools in Maasai areas; in one of these school areas, interviews and a focus group were also held with Maasai community members. The influence on students was evident, regarding knowledge about wildlife, positive attitudes and an understanding of pro-environmental behaviours. The filtration of knowledge and pro-environmental behaviours to the community level was positive but limited. Culture and human wildlife conflict were the predominant factors influencing attitudes. It was evident there is a need to include intergenerational learning, and focus attention on cultural and environmental challenges, to enhance the filtration of conservation education to the community.

Keywords: *conservation education, Maasai, human wildlife conflict, indigenous knowledge, culture*

Introduction

Human-wildlife conflict (HWC) is a significant issue globally, affecting communities in Africa especially; it is also a major factor in determining attitudes towards conservation (Redpath et al., 2013). In East Africa, human-carnivore conflict results in strong, negative views of these species (Romanach, Lindsey, & Woodroffe, 2011). In Tanzania, psychological factors such as past trauma, education level and demographics were more significant in causing negative attitudes than economic factors in HWC (Koziarski, Kissui, & Kiffner,

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2016). Communities in close proximity to megaherbivores/ carnivores must deal with the associated daily challenges of living alongside 'problem' species. For example, the illegal killing of elephants in Kenya due to crop raiding is a persistent problem, and mitigating damage can be expensive and difficult (Tiller et al., 2022). Negative attitudes towards problem species have become deeply embedded into many cultures. Maasai people consider carnivores as enemies because of their persistent livestock predation. These communities depend on livestock for their livelihoods, currency, nourishment, and cultural status (Hampson et al., 2015). While wildlife is seen to be important in generating income for local governments from tourism, in many cases the benefits are not equally distributed and local communities miss out (Kieti, Manono, & Momanyi, 2013). This can add resentment to the devastating impact HWC can have on communities. Given these issues of conflict, it is important to consider the local context, community needs, cultural values, and indigenous ways of life when designing conservation education programmes.

Global conservation management has shifted over the last two decades to include local initiatives in bigger conservation programmes. This is known as community-based conservation (Reyes-Garcia et al., 2013). This 'community conservation paradigm' has emerged because of poaching, biodiversity loss and the resentment of local communities towards protected areas (Kieti et al., 2013). This approach assumes that when communities are engaged, informed and supported to manage natural areas effectively, they will protect local natural resources (Kieti et al., 2013; Van der Duim et al., 2011; Western & Wright, 1994). Numerous African countries have applied Community-Based Natural Resource Management schemes that focus on biodiversity conservation and community development, although with increased wildlife populations this can increase HWC if close to farms and inhabited areas (Gargallo, 2021).

Conservation education is a response to environmental issues, which aims to teach ways to protect, nurture and appreciate nature (Sherrow, 2010). Conservation education programmes aim to develop long-term pro-environmental behaviours and informed decision-making about conservation and climate change (Wi & Chang, 2019). However, successful conservation education cannot take place in a vacuum, as local culture strongly influences social learning (Wostl et al., 2008). African youth can reach their potential and ensure the sustainability of future generations, by developing skills, knowledge and values inspired by the African continent's vast natural resources and cultures (Lotz-Sisitka & Lupele, 2017). Many conservation organisations assume that if they educate the youth to care for the environment, they will become 'conservation ambassadors' who will spread the message to the community. This study explored the potential contribution of conservation education in reducing HWC by transforming attitudes. More specifically, the study addressed a lack of literature in this area, by focusing on the knowledge, attitudes and practices (KAP) of primary-school Wildlife Warrior (WW) students, and whether their conservation messages were reaching the community.

The role of Maasai culture and indigenous knowledge in conservation education

The importance of culture in supporting conservation education is central to this research. We begin by reviewing the key features of Maasai beliefs and customs that are relevant to their relationship with wildlife and to the role of conservation ambassadors.

The Maasai are a pastoral semi-nomadic community, with many different clans organised in age-sets (Spencer, 2014). Livestock keeping is the source of livelihood and cultural identity, therefore these are people intimately connected to the environment, and dependent on preserving their land for their animals (Spencer, 2014). Maasai culture has a rich oral tradition; stories from elders are not only a source of entertainment but also nurture positive attitudes towards the land and pass down moral messages from generation to generation. Children sit at dusk around a fire and grandparents share stories about wildlife, and this is a key part of education. The warriors (men) go herding with the young boys until they are of right age (normally teenagers) and have enough knowledge of handling livestock alone in the bush (Spencer, 2014). Warriors protect livestock from being stolen by other people and from wildlife (Ameso et al., 2018).

Beliefs, practices, myths and taboos play a critical role in guiding individuals' relationships with the environment. In Maasai culture, for example, it is forbidden to hunt pregnant animals. These beliefs and practices, passed down from one generation to another, develop the community's relationships and interactions with wildlife and the land (Kieti et al., 2013). It is important not to romanticise the indigenous way of life through the lens of environmental idealism, by implying culture only has value if it shows positive environmental teachings (Ryan & Ferreira, 2019). The Maasai tradition previously required a boy to show strength by killing a lion before he could be considered a warrior, though this has had to change due to this being illegal (Hazzah et al., 2017).

Maasai communities face many environmental issues, including overgrazing, which is a result of reduced pasture because of population growth, encroachment and climate change. The Maasai lifestyle of living in proximity to wildlife, both in national parks and community lands, means HWC is a highly significant issue for these communities. Negative attitudes result from negative experiences with wildlife, especially when humans are injured or killed and/or livelihoods are destroyed (Bencin et al., 2016). With low literacy rates, many struggle to get the compensation the government offers, and, as HWC creates a real financial burden, this further reinforces negative attitudes towards wildlife. Livestock killing by predators can cause significant losses, for example, one ranch in Kenya experienced a loss of $US 8749 per year which was 2.6% of the value of the herd (Patterson et al., 2004). Consequently, losing livestock can often result in retaliatory killings of wildlife (Hazzah et al., 2017). Generally, these issues are highly complex including land use, environmental degradation, community socio-economic challenges and cultural breakdown. There is no simple 'silver bullet' solution; however there are ways to address some of the challenges.

Target programme: Wildlife Warriors

Wildlife Warriors Kids (WW) is a national conservation education primary school programme based in Nairobi, Kenya, that started in 2018, run by the non-governmental organisation WildlifeDirect. WW aims are to "educate, connect students with nature and to inspire students to act for wildlife and be stewards of their environment" (WildlifeDirect, 2020).

This research explored the knowledge, attitudes and practice (KAP) of WW primary-aged students, and then investigated if these conservation lessons were reaching the community. Data were collected from three primary schools in the Maasai areas of Kenya where HWC exists (see Figure 1). The school with the community case study was in the Laikipia region, and the other two schools were in the Amboseli region. In all three, KAP data were collected from the students in WW groups containing an average of 50 students aged 10-15 years-old. Within Maasai culture, warriors are only male but 'Wildlife Warriors' in schools are both genders.

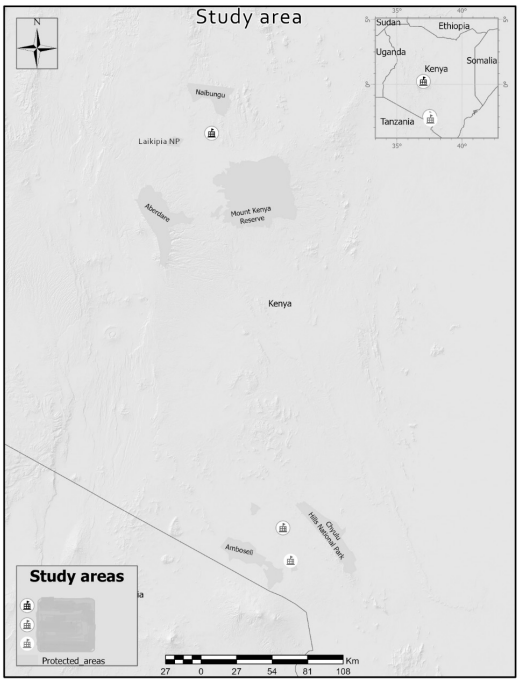

Figure 1: *Map showing the location of the three study schools (Laikipia Area School - LAS, Amboseli Area 1 - AA1, Amboseli Area 2 - AA2). The LAS is situated in a village 23 km from the town of Nanyuki and is home to mainly Maasai people and also includes other pastoralist communities.*

Methodology

Research design

More social science data is needed in conservation research in Africa (Browne-Nunez & Jonker, 2008). A social science qualitative methodology was used to explore the topic of

conservation education and its influence in depth (Denzin & Lincoln, 2011). Qualitative research provides insight into human experience, relying on the empathic skills of the researcher to present these concepts (Silverman, 2016). This design included a community case study within a broader participatory action research focus, in order to understand the social dimensions of conservation education to make social change (Franquesa-Soler, Sales, & Silva-Silva, 2022). This enabled situations and contexts to be viewed from the perspectives of many participants, within their mutual relationships (Cohen, Manion, & Morrison, 2013). To understand if students can be ambassadors for spreading conservation messages into the community, the study was split into two parts: schools and community. The schools were chosen based on their location in areas of HWC and their active participation in the WW programme. The chosen community was the extended village that was served by one of the schools that welcomed the research team.

Methods

Part One focused on answering this research question: What are the knowledge, attitudes and practices (KAPs) of school students exposed to the WW programme concerning wildlife and the environment? Participatory methods were used including oral, written and visual techniques which were child-centred, giving students the opportunity to input their data collaboratively (Ekhoff, 2019). Data were collected through three activities (see Table 1). A Wildlife Warrior bingo game was designed and played, to gain an understanding of the students' knowledge. A drawing questionnaire collected data about students' attitudes. Role plays/ dramas were used to collect data on behaviours/ practices.

Table 1: *Methods of student data collection to discover knowledge, attitudes and practice*

	Method	**Instructions**
Knowledge	Wildlife bingo game	Questions came from WW passports based on 12 endangered species: lion, giraffe, colobus monkey, pangolin, rhino, Grevy's zebra, cheetah, hawksbill turtle, elephant, honeybee, mountain bongo, vulture
Attitudes	Drawings and explanations as a questionnaire	1) Draw a picture of what the natural environment looks like near your school. 2) What is a perfect natural environment to you? 3) What has been easy or hard about Wildlife Warriors? 4) What do you like about wildlife and the environment? 5) What do you not like about wildlife and the environment?
Practice	Dramas/ role plays	Students to role play showing what they do to protect the environment at their school or homes, based on what they have learnt in WW. Give alternative drama idea too.

The questions and pictures used in the bingo game were based on the information written in the students' WW passports. After playing the bingo game, students chose another activity: either drawing or drama, to give them some agency over the process. Drawing as a research method can empower children to use their imaginations and freely express their opinions and values (Bland, 2018). For the same reason, it is also suited for cross-cultural research. Students were asked to write a sentence explaining their drawing to ensure correct interpretation of the data (Bland, 2018).

Part Two of the study focused on answering the second research question: To what degree does this programme affect KAP at the local community level? Data were collected from a case study using interviews and a focus group. The case study included different members of the Maasai community such as parents of WW students, warriors, elders, teachers, community members and a KWS (Kenya Wildlife Service) researcher. Appropriate participants were identified and recruited through a snowball sampling technique, starting with one community member who helped to find others (Parker, Scott, & Geddes, 2019). To ensure a sample best represented the different views of the community, participants were drawn from the three main stakeholder groups: parents, teachers and community members. Although those identities are not mutually exclusive, this was an approach demonstrated by Nthiga et al. (2015) in Kenya. Gender and age were also considered, since women and men play different roles. Data were generated through:

- Fifteen interviews: ten in Kiswahili, two in Maa (local Maasai language) and three in English; and
- A focus group discussion, in Kiswahili.

Translations from Kiswahili to English and transcriptions were done by the lead author (Georgina Hoare) and a Kenyan research assistant from the wider Maa community (Maasai and Samburu). To maintain quality in translations, member checking was done with other group participants before transcriptions into English were completed (MacKenzie, 2016).

Thematic analysis included theme development and coding of drawings, drama scripts, interviews and the focus group discussion (Gibbs, 2010). The data triangulation process involved reading government Kenya Wildlife Service (KWS) reports, and conducting an interview with the KWS personnel to gain deeper understanding and other perspectives on HWC issues. Secondly, one of the authors (Kennedy Leneuiyia) provided background, insights, and interpretations of some of the cultural data and issues from the field, on account of being from the same indigenous group. Ethical procedures for researching children were strictly followed and pseudonyms were created for all participants and schools. Contributors had a choice to participate freely.

Research findings

Discussions of students' data

The potential of students to spread messages into the community was evident. The average level of student knowledge of the WW endangered species was relatively high (Laikipia Area School-LAS 70%, Amboseli Area 2- AA2 65% and Amboseli Area 1-AA1 64%). In student drawings, positive attitudes towards wildlife and the environment were apparent. Many drawings showed students' dislike of HWC and human exploitation of the environment – for example, tree-cutting and littering. The dramas showed understanding of pro-environmental behaviours students can adopt. These included reporting/ arresting poachers, reporting people responsible for deforestation and planting trees. They served as a chance to explore a conservation message through students working together, redefining identities, showing values and perspectives in an inclusive and creative way (Heras & Tabara, 2014).

A clear and recurrent theme through the student data was the importance of culture. Many students drew their perfect environment containing livestock and, significantly, livestock with wildlife. This suggests students want co-existence in their lives. In these drawings, thoughts and opinions of culture were clearly expressed beyond the boundary of language and literacy (Esson & Moss, 2016). In addition, students drew mountains, rivers, trees, rocks and animals, showing that they value nature, and they see water and rain as crucial for their lives, livestock and wildlife (see Figure 2 for example).

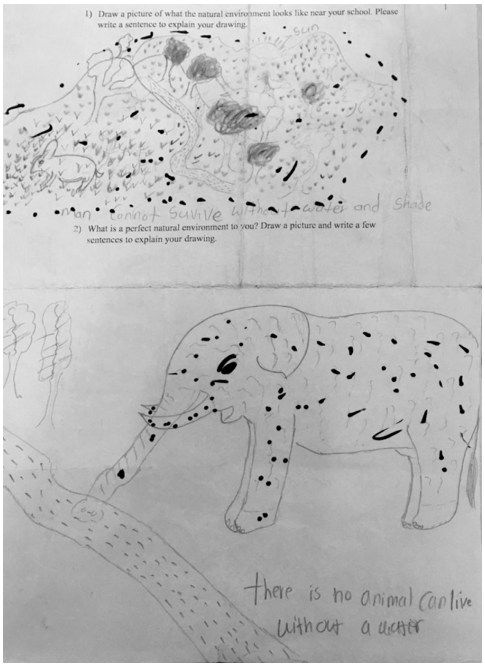

Figure 2: *An example drawing from AA2 school*

Many students expressed a hatred of hyenas and other predators due to conflict (see Figure 3). This reflected the dominant narratives within their community.

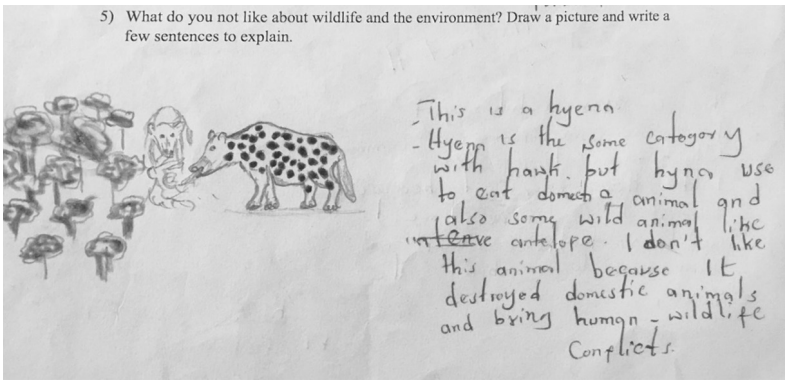

Figure 3: *An example of a HWC drawing from AA1 school*

This hatred could be exacerbated by traditional stories that often depict hyenas in a bad light, as being gluttonous and destructive. In other drawings, students showed it is illegal to hunt wildlife, for example, in a drawing of a man killing a hare (see Figure 4). In this case, conservation education has created a positive impact, as the student learnt through WW that killing wildlife is immoral and illegal, despite the fact that killing hares is a common practice. This drawing gives a lens into the student's newly formed understanding of the world through the WW programme.

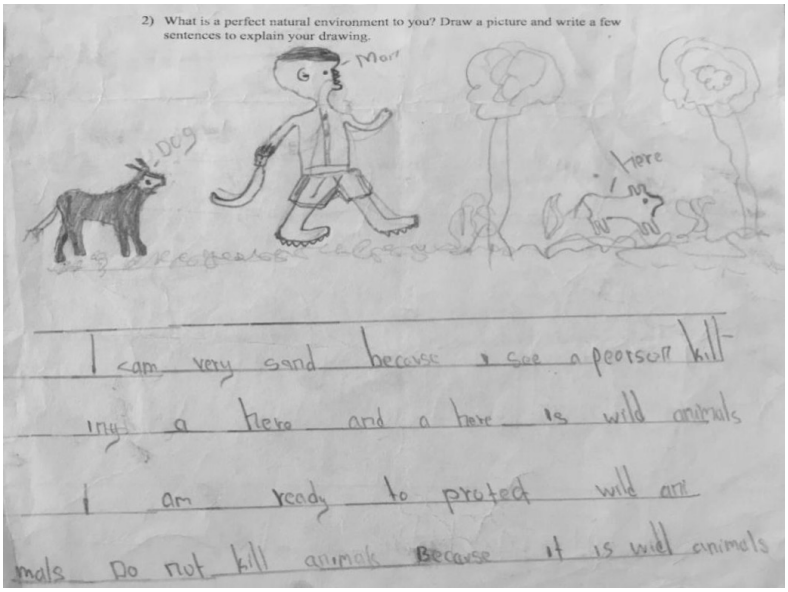

Figure 4: *An example of a drawing from a student at LAS*

Many students drew practical activities included in their WW lessons, such as planting trees around the school. Some had transferred the practice back home, growing trees in their compounds. From the drawings, students clearly understood the threats facing wildlife, for example deforestation and HWC, and the ecological role that animals play in the ecosystem. This demonstrated how practically WW has influenced the attitudes, knowledge and practice of the students, in addition to basic school curriculum teachings and their traditional way of life.

Knowledge transfer to community level

There was clear evidence of the students spreading messages to their parents, and the parents sharing these with others. It is important here, to present the 'stories' of some individual students as they demonstrated how WW impacted on their home lives. Participant KT, who became the student leader of WW, was determined to spread the messages of conservation to her family, for whom she wrote a song: '*I tell my parents we need to protect wildlife*'. The father of another said: "*My son PT brings back stories about the WW kitchen garden and it helps me plant and improve my own garden*". A mother said: "*My daughter KR suggested we make a kitchen garden after learning about it at school, and now at home it is doing well!*" These student stories, corroborated by community member interviews, show how WW actions are seen in the community through the messages they have spread.

Community discussion

Human Wildlife Conflict (HWC)

Loss was a major community theme that came up with every person in the research when discussing the challenges of living with wildlife. "*Hyenas come so often you can be losing livestock three times a month"* (Mr A) and "*When a hyena comes and meets a goat, for us it is war"* (Mr B). Elephant crop raiding is another issue, as some people are diversifying their livelihoods away from only livestock. *"Elephants killed my best friend. I will never recover"* (Mr C). Mr D said, *"I have given up on planting crops this year because of elephants*". Negative attitudes were obvious from statements like *"I hate hyenas"* (Mr E) and *"There is no benefit of wildlife, especially elephants*"(Mr D). Added to this was a frustration with the lack of compensation and slow process thereof for HWC incidences. High illiteracy rates exacerbate this challenge. Yet literacy is also directly impacted by HWC: "*Children getting to school is a big risk, as elephants block the way"* (Mrs F, Mrs G, Mr D). Sitati and Ipara (2012) discussed the issue of students facing elephants on the school route in a Maasai region in Kenya, and student exam results being lower in schools in elephant areas. However, teacher Mrs H said, *"grades are not a problem here because the elephants come seasonally"*.

Amongst these challenges, people also noted the following regarding human losses from wildlife *"[They] are just part of life, part of our culture of living with wildlife"* (Mr H) and *"Maybe the attack on humans was an accident, or the animal was provoked, as sometimes there is another reason"* (Mr I). There was a clear lack of knowledge transfer from WW students to

adults about the importance of elephants. Many focus group members complained about elephants destroying trees, clearly showing a lack of understanding of their role in ecology. Such an understanding may not necessarily change attitudes (Herberlein, 2012), especially if elephants have caused emotional pain through loss of a friend or family member. It is possible, however, to change attitudes if people experience wildlife in a non-threatening situation if they can start to understand them (Ballouard et al., 2012; Randler, Hummel, & Prokop, 2012). Mr D discussed 'just letting elephants be' while they are not a threat. An indigenous interpretation could be that he saw the animals as fellow tribe members. Even if he was not part of the specific elephant clan, he would not want to disrespect people from that clan by killing an elephant (Kuriyan, 2002). Elephants are respected by the Maa people who put green branches on their heads if they come across dead elephants in the bush (Kuriyan, 2002). This further demonstrates a desire for co-existence.

Cultural importance of the environment

The community results, added to the student data, suggest culture is an obvious recurrent theme. Maasai communities are intimately connected with their environment despite the challenges they face. Many people discussed how important the environment is for the use of water, pasture and traditional medicine. It was stated by a community member, and verified by the KWS, that areas of Maasai land have the most wildlife in Kenya: *"Maasai people have evolved to live with wildlife, they use wildlife as indicators of changing seasons, and show where good pasture and water are"* (Mr K). This shows the value of indigenous ecological knowledge of wildlife (Sitati & Ipara, 2012). Despite the challenges, community members declared opinions of optimism and shared the significance of the environment: *"My opinion about wildlife is, we are creatures that God created with better brains than all animals, it is our duty to protect wild animals"* (Mr J). This and many other encouraging statements demonstrated an appreciation of wildlife and a wish for co-existence.

This research was also concerned with discovering how much of the information and attitudes covered in the WW programme were transferred from students to the community level. The KAP of students were positive, however while some messages (e.g., no poaching and the importance of trees) did filter into individuals in the community, the knowledge transfer was limited, and to understand potential reasons why, it is important to return to the Maasai culture.

Cultural barriers

The Maasai community is organised by age set and gender. Each has specific roles, for example elders pass on knowledge to the rest of community (Spencer, 2014). It is difficult for the young generations to challenge the behaviour of elders. This proved particularly true when witnessing an incident of HWC, where an elder killed a snake that was threatening his livestock. This elder's daughter was part of the WW programme and had recently learnt about snake conservation. Deep respect is given to elders (parents) and the younger generation cannot go against their word. Gender issues are at play here too as men are

the decision-makers in the household, meaning their word is the strongest (Loos & Zeller, 2014). The negative interaction with wildlife, regular predation and some crop raiding have shaped attitudes negatively, hence the "*I hate …*" response in most of interviews to certain species. To change these practices and attitudes, conservation education should not only target schools, but also the wider community, especially elders. Elders are the authority and voice of the community. This means information could trickle down much faster working with them as leaders to speak to other community members, as opposed to working with students to pass on information. Aside from kitchen gardens and students planting trees, it became evident there was limited filtering of information from the school to the community taking place. Overcoming cultural barriers remains a significant challenge, for example killing snakes because of negative cultural beliefs and conflict, and not protecting planted trees from livestock. Therefore, tangible solutions to the existing challenges of HWC are needed, as it is difficult to cultivate positive attitudes without resolving conflict and cultural issues in the community.

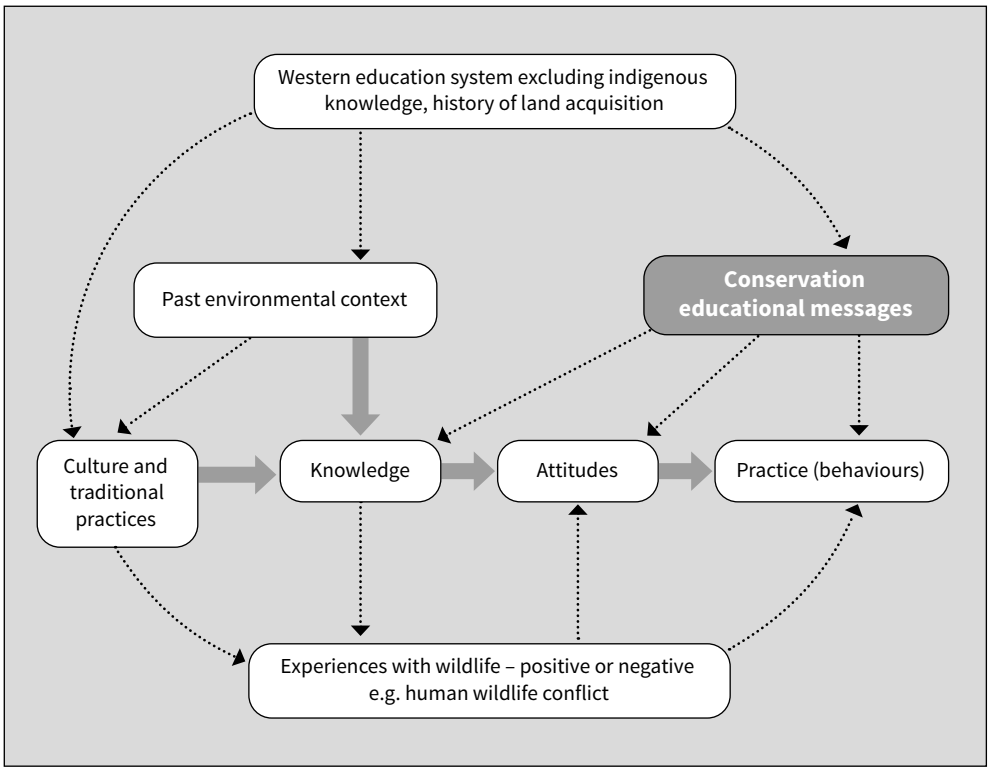

Figure 5: *The greater context and complexity of issues showing how factors are interconnected and influence or inform attitudes and behaviours towards conservation action. Thickness of the arrow shows relative importance in accordance with what was discussed with research participants, combined with literature (Bencin et al., 2016; Bonini, 2006; Charamba & Mutasa, 2014). The aim would be to increase conservation educational messages in the context of local culture.*

Figure 5 is a conceptual theoretical framework showing how conservation education fits within the broader context of society; culture, individual experiences and HWC. This originated from the research findings and many of the factors that became evident in this project. It is important to note the findings of this study were considered in the context of the local environment, culture, and community challenges – all of which are included in Figure 5. Culture is very significant in informing knowledge, attitudes and practice, for example when Maasai people value the environment as their provider of life. The greater context is key as arguably a Western colonial education system is limited in its capacity to meet the needs and complex issues of indigenous people on the ground (Omolewa, 2006). Culture is also linked to having direct experiences with wildlife, for example, when Maasai boys herd livestock – negative or positive experiences will have an effect on KAP.

Recommendations for conservation education programmes

Based on the findings discussed, three recommendations should be considered to improve the impact of conservation education in communities in Kenya:

1. Make conservation education goals and subjects culturally relevant to benefit communities.
2. Harness stories and suggest beneficial indigenous knowledge (IK) to cultivate positive attitudes to wildlife between generations and encourage intergenerational learning.
3. Discourage negative practices and myths about wildlife by using IK stories and conservation education.

Conservation education needs to target community issues on the ground in the context of culture. This will help address actual challenges instead of theoretical challenges, which are different depending on the area in which the community is living. Incorporating positive IK in conservation education curricula would make education more relatable/relevant for students and could be critical for local and global sustainability (Opoku & James, 2020). This could mean using sayings from the elders in teachings and telling stories. For example, there is a famous Maa cultural story that children are told when growing up, of how wildlife ran into the bushes away from humans, as they were disrespected and had not received enough care from the woman of the homestead. Since then, the relationship is not as close as it once was. That is why women are chased by elephants and buffalos when they go about their chores fetching water and collecting firewood. This is still emphasised today, as children are told off when livestock are lost and told not to let them run away like the wildlife did. It is important to discourage negative attitudes about wildlife, for example, hyenas being gluttonous and snakes being evil. The three recommendations above could be used with the example of a hyena in an educational programme. It is important to acknowledge HWC experiences and negative views and myths in the communities. However, the education focus could be on ecological significance. The stories can be harnessed, for example, to teach

that being gluttonous is a benefit as hyenas scavenging on dead animals can reduce disease risk, and can therefore ultimately protect the community and livestock. When harnessing stories, it is important to do this respectfully and not to directly challenge indigenous knowledge in a negative way (Ryan & Ferreira, 2019).

Recommendations for the future of Wildlife Warriors

Based on this research, improvements were suggested for WW to move forward. It is vital that culture be used in WW activities. It would benefit community learning if a HWC mitigation handbook for students was created and taken into the community to help with literacy issues. WW students can be involved in creating this handbook co-designed with the community. It would be helpful for the community including elders to be involved in workshops on specific HWC issues with appropriate mitigation methods. Taking community members into the bush to exchange knowledge and appreciation of wildlife in non-threatening situations could help to make attitudes more positive (Ballouard et al., 2012; Randler et al., 2012).

Conclusion and reflections concerning future research

The students in schools were actively engaged in the WW programme and had acquired knowledge, positive attitudes and understanding of some pro-environmental behaviours. The degree to which the WW messages reached the community was, however, limited. The wider context in which conservation education is taught is crucial, as the threats to the environment in each local place will differ and people's negative experiences with wildlife will be unique. The idea of student ambassadors for change in their community is dependent on the culture they live in. As environmental educators and researchers, we need to critically ask ourselves why we are delivering conservation education and for whom. For example, are we doing it to spread messages from students in schools to the community to foster positive relationships between students and nature to then target adults? Are we focused on the younger future generation to reap the benefit in fifteen years when they can be decision-makers, or given the current biodiversity and climate crisis, will this be too late? Cultural and gender issues may be significant barriers to community uptake of conservation practices. It is possible to get students to plant trees at home, as this is schoolwork parents will allow. However, parents will not necessarily be actively engaged in this as they have many responsibilities. The cultural beliefs of the Maasai are based on living from the land and it is challenging having to adapt to a modern world and modern Western education (Wangui, 2008). There is a clear need to navigate a way through this, to achieve co-existence of an indigenous culture with working to protect wildlife. As Kayira (2018) stated, it is important to design conservation education programmes in a specific local context to consider and allow for differences in learners' backgrounds. This is because each student has their own understanding of the world and their own story based on place, experience and culture, which needs to be considered in planning educational engagements. This study

has shown that conservation education has great potential for sustainable change, if the cultural context and the community way of life are taken into account.

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Percentage contribution

Areas of contribution	Author	% Contribution per area, per author (each area = 100%)
Conception or design of the paper, theory or key argument	Hoare	70%
	Leneuiyia	20%
	Higgins	10%
Data collection	Hoare	100%
Analysis and interpretation	Hoare	65%
	Leneuiyia	20%
	Higgins	15%
Drafting the paper	Hoare	50%
	Leneuiyia	40%
	Higgins	10%
Critical review of paper	Hoare	40%
	Leneuiyia	25%
	Higgins	35%

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