Institution: Oxford Brookes University

Unit of Assessment: 14, Geography and Environmental Studies

Title of case study: Human–wildlife interactions and coexistence: working to mitigate conflicts, internationally

Period when the underpinning research was undertaken: 2000–2008

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Catherine Hill	Professor of Anthropology	[text removed for publication]

Period when the claimed impact occurred: 1 August 2013–present

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact

Human–wildlife conflict (HWC) is one of the most pressing and complex challenges for global wildlife conservation. Understanding the factors that cause it is crucial in preventing it.

The impact described in this case study results from over 20 years of research conducted by Professor Catherine Hill into human–wildlife interactions and conservation conflicts in Africa. Her research shows that conflicts about wildlife are often the result of different groups' cultural values and priorities, and unequal power relations. Previously it was thought that these conflicts were the result of ecological or economic impacts of wildlife. Professor Hill's methodological focus on 'positionality' (an understanding of how a person's identity impacts and possibly prejudices their interpretation of the world) has also been influential.

Findings from this extensive research have informed international conservation guidelines, improved the skills of government wildlife agencies and conservation non-governmental organisations (NGOs), and influenced policy. Through training events it has also changed management practices – promoting coexistence strategies in local farming practices, and enhancing local livelihoods without harming wildlife, as seen in Uganda.

2. Underpinning research

Research led by Professor Hill has explored social and biological aspects of human–wildlife interactions and HWC in Masindi and Hoima District, Uganda (2010–2020), Cantanez National Park (2012–2018), Guinea Bissau and, most recently, in southeastern Madagascar (2016–).

From the start, Professor Hill and her research students and postdoctoral researchers have followed an interdisciplinary approach. This has involved using social science methods such as participant observation and qualitative interview techniques combined with quantitative, systematic ecological surveys and behavioural observation of animals. This has enabled a more nuanced understanding of the complex nature of human–animal relationships. Interdisciplinary approaches to this type of research are now more common, but during the first decade of Professor Hill's research her approach was ground-breaking. The research has been externally funded by research grants from The Leverhulme Trust, The North of England Zoological Society, and Maurice Lang Foundation, totalling £146,765.

In her earlier work, beginning in 2000, Professor Hill examined how sharing landscapes with wildlife (including protected species such as elephants and chimpanzees) impacted on Ugandan farmers' lives and livelihood security. She determined:

- the degree to which different food crops commonly grown in western and northwestern Uganda are vulnerable to damage by wildlife species
- how different cropping strategies affect patterns of crop damage, including the risk of incurring damage by wildlife
- how conflicts about wildlife are, in reality, conflicts between different human groups as a

result of their different value systems, beliefs, priorities, power and agendas **[R1]**.

The focus of Professor Hill's more recent research has built on earlier work, but has incorporated a more explicitly applied approach:

- examining how changing land-use strategies and increased cash-cropping in response to national policies to reduce rural poverty can make farmers less tolerant of sharing space with wildlife **[R2]**
- working closely with smallholder farmers at all project stages to develop and trial a series of humane, non-lethal crop protection tools to reduce crop damage by non-human primates and other wildlife species **[R3]**.

All crop protection methods (such as different models of hedging, fencing, early warning systems, use of repellents) were developed in collaboration with local farmers. They were trialled on farms to test how well they reduced crop damage by primates. The farmers chose to keep all crop protection installations on their farms after the end of the trials, and initial feedback from farmers during the trial period was strongly positive **[R4]**.

Professor Hill's work also explores the social complexities that underlie people's complaints about wildlife, and their retaliatory behaviour. There is a focus on instances where people's reaction to an animal seems excessive in relation to the losses or inconvenience experienced **[R5]**. Farmer conflict narratives have highlighted local people's concerns about the unpredictable and uncontrollable nature of wildlife incursions. This is in the context of restrictions requiring farmers to repel 'invading' wildlife to comply with national and international conservation legislation **[R1, R5]**. Farmers expressed their unhappiness with 'the government' that, in their view, forced them to share landscapes with wildlife without compensating them for crop losses, or for the additional time they had to spend protecting their crops from 'the government's cattle', as wild animals were sometimes referred to **[R1, R2]**.

Professor Hill and Dr Matthew McLennan were among the first to acknowledge the lack of recognition or discussion of positionality of researchers and practitioners in conservation science. Using case study research, which focused on human–chimpanzee relations in Uganda, they showed that assumptions made by members of other interest groups (in this case local farmers) about conservationists and researchers influences how conservationist/researcher actions are interpreted. In turn, this affects how conservation messages are interpreted and conveyed by others **[R6]**. This has the potential to create further mistrust between local people, government wildlife officials, conservation NGO representatives and researchers, and can inflame existing conflicts and even create new conflicts about wildlife.

Examining and acknowledging individual and institutional positionalities – motivations, values and belief systems, priorities and agendas – is central to understanding the intentional or unintentional impacts conservation actors can have on any HWC. It helps to clarify when and why conservation actors, and other stakeholders, may disagree in their respective agendas and priorities. It helps to explain why conservation actors are often not best placed to act as 'third-party neutral' facilitators in HWC, and the likely implications when they do take on these roles **[R6]**. The importance of considering positionality in human–wildlife conservation has continued as a focus in Professor Hill's work, including most recently in her contributions to the content of the forthcoming International Union for Conservation of Nature (IUCN) Task Force Guidelines on Human Wildlife Conflict.

3. References to the research

1. **Hill, C.M**., (2004): Farmers' perspectives of conflict at the wildlife-agriculture interface; An African case study. *Human Dimensions of Wildlife*. 9(4): 279-286. DOI: 10.1080/10871200490505710
2. McLennan, M.R., & **C.M. Hill,** (2012): Troublesome neighbours: changing attitudes towards chimpanzees (*Pan troglodytes*) in a human-dominated landscape in Uganda. *Journal of Nature Conservation,* 20: 219-227. DOI: 10.1016/j.jnc.2012.03.002
3. **Hill, C.M**., & G.E. Wallace, (2012): Crop protection and conflict mitigation: reducing the costs of living alongside non-human primates. *Biodiversity and Conservation*, 21: 2569-

2587. DOI: 10.1007/s10531-012-0318-y

4. Wallace, G.E. & **C.M. Hill** (2017): Engaging Farmers and Understanding Their Behaviour to Develop Effective Deterrents to Crop Damage by Wildlife. In: Hill, C.M., Webber, A.D., & N.E.C. Priston (Eds.) *Understanding Conflicts about Wildlife: A Biosocial Approach*. Berghahn Books: New York, Oxford. Pp: 170-193. ISBN: 9781785334627
5. **Hill, C.M**., & A.D. Webber (2010): Perceptions of Nonhuman Primates in Human-Wildlife Conflict Scenarios. *American Journal of Primatology*, 72(10): 919-924. DOI: 10.1002/ajp.20845
6. McLennan, M.R., & **C.M. Hill**, (2013): 'Ethical Issues in the Study and Conservation of an African Great Ape in an Unprotected, Human-Dominated Landscape in Western Uganda' in *Fieldwork Ethics in Biological Anthropology* (Eds) J.V. MacClancy & A. Fuentes, Berghahn Press: Oxford. Pp: 42-66. ISBN 9780857459626

4. Details of the impact

Professor Hill's cumulative and detailed research findings have had a clear impact by changing human behaviours, enhancing livelihoods and improving interactions with wildlife, across a range of countries. Specifically, her findings have made a significant contribution to changing farmers' and wildlife managers' behaviour and practices in the face of crop damage by primates in Uganda, and more widely throughout Africa. This is as a result of research-informed training activities.

More broadly, the research has promoted greater understanding of human conflicts about wildlife. This has been achieved by integrating biological and social science perspectives and challenging established assumptions about the causes and implications of wildlife conflicts. In turn this has led to the development of effective, humane, non-lethal methods to reduce crop damage.

Professor Hill's findings have also had a clear and beneficial impact on local coexistence practices, livelihoods and international guidelines. Beneficiaries of her research include smallholder farmers, conservation NGOs, and government wildlife and agricultural agencies. This impact has been achieved through:

- the development of small-scale, cost-effective crop protection tools
- training events for wildlife managers working with HWC
- research results that directly inform NGO policy and specially designed information, distributed to farmers to promote human–primate coexistence.

These specific impacts are explained in more detail below.

Empowering African farmers to develop humane methods for reducing crop damage

Professor Hill's research has informed the development and use of humane, non-lethal methods to reduce crop damage by primates such as the chimpanzee (*Pan troglodytes*), classed as Endangered, baboons (*Papio* spp.) and wild pigs (*Sus* spp.). These methods involve improving detection rates of animal incursions to fields through early warning systems, enabling farm guards to respond faster and more effectively to such events, and using barrier methods to deflect wildlife movements away from fields. This combination of methods helps farmers by reducing crop losses, enhancing livelihood security. It also supports Ugandan and international conservation policy and practice by reducing farmers' use of lethal crop protection methods, especially with wildlife species classed as Endangered or Vulnerable by IUCN, directly benefiting wildlife conservation in Africa.

Subsequent work confirmed that farmers continued to use the new tools after the original project finished in 2007. The farmers remained positive in their assessment of crop protection tools' effectiveness and practicality. These practices also spread to other farmers in the locality, who copied installations trialled on their neighbours' farms in the original study **[S1]**. Because of Covid-19 restrictions it has not been possible to verify whether these tools are still in use currently, as a funded and planned research-evaluation trip has been postponed. However, various of these techniques are now being introduced and trialled at other sites in Africa **[S7]**.

Professor Hill's research findings have informed the strategic planning process of the NGO Village Enterprise. This is a well-established NGO, operating in Uganda and Kenya since 1987 (https://villageenterprise.org/), whose mission statement is 'To end extreme poverty in rural Africa through entrepreneurship and innovation'. It focuses on reducing rural poverty through a development programme, supporting local farmers to set up profitable micro-agricultural businesses without making existing or future HWCs worse. Information from Professor Hill's research was incorporated into Village Enterprise's work in Uganda and Kenya in several ways. First, it informed the organisation's strategic planning and business/conservation training programmes. Her results were shared with NGO business mentors, so that they could more effectively support their mentees. The research findings also informed a list of non-fundable, micro-business enterprises that could negatively impact on local and national conservation initiatives. Evidence of each of these areas of contribution is provided in a letter from the organisation's senior director of programmes and operations **[S2]**.

Other beneficiaries of Hill's research include Connected Conservation, which was established in 1994 in Victoria Falls, Zimbabwe. This organisation works in conservation planning, conflict and coexistence strategies and economic development around wildlife. Various of Professor Hill's research findings have been used by the organisation to complete several projects commissioned by the Kavango–Zambezi Transfrontier Conservation Area (KAZA TFCA) secretariat, a government organisation. Professor Hill's work has been particularly important as a source of material for producing infographics to support farmer–wildlife coexistence within the KAZA TFCA in central southern Africa (Angola, Botswana, Namibia, Zambia and Zimbabwe). As Connected Conservation's director states: 'Our firm completed a survey of conflict with all wild animals in the KAZA region and relied heavily on the work of Dr Hill and her students on useful examples of how farmers cope with primates and conducting social science around conflict situations. Last year we were engaged again by the KAZA secretariat to develop a series of infographics to help farmers in the five countries and we revisited Dr Hill's work to find practical examples we could draw from this body of research' **[S8]**.

Supporting wildlife management, conservation funders and government and NGO policy makers working to address HWC

Professor Hill's research has had a material impact on African wildlife managers' knowledge and practice, through training events targeting wildlife managers working across Africa. Examples include invitations for Professor Hill to develop and deliver training on 'Understanding and Responding to Conflicts about Wildlife' as part of the Pathways Africa Conference training series, in Kenya (2016) and Namibia (2018) (https://sites.warnercnr.colostate.edu/pathways-africa/). These events were aimed at early and mid-career government and NGO wildlife officers working in countries throughout Africa. They focused on providing managers with:

- a clear understanding of the social complexities around conflicts about wildlife
- simple tools and techniques to reduce direct costs to farmers of sharing space with non-human primates **[as per R3]**, for example using a combination of hedges, fencing and aromatic plants to redirect animal movements away from standing crops
- basic tools to carry out pre-intervention information-gathering exercises and post-intervention evaluation.

Over 50 delegates from more than 10 African countries took part in the training provided during the Kenya conference; 42 trainees from 12 different African countries attended the training in Namibia in 2018. Post-training feedback collected 12 months after the 2016 Kenya HWC training indicates that the majority of those who attended (14/16) reported that they had used the tools/skills they learned at the training events during the past year in the execution of their job.

The report from the 2018 training in Namibia provides evidence of changed behaviours and understandings in relation to wildlife conflict, stating that: 'Of the 13 modules that were offered at the training, Conflict Transformation, Project Leadership and Human–Wildlife Conflict were the most liked by the trainees … Most trainees indicate that they liked these modules because the knowledge was important in their day-to-day jobs' **[S3, S4]**.

Professor Hill's expertise in human–wildlife interactions and conservation social science led to her being invited to become a member of the IUCN Human Wildlife Conflict Task Force. Her

innovative, interdisciplinary research has underpinned her expert contributions as a member of this international organisation **[S5]**. This international advisory group is tasked with providing expert support and guidance to the IUCN Species Survival Commission, including developing technical guidance materials and international training for groups working on HWC issues. The IUCN Guidelines are designed for project managers, funders and government policy makers. Professor Hill is lead author on sections of the guidelines, focusing on:

- the importance of cultural understanding and sensitivity when working with HWC scenarios
- the importance of understanding practitioner and researcher positionality, and how this impacts all actors' roles, relationships and likely effectiveness in conflict mitigation interventions. **[S6]**

This is important because a key aspect of training conservation science researchers and managers is positionality, yet this has rarely been a focus in conservation and wildlife management training or policy, to date. Addressing this in future training and policy production is crucial to enable more effective ways of addressing and preventing future HWCs.

HWCs have been identified as a key conservation concern for the 21st century. Professor Hill's research has demonstrated reach and relevance through contributions to the development of conservation practices and crop protection actions in Uganda and other parts of Africa, and to international guidelines for wildlife protection.

5. Sources to corroborate the impact

1. Hsaio, S., G.E. Wallace, C.M. Hill, & C.A. Ross, (2013) Crop raiding deterrents around Budongo Forest Reserve: An evaluation through farmer actions and perceptions. Oryx, 47(4):569-577. DOI:10.1017/S0030605312000853
2. Letter from Senior Director of Programs & Operations, Village Enterprise – detailing how they intended to use our results to inform their funding policy for micro-agricultural business enterprises in and around the Budongo Forest area, Uganda, and Kakamega Forest, Kenya, April 2012
3. Feedback from delegates attending the Pathways Africa 2016 training session held in Kenya, January 2016. Comment from the Director of Special Projects and Programs, Human Dimensions of Natural Resources, Colorado State University training organiser stating that my session was well received by the trainees in Kenya]
4. Feedback from delegates attending Pathways Africa 2018 training session held in Namibia, January 2018
5. Letter of invitation to join International Union for Conservation of Nature (IUCN) Task Force in Human–Wildlife Conflict, April 2016
6. Letter from the Chair, IUCN SSC Human-Wildlife Conflict Task Force, October 2020
7. Email correspondence with Research Coordinator, Alldays Wildlife and Research Centre, South Africa, January 2020
8. Letter from the Director of Connected Conservation, a conservation consultancy firm specialising in conflicts about wildlife, outlining how our research findings have been used to produce infographics for farmers in southern Africa sharing space with problematic wildlife**,** May 2020

Note: Sources 1 and 2 are included as latest available evidence, following cancellation of Research trip to Uganda due to Ebola (2018) and deferred trip (2020) cancelled due to Covid-19 restrictions (see 100 word justification).