

Protected areas and people: Understanding the links between well-being and rule breaking around the Ruaha-Rungwa landscape

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Published: 30/11/2023

[Cyswllt i'r cyhoeddiad / Link to publication](#)

Dyfyniad o'r fersiwn a gyhoeddwyd / Citation for published version (APA):
Ibbett, H., Dorward, L., & St. John, F. A. V. (2023). *Protected areas and people: Understanding the links between well-being and rule breaking around the Ruaha-Rungwa landscape.*

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Protected Areas & People:

Understanding the links between well-being & rule breaking around the Ruaha-Rungwa landscape

A briefing produced for and informed by research carried out as part of the Conservation and Human Behaviour (CONHUB) project at Bangor University (UK) in collaboration with the Tanzania Wildlife Research Institute (TAWIRI), the Research Centre for Climate Change University of Indonesia (RCCC-UI) and Queen Mary University of London. This project received funding from the European Research Council (ERC) under the European Union's Horizon 2020 grant agreement No. 755956 awarded to F.A.V. St John.



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Summary

- Protected area rules were generally very well known amongst people living across the landscape.
- How protected area rules are enforced is important, as it impacts how people respond, both to specific conservation rules, and to conservation more generally.
- When people believe rangers treat citizens fairly and respectfully and act within the limits of their rightful authority, they are more likely to feel that they should obey rangers' directives, even if they do not agree with those directives.
- Improving the management of wildlife that leaves protected areas and enters village land, and improving relationships between local people and rangers would help resolve many of the challenges that members of the public feel are imposed on them by protected areas.
- People experiencing lower levels of multidimensional well-being perceive fewer benefits from living alongside protected areas. There is a need to ensure that those most in need have access to basic necessities. This might be achieved through benefit-sharing programmes that explicitly target the least well-off.
- Despite reassurances made by researchers, people believed there would be repercussions if they revealed they had broken protected area rules. Consequently, methods such as key informant interviews, or group discussions that ask about wider social norms may provide more informative insights into who and why people break rules, than questionnaires delivered to individual respondents.
- Conservation requires information about human behaviour. Therefore, it is essential that conservationists undertake sufficient training in the human dimensions of conservation, including social science survey methods.

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ABOUT CONHUB

Conservation and Human Behaviour (CONHUB) is the name of a project and research group based at Bangor University (UK), led by Dr Freya St John. Established in 2018 with funding from the European Research Council, CONHUB is a collaboration between Tanzania Wildlife Research Institute (TAWIRI), the Research Centre for Climate Change University of Indonesia (RCCC-UI), and Queen Mary University of London (UK). This briefing focuses on findings from research conducted in Tanzania between 2019-21.



Project Overview

BACKGROUND



Protected areas form the cornerstone of national and international conservation strategies and play a vital role in the long-term protection of global biodiversity. Tanzania's protected areas represent some of the world's most important; they support ecosystems, habitats, and species found nowhere else on earth. This is largely achieved through the regulation and restriction of human activities within these areas. While these efforts generate substantial economic, social, and environmental benefits for the people of Tanzania, they can also impose costs on people, contributing to conflict and decreasing protected area effectiveness. Understanding who bears these costs, and how, is important for developing more just and equitable conservation policy and practice.

Successfully conserving Tanzania's biodiversity also requires that the rules governing natural resource use within protected areas are complied with. This is particularly important as many of Tanzania's protected areas are unfenced; wildlife and people can roam unhindered between protected and unprotected land. Across the country, significant investment is made in employing rangers to patrol protected areas, to deter people from breaking rules, to detect incidents of wildlife crime when they occur, and to respond when people have problems with wildlife. Despite these efforts, conflicts between people, wildlife, and the rangers tasked with protecting it, often occur around protected areas. Meanwhile rule breaking continues to threaten biodiversity. Low levels of human well-being is often assumed to be a major driver of non-compliance; however, the evidence is unclear.

About the Research

RESEARCH AIMS

To develop more effective conservation interventions, conservation practitioners and policymakers increasingly need information about the relationships between protected areas and those who live alongside them. Spanning some ~40,000km² the Ruaha-Rungwa landscape represents one of the largest areas of protected land in Tanzania. Focusing on this landscape, this research project aimed to meet this need in three ways:

1. By understanding whether people living alongside protected areas break rules, and why.
2. By exploring how interactions between people living alongside protected areas and those who enforce rules affects peoples willingness to follow rules.
3. By assessing what people perceive to be the benefits and costs of living alongside protected areas.

STUDY SITE

The research presented in this report was conducted by the Conservation and Human Behaviour project, a research collaboration between Tanzania and the UK, involving Bangor University and the Tanzania Wildlife Research Institute.

Between November 2019 and December 2021, the research team collected data in Iringa, Mbeya and Singida Regions covering 28 villages located within 10km of the boundary of Ruaha National Park, Muhesi, Kizigo and Rungwa Game Reserves, and MBOMIPA Wildlife Management Area (Figure 1).

Using a mixed-methods approach incorporating qualitative and quantitative methods, data were collected from more than 2,400 people.

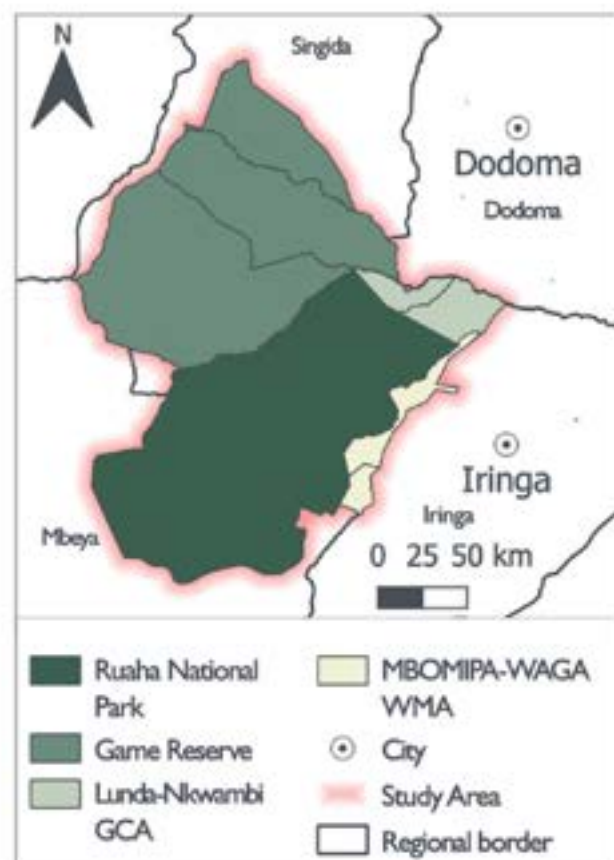


Figure 1. Research took place in villages located within 10km of a protected area boundary.

1 Understanding rule breaking in the Ruaha-Rungwa landscape

OVERVIEW

To monitor the success of protected areas, conservation practitioners and policymakers require reliable data about how many people comply with protected area rules, alongside information about the characteristics of those who do not comply. Such information is often obtained by asking people directly about their own behaviour. However, this can be challenging as people are rarely willing to report their involvement in illegal behaviours.

In response, social scientists have developed a series of methods (known as Specialised Questioning Techniques) designed to make people feel safer and more confident providing sensitive information (Figure 2). These methods have been tested in various conservation settings around the world, however, it remains unclear whether people understand the methods, whether they correctly follow instructions, and whether the methods produce more accurate data.

OBJECTIVES

This component of the project had three objectives:

- 1.1 To assess how willing people living in the Ruaha-Rungwa landscape are to discuss whether they conduct illegal activities in protected areas.
- 1.2 To assess whether people living here understand Specialised Questioning Techniques and whether the use of these methods produces more accurate data.
- 1.3 To estimate the prevalence of rule breaking amongst people living in the landscape.



Figure 2. Description of five methods that can be used to ask potentially sensitive questions. The UCT asks people to report how many activities they do, without identifying which. The RRT asks respondents to roll a dice & only report a truthful answer about their own behaviour if the dice lands on 1,2,3 or 4. The result of the dice roll is never revealed to the interviewer. The Crosswise method requires people to answer two questions simultaneously whilst the Bean Method instructs respondents to move a bean of a specified colour from one jar to another, depending on their answer.

RESEARCH APPROACH

We used separate approaches to address each of the research objectives:

Objective 1.1 Understanding what types of activities people do inside protected areas and assessing people's willingness to discuss these illegal activities

A series of group exercises were conducted in four villages (7 sessions, involving 6-10 people, with groups split by gender and livelihood type). In each group, participants were asked to list all the reasons why people in their village went to protected areas. Groups were then given 32 photo cards showing different behaviours and were asked to identify how willing they thought people in their community would be to talk about these behaviours (1) if they were doing them on village land; and (2) if they were doing them inside a protected area.

Objective 1.2 Assessing whether people understand Specialised Questioning Techniques and whether these methods provide more accurate data

We conducted two questionnaires. The first, administered to 306 respondents, aimed to determine whether people understood the instructions associated with each method described in Figure 2. In the second questionnaire, we assessed how comfortable 243 people felt using the Randomised Response Technique to answer questions about rule breaking conducted in protected areas.

Objective 1.3 Estimating the prevalence of rule breaking in Ruaha-Rungwa landscape

Using a third questionnaire, we also asked people whether they broke protected area rules. We asked 1,555 people about their behaviour directly (e.g., by asking, "In the last 12 months, have you entered the protected area to graze livestock?") and for 424 of these people we asked the same questions using a Randomised Response Technique.



Research Aim 1: Results

OBJECTIVE 1.1

Behaviours conducted in protected areas

Group participants reported people entered protected areas for a range of reasons, including to graze livestock, to farm, to hunt wildlife, to worship, and to collect natural resources such as timber, honey, firewood, thatch, and water (Table 1).

Peoples' willingness to discuss illegal behaviours

When asked how willing they thought people in their community would be to discuss the behaviours depicted on the photo cards if conducted on village land, participants reported many behaviours would be classified as sensitive, with few people willing to discuss them. Sensitivity increased when discussing behaviours conducted in protected areas (Figure 3).

During these group exercises participants reported a high awareness of protected area rules and regulations, for example, many acknowledged that killing wildlife was illegal, and that wildlife belonged to the State.

Table 1. Reasons why people went to protected areas, ordered by the number of times they were mentioned by a group. Eight groups of between 6-10 people were consulted.

Reason for entering PA	
• Grazing livestock; collecting timber to build houses	6
• Fishing; collecting honey; collecting water; collecting grass for roof thatch	5
• Hunting wildlife; farming; collecting firewood; collecting medicine	4
• Mining; charcoal making; to worship	3
• Collecting wood for tourist sculptures	2
• To work in the PA; to visit relatives who work in the PA; collecting natural fibres to make rope; to sell products to PA workers; to see the airplane landing; to run away from home	1

OBJECTIVE 1.2

Do people understand Specialised Questioning Techniques?

Of the five methods shown in Figure 2, we found that direct questions, the Unmatched Count Technique, and the Randomised Response Technique were best understood. Peoples' understanding of the instructions was significantly affected by their age, and education. However, findings also showed that even when methods such as the Randomised Response Technique were well understood, they did not necessarily offer enough protection to encourage truthful responding. Other factors, such as who is asking questions, and relationships between communities and conservation authorities, were found to strongly influence people's willingness to answer questions and engage with research.

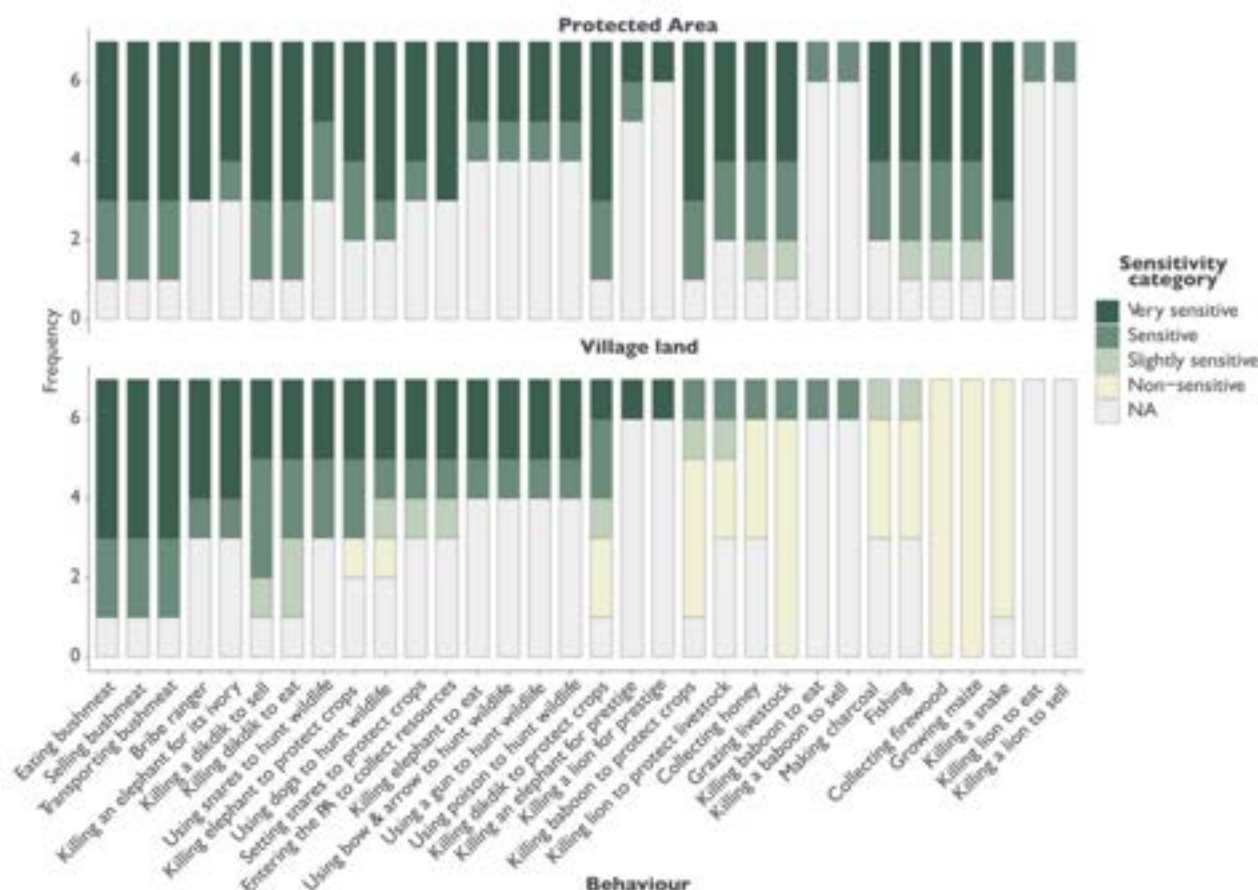


Figure 3. The bottom text lists the behaviours shown on the 32 cards sorted by participants in the group exercise. First participants sorted the cards into groups according to how willing they thought people in their community would be to discuss the behaviour if conducted on village land (bottom). They then sorted cards according to willingness to discuss the behaviour if conducted inside a protected area (top). The bar length shows how many times each behaviour was sorted into each category. Very sensitive implies people were very unhappy to discuss the behaviour, while non-sensitive suggests people were happy to discuss the behaviour.

OBJECTIVE 1.3

Quantifying rule breaking in protected areas using direct questions

We asked 333 women whether they encouraged members of their family to enter the protected area to hunt, fish, graze livestock or to collect construction materials, and whether they themselves entered the protected area without a permit. Overall, 5 out of 333 (2%) admitted to one of these behaviours, while 6 out of 333 (2%) said they intended to encourage, or conduct these behaviours themselves, in the next 12 months. Of the 1,222 men asked whether they had entered the protected area without a permit, or to hunt, fish, graze livestock or collect construction materials, 36 out of 1,222 (3%) admitted conducting these behaviours, while 12 out of 1,222 (1%) said they intended to in the next 12 months.

Quantifying rule breaking in protected areas using a Randomised Response Technique

We also asked these questions of 319 men and 105 women using a Randomised Response Technique, but results were inconclusive. No estimate significantly differed from zero and some estimates were negative, which occurs when respondents fail to follow instructions.



Research Aim 1: Key messages

WHAT DO FINDINGS MEAN FOR CONSERVATION RESEARCH, POLICY & PRACTICE

- Research suggests people conduct a variety of behaviours illegally within protected areas, but when questioned individually, people were extremely hesitant to provide accurate data about their potential involvement in any such activities. Protected area rules were generally very well known, with strong social norms governing behaviour. Despite reassurances made by members of the CONHUB team, people generally believed there would be repercussions if they revealed they had broken protected area rules.
- Collecting robust data on rule breaking is immensely challenging. When designing data collection, great care needs to go into questionnaire design, and method selection. Findings suggest that in this landscape asking people directly about their rule breaking behaviour using a standard question-answer format was ineffective. However, group exercises did provide more informative insights into who and why people break rules. Future research on rule breaking in the landscape may benefit from adopting more qualitative approaches, such as key informant interviews.
- Robust scientific evidence, informed by good quality data, is essential for policy decision making. Increasingly, conservationists require greater understanding of human behaviour. To provide this, it is essential that conservation scientists and practitioners undertake sufficient training in the human dimensions of conservation including social science survey methods. There is an inherent need to fully embed the social sciences into conservation curricula, and to ensure there are individuals within Government, conservation authorities, and NGOs with specific social science training.

2 Interactions between rangers & local people

OVERVIEW

To date, the dominant approach to generating compliance with protected area rules has largely been through law enforcement underpinned by deterrence theory. Deterrence theory suggests that would-be offenders weigh-up the costs and benefits of breaking rules when deciding how to act, and that they refrain from offending when the costs outweigh the benefits. Based on this premise, each year, significant resource is spent deploying rangers, park guards, the army, or police, to patrol protected areas and discourage offending. It is hypothesised that such patrolling increases the likelihood that offenders will be detected, which, when accompanied by swift and proportionate sanctioning, can deter offending and reoffending. Within conservation there has been considerable focus on deterrence.

Yet, evidence from criminology, as well as conservation science, suggests that deterrence, if detectable, is often small, local, and short-lived. Various factors, including funding, equipment and logistical constraints, corruption, and the ingenuity of offenders all restrict the potential of rangers to create the perception that rule breakers will be detected.

There is a growing body of evidence that suggests compliance is affected by the nature of encounters between rangers and citizens. Positive interactions between rangers and people living alongside protected areas can garner support for conservation. However, negative interactions can harm both human well-being and conservation outcomes. This is particularly so in contexts where local people have been disenfranchised by conservation measures. For example, if social values and laws do not align, people may view authorities as unfair, uncaring, and untrustworthy. Harsh enforcement can reproduce colonial inequalities and other power imbalances, and overtime a strong focus on sanctions can damage peoples' relationships with authorities, decreasing the effectiveness of governance.



Developed by criminal psychologists, procedural justice theory, focuses on citizen's perceptions of the legitimacy of law enforcers, as well as the legitimacy of laws themselves. As shown in Figure 4, this theory suggests that when rangers treat people fairly, with dignity and respect, make decisions based on fact not prejudices, and act within the limits of their rightful authority, citizens will perceive rangers act in a positive, professional way. As a result, they will believe rangers share the same values as them and their community, and feel more obliged to obey rangers. Further, where they perceive rangers act professionally, citizens are more likely to believe protected area rules align with the goals and values of the community, and feel more obliged to follow these rules. As part of this project, we aimed to test this theory and apply it in conservation settings.

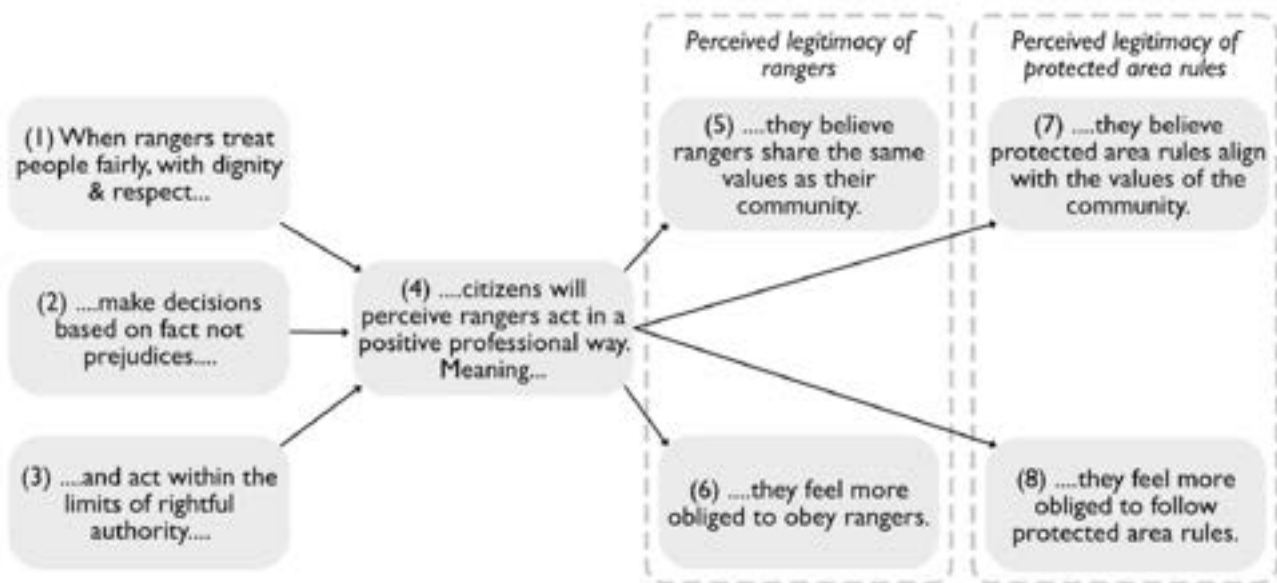


Figure 4. Diagram showing procedural justice theory, developed in the discipline of criminal psychology. The theory focuses on people's perceptions of the legitimacy of enforcers and the laws they enforce.

OBJECTIVES

This component of the project had three research objectives:

- 2.1 To understand how people interact with rangers in the landscape.
- 2.2 To assess how fair people perceive different sanctions to be, and to assess how corruption and social norms affect people's willingness to follow protected area rules.
- 2.3 To adapt procedural justice theory (Figure 4), in order to investigate people's perceptions of the legitimacy of rangers, and the protected area rules they enforce.

RESEARCH APPROACH

We used two approaches to answer these research objectives:

Between February 2020 and December 2021, 628 people living in 12 villages across the Ruaha-Rungwa landscape answered our statements measuring perspectives towards rangers (described as those who work as rangers in Ruaha National Park, Muhesi, Kizigo and Rungwa Game Reserves, or as village game scouts in MBOMPIA Wildlife Management Area). These data was used to answer Objectives 2.1 and 2.3.

For Objective 2.2 we conducted a questionnaire with a further 217 individuals in 6 villages. Comprised of two sections, the first measured the perceived fairness of ranger's sanctioning behaviour. We presented respondents with eight scenarios whereby someone was caught breaking protected area rules. In each scenario we varied: the crime committed; whether the offender was from the same community as the respondent or not; whether the offender held power or not (e.g., social influence over others); and the sanction administered. We asked respondent to rate the fairness of each scenario (Table 2).

Table 2. Examples of scenarios used to assess (1) people's perceived fairness of ranger sanctioning behaviour (very fair to very unfair) and (2) how factors such as corruption and social norms influences people's willingness to follow protected area rules (very willing to very unwilling).

Examples of scenarios assessed	
Section 1	<p>A person with <i>little power</i> from <i>your community</i> is caught <i>hunting wildlife</i> in the nearest protected area by a ranger. <i>They are allowed to continue without repercussions.</i></p> <p>A person with <i>power</i> from <i>outside your community</i> is caught <i>grazing livestock</i> in the nearest protected area by a ranger. <i>They receive a warning. The livestock is confiscated.</i></p>
Section 2	<p>Your fellow community members <i>rarely</i> break rules and enter the Protected Area to collect resources. If caught breaking rules, it is <i>highly likely</i> that rangers will accept a small amount of money, and any criminal charges or fines will disappear.</p> <p>Your fellow community members <i>often</i> break rules and enter the Protected Area to collect resources. If caught breaking rules, it is <i>highly unlikely</i> that rangers will accept a small amount of money, and any criminal charges or fines will disappear.</p>

In the second section, we first measured attitudes towards protected area rules, and then randomly allocated respondents to one of four scenarios and asked, "How willing would you be to follow protected area rules?" (Table 2). Each scenario varied according to whether rangers were likely to accept a bribe, or not; and whether compliance of others in the community was high, or low.



Research Aim 2: Results

OBJECTIVE 2.1

Contact with rangers and village game scouts

In general people did not report interacting with rangers frequently. Only 46 people reported being stopped by a ranger for any reason during the last 10 years. Of these people, 25 felt they were treated fairly by the ranger, whilst 20 people did not. The fact that almost half of those being stopped by rangers felt they were treated unfairly suggests that the actions of rangers do not always align with those expected by the public.

Over the last 10 years, 54 people had approached a ranger to ask for help. 41 of these people felt they were treated fairly by the ranger whilst 11 people did not. Findings suggest people who approach rangers for help are more likely to feel they are treated fairly than those who are stopped by rangers.

Local people's perspectives concerning rangers

Support for how rangers act was strongest in villages located alongside MBOMIPA where 80% of people reported high levels of support (Figure 5). Only 40% of people living near Ruaha National Park reported high levels of support for how rangers act in their community.



Figure 5. Level of support for how rangers act in the community

The feeling that people should support the decisions that rangers make was strongest in villages near MBOMIPA where 50% of people reported high levels of support (Figure 6). Only 40% of people living near Ruaha National Park or the Game Reserves reported feeling they support the decisions rangers make.



Figure 6. Level of support for decisions rangers make



Local people's perspectives on rules governing protected areas

The same 628 respondents were asked statements that explored their perceptions of the rules that govern the protected area closest to their village. Irrespective of the type of protected area they live near, 90% of people believe that protected area rules should be strictly obeyed (Figure 7).

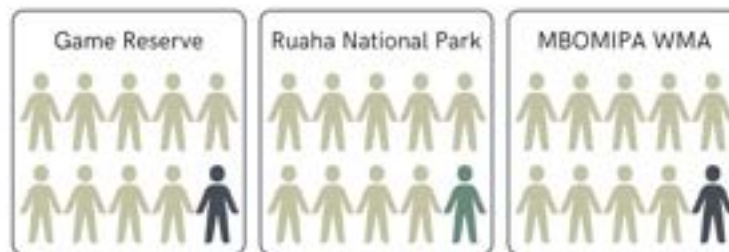


Figure 7. Belief that protected areas should be obeyed

Compared to the other protected areas, rules associated with Ruaha National Park were less aligned with people's feelings about what is right and wrong; 30% of people felt that park rules did not align with their views of what is right and wrong (Figure 8).

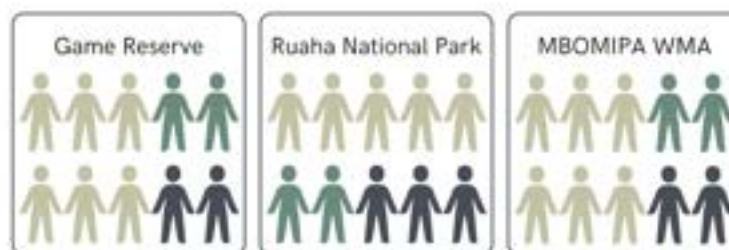


Figure 8. Views on what is right and wrong are aligned with protected area rules.



OBEJECTIVE 2.2

Perceived fairness of sanctioning behaviour

Of the four factors assessed (e.g. where an offender was from, their power, the crime, and the sanction received, Table 2), the most significant factor affecting respondents' perceptions of fairness was the sanction administered. Receiving a warning with the goods confiscated, no sanction being given, or a bribe being accepted were all perceived to be significantly less fair than someone being arrested and prosecuted, if caught grazing livestock or hunting wildlife in a protected area. Importantly, unlawful sanctions (e.g. no arrest, or acceptance of a bribe) were perceived as much less fair than lawful sanctions (e.g. a warning with goods confiscated, or arrest and prosecution). These perceptions held, regardless of an offender's characteristics, suggesting that people wish sanctions to be administered fairly to all, and in line with the law.



How do corruption and social norms affect compliance?

Results from the second set of scenarios (Table 2) suggested that those with more positive attitudes towards protected areas were more willing to comply with rules. Corruption did not affect individuals' willingness to follow protected area rules, but descriptive norms did; in scenarios where community compliance was high, so too was willingness to follow rules. Female, and older respondents were also found to be more willing to comply. Years of formal education completed, and the household's wealth status had no affect.

OBJECTIVE 2.3

Testing procedural justice theory

In line with the theory described above, respondents were more likely to form positive impressions of rangers when they believed rangers treated them fairly and respectfully, made decisions based on fact, not prejudices, and acted within the limits of their authority.

People who held more positive impressions of how rangers act were more likely to:

- Think that rangers act in ways consistent with their own sense of what is right; and feel that they should obey rangers' directives, even if they did not agree with those directives.
- Believe protected area rules are consistent with their own sense of what is right; and that protected area rules should be obeyed.



Research Aim 2: Key Messages

WHAT DO FINDINGS MEAN FOR CONSERVATION RESEARCH, POLICY & PRACTICE

- How rules are enforced is important since it impacts how people respond both to specific conservation rules, and conservation more generally.
- Positive ranger encounters have the potential to both limit low-level rule breaking in protected area contexts, and to help tackle more severe wildlife crime, by encouraging people to cooperate with and empower rangers to perform their duties (e.g., by granting them a wide range of discretion).
- If people view protected area rules and their rangers as unfair, they will not recognise them as legitimate, resulting in mistrust and decreased compliance.
- Results from our scenarios suggest it is important to administer rules fairly, and equally to all, regardless of an offender's characteristics.
- When people believe rangers treat citizens fairly and respectfully and act within the limits of their rightful authority, they are more likely to feel that they should obey rangers' directives, even if they did not agree with those directives. Ultimately, increased self-regulation has potential to diminish the enforcement-focus of ranger patrols.

Integrity and accountability are increasingly promoted within conservation law enforcement, for example, through the promotion of International Code of Ranger Conduct, as well as Human-rights based training initiatives, such as those listed below:

- <https://www.internationalrangers.org/resources/#code-of-conduct>
- <https://newsroom.wcs.org/News-Releases/articleType/ArticleView/articleId/19399/HUMAN-RIGHTS-TRAINING-FOR-RANGERS-A-new-training-manual-available-for-trainers-and-rangers-English-and-French.aspx>

3 Relationships between protected areas & local people

OVERVIEW

Protected areas have many benefits. Compared to unprotected areas they may contain higher species richness and have slower rates of species decline. Their presence can protect, and help maintain a range of local, regional, and global ecosystem services, with wide-ranging benefits for people. They can also provide direct economic and social benefits, for example, revenues from tourism can support poverty alleviation, and nature plays important cultural roles in many societies. Many people also derive a sense of well-being from the very existence of protected areas, safe in the knowledge that biodiversity is being protected for future generations.

However, protected areas can also impose costs on people, particularly those living closest to them. These include economic displacement, which occurs when people lose access to land or natural resources which support their livelihoods, and negative wildlife interactions which may inflict physical, economic, and psychological harm on people through the destruction of crops, livestock, property, or even human life. These costs can cause resentment among local people and contribute to conflict with conservation authorities and organisations. When the costs that protected areas impose on neighbouring people are severe, they can contribute towards decreased support for conservation, with significant implications for human well-being and conservation outcomes.



RESEARCH OBJECTIVES

This component of the project had three research objectives:

- 3.1 To measure levels of multi-dimensional well-being across the landscape.
- 3.2 To investigate the perceived costs and benefits of protected areas among people living in the Ruaha-Rungwa landscape.
- 3.3 To examine how perceived costs and benefits differed across different protected area types within the landscape; and according to people's multidimensional well-being status.

RESEARCH APPROACH

To meet these research objectives we used a mixed methods approach.

We first conducted a series of group exercises with people living in the landscape (November 2019-January 2020). During these group sessions we asked questions about peoples' standards of living and their perceptions of well-being, which helped us to develop and refine our survey instrument. We also asked participants to list all the challenges that they faced from living alongside protected areas.

Then, between February 2020 and December 2021, using a questionnaire, we collected data from 1,555 people living in 12 villages bordering protected areas in the Ruaha-Rungwa landscape.

The first part of the questionnaire captured respondent demographics, and asked a series of questions that allowed us to measure respondent's experience of well-being across four dimensions: education, health, living standards and subjective well-being which we combined into a single measure of multidimensional well-being.

We then asked 1,181 of these respondents to indicate how much they agreed or disagreed with a set of 13 statements: six described possible benefits of living near protected areas, while seven statements described potential costs.



Research Aim 3: Results

OBJECTIVE 3.1

Sample characteristics

Overall, 1,555 people from 60 tribes (1,222 men, 333 women) answered questions about their own, and their household's well-being. The average number of people living in a household was five, this was the same for all three regions.

Access to schooling

Average years of schooling completed was lowest in Singida Region (5 years), then Mbeya Region (6 years). Respondents from Iringa Region more likely to have completed primary school with 7 years of schooling.

Access to water

On average, it takes people nearly half an hour (23 minutes) to collect drinking water.

Livelihood activities

On average, households were involved in three livelihood activities. The most common livelihood activity was subsistence farming, followed by small-scale farming to make an income. Herding livestock for subsistence means, casual labour and small-scale trading were also other important activities. The high reliance on farming suggests that other livelihood opportunities in rural areas across the regions was low.

Household and community well-being

All 1,555 participants were asked questions about the happiness and prosperity of their household (also called 'subjective well-being'). While many people reported that their households were happy (70%, Figure 9), most people also reported that their households were also poor (70%, Figure 10). While it is without doubt a positive result that most households are happy, and derive well-being from something other than wealth, it is important to note that reducing poverty is an important development goal.



Figure 9. Household happiness



Figure 10. Household poverty

Multidimensional well-being

We added measures of subjective well-being to the Global Multidimensional Poverty Index (used by UNDP to track global poverty rates) to create an index of multidimensional well-being. This included questions on respondent's health, education, living standards and subjective well-being.

We found respondents living in Iringa region had the highest levels of multidimensional well-being, followed by those living in Mbeya and then Singida. However, our data show that there are respondents experiencing high and low levels of multidimensional well-being living in all regions (Figure 11).

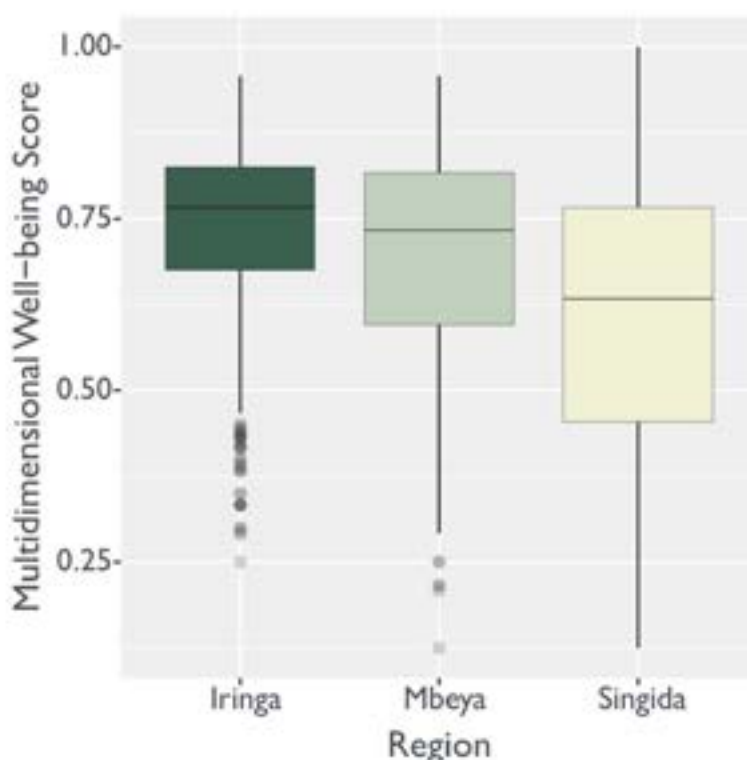


Figure 11. Distribution of multidimensional well-being scores for respondents, displayed according to the region in which they lived. The higher the score, the higher the level of multidimensional well-being experienced. The line in the centre of the shaded box represents the median level of multidimensional well-being reported, while the boundaries of the box represent the interquartile range.





All 1,555 participants were asked questions about life in their community. Generally, people were willing to help each other suggesting that social cohesion is reasonably good (Figure 12). In addition, conflict within communities was reported to be infrequent suggesting people feel peaceful and secure in their communities (Figure 13).



Figure 12. Community helpfulness; 60% of respondents reported that members of their community were willing to help each other.



Figure 13. Conflicts between community members were reported as arising infrequently by 50% of respondents.

OBJECTIVE 3.2

While we found people's knowledge of protected rules to be high in our group exercises (Objective 1.1 results) knowledge of protected area boundaries was generally low with nearly half of all respondents reporting no knowledge about the boundary of the protected area closest to their village. People were less clear about the location of the border of Ruaha National Park compared to the borders of MBOMIPA or the Games Reserves. 40% people stated that the National Park border was unclear to them, while only 20% people reported that the border of the Game Reserves was unclear (Figure 14).



Figure 14. People's knowledge of protected area boundaries

Challenges faced by people living alongside protected areas

The 66 participants in our eight group discussions associated 25 challenges of living alongside protected areas. These included problems with living alongside potentially dangerous wildlife, issues with the way rules were enforced by rangers, restrictions on lives because of living near protected areas, as well as issues with the location of protected area boundaries (Table 3).

Table 3. Number of times each item was mentioned by groups when asked to the challenges of living alongside protected areas. Data are from eight groups totalling 66 people.

Reported challenges of living alongside protected areas	
• Crop raiding by wildlife.	7
• Wildlife attacks on people; livestock predation by wildlife.	4
• Conflict over PA boundaries; people threaten to report others to rangers; unable to access water sources; High fines if caught grazing livestock in protected areas.	2
• Poor relationship between PA managers and the community; rangers searching homes and if no crime found they arrest or beat people; rangers do not notify village authorities before making arrests; corruption, having to pay rangers; people killed by rangers; people/livestock lost after being chased by rangers; killing of livestock by rangers if found in the PA; movement of the boundary closer to the village; land shortages increase conflict between agriculturalists and pastoralists; land shortages for agriculture; nowhere to graze livestock; TANAPA do not allow the construction of electricity pylons; unable to collect firewood; tsetse flies; destruction of water sources; chased by buffalo; unsafe for children when wildlife is around; unreliable infrastructure (due to remoteness).	1



Perceived benefits and costs of living alongside protected areas

In total, 1,181 respondents answered questions about their perceptions of the benefits and costs of living alongside a protected area (Figure 15).

In general, respondents supported the existence of protected areas in the landscape; only 24% of our 1,181 respondents thought it would be better not to have a protected area nearby, while 73% agreed that protected areas protect aspects of the environment important to them (Figure 15). The average response to our benefit and costs statements was close to neutral, implying that in general, respondents perceived protected areas were neither very beneficial nor very costly (Table 4). More specifically, respondents perceived that protected areas offered some positive Environmental Protection Benefits but low Economic Benefits; and that they incur Wildlife-related Costs.



The benefits associated with living near protected areas differed depending on the type of protected area respondents lived near. Those living near MBOMIPA Wildlife Management Area perceived higher benefits than respondents living near Ruaha National Park or game reserves. This may be for two reasons, firstly due to the potential benefit-sharing programmes associated with MBOMIPA's income generation (although it is important to note that game reserves and Ruaha National Park also have revenue-sharing mechanisms). Secondly, due to exposure to tourists visiting Ruaha National Park by road, who must pass through MBOMIPA member villages to reach the park gates. There was no significant difference in perceived costs between different protected area types.

Most respondents were concerned about the impact of wildlife on their property (68%) and their food security (59%). Many also worried that the protected area boundaries may change in the future (46%), and that they would be reported to rangers for wrongdoing (35%).

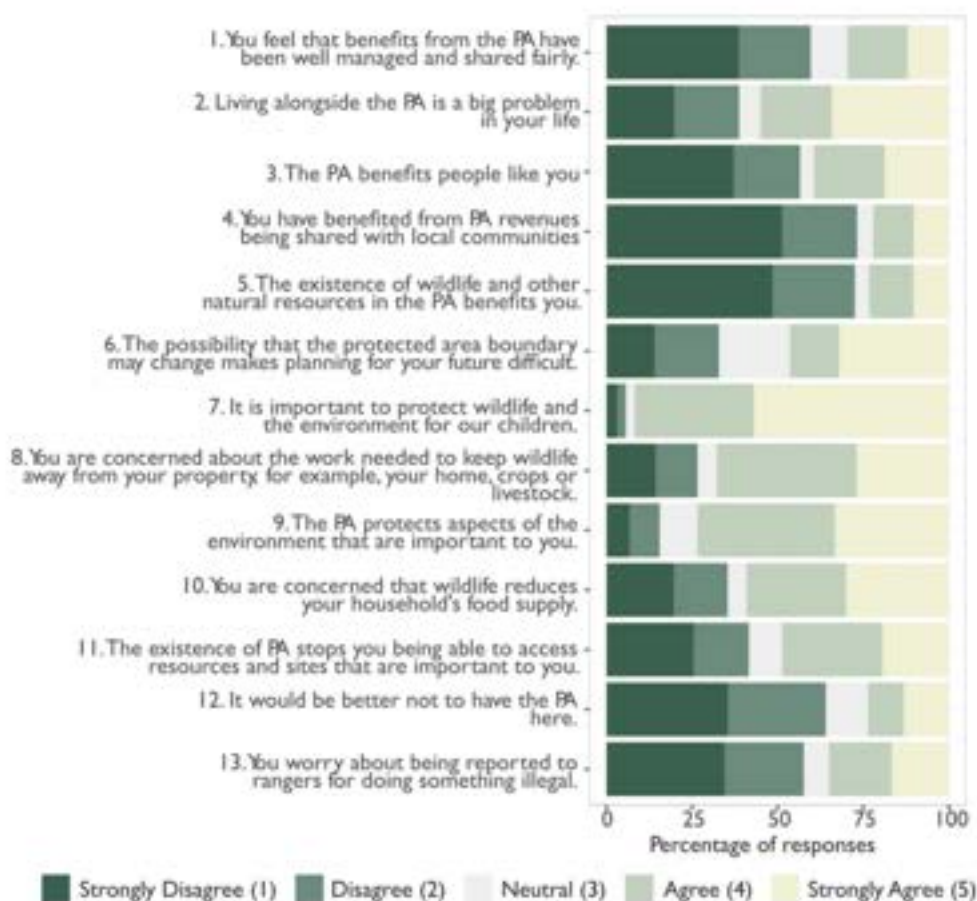


Figure 15. These statements were used to measure people perceptions about the benefits and costs of living alongside protected areas. The width of the bars represents the percentage of people who either agreed or disagreed with the statement (n=1,181).

Table 4. The statements shown in Figure 16 were grouped together to assess specific types of benefit or cost. The table below shows the mean scores for these groups of statements. For the costs groups, higher values indicate higher perceived costs; for the benefits groups, higher values denote higher perceived benefits. Three represents neutral responses.

Groups of statements	Mean response (Standard Deviation)
• Overall Benefits (Statements 1, 3, 4, 5, 7, 9)	2.91 (0.90)
• General and Economic Benefits (Statements 1, 3, 4)	2.36 (1.16)
• Environmental Protection Benefits (Statements 5, 7, 9)	3.46 (0.83)
• Overall Costs (Statements 2, 6, 8, 10, 11, 12, 13)	3.06 (0.86)
• General Costs (Statements 2, 6, 11, 12, 13)	2.91 (0.88)
• Wildlife-related Costs (Statements 8, 10)	3.44 (1.3)

OBJECTIVE 3.3

Relationships between benefits & costs of protected areas & multidimensional well-being

Our results suggests that people with lower levels of multidimensional well-being perceived lower benefits from protected areas compared to those with higher multidimensional well-being. There was no significant difference in the perceived costs.



Research Aim 3: Key Messages

WHAT DO FINDINGS MEAN FOR CONSERVATION RESEARCH, POLICY & PRACTICE

- Importantly, people living across the Ruaha-Rungwa landscape generally supported the presence of protected areas. However, many respondents perceived benefits are not adequately distributed, and reported several challenges associated with living near protected areas.
- People experiencing lower levels of multidimensional well-being are perceiving lower benefits from protected areas. There is a need to ensure that those most in need, have access to basic necessities. This might be achieved through benefit-sharing programmes that explicitly target the least well-off.
- The higher benefits perceived by those living alongside MBOMIPA show that there is some geographic disparity in benefit sharing, either driven by different types of protected area management or by the concentration of tourism in the east of the landscape.
- Improving the management of wildlife that leaves protected areas and enters village land, and strengthening relationships between local people and rangers would help resolve many of the challenges that protected areas impose on people living near them.
- Addressing these phenomena has the potential to enhance human well-being and the acceptance of protected areas.

The Team

In total, there were eight members of the CONHUB team working in Tanzania.



DR FREYA ST JOHN

The research was developed and led by Dr Freya St John, Reader in Conservation Science at Bangor University.



DR EDWARD KOHI

Dr Edward Kohi was responsible for providing in-country support and advice, and helped inform research design, facilitate data collection, and research outputs.



DR LEEJIAH DORWARD

As a Post-doctoral Research Officer, Leejiah was responsible for designing research, over-seeing data collection, and producing research outputs.



DR HARRIET IBBETT

Before joining as a Postdoc in 2023, Harriet completed her PhD with the project between 2019-22, and was responsible for research design, over-seeing data collection, and producing research outputs.



STEPHEN SANKENI

As Field Team Leader, Stephen managed the field team, oversaw and contributed to data collection, and played a vital role in research design and interpretation.



JESCA MCHOMVU

Jesca was a Field Team member, and played a vital role in research design, data collection and result interpretation.



JOSEPH KADUMA

Joseph was a Field Team member, and played a vital role in research design, data collection and research interpretation.



ROSE MAWENYA

Rose joined the project in February 2021. As a Field Team member, she played a vital role in research design, data collection and research interpretation.

Acknowledgements

The CONHUB project extends thanks to the Government of Tanzania and all the people who helped facilitate research and gave their time to complete the survey. Specific thanks to the Village Chairmen and Chairwomen, VEOs and WEOs who helped us complete our work. All research was conducted with permission of the Tanzanian Government, and with approval of the Ethics Committee of the College of Environmental Sciences & Engineering at Bangor University. All data was collected with free, prior and informed consent.

Find out more: www.conhub.org

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This project has received funding from the European Research Council (ERC) under the Horizon 2020 research and innovation programme (grant agreement No 755965).

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