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Society & Natural Resources

An International Journal

ISSN: 0894-1920 (Print) 1521-0723 (Online) Journal homepage: http://www.tandfonline.com/loi/usnr20

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To cite this article: Niki A. Rust, Joseph Tzanopoulos, Tatyana Humle & Douglas C. MacMillan (2016): Why Has Human–Carnivore Conflict Not Been Resolved in Namibia?, Society & Natural Resources

To link to this article: http://dx.doi.org/10.1080/08941920.2016.1150544

SOCIETY & NATURAL RESOURCES
2016, VOL. 00, NO. 00, 1–16
http://dx.doi.org/10.1080/08941920.2016.1150544

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Why Has Human–Carnivore Conflict Not Been Resolved in Namibia?

Niki A. Rust, Joseph Tzanopoulos, Tatyana Humle, and Douglas C. MacMillan

[a]Durrell Institute of Conservation and Ecology, University of Kent, Canterbury, United Kingdom

ABSTRACT

Human–wildlife conflict has historically been portrayed as a management problem where solutions lie in technical changes or financial incentives. However, recent research shows many conflicts stem from social, economic, and political drivers. We undertook qualitative data collection on livestock farms to determine whether relationships between farmers and their workers affected frequency of reported livestock depredation in Namibia. We found that the conflict was affected by social and economic inequalities embedded in the previous apartheid regime. Macro- and microlevel socioeconomic problems created an environment where livestock depredation was exacerbated by unmotivated farm workers. Poor treatment of workers by farmers resulted in vengeful behaviors, such as livestock theft and wildlife poaching. Successfully addressing this situation therefore requires recognition and understanding of its complexity, rather than reducing it to its most simplistic parts.

ARTICLE HISTORY
Received 27 May 2015
Accepted 14 January 2016

KEYWORDS
Apartheid; depredation; human–wildlife conflict; livestock farming; racism; wildlife poaching

Despite a multitude of different approaches proposed to mitigate the so-called "conflict" between livestock farmers and carnivores, people are reporting increased damages by carnivores across many parts of the world (Conover 2002; Harper, Paul, and Mech 2005; Tamang and Baral 2008; Moheb, Lawson, and Mostafawi 2012). This not only threatens the livelihoods of farmers that share their land with carnivores, but also endangers recently restored carnivore populations, as some farmers can turn to lethal control to manage this situation (Aryal et al. 2014; Rust and Marker 2014). Why is it that we have not found a sustainable way to resolve human–wildlife conflict in the long term? This could be because we are not addressing the deeper social problems associated with this issue (Madden and McQuinn 2014). Furthermore, carnivores living on livestock farms are managed by a multitude of human players: For instance, herders can reduce livestock depredation but farmers might not employ them because herders can be inattentive (Rigg 2001) or expensive (Swenson and Andrén 2005). Alongside the human players on the farm are those influencing decisions from a distance: Policymakers and international trade officers have the power to alter the profits of the farming industry; this in turn influences the management of farms (van Meijl et al. 2006; Schmid and Sinabell 2007) and the carnivores living on farmland

CONTACT Niki A. Rust nr208@kent.ac.uk Durrell Institute of Conservation and Ecology, Marlowe Building, University of Kent, Canterbury, CT2 7NR, United Kingdom.

(Jones and Barnes 2006). However, limited attention has been placed on understanding how these players affect human–wildlife conflict.

In Namibia—a country where wildlife is more populous on farmland than in protected areas (Krugmann 2001)—there have been various methods used to reduce conflict with carnivores, including translocating problem animals, using livestock-guarding dogs and herders, excluding predators from farms, and killing recurrent problem animals (Marker, Dickman, and Macdonald 2005; Rust et al. 2015). Sometimes these techniques have successfully limited livestock depredation, yet farmers are reporting more frequent problems with carnivores (NACSO 2013). This could be because carnivore populations are increasing nationally, but could also be because underlying social and ecological causes of the conflicts have not yet been adequately addressed.

Recent scholars have shown that human–wildlife conflict is often due to disagreements between different groups of people over how to manage wildlife (Clark, Rutherford, and Mattson 2014; Redpath, Bhatia, and Young 2015). There have been calls to rename human–wildlife conflict as "human–human conflict over wildlife" or simply as a "conservation conflict" (Redpath et al. 2015). Carnivores can therefore be thought of as peripheral players pulled into the debate of wildlife management by individuals who hold contrasting values, whereas the true causes of the conflict often lie more deeply in cultural, historical, political, and sociological factors (Clark, Rutherford, and Mattson 2014). While academic studies have explored the social and psychological aspects of conservation conflicts in their research (e.g., Mosimane et al. 2013), few conflict mitigation schemes have fully integrated these human dimensions in their entirety when implementing carnivore management strategies. Indeed, Namibia has a national policy on managing human–wildlife conflict (Government of Namibia 2009) but this focuses almost exclusively on technical, economic, and ecological factors related to the problem while ignoring social and psychological drivers.

Associated with the complex social and psychological factors influencing human–wildlife conflict is the management of the farm and its natural resources, which can alter the extent of livestock depredation. For instance, killing game animals in the local area will decrease the availability of wild prey for carnivores, which can then lead to greater livestock depredation (Soh et al. 2014). Poaching of game is an important factor when understanding the ways in which farmer–worker relations affect livestock depredation because employees are often involved in poaching (Warchol and Johnson 2009; Lindsey et al. 2011). Workers have also been known to steal livestock (Khoabane and Black 2009), which could potentially result in farmers perceiving carnivores to be a greater threat than in reality if they believe carnivores rather than humans are reducing livestock numbers. As such, it is essential to understand the farmer–worker relationship when trying to mitigate conflict.

Due to the important influence that employees have on the frequency of depredation, we took a novel angle to studying this conservation conflict. Our aim was to determine whether the relationship between farmers and their employees influenced reported conflict on Namibian commercial livestock farms. The objectives were to:

1. Identify themes on farms with higher and lower levels of reported livestock depredation, livestock theft and game poaching.
2. Explore these themes to understand what (if any) social, economic and political factors influenced reported livestock depredation, theft and poaching.

Although we note that other actors also significantly affect farm management (e.g., policymakers), we focused on the farmer–worker interaction as a starting point to

understanding the complexity of farm systems and their effect on human–wildlife conflict.

Methods

Study Area

This research focused on the north-central area of Namibia, as this location has a relatively high density of carnivores (Hanssen and Stander 2004). It is also one of the country's main commercial cattle farming areas and therefore has the potential to be significantly affected by conflict between farmers and carnivores.

In Namibia, there are two forms of farming: Commercial (or "freehold") farming is on private land where livestock are marketed on a large scale for profit. Conversely, communal farming is on government-owned land where some resource rights are given to the occupier. This study area focused on commercial farming. Commercial farmers in Namibia (who are predominantly of Caucasian European descent) often employ individuals from communal lands, who are almost exclusively the descendants of indigenous Africans prior to European colonization, hereafter referred to as "indigenous Africans" (Hunter 2004a; Atkinson 2007). This is due to the historical context from which commercial farming arose in Namibia: During apartheid, indigenous Africans were forcibly removed from their lands and relocated to tribe-specific areas of the country, known as "reservations" or "homelands" (Adams and Devitt 1992). Many of the relocated areas suffered insufficient water points and lacked access to livestock markets. This resulted in widespread poverty and unemployment due to the agrarian lifestyle of the indigenous communities (Hunter 2004a). The enforced poverty created a reservoir of potential workers for commercial farmers to utilize and, due to a large supply and low demand, wages were extremely low (Atkinson 2007). Although the country gained independence in 1990, Namibia continues to have one of the most unequal wealth distributions in the world (Central Intelligence Agency 2013), as progress has been slow to readjust power from the Namibians of Europeans descent to the indigenous Africans (World Bank 2009); discontent between these two sectors of society still persists (du Pisani 2003; Hunter 2004b).

Interviews

The first author conducted, coded, and analyzed the data. Qualitative interviews followed a grounded-theory approach (Strauss and Corbin 1990) and were undertaken between September and November 2013. The interviews were conducted with 22 farmers, 26 farm workers, and 21 unemployed farm workers. Sixty interviews were conducted face-to-face, and, due to logistical constraints, five farmer interviews were conducted by e-mail, two via Skype, and two by telephone. Data collection followed a predominantly inductive approach to learning about the depth of this underexplored and sensitive topic (Sarker, Lau, and Sahay 2001), with interviews undertaken in a semistructured manner to allow scope to explore other issues as they arose. The focus was not specifically on human–wildlife conflict, but rather looked at broader issues associated with employee–worker relations on commercial livestock farms and how this related to livestock depredation, theft, and poaching.

Questions posed to respondents related to the respondents' relationships with their colleagues; instances of livestock depredation on the farm; and instances of livestock theft

or wildlife poaching on their farm or on farms nearby. The questions on theft and poaching could be considered sensitive for respondents due to their illegal nature. To overcome the potential for nonresponses or untruthful answers, respondents were interviewed privately and assured confidentiality. By asking sensitive questions at the end of the interview, it was also assumed that respondents were more comfortable and relaxed (Newing et al. 2010). The questions were posed so as not incriminate the respondent, for example, by asking, "Do you know of any cases where there have been livestock stolen or wildlife poached on this farm or farms near here?" It was also assumed that if the farmer knew of poaching or theft instances caused (or perceived to be) by employees, the farmer would freely admit this.

Informed consent was obtained from all respondents before interviews took place (Puri 2011), and interviews were conducted in English (the official language of Namibia). Many Namibians speak Afrikaans as their first language, so respondents were offered the option of having a translator present at the interview. All respondents were, however, comfortable speaking in English. Interviews were recorded on a Dictaphone for later transcription, with the average interview lasting approximately 1 hour. Ethical approval was received for this methodology by the University of Kent ethics committee. All interviews remained confidential and anonymous.

Lastly, triangulation was used as a method of data corroboration (Newing et al. 2010) by asking the same question of different respondents and by comparing these responses to those of others. Where important themes emerged from interviews, questions were then posed to other respondents to validate findings; data collection was therefore iterative and followed a grounded-theory approach, where initial data rounds were analysed to explore themes, which informed subsequent data collection (Strauss and Corbin 1990).

Participant Observation

The first author lived and worked on a livestock farm for 8 months during 2013 to understand more about livestock husbandry and the farming system. Nine nearby farms were also visited to gather additional information on the range of livestock husbandry practices used, with a focus on methods to deter carnivores and on farmer–worker relationships. Each trip lasted 1–7 days, averaging 3 days. Interactions between the farmers and the employees were observed to gain an understanding of the relationship between these two actors. Data were collected through participant observation, where the first author shadowed the farmer and employees around the farm. Information was recorded on a notepad, detailing interactions between the farmer and employees and the methods used to limit predation.

Sampling

The first author attended various rural social activities in the study area in order to develop a network of farming respondents. A snowball sampling technique was used to recruit farmers for interviews with the help of a number of key informants. This was used in addition to employing theoretical sampling (Glaser 1978), whereby respondents were selected based on their ability to convey breadth and depth of the theories that were emerging from the data. From a total of 35 farmers contacted, 22 respondents were interviewed (a 63% response rate), which is deemed an acceptable level of response for interviews (Witkin and Altschuld 1995).

All 26 farm employees were interviewed at each farm visited. Unemployed farm workers ($n = 21$) were recruited via convenience and purposeful sampling by visiting a large farm supply store in the district's main town of Otjiwarongo, where scores of unemployed farm workers congregated to obtain employment from farmers who visited the shop. It was assumed that unemployed workers would be more open and honest about any possible problems with their previous employment as there would be no fear of retributive action. No employed or unemployed worker refused to be interviewed. New respondents were continually sourced for interviews until theoretical saturation was reached, that is, where no new themes were emerging from new data (Glaser and Strauss 1967).

Analysis

All interviews were transcribed into NVivo 10 (QSR International Limited, Cheshire, UK) within 24 hours of each interview. These interviews were then coded using the grounded-theory approach (Strauss and Corbin 1990), by first reading initial interviews to determine common themes that were beginning to emerge. Each theme was coded using a coding framework, which developed as further data were collected. The emergent themes helped to frame future interview questions to explore these factors more thoroughly. Second, specific codes were generated within NVivo that applied to each theme (Auerbach and Silverstein 2003), which used both axial and open coding (MacMillan and Han 2011). Third, a final iteration of coding was conducted at the end of data collection to validate the findings and the coding framework (Saldaña 2010; Cassidy 2012). Data collected from participant observation were analyzed in the same manner. Quotes used in the results section were selected for their typical representation of a particular theme that emerged from the data (Auerbach and Silverstein 2003).

To answer objective 1, farms were categorized by the level of livestock depredation, poaching, and theft reported to occur. This was undertaken as follows:

1. Percentage of animals lost via livestock depredation in the last year: none, low (1–3% of the flock/herd), or high (4%+).
2. Poaching of game: none or present on the farm in the last 2 years.
3. Theft of livestock: none or present on the farm in the last 2 years.

Categorizing the first variable was based upon on a previous Namibian study (Stein et al. 2010) where farmers indicated the degree of livestock loss that would be tolerable. As theft of livestock and poaching of wildlife were reported by farmers to be memorable events, initial interviews with farmers confirmed that they would be able to recall instances of these activities within the last 2 years. However, because of insufficient record keeping by some farmers, it was not possible to quantify how many animals were poached or stolen, so we used binary variables. Data were analyzed to search for common themes that arose from the farms with varying degrees of depredation, and whether poaching or theft occurred on farms.

To answer objective 2, further data analysis using open and axial coding of emergent themes was undertaken to assess what social, economic, or political factors (if any) were mentioned by respondents to drive depredation, poaching, and theft.

Due to the previously described benefits of using qualitative methods to research complex, sensitive, and hard-to-reach concepts (Drury, Homewood, and Randall 2011), a qualitative approach was used in data collection and analysis. Results from this study

are not intended to be extrapolated to other locations but can be used to understand general themes that may be applicable elsewhere.

Results

Several political, social, and economic causes for human–wildlife conflict on Namibian commercial livestock farms emerged from the data. Deep-rooted drivers caused a multitude of additional problems contributing to human–wildlife conflict (Figure 1 and Table 1). It appeared that the ultimate driving force behind this conflict was the political history of the country. The apartheid era resulted in an unequal distribution of resources, fueling subsequent problems: high unemployment, low wages for farm workers, land tenure disparity, and polarity in education levels. These led to micro socio-economic problems for farm workers, including racism, substandard living and working conditions, absent or inadequate job training, few incentives, and low job satisfaction. As a result, game poaching and livestock theft by employees were common activities, which were thought to be acts of revenge for poor treatment from the owners and a means to increase income and food supply. These activities reportedly increased human–wildlife conflict in three ways. First, poaching could reduce wild prey availability for carnivores, which may have increased livestock depredation. Second, workers often blamed stolen livestock on carnivores, which reportedly led to more carnivores killed by farmers. Third, employees had inadequate training and low motivation to guard livestock from predators, leading to more livestock depredation. These conflict-causing factors are next described in more detail.

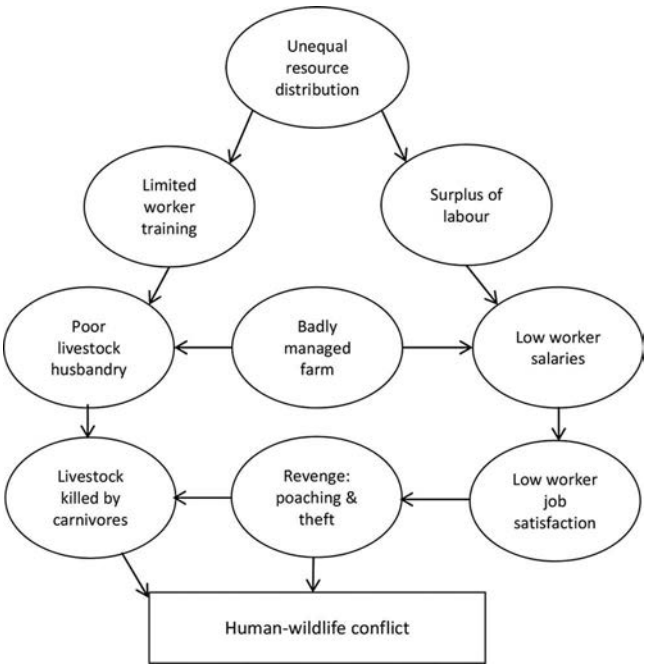

Figure 1. Social, political, and economic drivers of human–wildlife conflict on commercial farms in Namibia.

Table 1. Main themes that emerged from the data on the human dimensions that affected human–wildlife conflict on farms, with supporting quotes from respondents who reported either more or less poaching, theft, and depredation.

Themes that influence human–wildlife conflict	Quotes from interviews	
	Farms with more reported poaching, theft, and livestock depredation	Farms with less reported poaching, theft and livestock depredation
Macro		
Surplus of labor	"There are so many people without jobs that if a person doesn't want to work for such a low salary, someone else will; so the white people are still in power."—farm worker, FW12	"There's not enough employment in the country to get another job, so I need to stay here."—farm worker, FW1
Unequal resource distribution	"If you ask for help from your boss, such as a loan, but the boss doesn't pay you, then you feel angry towards him, which is why you might poach."—farm worker, FW6	"All of the thefts are from inside information … Some farms round here have a big problem with it … I think maybe because the workers feel a sense of entitlement."—farmer, FR6
Lack of worker education	"Those who have a better education go and work in the towns because they get a better salary; it's only the very uneducated that go to work on farms."—farmer, FR22	"One of the main reasons why poaching and theft goes on so much is because the education system is broken; people in public schools are shifted from grade to grade without proper examination so that by the time they leave at grade 10 some can't even read or write. This means they're not properly educated so can't get a good job, so many people are unemployed. So to get by they need to steal or poach."—farmer, FR4
Decreasing profitability of farming	"You farm with 4 people but in the past you have 10 people, where are the other 6 people? They're not working now. Where must they get food? From these guys who work, or by stealing."—farmer, FR5	"Many farmers believe it is cheaper to kill the carnivores than spend money on labour." - farmer, FR21
Micro		
Disparity in living conditions	"I live in a metal shack next to the pigs, which gives me asthma. My boss lives in a 3-level mansion with a swimming pool. It's unfair."—farm worker, FW18	"The last farm I worked on was nice. I had my own house, TV, chickens, garden … Other farms I worked on it wasn't like that, so I didn't care about my job as much."—unemployed farm worker, UF2
Racist treatment of workers by farmers	"These vultures [workers] come from their nests [the communal areas] to work for us … They're bobbejaans [Afrikaans for "baboons"]."—farmer, FR12	"When you're respected, you try harder, you look after the herd better, you don't want to annoy your boss."—unemployed farm worker, UF7
Ineffective worker management	"I think that all workers sometime steal and kill livestock. I would say 90% of people doing this is when there are a dispute and the workers want revenge."—farmer, FR7	"If you treat your workers well they will not steal from you."—farm worker, FW2.
Ineffective livestock management	"During lambing we don't count the sheep in order for not to disturb the flock too much. We just move them to the next camp and that's it. I can't tell you exact numbers of how much, how many lambs did the jackal did eat."—farmer, FR20	"I lost a lot of livestock mainly to not paying enough attention … I think from all the losses I had on the farm, 90% was related to managed, 10% to predators. I spent 90% of my time on trying to kill leopards and jackals. I then focused on improving my management, and by doing that one, I automatically addressed the problems of losses to predators."—farm manager, FM2

(*Continued*)

Table 1. Continued

Themes that influence human–wildlife conflict	Quotes from interviews	
	Farms with more reported poaching, theft, and livestock depredation	Farms with less reported poaching, theft and livestock depredation
Low salaries	"If you're not paid enough, you have to get meat from somewhere."—farm worker, FW20	"The farm workers nowadays, they need to have housing, they need to have water, electricity there, they have social security. I don't see that as a drawback; these things improve staff morale so we have a more productive farm with fewer losses to predators."—farmer, FR2
Workers blamed predators for stolen livestock	"We would sometimes tell our boss that the jackals came in the night to take the sheep away."—unemployed farm worker, UF18	"Workers can blame predators for livestock loss in theory, but this doesn't happen on my farm. If a worker has told me that a leopard has taken a calf, I need proof."—farmer, FR16

Macro Socioeconomic Factors

Disparity in resources (namely, education, wages, land ownership, and job opportunities)—partly as a result of apartheid—fueled poaching and theft on the farm. High unemployment rates created a surplus of job seekers with limited employment options because of low education. Because of the labor surplus, farm workers were not paid well (averaging US$71/month). The majority of farm workers reported it being impossible to survive on the salaries paid, and thus supplemented incomes elsewhere, such as by stealing.

A further macroeconomic problem that affected the situation was the reported shrinking profitability of livestock farming. Farmers often mentioned that livestock feed, veterinary costs, and fuel prices were continually rising whereas the market price of livestock was unpredictable and did not rise with inflation. This suggests that additional players at different scales (notably national and international policymakers) affected farm systems. Many farmers responded by reducing staff numbers, despite the same (or higher) workload, which stressed remaining workers, who had to work longer hours for less pay. Some farm duties were performed less frequently or removed altogether (e.g., herding), which increased reported livestock depredation as herds were not guarded from carnivores.

Micro Socioeconomic Problems

Micro socioeconomic problems, again predominantly caused by apartheid, created various challenges on Namibian commercial livestock farms in this study. The most clearly visible of these was the disparity in living conditions between farmers and workers, which was due to a perception by the Europeans of differing standards of living needs for different ethnicities. This disparity angered workers, who were frustrated at farmers for spending money on what the workers perceived to be unnecessary, luxury items when farmers often told workers they could not afford to pay them a higher salary.

Farm workers also admitted to stealing from employers because of racist and unfair treatment: another consequence of apartheid. Many farmers were observed acting hostile and dominating toward workers. Racism and poor treatment by farmers annoyed workers, who were more inclined to resort to poaching and theft in retaliation, as well as becoming demotivated about looking after livestock effectively.

On top of the poor treatment, workers interviewed had no vested interest in farm productivity, as they were not empowered to take control over the business. They did not seem to care whether predators killed livestock or poaching occurred because there were no repercussions for them. To increase productivity and reduce the chance of livestock depredation, one worker suggested offering part ownership of farms or some profits from livestock sales to workers. Many farmers, however, were against handing over any power to workers.

Because of the poor living conditions, racist treatment, and low salaries, employees were frequently unhappy. A few farmers suggested that raising wages would increase staff morale, as they believed that the current wages were currently too low. However, other farmers were against this idea as they did not believe workers deserved a raise. Workers who were unhappy did not undertake tasks diligently and instead left vulnerable livestock open to predation rather than checking on them regularly, which reportedly led to increased livestock depredation.

As well as the challenges facing the workers, there were many aspects of livestock management that increased reported livestock depredation. For example, livestock were sometimes not counted for weeks or months at a time, which meant that farmers did not know how many livestock were stolen, predated upon, or lost to other causes. However, when counting finally did occur, predators were usually accused for any losses. Poor management also resulted in increased theft: On one farm, a farmer reported 12 cows stolen by a neighbor, which he blamed on himself for not counting his cattle for more than a month.

Bad management extended to the way workers were managed. Workers often complained about the negative, dictatorial style by which farmers commanded employees. On badly managed farms, workers were seen as objects to exploit and dominate—similar to the livestock—in order to complete work. Workers were therefore not given any incentive to care for livestock properly, which sometimes resulted in livestock being more vulnerable to predation.

As well as the lack of incentives, workers were not adequately trained in effective husbandry. Some lacked literacy and numeracy skills and were not able to count the number of livestock to check all were present. The farm owners interviewed, however, although aware of the need for trained workers, often did not want their employees trained as they worried that workers may leave for a better job or would ask for a higher salary once trained.

Human–Wildlife Conflict

Due to the aforementioned political, social, and economic factors, livestock depredation was reportedly more severe on farms where workers were not respected. Respondents agreed that poaching and theft were often undertaken by workers to supplement income. Farmers tried to limit these activities by firing workers who they believed were involved or taking perpetrators to the police. Sometimes, however, farmers resorted to torturing or even killing suspects, which led to a significant adverse reaction among local communal residents and spurred further poaching.

Workers involved with poaching and theft often told managers that missing livestock and game animals were killed by carnivores, leading some farmers to believe that carnivores were more of a problem on their farm than in reality. Some farmers were aware of this scapegoating tactic and requested to see evidence of a predator attack, such as carcasses or carnivore tracks. On one farm visited, for example, workers complained that wildcats were attacking goats. The farmer confronted the workers, saying that the predator looked like he walked on two feet, not four; after this, no more goats were reported by workers to have been killed by wildcats.

Discussion

This is the first known study to uncover the effects of power differentials, farm governance, and racism on farms in relation to livestock depredation. It highlights the previously noted finding that human–wildlife conflict is driven by complex social factors that affect how people perceive each other (Madden and McQuinn 2014), in addition to how people perceive predators (Dickman 2010). This study is, however, unique as it demonstrates that workplace relations and the political history of a country affected the level of perceived human–wildlife conflict on farms, which had knock-on effects of game poaching and livestock theft.

In this study, poaching usually involved farm workers, a finding that has also been noted in neighboring Zimbabwe (du Toit 1994). In Malawi, stock theft has been attributed to be a form of resistance by the poor against rich landowners (Malekano 2000); this was also thought to be the main cause of poaching in Victorian Britain, too, where poaching subsided as job security and education improved for the economically disadvantaged (Jones 1979). The main reason for undertaking poaching and livestock theft in this study was reportedly due to unequal resource distribution, the most important resource of which was income. The average wage for livestock employees interviewed in this study was 41% lower than the average Namibian monthly salary (Namibia Statistics Agency 2012). This is a very low wage to survive on in Namibia and it is therefore not surprising that workers resorted to alternative income sources to supplement salaries. Furthermore, minimum wage for farm workers had not changed in Namibia since 2004 up until the end of this study's data collection, so despite a 17% increase in food prices (Minde, Chilonda, and Sally 2008), workers had an income deficit. In other societies, poachers have sometimes been regarded as Robin Hoods of their community—stealing from the rich and redistributing back to the poor (Child et al. 2012). It is possible that such a scenario was also present on these farms in Namibia.

Along with the low salaries paid to workers, lack of employee empowerment also added to worker dissatisfaction. Previous research in South Africa has demonstrated that farm workers who were given more responsibility were more productive, had longer job retention, and increased farm profits (Eckert, Hamman, and Lombard 1996). Namibia may do well to follow this example. Farmers in this study, however, appeared reluctant to relinquish any form of control of their "kingdom" (farmer FR5) to their workers. Employees often felt trapped, as they were not able to find employment elsewhere due to having a poor education, which has also been noted in South Africa (Robertson 1988). They were thus "caught in a cycle of dependency and poverty" (Republic of Namibia 1997, 227), solely reliant on the farmer for food, shelter, wages, and health care provision (Sylvain 2001).

Some farmers' racist, exploitative treatment of their workers caused retributive actions among workers, which then increased perceived human–wildlife conflict. Previous research in Namibia has also highlighted the poor treatment of indigenous employees by settler farm owners (Suzman 2001; Sylvain 2001), where "workers lived under constant fears of either physical or verbal abuse and of arbitrary dismissal" (Karamata, 2006, 7). Derogatory, demeaning communication from some farmers angered workers, who were more likely retaliate, such as by poaching game and stealing livestock.

Previous research into the causes of human–wildlife conflict has indicated that insufficient education of farmers and workers increased livestock depredation (Mwathe 2007; Schumann, Walls, and Harley 2012). This was also found in the current study, as workers did not understand the need to undertake certain husbandry techniques known to reduce predation. A further educational factor previously noted in other studies is that farmers incorrectly blamed predators for lost livestock, as they were not aware of the real cause of death (Marker-Kraus, Kraus, and Hurlbut 1996; Mizutani and Muthiani 2005); this was also found in the current study. Worker education in livestock husbandry and farmer education in the correct cause of death could help reduce real and perceived human–wildlife conflict (Marker, Mills, and Macdonald 2003). However, the problem may still persist if underlying racial and inequality issues are not addressed.

The Namibian conflict between livestock farmers and carnivores is therefore an entangled problem that cannot be completely solved by only addressing direct causes of

depredation. Although technical solutions such as guarding dogs, fences, and herders reduce depredation, they will not eliminate this problem completely (Inskip et al. 2013). This is because many drivers of conflict are due to the way in which livestock are managed, which is heavily influenced by the farmer–worker relationship and the political history of the country. If racism, domination, and exploitation continue, workers will have little motivation to undertake jobs effectively to protect livestock from predators. Although progress has been made in reducing human–wildlife conflict in many areas of the world (Zabel and Holm-Muller 2008; Rust, Whitehouse-Tedd, and MacMillan 2013; Hazzah et al. 2014), we would do well to appreciate the complexity of the factors that are influencing this situation (Madden and McQuinn 2014) before jumping in with quick fixes.

One limitation to this research is the fact that the interviews relied on respondents being open and honest, which could be difficult to achieve with a foreign interviewer during a 1-hour interview. While this was less of an issue during participant observation (due to the length of time immersed in the community), the interviews with the unemployed workers in particular did not involve significant time to build rapport and trust with these respondents. However, interviews were undertaken privately and confidentially to improve frank discussion, and interviews were undertaken only after spending a full day informally meeting with the respondents to build a relationship with them. That said, nervous or untrusting respondents may withhold sensitive information for fear of negative repercussions (such as information from the interview being used against them for job opportunities). To overcome this possibility, future research should be supplemented with data collection methods specifically designed for asking sensitive questions, such as the Randomised Response Technique (Nuno and St John 2014).

Conclusion

This research has demonstrated a tangled relationship between farmers and workers on commercial livestock farms in Namibia that influenced human–wildlife conflict. When this relationship worked well, farms were managed productively and employees had higher job satisfaction. These employees worked harder and undertook more effective livestock husbandry, which reduced the likelihood of livestock going missing, both to predators and by other means. Happy employees were treated with respect and paid a liveable wage; when they were not, they did not perform well at their job, which sometimes resulted in revenge tactics, such as stealing livestock or poaching game. Namibian commercial farms may therefore be described in a similar fashion to how South African farms have previously been described:

> [They] "are not simply places of work … [T]hey are individual arenas in which power games of control and subjugation between worker and employer … are the daily norms of life in an extremely complex setting." (O'Conchuir 1997; cited in Husy and Samson 2001, 25)

Far from this particular human–wildlife conflict being a linear problem of carnivores killing livestock and farmers then killing carnivores, this research has shown complex socioeconomic and political underlying drivers of the problem that are deeply embedded in the human dimension. In Namibia, if conflict between humans and carnivores is to be mitigated, the conflict between farmers and workers must first be addressed.

Acknowledgments

Thanks to all the respondents who agreed to take part in this survey, especially H & B Sohrada.

Funding

This work was funded by the Economic and Social Research Council (grant 12906529) and a Panthera Kaplan graduate award. Logistical assistance was provided by Cheetah Conservation Fund.

ORCID

Niki A. Rust http://orcid.org/0000-0002-0421-6461

References

Adams, M. E., and P. Devitt. 1992. *Grappling with land reform in pastoral Namibia*. London, UK: Overseas Development Institute.

Aryal, A., D. Brunton, W. Ji, R. K. Barraclough, and D. Raubenheimer. 2014. Human–carnivore conflict: Ecological and economical sustainability of predation on livestock by snow leopard and other carnivores in the Himalaya. *Sustainability Science* 9 (3):321–29. doi:10.1007/s11625-014-0246-8

Atkinson, D. 2007. *Going for broke: The fate of farm workers in arid South Africa*. Cape Town, South Africa: HSRC Press.

Auerbach, C. F., and L. B. Silverstein. 2003. *Qualitative data: An introduction to coding and analysis*. New York, NY: New York University Press.

Cassidy, A. 2012. Vermin, victims and disease: UK framings of badgers in and beyond the Bovine TB controversy. *Sociologia Ruralis* 52:192–214. doi:10.1111/j.1467-9523.2012.00562.x

Central Intelligence Agency. 2013. Distribution of family income—Gini index. *The World Factbook*. https://www.cia.gov/library/publications/the-world-factbook/fields/2172.html (accessed February 3, 2015).

Child, B. A., J. Musengez, G. D. Parent, and G. F. T. Child. 2012. The economics and institutional economics of wildlife on private land in Africa. *Pastoralism: Research, Policy and Practice* 2 (1):1–32. doi:10.1186/2041-7136-2-18

Clark, S. G., M. B. Rutherford, and D. J. Mattson. 2014. Large carnivores, people, and governance. In *Large carnivore conservation: Integrating science and policy in the North American West*, ed. S. G. Clark and M. B. Rutherford 1–28. Chicago, IL: University of Chicago Press.

Conover, M. R. 2002. *Resolving human–wildlife conflicts: The science of wildlife damage*. Boca Raton, FL: Lewis.

Dickman, A. 2010. Complexities of conflict: The importance of considering social factors for effectively resolving human–wildlife conflict. *Animal Conservation* 13 (5):458–66. doi:10.1111/j.1469-1795.2010.00368.x

Drury, R., K. Homewood, and S. Randall. 2011. Less is more: The potential of qualitative approaches in conservation research. *Animal Conservation* 14 (1):18–24. doi:10.1111/j.1469-1795.2010.00375.x

du Pisani, A. 2003. Liberation and tolerance. In *Re-examining liberation in Namibia: Political culture since independence*, ed. H. Melber 129–36. Stockholm, Sweden: Nordiska Afrikainstitutet.

Du Toit, R. 1994. Management of black rhino in Zimbabwean conservancies. In *Rhinos as game ranch animals*, ed. B. L. Penzhorn and N. P. J. Kriek, 95–9. Onderstepoort, South Africa: South African Veterinary Association.

Eckert, J. B., J. N. Hamman, and J. P. Lombard. 1996. Perceiving a new future: Empowering farmworkers through equity sharing. *Development Southern Africa* 13 (5):693–712. doi:10.1080/03768359608439926

Glaser, B. G. 1978. *Theoretical sensitivity*. San Francisco, CA: Sociology Press.

Glaser, B. G., and A. L. Strauss. 1967. *The discovery of grounded theory: Strategies for qualitative research*. Chicago, IL: Aldine.
Government of Namibia. 2009. *National policy on human–wildlife conflict management 2009*. Windhoek, Namibia: Directorate of Parks and Wildlife Management.
Hanssen, L., and P. Stander. 2004. *Namibia large carnivore atlas*, vol. 1. Windhoek, Namibia: Predator Conservation Trust.
Harper, E. K., W. J. Paul, and L. D. Mech. 2005. Causes of wolf depredation increase in Minnesota from 1979–1998. *Wildlife Society Bulletin* 33 (3):888–96. doi:10.2193/0091-7648(2005)33[888:cowdim]2.0.co;2
Hazzah, L., S. Dolrenry, L. Naughton, C. T. T. Edwards, O. Mwebi, F. Kearney, and L. Frank. 2014. Efficacy of two lion conservation programs in Maasailand, Kenya. *Conservation Biology* 28:851–60. doi:10.1111/cobi.12244
Hunter, J. 2004a. *Who should own the land? Analysis and views on land reform and the land question in Namibia and South Africa*. Windhoek, Namibia: Konrad-Adenauer-Stiftung and Namibia Institute for Democracy.
Hunter, J. 2004b. Interviews on land reform in Namibia. In *Who should own the land? Analysis and views on the land reform and the land question in Namibia and South Africa*, 109–21. Windhoek, Nambibia: Konrad-Adenauer-Stiftung and Namibia Institute for Democracy.
Husy, D., and C. Samson. 2001. Promoting development and land reform on South African farms. Paper presented at the SARPN Conference on Land Reform and Poverty Alleviation in Southern Africa, Pretoria, South Africa, June 4–5.
Inskip, C., M. Ridout, Z. Fahad, R. Tully, A. Barlow, C. G. Barlow, A. Islam, T. Roberts, and D. C. MacMillan. 2013. Human–Tiger conflict in context: Risks to lives and livelihoods in the Bangladesh Sundarbans. *Human Ecology* 41 (2):169–86. doi:10.1007/s10745-012-9556-6
Jones, B. T. B., and J. I. Barnes. 2006. *Human wildlife conflict study: Namibian case study*. Windhoek, Namibia: WWF.
Jones, D. J. V. 1979. The poacher: A study in Victorian crime and protest. *Historical Journal* 22 (4):825–60. doi:10.1017/s0018246x00017143
Karamata, C. 2006. *Farm workers in Namibia: Living and working conditions*. Windhoek, Namibia: Labour Resource and Research Institute.
Khoabane, S., and P. A. Black. 2009. *The effect of livestock theft on household poverty in developing countries: The case of Lesotho*. Stellenbosch, South Africa: Stellenbosch University & Bureau for Economic Research.
Krugmann, H. 2001. *Fundamental issues and the threats to sustainable development in Namibia*, vol. 264. Windhoek, Namibia: Ministry of Environment and Tourism.
Lindsey, P. A., S. S. Romañach, S. Matema, C. Matema, I. Mupamhadzi, and J. Muvengwi. 2011. Dynamics and underlying causes of illegal bushmeat trade in Zimbabwe. *Oryx* 45 (01):84–95. doi:10.1017/s0030605310001274
MacMillan, D. C., and J. Han. 2011. Cetacean by-catch in the Korean Peninsula—By chance or by design? *Human Ecology* 39:757–68. doi:10.1007/s10745-011-9429-4
Madden, F., and B. McQuinn. 2014. Conservation's blind spot: The case for conflict transformation in wildlife conservation. *Biological Conservation* 178:97–106. doi:10.1016/j.biocon.2014.07.015
Malekano, L. 2000. The social-economic impact of stock-theft and disease in the lower shire districts of Malawi. Paper presented at the International Conference on Historical and Social Science Research, Zomba, Malawi, June 26–29.
Marker, L. L., A. Dickman, and D. W. Macdonald. 2005. Perceived effectiveness of livestock-guarding dogs placed on Namibian farms. *Rangeland Ecology & Management* 58 (4):329–36. doi:10.2111/1551-5028(2005)058[0329:peoldp]2.0.co;2
Marker, L. L., G. Mills, and D. W. Macdonald. 2003. Factors influencing perceptions of conflict and tolerance toward Cheetahs on Namibian farmlands. *Conservation Biology* 17 (5):1290–98. doi:10.1046/j.1523-1739.2003.02077.x
Marker-Kraus, L. L., B. D. Kraus, and S. Hurlbut. 1996. *Cheetah survival on Namibian farmlands*. Windhoek, Namibia: Cheetah Conservation Fund.

Minde, I. J., P. Chilonda, and H. Sally. 2008. Rising global food prices—Policy challenges and options for Southern Africa. *ReSAKSS Issue Brief* (November):1–8.
Mizutani, F., and E. Muthiani. 2005. Impact and value of wildlife in pastoral livestock production systems in Kenya: Possibilities for healthy ecosystem conservation and livestock development for the. In *Conservation and development interventions at the wildlife/livestock interface: Implications for wildlife, livestock and human health*, ed. S. A. Osofsky 121–32. Durban, South Africa: IUCN.
Moheb, Z., D. Lawson, and S. N. Mostafawi. 2012. Brown bear status and threats in Darwaz, Northern Badakhshan, Afghanistan. *Ursus* 23 (2):237–40. doi:10.2192/ursus-d-12-00001.1
Mosimane, A. W., S. McCool, P. Brown, and J. Ingrebretson. 2013. Using mental models in the analysis of human–wildlife conflict from the perspective of a social–ecological system in Namibia. *Oryx* 48 (01):64–70. doi:10.1017/s0030605312000555
Mwathe, K. M. 2007. The nature, economic costs and management strategies for human wildlife conflict in Magadi Area, South Rift, Kenya. Master's thesis, University of Nairobi, Nairobi, Kenya.
NACSO. 2013. The state of community conservation in Namibia—A review of communal conservancies, community forests and other CBNRM initiatives. 2012 Annual Report, NACSO, Windhoek, Namibia.
Namibia Statistics Agency. 2012. *The Namibia labour force survey 2012 report*. Windhoek, Namibia: Government of Namibia.
Newing, H., C. Eagle, R. Puri, and C. Watson. 2010. *Conducting research in conservation: Social science methods and practice*. Abingdon, UK: Routledge.
Nuno, A., and F. A. V. St John. 2014. How to ask sensitive questions in conservation: A review of specialised questioning techniques. *Biological Conservation* 189:5–15. doi:10.1016/j.biocon.2014.09.047
O'Conchuir, R. 1997. *Farm worker conditions of employment on Free State commercial farms*. Research report. Bloemfontein, South Africa: Free State Rural Committee.
Puri, R. K. 2011. Participant observation. In *Conducting research in conservation: A social science perspective*, ed. H. Newing, C. M. Eagle, R. K. Puri, and C. W. Watson 85–97. Abingdon, UK: Routledge.
Redpath, S. M., S. Bhatia, and J. Young. 2015. Tilting at wildlife: Reconsidering human–wildlife conflict. *Oryx* 49 (2):222–25.
Redpath, S. M., R. J. Gutiérrez, K. A. Wood, and J. C. Young. 2015. *Conflicts in conservation: Navigating towards solutions*. Cambridge, UK: Cambridge University Press.
Republic of Namibia. 1997. *Resettlement policy*. Windhoek, Namibia: Ministry of Lands, Resettlement and Rehabilitation.
Rigg, R. 2001. Livestock guarding dogs: Their current use world wide. IUCN/SSC canid specialist group occasional paper no. 1 [online]. http://www.canids/org/occasionalpapers
Robertson, B. J. 1988. An economic study of farm labour in the Lion's River, Lower Tugela and Elliot Magesterial Districts. Master's thesis, University of Natal, Natal, South Africa.
Rust, N. A., and L. L. Marker. 2014. Cost of carnivore coexistence on communal and resettled land in Namibia. *Environmental Conservation* 41 (1):45–53. doi:10.1017/s0376892913000180
Rust, N. A., M. T. Nghikembua, J. J. W. Kasser, and L. L. Marker. 2015. Environmental factors affect swing gates as a barrier to large carnivores entering game farms. *African Journal of Ecology* 53 (3):339–45. doi:10.1111/aje.12188
Rust, N. A., K. M. Whitehouse-Tedd, and D. C. MacMillan. 2013. Perceived efficacy of livestock-guarding dogs in South Africa: Implications for cheetah conservation. *Wildlife Society Bulletin* 37 (4):690–97. doi:10.1002/wsb.352
Saldaña, J. 2010. *The coding manual for qualitative researchers*. London, UK: SAGE Publications.
Sarker, S., F. Lau, and S. Sahay. 2001. Using an adapted grounded theory approach for inductive theory building about virtual team development. *ACM SIGMIS Database* 32:38. doi:10.1145/506740.506745
Schmid, E., and F. Sinabell. 2007. On the choice of farm management practices after the reform of the common agricultural policy in 2003. *Journal of Environmental Management* 82 (3):332–40. doi:10.1016/j.jenvman.2005.12.027

Schumann, B., J. L. Walls, and V. Harley. 2012. Attitudes towards carnivores: The views of emerging commercial farmers in Namibia. *Oryx* 46 (04):604–13. doi:10.1017/s0030605311000779

Soh, Y. H., L. R. Carrasco, D. G. Miquelle, J. Jiang, J. Yang, E. J. Stokes, J. Tang, A. Kang, P. Liu, and M. Rao. 2014. Spatial correlates of livestock depredation by Amur tigers in Hunchun, China: Relevance of prey density and implications for protected area management. *Biological Conservation* 169:117–27. doi:10.1016/j.biocon.2013.10.011

Stein, A. B., T. K. Fuller, D. T. Damery, L. Sievert, and L. L. Marker. 2010. Farm management and economic analyses of leopard conservation in north-central Namibia. *Animal Conservation* 13 (4):419–27. doi:10.1111/j.1469-1795.2010.00364.x

Strauss, A., and J. Corbin. 1990. *Basics of qualitative research: Grounded theory procedures and techniques*. Thousand Oaks, CA: Sage.

Suzman, J. 2001. *An assessment of the status of the San in Namibia*, vol. 4. Windhoek, Namibia: Legal Assistance Centre.

Swenson, J. E., and H. Andrén. 2005. A tale of two countries: Large carnivore depredation and compensation schemes in Sweden and Norway. In *People and wildlife, conflict or co-existence?*, ed. R. Woodroffe, S. Thirgood, and A. Rabinowitz 323–39. Cambridge: Cambridge University Press.

Sylvain, R. 2001. Bushmen, Boers and Baasskap: Patriarchy and paternalism on Afrikaner farms in the Omaheke region, Namibia. *Journal of Southern African Studies* 27 (4):717–37. doi:10.1080/03057070120090709

Tamang, B., and N. Baral. 2008. Livestock depredation by large cats in Bardia National Park, Nepal: Implications for improving park–people relations. *International Journal of Biodiversity Science, Ecosystems Services & Management* 4:44–53. doi:10.1080/17451590809618182

Van Meijl, H., T. van Rheenen, A. Tabeau, and B. Eickhout. 2006. The impact of different policy environments on agricultural land use in Europe. *Agriculture, Ecosystems & Environment* 114 (1):21–38. doi:10.1016/j.agee.2005.11.006

Warchol, G., and B. Johnson. 2009. Wildlife crime in the game reserves of South Africa: A research note. *International Journal of Comparative and Applied Criminal Justice* 33 (1):143–54. doi:10.1080/01924036.2009.9678800

Witkin, B. R., and J. W. Altschuld. 1995. *Planning and conducting needs assessments: A practical guide*. Thousand Oaks, CA: Sage.

World Bank. 2009. *Namibia: Country brief*. Washington, DC: World Bank Publications.

Zabel, A., and K. Holm-Muller. 2008. Conservation performance payments for carnivore conservation in Sweden. *Conservation Biology* 22 (2):247–51. doi:10.1111/j.1523-1739.2008.00898.x