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Women, Human-Wildlife Conflict, and CBNRM: Hidden Impacts and Vulnerabilities in Kwandu Conservancy, Namibia

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Abstract

Community-based natural resource management (CBNRM) programmes are designed to ensure that rural residents benefit from conservation initiatives. But where human-wildlife conflict threatens life and livelihood, wildlife impacts can undermine the goals of CBNRM. Based on research on women's experiences in Namibia's Kwandu Conservancy, we examine both the visible and hidden impacts of human-wildlife conflict. In Kwandu Conservancy, the effects of human-wildlife conflict are ongoing, reaching beyond direct material losses to include hidden impacts such as persistent worries about food insecurity, fears for physical safety, and lost investments. Existing vulnerabilities related to poverty and marital statuses make some women more susceptible to wildlife impacts, and less able to recover from losses or to access compensation. This process may actually deepen the vulnerability of women whose economic status is already marginal. Because the benefits of wildlife conservation accrue at multiple scales, we recommend that the cost of human-wildlife conflict be better distributed, with additional resources for prevention and compensation made available for conservancy residents.

Keywords: human-wildlife conflict, CBNRM, conservancy, gender, vulnerability, Kwandu, Namibia

INTRODUCTION

In many economically poorer regions of the world, conservation is increasingly integrated with development on the assumption that conservation programmes can provide benefits to rural residents. However, in the case of wildlife conservation, the wildlife populations protected and promoted by conservation may threaten both life and livelihood. Further, wildlife impacts are not evenly distributed, as some individuals and households are more vulnerable to human-wildlife conflict (HWC) and are less able to recover from crop damage, livestock losses, and human injury. In this article we explore the relationship between HWC and a community-based natural resource

management (CBNRM) programme in Namibia, with a focus on impacts to, and responses of, women.

CBNRM and HWC

CBNRM seeks to link rural residents with benefits derived of conservation (Adams and Hulme 2001a,b; Hulme and Murphree 2001a,b; Igoe and Brockington 2007; Jones and Weaver 2009). Advocates of CBNRM hope to address the failings of top down, state controlled, exclusionary policies, typically associated with protected areas, by ensuring conservation provides benefits to the local people (Jacobsohn and Owen-Smith 2003; WWF et al. 2008; Anderson and Mehta 2013; NACSO 2013). Where cash incomes produced through increased market integration become possible, these are believed to reduce communities' direct dependence on natural resources (Büscher and Dressler 2012), foster positive attitudes towards conservation (Scanlon and Kull 2009), incentivise sustainable harvest levels (WWF et al. 2008), and alleviate poverty (Jones and Weaver 2009; NACSO 2013). Critics have charged that CBNRM assumes conservation goals mesh with the development goals of rural communities

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(Young et al. 2001; West 2006; Beilin 2010; Peterson et al. 2010; Büscher et al. 2012) and that communities do not value wildlife unless it has a market value (Hill 1998; Moore 2010; van der Ploeg 2011). However, some studies have shown that rural residents attach intrinsic value to wildlife and the broader environment (Hinz 2003; West 2006), and that market-based CBNRM schemes can displace community values and erode autonomy (Sullivan 2006). Further, CBNRM programmes may limit communities' access to resources without providing adequate returns (West 2006), fundamentally alter people's relationships with nature (Büscher and Dressler 2012), and fail to distribute conservation benefits equally when confronted with intra-community power imbalances (Belsky 1999; Leach et al. 1999; Kellert et al. 2000; Sullivan 2000).

The implicit or explicit assumption behind many CBNRM programmes is that the benefits from conservation outweigh the costs that conservation restrictions, or increased wildlife presence may entail. This paper focuses on the particular assumption that financial benefits of wildlife conservation under CBNRM compensate for increased or ongoing crop or livestock losses and risk to human life. *Common ground – solutions for reducing the human, economic, and conservation costs of human wildlife conflict*, the World Wildlife Fund report (2008: 15) states that, "Human Wildlife Conflict occurs when wild animals injure, destroy or damage human life or property and are killed, injured, captured or otherwise harmed as a result – i.e. both humans and animals suffer from the interaction with each other". HWC can undermine livelihoods, food security, and physical safety, and contribute to the perception that wildlife is owned by government rather than community members (Hill 1997; Naughton-Treves 1997; Naughton-Treves and Treves 2005; Osborn and Hill 2005; Ogra 2008; WWF 2008). HWC also makes it more difficult to protect wildlife, because in areas prone to HWC, the real and/or perceived costs of living with wildlife can be greater than conservation benefits, reducing residents' incentives to conserve wildlife (Naughton-Treves and Treves 2005; Walpole and Thouless 2005), and poaching has been associated with areas where perceived livelihood risks are higher (Kahler et al. 2013). To the extent that HWC is problematic under CBNRM, losses from wildlife may undermine the very logic of conservation programmes because they make 'development'—loosely defined as improved livelihoods and food security—difficult to achieve at the individual and household levels.

Conservation organisations have portrayed HWC as a set of discrete events that negatively impact individual farmers or residents. However, social scientists have demonstrated a need to broaden HWC to capture its "hidden costs" (DeMotts and Hoon 2012; Barua et al. 2013). Of particular concern are HWC's differential impacts on individual residents (Hill 2004; King and Peralvo 2010), its psychological impacts, and its prevention and opportunity costs (Barua et al. 2013). Gender, age, wealth, landholding size, farm location, crop type, household composition, and access to information influence a person's ability to prevent, cope with, and receive compensation for HWC (Hill 1997; Naughton-Treves and

Treves 2005; Osborn and Hill 2005; Ogra 2008; Ogra and Badola 2008; DeMotts and Hoon 2012). Women and female-headed households, in particular, experience a disproportionate HWC burden (Hill 1998; Osborn and Hill 2005; Ogra 2008; Ogra and Badola 2008; DeMotts and Hoon 2012). Prevention carries costs like increased workloads and heightened physical risk of direct injury from wildlife, and increased exposure to insect-borne diseases while guarding fields (Ogra 2008). HWC's emotional toll encompasses fear for physical safety (Ogra 2008; DeMotts and Hoon 2012), worry about lost livelihoods (DeMotts and Hoon 2012; Gore and Kahler 2012), and frustration with outsiders (DeMotts and Hoon 2012). People may experience the opportunity costs of delaying or abandoning their customary natural resources activities, or forsaking their farms (Hill 1998; Naughton-Treves and Treves 2005; Ogra 2008). According to Barua et al. (2013), the hidden impacts of HWC are poorly understood and detailed ethnographies examining differential impacts on gender, perceptions of crop and livestock guarding, and delayed effects, among others, are needed.

While CBNRM seeks to improve local livelihoods, HWC is both a stress and a shock to livelihood and food security. Stress is a continuous, predictable, slowly increasing disruption to livelihoods with a cumulative impact (Scoones 1998; Adger 2000; Turner et al. 2003), while a shock is a large disturbance, beyond the normal range of variability, with immediate impact (Scoones 1998; Marschke and Berkes 2006). A household's entitlements (i.e., education, physical health, and income alternatives) influence whether an event is experienced as a stress or a shock (Marschke and Berkes 2006). In the rural communities, typically served by CBNRM projects, food security depends on livelihoods that can provide access to food of sufficient quality and quantity (Kerr 2005; Misselhorn 2005). Access to a secure cash source, labour, kin networks, and an ability to control intrahousehold income positively influence food security (Kerr 2005). Livelihood diversification can improve food security in areas with variable climates and where subsistence agriculture dominates livelihoods (Ellis 1998).

Such diversification builds resilience—"the capacity to cope with and adapt to stresses and shocks" (Shackleton and Shackleton 2012: 276)—by infusing flexibility and options into an individual's or household's livelihood (Marschke and Berkes 2006). In many ways, a vulnerable individual or household is one that does not have the capacity to cope with stresses or shocks without jeopardising their livelihood or food security (Adams et al. 1998; Shackleton and Shackleton 2012). Accordingly, an individual or household's ability to recover from HWC interacts with non-HWC stressors, and depends on a range of material and social resources. While building resilience to HWC (and other stresses and shocks) may be a worthy goal, responses to HWC, however, need to recognise how power differences and unequal distribution of resources produce different vulnerabilities within rural communities (Béné et al. 2012 for a critique of resilience). O'Brien et al. (2007) argue for a more "contextual"

vulnerability that considers the ways in which biophysical stressors interact with a complex set of political, institutional, economic, and social structures and processes, suggesting that both location and context play a role in producing vulnerability. A contextual approach allows us to consider “why some regions and social groups are more vulnerable than others” (O’Brien et al. 2007: 79). Thus, thinking of HWC in terms of vulnerability can reveal the ways in which impacts to particular hazards at particular places, such as HWC in Kwandu Conservancy, differ between groups.

To better understand HWC, we need detailed ethnographies of the impacts of and responses to HWC at particular places (Barua et al. 2013). We need to examine how HWC impacts different groups of people and how it interacts with existing vulnerabilities. We also need to better understand the role of HWC in supporting or undermining the desired outcomes of CBNRM. Below we examine the impacts of HWC in the context of a specific CBNRM project, with a focus on both the hidden and visible impacts to women specifically.

Kwandu Conservancy

We selected Namibia’s Kwandu Conservancy as the focus for a broader study on how CBNRM affects women’s empowerment (Khumalo 2012). During the study, HWC emerged as a subject of concern among women and men. Namibia’s CBNRM programme operates through communal conservancy units, each having clearly defined boundaries, a defined membership, a legally recognised constitution, an elected body of representatives, and a plan for equitable benefits distribution to members (Jones and Weaver 2009). Once registered, a conservancy gains the right to conditionally use, consume, and sell game, as well as enter into tourism ventures (NACSO 2008). Kwandu Conservancy (hereafter referred to as ‘the Conservancy’) was formally established in 1999. It is located in Namibia’s Caprivi region¹, at the heart of the Kavango Zambezi Transfrontier Conservation Area. Regional studies suggest some Kwandu Conservancy residents, like many other Caprivians, live with food insecurity. Approximately 28.6% of Caprivians are considered ‘poor’, with adult monthly expenditures of less than NAD262.45² (CBS 2008). The Conservancy is located in a region where threats from annual floods have contributed to chronic food insecurity among 32% of Caprivians living in flood-affected areas (WFP 2008). Informal interviews revealed some households in the Conservancy have too little food to guarantee three meals each day, especially during the months of December and January.

The Conservancy serves as a key link in an elephant migration corridor that extends through Botswana, Zambia, and Angola (Chase and Griffin 2009; von Gerhardt-Weber 2011). The Conservancy borders unfenced Bwabwata National Park, a state forest, Zambia’s Sioma Ngwezi National Park, and the Trans-Caprivi Highway. With an area of 190 sq. km, the Conservancy has an approximate population of 4,300 (NACSO 2008). At the time of the research, the Conservancy did not have a list of registered members. The Conservancy

generates most of its revenue from trophy hunting, timber sales, and grants, but its lack of a destination lodge distinguishes it from the country’s more lucrative conservancies. Resident households have only twice received cash dividends from the Conservancy, amounting to a maximum of NAD30 per household per distribution, but most revenue goes to pay staff salaries. Suich (2013) found that there were no significant differences in impacts on poverty between randomly-sampled Kwandu Conservancy households and the households outside the Conservancy. The Conservancy has the country’s highest levels of recorded wildlife-induced crop and garden damage (as discussed in the section on The impacts of HWC in the Conservancy), and ranks second highest among conservancies in incidents of wildlife attacks on people (Brown 2011), making it an ideal location for studying HWC in the context of CBNRM.

The Conservancy’s population is predominantly composed of *Hambukushu* (*Simbukushu*-speaking) and *Mafwe* (*Sifwe*-speaking) people; both ethnic groups have lived in the Kwando/Mashi River corridor for over a century (Pretorius 1975; Larson 2001; Fisch 2003). Records suggest both groups historically focused on agriculture, fishing, hunting, and gathering, their livelihoods patterned around annual floods (Gluckman 1950; Larson 2001). Presently in the Conservancy, subsistence agriculture is the primary occupation of household heads (84% of households); formal employment (5%), informal employment (3%), and cash-crop farming (3%) are less dominant (Bandyopadhyay et al. 2009). The Conservancy residents, male and female, grow maize, sorghum, millet, beans, pumpkins, and other crops, raise cattle for personal consumption, and sell surplus maize and meat for cash. Published information on agricultural holdings is scarce, but an agricultural census showed that in 2002–2003, female-headed households in the broader Caprivi region planted an average of 1.63 ha per year, less than male-headed households’ average of 2.01 ha (CBS 2003). In 2011, an employee of the Conservancy recorded 1,077 female farmers and 900 male farmers in the Conservancy working fields of at least 1 ha. Among married couples, a wife will often manage a joint field with her husband for household needs, while a husband will often manage a separate field, in part for household needs as well as for meeting his own expenses. In addition to agriculture, men and women also work on neighbours’ farms or houses, run small stores, gather wild foods, and fish (Mulonga 2003). Pensions and remittances provide additional sources of income (CBS 2006). With few local opportunities for formal employment, many residents leave the Conservancy to work in urban areas.

Thirty six percent of the households in Kwandu Conservancy are female-headed (Bandyopadhyay et al. 2009). Women have constituted roughly a quarter of the Conservancy’s 19 to 28 salaried employees, and like men, held leadership positions and represented both dominant ethnic groups (based on 2004–2010 data reported in Khumalo and Freimund, 2014). Nonetheless, male dominance in leadership structures poses an obstacle to female residents’ full participation in conservancy activities (Lendelvo et al. 2012). Due to rigidly-defined gender roles and

responsibilities, women rarely engage in certain livelihood activities like home construction, field clearing, and livestock herding because they are believed to be ‘men’s work’. Men grant women access to farmland, women plant and weed the fields, and both men and women harvest and protect crops. Women also have a variety of other responsibilities, including fetching water, collecting firewood, making fires, washing dishes and clothes, cooking, caring for children, pounding maize, and sweeping the courtyard around their houses. In addition, women in the region confront an HIV/AIDS rate of 35.6%, and husbands’ sexual behaviour often subjects women to infection risk (Edwards 2007; Thomas 2007; MOHSS 2010). Because men mediate access to important livelihood resources, many women do not envision leaving an abusive husband as a viable option (Thomas 2007).

METHODS

We employed an extended case method (Burawoy 1998) to assess the effects of CBNRM on women in Kwandu Conservancy. Six months’ total fieldwork in the Conservancy in 2010 and 2011 included indepth, semistructured interviews, participant observation, and document review. Purposive diversity sampling (or “sampling for range”, Weiss 1994) for different social characteristics (class, education, religion, number of children, livestock owned, etc.) and types of engagement in the Conservancy activities (ranging from employed full time to no involvement) was used to select female Conservancy residents for interviews. For example, female respondents ranged in marital status (47% married, 24% single, 14% divorced, 14% widowed), ethnicity (65% *Mafwe*, 22% *Hambukushu*, 10% other ethnicities, with one respondent’s ethnicity unidentified), and age (from 19 to over 90 years old). Women from the *Mafwe* and *Hambukushu* ethnic groups did not respond differently to any of the questions and their experience of HWC did not appear to differ. Sixty seven percent of the female respondents considered themselves to be the Conservancy members (there were no differences between respondents who identified as the Conservancy members and those who did not). The lead author interviewed 49 female residents of the Conservancy (hereafter referred to as “respondents”), plus 20 key informants, including male members of the Conservancy staff, government officials, customary traditional authorities, religious leaders, and staff from a local conservation nongovernmental organisation (NGO). In addition to questions about household characteristics and livelihood activities, the interview guide included questions like, “How has the Conservancy affected your life?”, “What are you able to do now that you were not able to do before the Conservancy?”, and “How do you think the Conservancy has influenced the challenges women face?”. While obtaining informed consent from each study participant, the lead author explained he/she did not work for the Conservancy, nor any conservation or development organisation. A Caprivian woman translated interviews ‘in situ’ when needed. The interview guide was back translated to improve translation accuracy.

Participant observations included attending the Conservancy meetings and village events, observing routine activities, and staying with five host families.

Analysis began with the very first interview, document review, and observation, and it informed each subsequent act of data collection in what Hammersley and Atkinson (2007: 160) term an increasingly focused ‘funnel’ of data collection. Memos were used for each of the methods described above, and diagrams were used intermittently to keep a log of insights, conceptual reflections, emergent questions, and theoretical connections as they evolved over the course of the fieldwork (O’Reilly 2005; Corbin and Strauss 2008). Each interview transcript was read to identify themes and to develop a better understanding of each respondent (Bradley et al. 2007). Thematic coding began within each interview and then extended outwards across interviews (Jackson 2001). Interviews were coded with the assistance of QSR NVivo software. Interview excerpts were selected for inclusion below because they represent views that were widespread in the sample. Diverging or minority views are also included and explicitly identified as such. We provide numbers in some sections to illustrate the extent of agreement or disagreement.

RESULTS

Below we describe how women in the Conservancy respond to HWC, including the complex ways social position and livelihood activities structure the experience of HWC. We then discuss the Conservancy’s mitigation programme and how women have differential access to resources designed to ameliorate the impacts of HWC.

The impacts of HWC in the Conservancy

According to the Kwandu Conservancy Event Book (unpublished data systematically collected by the Conservancy staff and provided by WWF in 2011), between 2003 and 2010, the Conservancy averaged 517 reported incidents of wildlife-induced crop damage per year and had a total of 19 reported wildlife attacks on people. In 2010, for example, crocodiles killed two children and injured an adult woman in two separate attacks. The Conservancy also averaged 21 reported incidents of livestock predation per year (Kwandu Conservancy Event Book). Elephants, pigs, hippopotami, antelope, and baboons cause the greatest number of reported human-wildlife conflicts. While a key informant claimed pigs caused the most crop damage, elephants pose a dual threat to crops and human safety (Jones and Barnes 2006). More research is needed to determine the most problematic animals from the perspectives of the Conservancy residents. Wildlife numbers in the area have increased dramatically in the last decade. Aerial surveys of Namibia’s Caprivi and Kavango river systems recorded a 54% increase in wildlife numbers from 2004 to 2009, and 9,633 elephants were counted in 2009 compared to 3,262 elephants in 2004 (Chase 2009). Chase and Griffin (2009)

attribute the increase to the end of military conflicts in Angola and the Caprivi region.

The Conservancy's establishment has restricted how residents can react to wildlife threats. While Namibian law permits residents to possess firearms (subject to having a license and a place to securely store the firearm), their use is monitored and enforced by the Conservancy game guards. All gunshot sounds are investigated, and the game guards determine whether an animal shooting was warranted (i.e., a person or livestock was being attacked by a wild animal). Additionally, shots into the air are only allowed when a wild animal is in the immediate vicinity of a farmer. The Conservancy staff have reported farmers to the police who have repeatedly shot into the air when there was no evidence of animals near their fields.

In response to questions about life in the Conservancy, 33 out of the 49 female respondents expressed concern about wildlife raiding farms in the Conservancy. HWC in the Conservancy has a range of impacts on women. Because many women grow crops for direct consumption, losing crops to wildlife can translate into less food for their families. When asked how the Conservancy had affected their lives, women complained about elephants and bushpigs raiding their farms. For example, one woman said: "We end up losing everything... You end up with no food in your farm." She added:

We don't usually feel good because when you are ploughing those different types of food so that maybe you try to feed yourself and your family—you know how to gather those things to cook for your family—but when those animals come into your field and then they eat everything, it's not going to be good because you only get a little.

This respondent's viewpoint is made more interesting by her high social status and wealth relative to other community members, and by the profits she has earned from the Conservancy activities.

Food loss has different consequences for women based on their relative entitlements. Women and men with sufficient cash can overcome food losses by purchasing maize meal, and women with physical strength can work in exchange for food. But women with little cash, limited education, poor physical health, and/or little ability to barter may face food shortages when their crops are trampled or eaten. A married, unemployed woman with an education lower than Grade 12, five children, and no cattle, claimed, "...we are suffering from hunger because [the farm is] where we were supposed to get what we eat. ...In 2004, I ploughed somewhere in the forest. My field was trampled. I didn't get anything from there." She, like other relatively poor respondents, explained she had to rely on informal, temporary jobs (piece work) to acquire food after losing her crops to wildlife. She expressed the wish for long term, reliable employment because of its perceived security compared to farming, saying:

If by this time I was working, my children couldn't die of hunger. I would be able to afford to take care of

all my children. With farming, if I can't get anything from the field, it's not the same like working. When you are working, every month you have to receive something. It's not like in the field where if you lose, then you lose for good. You don't get anything again.

We interpret her comments to reflect her fear of not being able to provide for her children. Interestingly, later in her interview she stated that "the Conservancy is good" and specifically indicated that she does not want the Conservancy "abolished," indicating some favourable sentiments toward it, despite her concerns about crop loss.

One woman with a self-described 'big field' lost her crop to elephants near harvest time, leaving her with only half a bag of maize. She explained, "I cannot even eat for more than three days. It's already finished." When asked what she was going to do for food, she replied, "There is no ways." While her husband earns a pension, she has no other direct source of income, lacks formal education, and owns no cattle, therefore, extensive losses would leave her in a particularly difficult position for providing for the nine children (her own and the orphans of relatives) for whom she is responsible. This example indicates that even women with fields they perceive to be large can be vulnerable to crop damage due to other social and economic factors.

With few formal employment opportunities in the Conservancy, women also use farms as a source of cash. They grow and sell surplus maize to pay for school fees, purchase clothes, hire labourers, and pay for transportation and medical expenses. A trampled or damaged harvest is therefore lost revenue, and women without alternative income sources experience wildlife as a threat to meeting their basic needs. Additionally, the possibility of lost labour and monetary investments can make farming seem futile, sometimes pushing farmers to pursue alternative livelihood options and forgo farming altogether, a decision that can reduce livelihood diversity, and increase the risk of food shortages. As one local NGO employee explained: "[A] few individuals can say that 'Ah, I cannot even plough. Or I'm just wasting time. I cannot go to the field because I'm just planting for the wild animals.'" His words describe people who have quit farming because they believe wildlife will intercept the food meant for their own livelihoods. However, the scarcity of formal employment leaves many women without viable alternatives to farming. As this married woman without formal education claimed, "Women... usually help themselves by ploughing, having fields. If you don't have a field, you can only die from hunger". Her words reflect the high level of importance women place on farming for their household livelihood.

The threat of wildlife incursions propels most farmers, male and female, to guard their fields day and night, where they often use deterrent techniques like making loud noises and burning diesel-soaked, chilli-laden rags or elephant dung "chilli bombs". These efforts demand additional labour, and invite sleep loss and risky encounters with wildlife. One woman explained, "It's like you don't even have time to sleep during the night. What you have to do is stay awake, and then you have to chase away those animals. That's the bad part

of it.” While she indicated “the Conservancy is good,” she wanted more assistance from it for preventing and responding to wildlife conflict. Protecting fields from dangerous wildlife, especially elephants, hyena, lions, bushpigs, and warthogs, frightens women, but they see it as a necessity for reaping a harvest, as this widowed woman, who was over 80 years old, conveyed:

It’s really scary because we don’t have weapons. We only have to beat on something which makes a loud sound. And then when you hear that it’s rolling somewhere, then again you have to run from there and come and stay at the hut. Only later, it’s when you can go and check [your farm]. ...But if you don’t go [to the farm] and build a small hut so that you can stay there and scare animals, you get nothing from [that farm].

Despite the risk of losing crops to nocturnal wildlife raids, some women expressed reluctance to guard their fields at night because of their fields’ remoteness. Women feared people or wildlife might assault them. Unmarried women in particular expressed reluctance to sleep at their fields. When one unmarried, and relatively poor woman was asked why she did not sleep at her farm, she replied, “I can’t sleep at the field alone. There are a lot of things there. You think I can get some elephant chasing me there? Where can I go?” Another woman alluded to her single status, saying, “With me, I don’t always sleep there. Only those who are married who have got husbands, they are the ones who can sleep at the field.” Failure to guard crops at night not only increases risk of crop loss, but it makes farmers ineligible to receive crop loss payments, raising the stakes for women who cannot draw on a husband’s assistance.

As with farming, dangerous wildlife can prevent women from harvesting valuable natural resources. Hippopotami and elephants, for example, restrict women’s reed harvesting and firewood collecting, respectively. As this woman described:

Most women used to go out. But now we don’t go deep to the riverside because it’s very scary there. If

you go there, there are many hippos. We now collect these reeds which are not even strong. ...There are times when most elephants come closer to the people even when you go just out there to collect firewood, unless if you run out from there.

The documented injuries and deaths from wildlife encounters in the Conservancy further substantiate women’s claims about risks from wildlife and their associated fears.

Not only does wildlife threaten food security, livelihood diversity, and physical security, it also increases uncertainty about the future in an already insecure environment. Women can invest their labour and finances only to lose their investment in a single night. This woman described her lost investment after wildlife damage to her crops, “In 2007, I wasted almost NAD1,000 for ploughing, then NAD500, which I gave people to weed my field. But I didn’t get anything again.” Women expressed feelings of futility, anxiety, and uncertainty about the future. When this widowed woman was asked what would help her granddaughters in the future, she replied:

There is nothing which can change their life. The things which we are always ploughing in our fields are the ones which should change their futures. But for now since every time fields are being trampled, there is no future on that. As you can see now, it’s only that... just look at how I am. You will find that I’m suffering. It’s either stress or what, thinking too much about what I can do for my family.

Rather than a discrete event (i.e., an elephant trampling a particular field one night in the summer), HWC in the Conservancy poses a continuous burden on women who farm and/or collect natural resources (see Table 1). For many women, the threat of HWC translates into ongoing fears about livelihood security, concerns about feeding family members, worries about physical safety, and frustrations over lost investments. For women who sustain crop damage or lose family members, impacts and recovery may be long term. But even women who are not directly impacted by HWC may pay a high emotional toll because of fear, anxiety, and uncertainty.

Table 1
Visible and hidden impacts of HWC

	Continuous events	Discrete events
Direct costs	<ul style="list-style-type: none"> • Time lost from chasing animals away as they try to enter fields • Physical risk 	<ul style="list-style-type: none"> • Crop loss • Livestock predation • Human injury • Infrastructure damage • Death
Indirect costs	<ul style="list-style-type: none"> • Additional time investment • Fear of what will happen if one encounters a dangerous animal; fear of what will happen if crop is lost; anger at the conservancy; uncertainty about being able to provide for one’s household • Lost sleep staying on the lookout for animals 	<ul style="list-style-type: none"> • Fear/stress during animal encounters • Food loss, hunger • Income loss • Lost opportunity cost • Lost labour investment • Lost financial investment

Note: Discrete events happen at moment of contact in which a wild animal causes damage (i.e. crop loss, injury, or mortality). Continuous events are on-going, and have lasting and long-term impacts

And HWC inflicts opportunity costs by deterring women from farming and/or collecting forest products.

It is also quite possible that HWC in the Conservancy impacts women differentially. Women with more entitlements are likely able to recover from a loss by purchasing food or pursuing other livelihood paths, while for poorer women, crop losses may result in food shortages. Married women are likely better able to prevent wildlife damage, as they have assistance guarding their fields at night.

The Kwandu Conservancy responses to HWC

According to the Conservancy staff, the Conservancy has responded to HWC by implementing a variety of prevention and compensation measures. The Conservancy staff, customary traditional authorities from the Conservancy, the Ministry of Environment and Tourism, the Ministry of Agriculture, Water, and Forestry, the World Wildlife Fund, and the Namibian Nature Foundation collectively drafted a zonation plan to encourage farming and settlement away from wildlife corridors, but a local NGO employee claimed the plan has not been enforced because residents resisted relocation away from the lowland river area to the upland where they had no allocated land or perennial water supply. The Conservancy staff educate residents about HWC prevention, and they provide residents with chilli-based deterrents. The Conservancy also employs 12 game guards to patrol the area for poachers, sleep at fields to guard residents' crops from imminent wildlife threats (provided fields are at least 1 ha), and to survey and record wildlife crop raiding incidents, livestock predation, physical injury, and mortality. Compensation³ began in 2003, initially for livestock predation and human injury and mortality through the Human Animal Conflict Self-Insurance Scheme (HACSIS). In 2007, the Conservancy and a local NGO began providing compensation for crop loss. Following the enactment of the National Policy on Human-Wildlife Conflict Management in 2009, the Government of Namibia allocated the Conservancy NAD60,000 to provide payments to people harmed between December 1, 2010 and November 30, 2011, and HACSIS was discontinued. The government policy established criteria for payment eligibility. For example, it states that "payments [for] crops will be made for damages caused only by elephants and hippopotamus", and it sets crop payments at a rate of NAD200 per quarter ha lost. The Conservancy requires farmers to be present in their fields at the moment of crop loss, and the Conservancy has elected to only pay farmers who have field sizes of at least 1 ha, and who have lost at least one quarter of their field. The Conservancy staff speak with farmers and inspect fields after allegations of damage, looking for evidence of damage as well as wildlife spoor and tracks. According to the Conservancy staff, a funding gap between 2008 and 2010 has left some farmers with older losses unpaid even as more recent HWC victims have received money.

While most women described problems with HWC in the Conservancy, five women suggested losses to wildlife had increased under Kwandu Conservancy management. One

such woman claimed, "The Conservancy has brought animals around the villages to come and destroy crops." Losses were often attributed to the Conservancy's protection of wildlife. As this woman conveyed, "People's fields are being destroyed. And coming to the riverside, people are being caught by crocodiles, and it's because those animals, they are not allowed to be [killed]." Though her comment did not reflect most women's statements, another woman expressed a desire for wildlife in the Conservancy to disappear: "...They are not good because they kill people. It can be okay even if they finish. The elephants also are not good because they trample the fields."

While five women expressed approval of the Conservancy's response efforts, 28 respondents expressed dismay about its response to HWC. Eight women claimed the Conservancy did not provide adequate protection by game guards. Women cited denied requests for assistance, saying "Last year we asked them, those people from the Conservancy, to start by camping nearby the fields so that in the night they scare animals from the fields. But those people don't show up." They also told of game guards arriving too late to offer protection. This woman describes this problem:

When those people from the Conservancy arrive, they'll find that everything has been just trampled. But they don't always come and sleep at the fields. The elephants, especially at our fields which are in the forest, they used to pass by there, then they go deep into the forest. But those people from the Conservancy, we don't even see them by that time.

Women's frustrations likely reflect the low ratio of game guards per farmer in the Conservancy, as well as its policy to send game guards to camp in fields only after a farmer has reported a raiding attempt.

Several women also expressed frustration about their inability to use firearms to scare or kill wildlife. One woman claimed, "In the past we were able to kill animals if they were troubling at the field. But for now, we are not able to do that." Another woman said, "Before there were these things of the Conservancy we were living well. It was good because you will find that even at our fields, when elephants come, you can just shoot in the air, then the elephants will go away." These comments refer to the pre-Independence period, during which, killing wildlife was not allowed, but enforcement was conducted by centralised ministries (and there was no local enforcement agency like Kwandu Conservancy). Several women expressed nostalgia for this period, arguing they had more freedom to respond to HWC. While the Conservancy claims they allow farmers to shoot in the air as long as elephants are about to enter fields, the previous statement reflects the perception that farmers are no longer allowed to use firearms to scare away wildlife. Women also expressed frustration with increased monitoring of firearm use in the Conservancy and regret at not having access to firearms.

Women held conflicting beliefs about the effectiveness of chilli-based prevention in deterring elephants. Some women had confidence in chilli's ability to deter elephants, but other

women found the measures less dependable. They claimed that the effectiveness of chilli bombs and similar tools depends on wind direction and a farmer's ability to consistently stay awake to chase away animals. Even with deterrents, the cost of guarding the fields was high. This woman described the challenge, saying, "The Conservancy people are the ones who are providing these chilli. But there is no use unless we sleep at the field, chasing animals the whole night." Still other women claimed chilli bombs do not deter elephants: "With the elephants, we used to protect our field by using chilli. But even though there is no use. They still also come and eat." Women also lamented the ineffectiveness of chilli against bushpigs and other wildlife.

Once an animal has raided a farm and caused damage, the Conservancy requires farmers seeking payments to report the damages at the office or to a local game guard. However, 19 women complained that "nothing happened" when they reported, saying:

I reported at the Conservancy [office], but nothing happened. I went to [a game guard who resides near her village]. I told him. Nothing happened. I told him that, You see now. What will I use to feed my children with? Then nothing happened from there.

Claims that "nothing happened" referred both to instances where game guards did not arrive to assess crop damage and instances when game guards recorded damages, neither resulting in compensation. Women often conveyed frustration and anger when discussing how the Conservancy staff had recorded their crop damage but had not paid them. As one woman described, "When we go report, they will say the money is there, almost NAD 50,000. But they were not even covering those losses. We don't know why." Another woman claimed, "We always report to the Conservancy people when our fields get trampled. They only fill in some of the forms. And then they say we have to wait for our money that they will pay us. But nothing happens after that." These complaints indicated a mistrust of the Conservancy, perhaps fuelled by inadequate communication about payment delays and why some people receive payments when others do not. Consequently, some women believed the Conservancy was "cheating", engaging in favouritism, or "discriminating".

Many women also discussed the low compensation amounts. Women who had received payments claimed that the amount was significantly less than what their harvest was worth. One woman, who had received NAD200 for her losses, claimed, "What I don't like about the Conservancy is when we report something concerning animals eating in our field, it's like they are not serious. They don't pay well." Another woman who had received the same amount for her damages said:

With that amount, it's not good because with us when we check, we see that that's where we were supposed to have food for our whole family. Then now two hundred has nothing to do with the family. It's just nothing. It's just a loss.

She claimed she could have earned about NAD1,500 had she harvested her crops. The threat of losing crops with little hope for compensation provokes anxiety, keeping women "worried all the time". A conservation organisation staff member agreed that the payments "are very low", but he "hope(d) the government will still think of adjusting the prices [upward], as we're still piloting the programme and seeing whether it will work."

Consistent with national policy, the Conservancy confines its compensation to damage by certain species, which means that damage by bushpigs and warthogs is not covered. Plus, women without field sizes of at least 1 ha are not eligible for compensation, creating frustration among women who can only access hand-held hoes, and thus are only able to farm small plots. One woman recognised the way the system provides compensation for wealthier farmers, saying, "I can't feel well because those Conservancy people, they won't pay me. They're just looking for those people who have a big house, big fields." One Conservancy staff member claimed the field size minimum was designed to encourage people to farm fields large enough to prevent total loss in the event of wildlife incursion. This same staff person also acknowledged that older men and women tend to have fields smaller than 1 ha "because they cannot afford to clear a big portion of land".

In short, while some women voiced appreciation for the Conservancy's provision of chilli-based deterrents, assistance with field guarding, and compensation, the frustrations women expressed suggest the Conservancy's management of HWC may be undermining the legitimacy of conservation and failing to meet women's needs. While only five women described crop loss compensation in neutral or positive terms, 20 women described it as unreliable and/or insufficient. The latter group described distribution of payments at best as arbitrary and at worst as favouring wealthier households. They saw the Conservancy as "not serious" about providing meaningful compensation, let alone compensation that allows families to recover from crop loss.

CONCLUSION

As described above, HWC in the Conservancy poses both direct and indirect costs to female farmers. Some costs, like crop loss, injury, and death occur in discrete segments of time, but other costs, like physical risk and fears of physical injury, and lost time and monetary investment are ongoing. These indirect or ongoing costs are often the hidden costs—the opportunity and transaction costs, psychological effects, and temporally-delayed impacts—that Barua et al. (2013) and DeMotts and Hoon (2012) argue must be recognised to fully address HWC. Further, the persistent fear and uncertainty of living with wildlife in an area dependent on small-scale agriculture and natural resources negatively impacts women whether or not they personally lose crops or livestock, because fears about wildlife may influence a range of livelihood activities (e.g., the collection of nontimber forest products, such as firewood or reeds). Also, prevention

measures require significant time investment, and thus entail important opportunity costs. Chilli-based deterrents do not deter most species, and might not even effectively deter elephants (Hedges and Gunaryadi 2009). Based on this research, we argue that HWC should be conceptualised not only as a discrete event or a series of events that impact only those individuals who sustain direct material losses but as an ongoing or continuous impact to individuals who may or may not experience direct, material loss.

While the risk of discrete, direct impacts may not differ much among women in Kwandu (i.e., all fields are at some risk of wildlife damage), women with fewer entitlements likely face higher continuous and indirect costs than women with more entitlements. Poorer, unmarried women are likely less able to prevent crop loss (less able to guard), more impacted by crop loss (need the crops for food), less able to recover in the short term (less cash available to buy food), less able to pursue other livelihood paths (less cash for investments in small business and fewer marketable skills), and have less access to compensation when loss occurs (may not be guarding crops and fields may be too small).

The concept of vulnerability can help us understand the extent to which HWC impacts some women more than others. To begin with, some women are more vulnerable to short-term shocks and longer-term stressors due to poverty, marital status, lack of farmland, or limited entitlements; and these women are more likely to experience a discrete HWC event as a shock than other women. Crop loss, livestock depredation, or the death or injury of a family member hit these women harder than others because they are more dependent on limited resources for critical food or income. Further, these losses increase their vulnerability to other stresses and shocks because these women are already living at the margins. Finally, the Conservancy policy to restrict compensation to farmers who have more than 1 ha and who are able to guard their fields means that women with smaller fields and unmarried women have less access to funds that would assist them in coping with loss. In other words, compensation is less accessible to women who are more vulnerable to the impacts of HWC and less able to recover from losses.

Leichenko and O'Brien (2008) suggest that multiple stressors can interact to create "double exposures". In the case of the Conservancy, existing vulnerabilities, (e.g., poverty) interact with specific biophysical risks (e.g., high elephant populations) and specific policies (e.g., restricting compensation) to deepen impacts to the women who are already marginalised. In effect, both the wildlife impacts themselves and the Conservancy's responses serve to produce vulnerability under certain circumstances. Further, the Conservancy's compensation practices are influenced by processes operating at multiple scales, from national level funding and policies to local conservancy management. These institutional and political forces interact with community norms (e.g., women's roles and responsibilities) and household entitlements (e.g., landholdings, education level) to create vulnerability to wildlife conflict. Thus, in many senses women's vulnerability

in the Conservancy is produced by a range of cross-scale interactions.

As Barua (2013: 310) points out, "Such losses may seem insignificant at a national level, but they give rise to exponentially high costs for the affected individuals and families, many of whom are amongst the least privileged people in the world." This is particularly problematic in the context of the CBRNM programme, which intends to link wildlife protection to development and other benefits to rural residents. As described above, many women hold the Conservancy responsible for HWC and claim that compensation is delayed, unavailable, or inadequate. Research on compensation elsewhere also finds that payments for loss of livestock or crops are a common response but they are rarely transparent, fair, timely, or user friendly (Nyhus et al. 2005; Anthony et al. 2010). Similar to other places, women's efforts to secure compensation from the Conservancy entail important transaction costs, such as time spent reporting losses and attempting to secure compensation (Ogra and Badola 2008). Not only does HWC in the Conservancy jeopardise women's livelihoods and food security, it also weakens support for wildlife conservation. Again, this is consistent with previous research which finds that HWC can reduce support for conservation (Barua et al. 2013; Kahler et al. 2013).

While this study has focused on women, men in the Conservancy are also impacted by HWC, in ways both similar and dissimilar to women. In the interviews, women did not focus on livestock losses to wildlife, despite numerous documented incidents of depredation in the Conservancy, perhaps because men are typically responsible for livestock in this region. This omission provides further evidence that social position and livelihood activities structure the experience of HWC in different ways for different people.

Because HWC poses significant costs to rural residents and undermines support for CBRNM projects, policymakers often ask for a cost benefit analysis. The Namibian State of Conservancies Report (NACSO 2013) includes such an analysis, which concludes that financial benefits to conservancy residents outweigh financial costs. However, the scale of such analyses is critical as is the way differential impacts are regarded. While the benefits of CBNRM occur at multiple scales, from local employment opportunities to national access to international conservation funding to preservation of global biodiversity heritage, costs occur almost exclusively at the local level and are particularly burdensome for households that are already poor and marginalised. In Namibia direct benefits are not distributed evenly within conservancies (Silva and Mosimane 2012), and those households who benefit from employment opportunities, craft programmes, and tourism ventures may not be the same households who are most vulnerable to losses from wildlife. Thus, even at the local scale some people may benefit from CBNRM while others bear the burden.

As described earlier, of all conservancies in Namibia, Kwandu Conservancy is the most impacted by crop loss to wildlife (NACSO 2013). Conservancies in the Caprivi also experience

more human attacks as compared with conservancies in other regions of Namibia (NACSO 2013). Thus, in other Namibian Conservancies and CBNRM projects, where HWC is not as common, local benefits may truly outweigh costs. However, many places around the world experience significant losses to wildlife (Lamarque et al. 2009; Madhusudan and Sankaran 2010 for estimates for Asia, Africa, Europe, Australia, and North America), and are therefore similarly risky as compared with Kwandu Conservancy. Further, as wildlife populations recover and grow around the world, HWC will likely increase, making questions about whether or not the local benefits of CBNRM outweigh the costs ever more pressing.

If CBNRM is to continue in places like Kwandu Conservancy, where the costs of HWC are particularly high, where vulnerable groups bear a disproportionate burden, and where wildlife losses can exacerbate a household's food insecurity, the scale of the response needs to match the scale of the problem. In short, the Government of Namibia and conservation organisations should offer additional financial and technical support to address HWC. Because the benefits of the Conservancy's conservation efforts are being experienced at national and international scales (particularly given the Conservancy's location at the heart of the Kavango Zambezi Transfrontier Conservation Area), the costs should also be better shared at these scales. Additional resources can be utilised to hire more game guards; to provide timely and sufficient compensation to all farmers, regardless of field size or ability to guard; and to study the effectiveness of deterrents and develop more effective techniques. Care needs to be taken to ensure that the individuals who bear the greatest costs have access to effective prevention and meaningful compensation. Because HWC is much more than a discrete event, addressing the problem requires recognising the ways that vulnerability is structured in particular places and responding to reduce vulnerabilities throughout the system. That means tackling poverty and gender issues in substantive ways. If the very premise of CBNRM is that the benefits of conservation can and should outweigh the costs to local people, then threats to life and livelihood need to be fully addressed.

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NOTES

1. The Caprivi region was renamed the Zambezi region in August 2013, after our research was completed. Since respondents referred to themselves as Caprivians during our research, we use that term throughout this paper.
2. NAD10 is approximately equal to USD1.
3. We use the term 'compensation' for consistency with HWC

literature, but it is worth noting that the Namibian government avoids the term. Namibia's 2009 National Policy on Human-Wildlife Conflict Management (p. 1) states that "Government shall not establish a compensation scheme for losses caused by wildlife", but rather "establish best practice mitigation measures for human wildlife conflict."

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