# Local perceptions of risks to semi-nomadic livelihoods in Namibia: A case study of the Himba pastoral community

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**Abstract**

This study investigates Himba pastoralists' perceptions of risks to their livelihoods. Using a semi structured questionnaire, 20 pastoralists from a Himba community were interviewed. The results show that there are multiple perceived risks that are seemingly threatening their livelihoods. Most of the perceived risks are associated with natural resources; primarily the limited sources of water and the lack of adequate pastures. These two are the most important factors to a semi-nomadic lifestyle; hence they pose the greatest threat to their livelihoods. Pressures from both wildlife and the increase in human population have also been recognized as risks to the community. While these perceptions of risks appear to have spurred the community into employing certain management strategies, this has not changed their semi-nomadic way of living as pastoralists. The current management strategies appear to be insufficient in managing the risks. The struggles of farmers in an arid country is expected under the climatic change dynamics, but the provision of solutions by the government is limited, especially for human wildlife conflicts. Thus, leaving the semi-nomadic Himba people to continue being vulnerable to risks with no feasible solutions at the moment. This begs the question of whether the nomadic way of living has a chance of surviving under the changing climate in dryland countries such as Namibia.

***Keywords:*** *Himba community, farmers' perceptions, livelihood risks, semi-nomadic, Namibia*

Namibia is by far the most arid country in southern Africa, where more than one third of the country is characterised by semi-arid to arid systems. Accordingly, the country is

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predominantly characterised by poor and irregular precipitation, with prolonged dry spells (Angula & Kaundjua, 2016; Kluge, Liehr, Lux, Moser, Niemann, Umlauf, & Urban, 2008; Zimmermann, Jokisch, Deffner, Brenda, & Urban, 2012). Rainfall only occurs in a single season, mainly between the months of October and April. The average annual rainfall varies from the coast with less than 250mm to an average of 600m in areas with the most rainfall (Mendelsohn, Emanuel, Chonabayashi, & Bakkensen, 2012; Stols, 1993; Sweet & Burke, 2006). Observed evaporation is estimated to be six times higher than the mean annual in the inland headwater areas and more than 100 times higher in hyper arid areas (Jacobson, Jacobson & Seely, 1995; Seely et al., 2003), where at least up to 83% of the rainfall total evaporates back into the atmosphere (City of Windhoek [CoW], 2017; Mostert, 2017). Based on projections, Namibia is becoming even hotter with an increase in temperature ranging between 1 ˚C to 3.5 ˚C and the impacts are increasing the vulnerability of farmers (Angula & Kaundjua, 2014).

Due to aridity, agricultural activities in Namibia are extremely affected by the shortage of moisture, high rates of evaporation and the relatively shallow soils with low levels of nutrients (Mendelsohn, Jarvis, Roberts, & Robertson, 2002; Sweet & Burke, 2006). This subsequently reduces agricultural productivity and increases the risks to livelihoods of communal farmers such as nomadic pastoralists. Despite this, the country remarkably still manages to host a high percentage of agricultural activities. To date, agriculture remains one of the main sources of livelihoods for about 71% of the Namibian population who practise diverse livelihood activities such as *Mahangu* (pearl millet), sorghum and maize cultivation as well as keeping herds of cattle and/or goats (Mendelsohn et al., 2002; Sweet & Burke, 2006). Diversification of agricultural activities in dryland regions is, to an extent, used to reduce the level of risks to livelihoods (Quinn, Huby, Kiwasila, & Lovett, 2003). By the year 2004, communal farmers held a total of 62% of the cattle population, 72% of the goat population and 17% of the sheep population (Sweet & Burke, 2006). The Himba communities are part of the joint management of communal pastures and water during drought periods (Müller Linstädter, Frank, Bollig, & Wissel, 2007).

This study examined the perceived risks to semi-nomadic pastoralists in semi-arid Namibia. Despite many scholars acknowledging the importance of assessing the perceptions of the local people as regards various environmental issues (Bunting, Steele, Keys, Muyengwa, Child, & Southworth, 2013; Debela, Mohammed, Bridle, Corkery, & McNeil, 2015; Nhemachena, Mano,

Mudombi, & Muwaningwa, 2014; Quinn et al., 2003; Schattman, Conner, & Méndez, 2016; Udmale, Ichikawa, Manandhar, Ishidaira, & Kiem, 2014), there are limited studies on the perceptions of pastoralists in semi-arid regions and such studies are largely lacking for semi-nomadic communities in Namibia. This study fills this gap by examining local perceptions of risks to livelihoods of semi-nomadic pastoralists in semi-arid Namibia.

## Objectives of the study

The objectives include:

(1) Identifying the perceptions of risks to livelihoods.

(2) Exploring the perceived potential solutions to the risks under the current climate.

## Literature review

The fourth Assessment of the Intergovernmental Panel on Climate Change (IPCC) stated that Southern Africa could significantly experience frequent, intensive drought and reduction in rainfall in the 21$^{st}$ Century (IPCC, 2007; Udmale et al., 2015) and projected that by 2020, the increase in warming could negatively impact the livelihoods of vulnerable communities and climate-sensitive natural resources especially agricultural yields, ecosystems and water resources (Nhemachena et al., 2014). According to Debela et al. (2015), rural households in sub-Saharan Africa rely on natural resources such as rain-fed agriculture, which depends on favourable seasonal weather conditions and the effects of climate change increases households' vulnerability.

Climate change is currently one of the major factors threatening farmers in dry land countries (Below, Artner, Siebert, & Seiber, 2010; Nhemachena et al., 2014; Udmale et al., 2014). Apart from leading to reduced yields of rain-fed crop production (Bannayan, Sanjani, Alizadeh, Lotfabadi, & Mohamadian, 2010; Cooper et al., 2008; Mongi, Majule, & Lyimo, 2010; Morton, 2007), the irregularity of rainfall seasons, the sporadic and low amount of rainfall affect the rearing of livestock through reduction in pastures (Newsham & Thomas, 2009; Padgham et al., 2015; Spear et al., 2015) while also increasing the number of risks to farmers' livelihood and exacerbating the existing ones. Understanding of the risks perceptions to livelihoods of the locals is vital as these perceptions influence the way these farmers respond to risks (Debela et al, 2015). Though there could be a mismatch between the perceived and the actual risks (Botterill & Mazur,

2004; Schattman et al., 2016), farmers are likely to act based on their own perceptions of risks as these risks are normally based on experiences and observations (Bunting et al., 2013; Slegers, 2008).

Douglas (1992) defined risk as "the probability of an event combined with the magnitude of the losses and gains that it will entail" (Botterill & Mazur, 2004, p. 40). However, our political discourse, in his view, debases the word. Douglas argues that from a complex attempt to reduce uncertainty it has become a decorative flourish on the word 'danger'" (Botterill & Mazur, 2004, p. 40), To Harding (1998, p. 167) it is "a combination of the probability, or frequency, of occurrence of a defined hazard and the magnitude of the consequences of the occurrence: how often is a particular potentially harmful event going to occur [and] what the consequences of this occurrence are?" Harwood, Heifner, Coble, Perry, and Somwaru (1999) defined it as "uncertainty that affects an individual's welfare and often associated with adversity and loss" (Schattman et al., 2016, p. IV). While the definitions might slightly differ, their concerns are all about how parties is or are going to be affected and the related consequences.

Risks, for the purpose of this study, adopts Hardwood et al.'s (1999) definition. Risks are clearly one of the most important factors that influence livelihoods and determine the success of the activities of communities (Schattman et al., 2016). As such, how one perceives risks will significantly determine one's posture. Although, Niles et al. (2016) argue that the perceptions of risks do not always lead to changed behaviours, to a certain extent perceptions shape the adaptation options employed by the local people (Bunting et al., 2013; Debela et al., 2015).Consequently, the perceptions of the households affects how they deal with risks of climate change and management options (Adger et al., 2009; Debela et al., 2015; Pauw, 2013).

## Methods

### Study area

The study focused on the Himba community in the north-western part of Namibia, in Kunene Region (Kaokoland is part of the region). To the north, the area is bordered by a perennial river (Kunene River), which is also the border of Namibia and Angola. On the western part, the area is bordered by the Skeleton Coast that lies along the Atlantic Ocean, while on the southern part the area is bordered by the non-perennial Hoanib River. The area gradually transits into Ovamboland on the eastern side. The area covers around 50 000km$^2$ and it has a very

heterogeneous landscape, including structures such as mountains and basins that make up the escarpment zone, Basalt plains and Kalahari sands (Brunotte, Maurer, Fischer, Lomax, & Sander, 2009). At least 50 000 Himbas currently live in Kaokoland (Namibia Tourism Board, 2011).

The average annual rainfall for the Kunene region ranges between 50mm on the far north-western part to 380mm in the eastern part of the region (Brunotte et al., 2009; Müller et al.). However, for Opuwo station area which falls closest to the Himba community (Fig.1a) the average precipitation is 320mm and the average temperature is 21.6 °C (Figure 1b). Vegetation cover is characterised as grassland with scattered trees of Mopane savannah dominated by *Colophospermum mopane* and various species of *Acacia* (Geiss, 1998; Okitsu, 2005; Sweet & Burke, 2006; Wagenseil & Samimi, 2007).

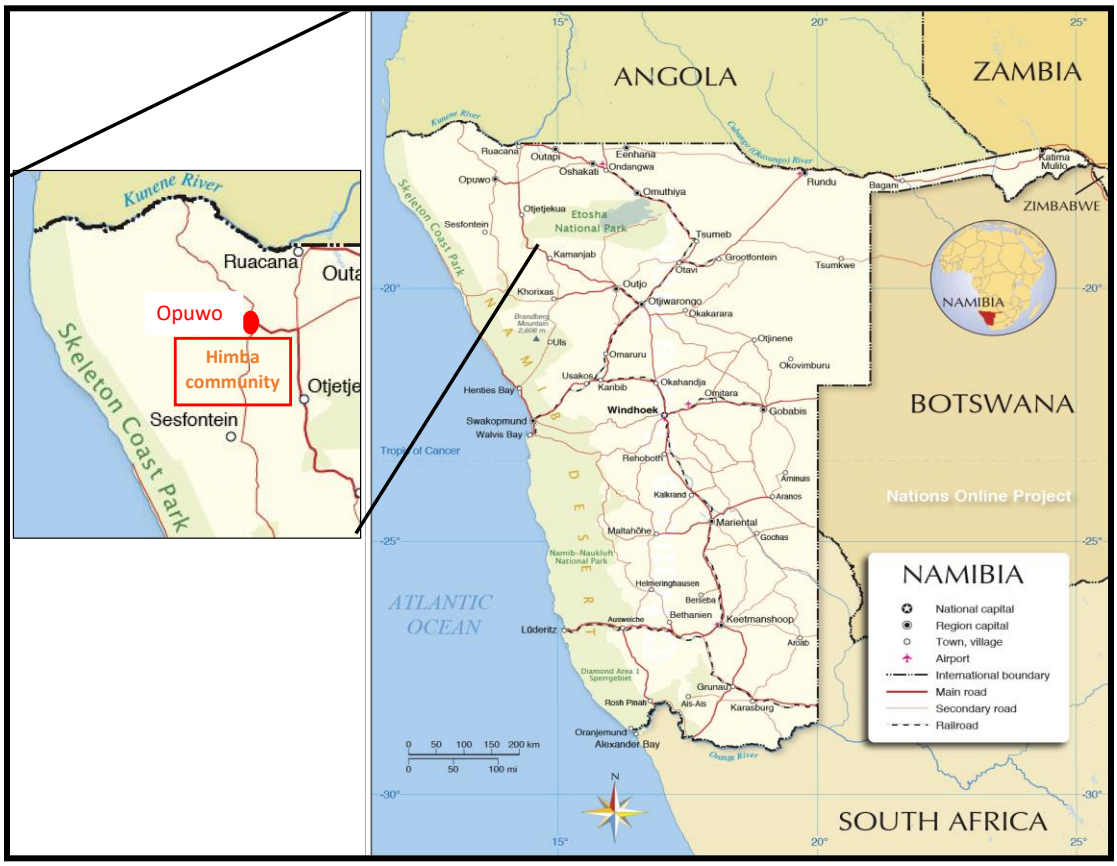



*Figure 1*. Study area: the Himba community (adopted from Nationsonline.org, 2012)

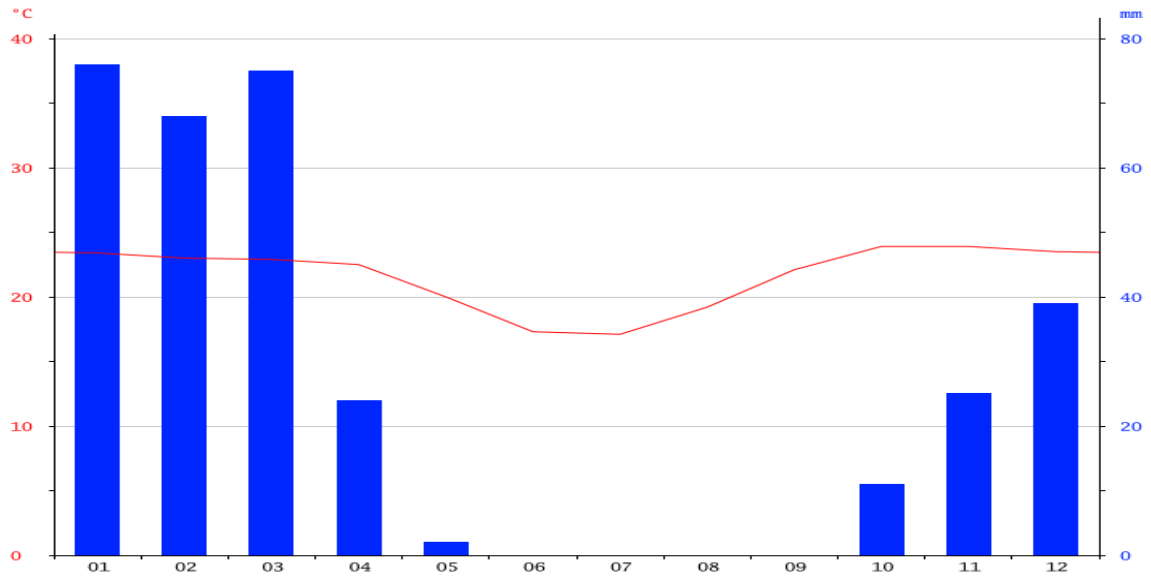



*Figure 2*. Climate conditions at Opuwo (en.climate-data.org, 2017).

**Data collection**

This study examined the pastoral community and households as sampling units. Informants were household nomadic pastoralists. Although the small villages for the interviews were randomly selected, purposive sampling was applied in terms of selecting at least one household (person) from a different area within the Himba community. The households selected for the interviews were recommended by the head of each village. Twenty key informants from 19 villages constituted the sample – one each except in one instance when they were two interviewees from the same village. This included small villages such as Ovinyange, Oukongo, Onyezu, Otjiumbu, Omwee omire, Okamanga, Ondiye, Ohandungu, Omatjaundja, Ongongo, Ombwarundu, Okovingava, Otjiuu, Ombazu, Othimitjira, Okavivitu, Okapawe and Otjahorokara. To be included in the study, the household must have been resident there for a minimum of five years (a profile for each informant is provided). The family size in the community were fairly large with at least 30% of the respondents living in houses with the number of persons ranging from 31 - 40 (15%) and 41 - 50 (15%) [See Table 1].

Table 1

*Profile data for the informants.*

| ***Family size range (people per house)*** | ***%*** | ***Age range (years)*** | ***%*** | ***Gender*** | ***%*** |
|---|---|---|---|---|---|
| *01 to 10 people* | 20 | 15 to 25 | 15 | Male | 45 |
| *11 to 20* | 30 | 26 to 35 | 30 | Female | 55 |
| *21 to 30* | 5 | 36 to 45 | 5 | | |
| *31 to 40* | 15 | Above 46 | 40 | | |
| *41 to 50* | 15 | No data given | 10 | | |
| *Above 51* | 5 | | | | |
| *No data given* | 10 | | | | |

The study employed a mix of qualitative and quantitative methods. The data collection was carried out through interviews, using a semi-structured questionnaire, in the months of November and December 2016. Open-ended questions were mainly used to identify the perceived risks to livelihoods and to allow the researcher to gain information without preconditioning the participants' responses (Antwi-Agyei et al., 2017; Bernard, 2000). The main questions included listing of currently practised activities, perceived risks to livelihoods, factors contributing to risks and possible ways to overcome the risks. This method has been used by other scholars in similar studies (Antwi-Agyei et al., 2017; Bunting, Steele, Keys, Muyengwa, Child, & Southworth, 2013; Debela et al., 2015; Nhemachena et al., 2014; Quinn et al., 2003; Schattman, Conner & Méndes, 2016). Because the study is descriptive in nature, data were analysed using frequencies (percentages) only, taking after various studies (Harun, Hock & Othman, 2011; Hope, 2016; Karami, Shobeiri, Jafari, & Jafari, 2017; Glasgow, Langaigne, Thomas, Harvey & Campbell, 2018; McAdams, Rehr, Kobayashi, & DeArman, 2019).

## Results

### Livelihoods and perceived risks

Throughout the result section, it should be noted that the participants had multiple answers for each question, thus each variable can have up to a 100% response. Figure 2 shows the livelihood activities being currently practiced by the Himba community. All participants (100%) practice livestock rearing, but 95% of the respondents do trade their livestock. Furthermore, up to 85% of the respondents are involved in crop cultivation and only 15% of the respondents trade

their crops. Other activities indicated are the occasional selling of wood and renting of equipment or farming which is practiced by less than 5% of the respondents.

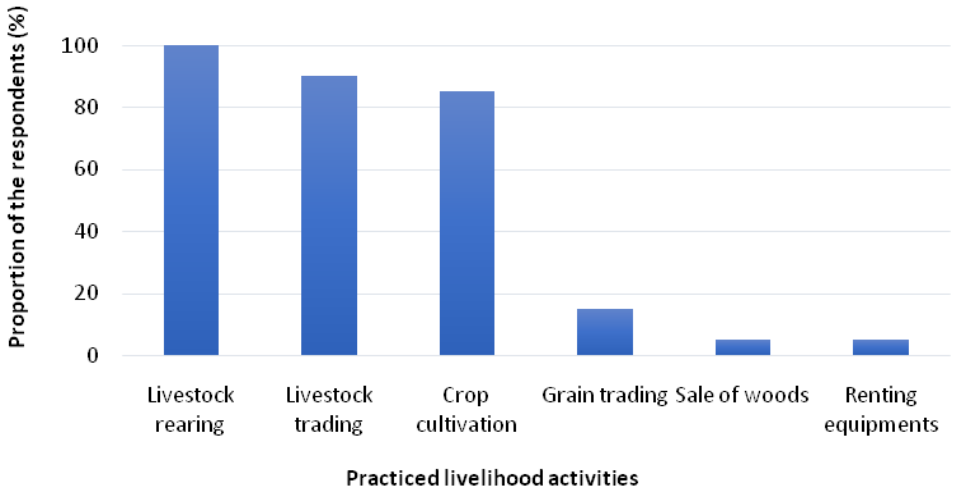



*Figure 2.* Livelihood activities practiced by the Himba community

Although up to 95% trade their livestock, this activity is ranked to be of low importance as indicated by 60% of the respondents, while 25% thought that it has equal importance to crop cultivation (Figure 3). Other activities of grain trading, selling of wood and renting of equipment are similarly ranked to be of low importance. Only livestock rearing is ranked to be of high importance.

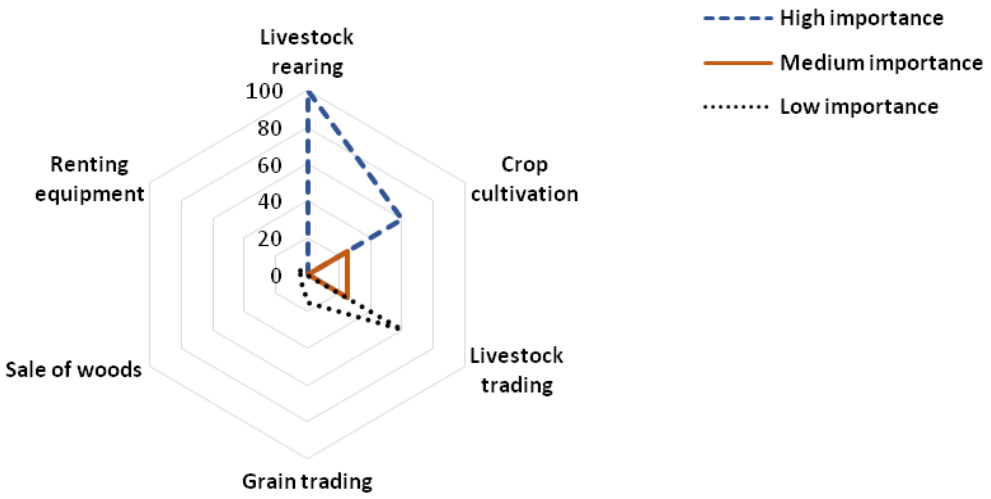


*Figure 3*. Livelihood activities practiced in order of importance.

The respondents were asked to list and rank the risks to their livelihoods. Drought and loss of pasture were ranked the highest by 90% and 80% respectively (Figure 4), with only 20% and 10% of the respondents ranking attacks on livestock by wildlife and hunger as high risks respectively. Up to 40% of the respondents however ranked the attack on livestock as second and as third highest risks. Wildlife also poses risks through damage to crops and it was ranked as the third highest risk by 40% of the respondents. Other risks included less grazing space (35%), health problems (10%) and a decrease in the prices of livestock (10%).

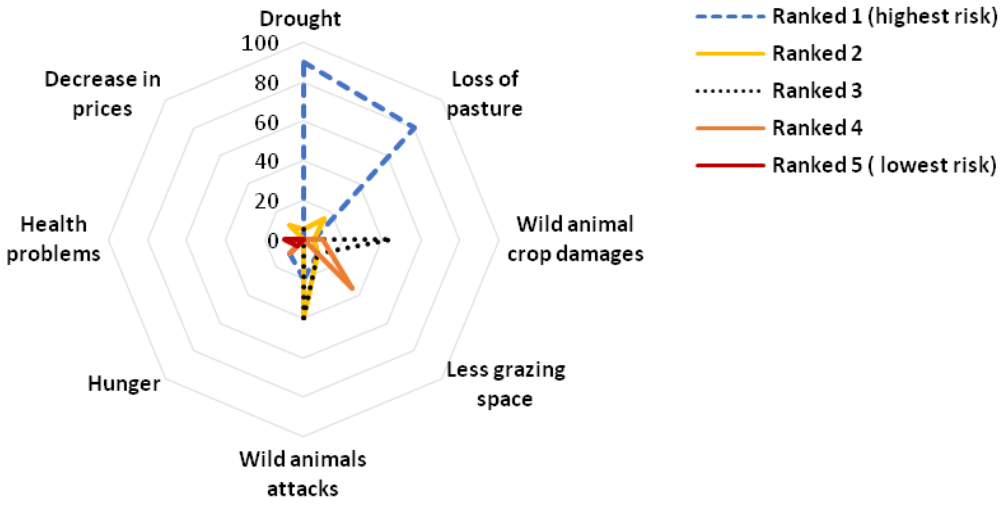



*Figure 4*. Perceived risks to livelihoods

Factors perceived to be contributing to the risks are shown in Figure 5. All respondents (100%) ranked the recurrence of drought and land degradation to be the highest contributor to the risks to their livelihoods (Figure 5a). About 90% of the respondents also indicated that freely roaming wildlife and the increase in the human population in the area (up to 80% of the respondents) threaten their livelihoods. In contrast, 10% of the respondents perceived the roaming of wildlife and 5% perceived the increase of the human population to be of medium importance rather than of high importance. Another 10% also indicated the increase in the human population as “least important” in contributing to risks to their livelihoods. In terms of wildlife risks, animals

responsible for attacks on livestock were listed as cheetahs, leopards, hyenas, jackals and lions while animals responsible for crop damage are elephants, squirrels and monkeys (Figure 5b).

*Figure 5a*. Perceived factors contributing to risks

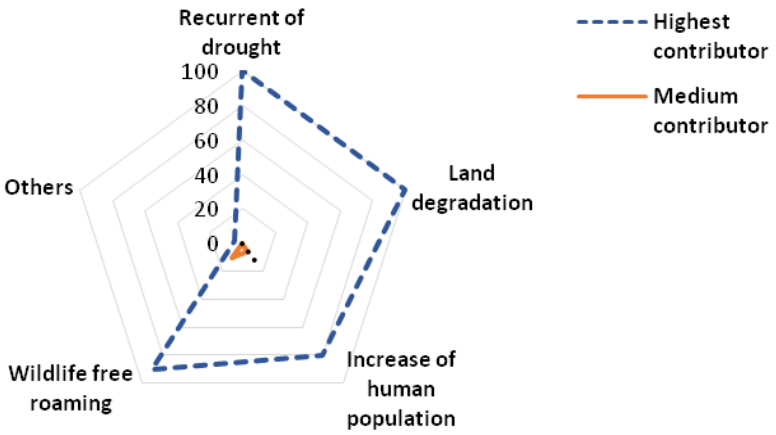
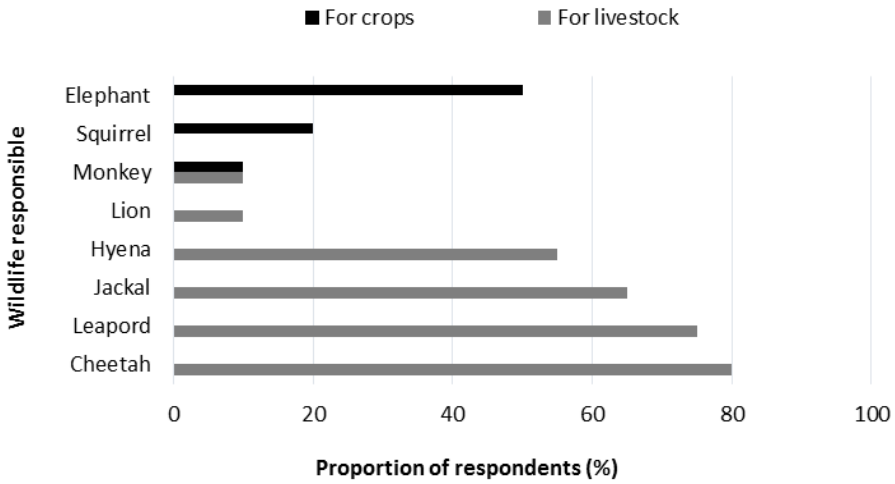



*Figure 5b.* The kind of wildlife responsible for damage to crops and livestock

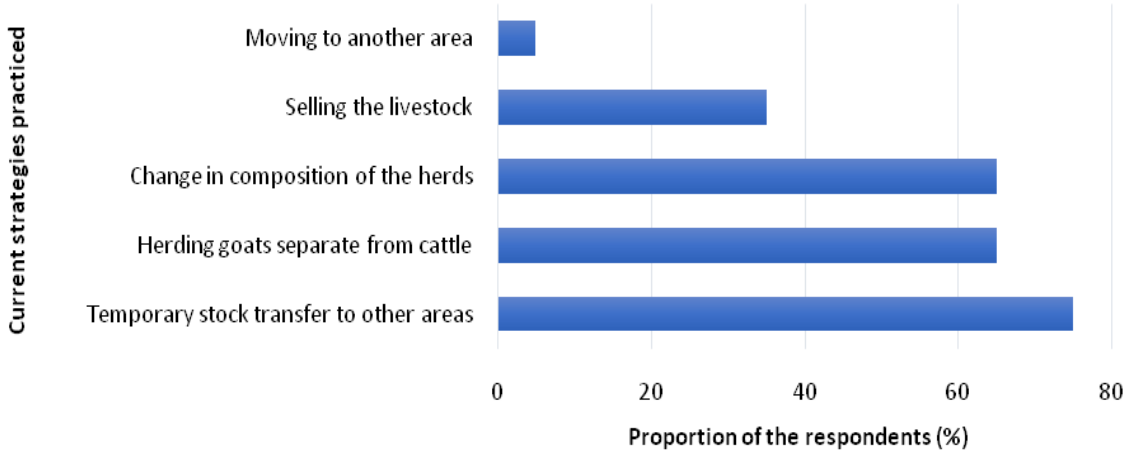



**Managing the risks**

To manage the risks to their livelihoods, pastoralists concentrate on the survival of their livestock. The activity practised most by 75% of the respondents is to transfer their livestock to better grazing areas (Figure 6). Up to 65% also practice separating cattle from goats when going for herding and generally trying to change the composition of the herds by taking out the big ones or taking out some of the male cattle. In addition, up to 35% also sell their cattle as a management

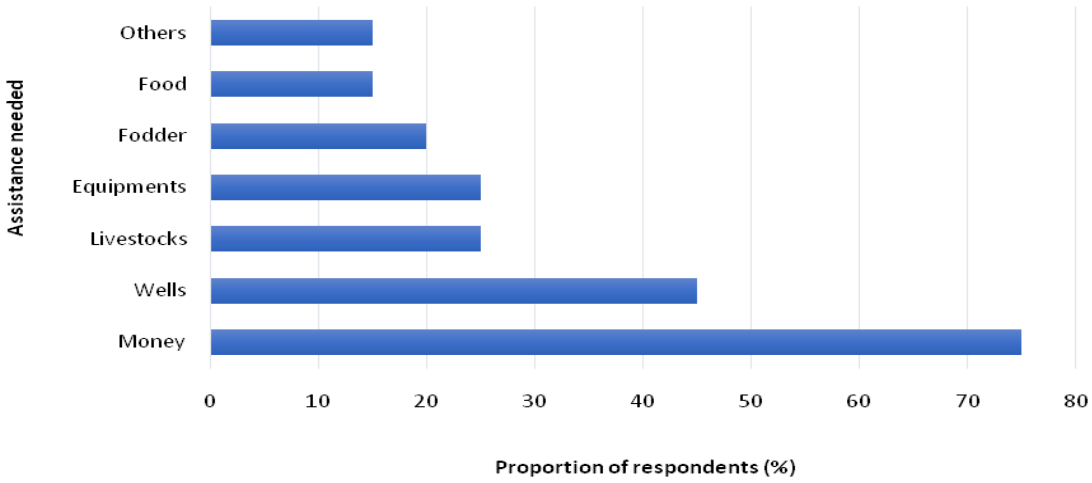
strategy. However, only 5% of the people permanently move to other areas to manage the risks to their livelihoods. Management strategies were merely listed and not linked to specific risks but all are linked to dealing with livestock.

*Figure 6.* Practiced strategies in dealing with the risks to livelihoods




The community also indicated that to manage the risks at this point, immediate assistance is needed mainly from the government but also from other organisations such as nearby conservancies, NGOs and the Red Cross. Up to 75% of the respondents indicated that the main thing that the government should assist them with is money to improve their farming (mainly to buy livestock and medicine for the animals) (Figure 7). Whilst 45% of the respondents also indicated that they need help with wells, livestock and farming equipment (25%), fodder (20%) and drought relief food (15%).

*Figure 7.* Assistance needed to minimise the risks to livelihoods




The community also suggested other interventions that they believe can help in the long run. Apart from the assistance required in general as presented in Figure 7, suggestions were made with a specific focus on the risks (Table 2). The community suggested that the government should move the wild animals away from their communities as the animals are responsible for almost all the risks (drought, loss of pasture, attacks on livestock and damage to crops). This is corresponding with the free roaming that is indicated by around 90% of the respondents as of high importance in terms of threatening their livelihood (Figure 4). Other solutions include the provision of equipment such as generators, solar pumps and other farming implements as well as dealing with migrations. Interestingly, one of the suggestions was to divert the river channels to the villages for water supply.

Table 2

*Other ways suggested for reducing the risks for the long term*

| # | Risks to livelihoods | Suggested ways of reducing the risks |
|---|---|---|
| 1 | Long drought periods and water issues due to lack of wells/ boreholes nearby | i. Construction of wells / bore holes<br>ii. Provision of generators / solar panels to pump water<br>iii. Diverting of river channels to the community<br>iv. Government must move the wild animals away from the communities to ensure less competition for water |
| 2 | Loss of pasture / grass/ vegetation for animals | i. People should not be let to settle in one place<br>ii. Government must move the wild animals away from the communities<br>iii. Separating goats from cattle when herding |
| 3 | Attacks on livestock by wild animals | i. They should be allowed to poison of predators<br>ii. Government must provide cash to buy new stocks<br>iii. Government must move the animals away from the communities |
| 4 | Loss of crops due to damage caused by wild animals | i. Government must move the animals away from the communities<br>ii. The use of chemicals to repel elephants<br>iii. Government to avail materials for fencing fields and gardens |
| 5 | Less space for grazing due to too many people in the community | i. Persons who are not from the community should be relocated to commercial farms<br>ii. Reducing of migration process<br>iii. Relocate farmers to commercial farms |
| 6 | Others: (theft, lack of electricity, lack of supplements) | i. Having a community policing group<br>ii. Provision of electricity, provision of drought relief food. |
| 7 | Hunger | i. Government should provide food for drought relief |

## Discussion

### Perception of risks to livelihoods under a changing climate

For Southern Africa, the recurrence of drought has been experienced more frequently. Further increases in temperature and a decrease in the amount of rainfall are anticipated (IPCC, 2007; Nhemachena et al., 2014; Tadross et al., 2009). Namibia is characterized by drought and inconsistent precipitation which are now largely accepted as normal. A warmer climate increases the risks of climate effects and it intensifies the magnitude of the risks to livelihoods because of other variables (IPCC, 2007; Udmale et al., 2014). However, the consequential risks are most

likely not going to be easily endurable as people do with the effect of climate change because the effects of risks are felt immediately on livelihoods.

Unlike other communities in Namibia that practice livestock herding and small scale rain-fed agricultural activities from their permanent settlements (Gulelat, 2002; Newsham & Thomas, 2009; Sweet & Burke, 2006), the semi-nomadic pastoralists practice the alternating movement between the wet and dry season; by moving their livestock from their permanent settlements to areas with better pastures during the dry season (Gulelat, 2002; Müller et al., 2007). Their perceptions of risks to livelihoods are most likely to be unique as they are based on the uniqueness of their nomadic way of living. Most of the respondents perceived drought, loss of pasture for their animals and attacks on livestock by wildlife to be the highest risks to their livelihoods. While these factors are related to the aridity of the country and directly influence each other, they are most importantly perceived to be significant threats to their nomadic way of living.

These perceived risks severely impact the semi-nomadic living conditions. Since drought is an indicator of lack of water, this means that the seasonal movements are limited to areas with water sources which are often a distance of over 2km from the permanent settlements (Müller et al., 2007). This contributes to the attacks on livestock by wildlife as the two groups are forced to roam in the same space while sharing and competing for the limited sources of water. Recurrent drought and land degradation are ranked as the highest contributors to these risks. Both factors contribute to the reduction of the amount of pasture for animals and harvest from the rain-fed agricultural practices, thus posing further threats to the survival of the nomads and aggravating problems of seasonal movement as a management strategy for the livestock. The increase in human population, which is exacerbated by migration, is another point that was identified as threatening the pastoralists' semi-nomadic lifestyle. This threat is taken as seriously as the risks posed by wildlife. Overall, if the perceived risks corresponds with the actual risks, these risks will eventually lead to a state of soil degradation as a result of over grazing of the limited areas for pasture. A situation that is likely to force the pastoralists into changing from the nomadic way of life to other possible alternative ways of living for their own survival as well as of their livestock.

**Behaviour responses and perceived potential solutions**

A normal strategy practised by the majority of the Himba community is the transferring of livestock to better grazing areas during the dry season. Another solution practiced by many is the

change in the composition of the herds where the breast feeding and small cattle (calves) are left at home while the others go for grazing over long distances. Selling their livestock and moving permanently to other areas appear to be the last resort for the nomadic pastoralists. However, with prolonged drought and constant poor rainfall, these management strategies are seemingly no longer sufficient. Further assistance (mostly money to buy fodder, more livestock and farming implements) is required to minimise the risks. As long term solutions, the community suggested that nearby rivers can be diverted to the community and/or alternatively to install wells / boreholes to counteract drought. To reduce the risks of attacks and crop damage caused by wildlife and ultimately to reduce the competition for water resources, the community repeatedly suggested that the government must move wildlife away from their community (Table 2). However, under the current human wildlife policy, the government does not make provision for this. Problematic animals can only be removed in extreme cases such when human life is threatened or major damage is done to property while a little bit of compensation is only offered for the loss of livestock or damaged caused to crops (Ministry of Environment and Tourism, 2009). These conflicts have also been experienced by many developing countries worldwide for decades (Baird, Leslie, & McCabe, 2009). Permanent solutions where the safety of both is ensured at the moment, are seemingly non-existent in developing countries.

## Conclusion

The study drew on the perceptions of risks to livelihoods of semi-nomadic pastoralists in a semi-arid country. There is a great homogeneity in the perceptions of the risks to the community's livelihood and also the contributory factors. Apart from the major risks of drought, land degradation (decrease in the amount of pasture and in fodder) that is likely to persist under the conditions of climate change, the community faces the risks of decreases in their livestock, food security and in the physical environments (space for grazing) which are posed by wildlife and the increase in the human population. Hunger was ranked as one of the highest risks, but it was only raised by a small proportion of the respondents (10%), indicating that currently the nomadic pastoralists are not worried about the possible end result of hunger. However, how much longer they have to worry about hunger is questionable, considering that the effects of climate change on the risks are unlikely to reduce anytime soon.

The community employed multiple management strategies to deal with the risks to their livelihoods. Even though the overall semi-nomadic livelihood activities practised remain the same as in the past, the perceptions of the risks do influence the management options as a response to the risks, regardless of whether or not they are effective. Therefore, the requests for assistance and the suggestions for the government to move wildlife away from the community are already a sign that the current management practices against the contemporary risks are insufficient. Even though such a struggle, to some extent, is to be expected for any farmer under the current climatic change situation. And in an arid country, provision for solutions by the government is equally limited under the human wildlife policy, leaving those with semi-nomadic livelihoods to continue being vulnerable to the risks with no feasible permanent solutions at the moment. Further research needs to be carried out to improve knowledge on the link between the perceptions of the risks, livelihood management systems and the sustainability of the semi-nomadic way of living.

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