THE MISMEASUREMENT OF CATTLE OWNERSHIP IN NAMIBIA'S NORTHERN COMMUNAL AREAS

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Abstract

The standard approach to measuring livestock ownership in pastoralist communities relies on an assumption of uniformity that does not reflect the diverse concepts of ownership held by pastoralists themselves. In Namibia's Koakaveld Region, Himba and Herero pastoralist communities have a rich vocabulary for categorising the origins, usage rights and cultural valence of their cattle. Drawing on both authors' experience overseeing a large-scale rangeland management programme evaluation in Namibia's Northern Communal Areas – and one author's experience growing up in and keeping cattle in a Himba pastoralist community – we show how the standard approach to measuring cattle ownership undermines accurate estimates of livestock wealth, off-take and inequality, and obfuscates pastoralist's strategies for turning ecological variability to their advantage. We conclude with lessons about how multi-dimensional data collection methods improve upon the standard approach to livestock ownership measurements.

KEYWORDS: Namibia, pastoralism, measurement, livestock, rangeland, Kaokoland.

In this paper we examine the methods used to measure livestock ownership in pastoralist communities. We argue that these methods rest on assumptions of uniformity and stability that are fundamentally at odds with the reality on the ground. The standard approach to measuring livestock ownership treats ownership as a single category, obscuring the diverse concepts of ownership developed by pastoralist communities. Engaging these diverse concepts is important for two reasons. First, it is necessary to obtain accurate estimates of household livestock wealth, off-take rates and community inequality. Second, it is important for understanding pastoralists' strategies for turning ecological variability to their advantage (Krätli and Schareika 2010), which are sustained in part by nuanced social rules around ownership, sharing and the inheritance of cattle.[1]

We illustrate our argument by describing the dissonance between our

1 By 'ecological variability' we mean variability in ecological inputs to the pastoralist production process, such as rainfall, fodder availability and (increasingly) access to grazing land.

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shared experience working on the evaluation of a large-scale rangeland management programme evaluation in Namibia's Kaokoland,[2] and Tjiseua Venoo's individual experience growing up and managing cattle in an Ovahimba pastoralist community the region. We show how the strategies used for measuring livestock ownership developed by the government and international donor organisations clashed with the concepts Ovahimba and Ovaherero pastoralists use to understand their own livestock wealth, which biased the research team's initial measurements and obfuscated local resilience strategies. We conclude with lessons about how multi-dimensional data collection methods can improve methods for measuring livestock ownership.

The 'standard approach' to measuring cattle ownership

In this section, we review the three sources of large-scale livestock ownership data in Namibia's Northern Communal Areas (NCAs). We show that despite substantial variation in context and goals of different livestock ownership surveys, all assume a uniform relationship between an individual or household and their livestock. Hereafter, we refer to the assumption of a uniform relationship as the 'standard approach' to livestock measurement in Namibia's NCAs, since it reflects a long-running assumption about livestock management by governmental and international agencies.

Government of Namibia agricultural census and national household income and expenditure survey

The first two large-scale livestock ownership surveys in Namibia were conducted by the Government of Namibia. The government conducted a regular national household income and expenditure survey (NHIES) and agricultural census (AC) through the Namibia Statistics Agency (NSA).[3] The NHIES and AC exemplify the standard approach to measuring household livestock ownership in Namibia. While the surveys asked respondents to delineate between types of cattle (heifers, bulls, oxen, for example), they assume a uniform ownership relation: a household either owns a given head of livestock or it does not.[4] For example, the livestock ownership question used in the agriculture survey is: 'How many heads of livestock did the holding raise or own? [From the

2 Kaokoland is a common informal name for the geographic area in Namibia's Kunene Region.

3 The agricultural census was partially funded by and drew on recommended practices from the UN Food and Agriculture Organization.

4 In interviews, individuals who served as enumerators for the AC and NHIES indicated that, as a general rule, enumerators did not consistently probe respondents about whether they owned

drop-down list select the livestock type and enter number per type of animal]'. Translated into Ovaherero and Ovahimba, the phrase 'raise or own' takes a meaning closer to 'How many heads of livestock did the holding have?' in reference to all cattle held by a household.[5]

Government surveys of household income and expenditure in Namibia have important implications for pastoralist communities. The NHIES and AC are the primary quantitative inputs for the government's five-year development plans, which include policies aimed at environmental conservation, agricultural transformation and economic development. The data is also made publicly available to researchers and international organisations. Foreshadowing a theme we elaborate in the sections that follow, the application of NHIES data for new purposes can compound biases in the original measurements. For example, measurements of livestock ownership in the AC have been used to generate livestock density maps to help researchers, policymakers and international organisations assess risks of drought and overgrazing (Wint and Robinson 2007). However, the AC is not designed to measure local livestock density and does not gather information on livestock mobility between seasons. As a result, researchers who accept AC livestock density data at face value would dramatically overestimate overgrazing risks in some parts of Kaokaland.

Department of Veterinary Services annual livestock inventory

The most comprehensive measurement of cattle ownership in the NCAs occurs when the Government of Namibia's Department of Veterinary Services (DVS) surveys all livestock ownership in Kaokoland each year alongside its mandatory cattle vaccination programme.[6] To conduct the survey, the government requires households to bring their cattle to a district auction kraal where cattle are vaccinated and checked for a mandatory electronic ear-tag and brand that links each cow with an individual legal owner.[7]

The mandatory electronic identification and tracking of livestock movement is part of the Namibian Livestock Identification and Traceability System (NAMLITS), a government initiative set up in part to meet standards of cattle tracking demanded by the European Union to trace the sourcing of Namibia's cattle exports (Prinsloo 2018). The DVS maintains an electronic database of all registered cattle, their legal owners and their grazing location. Pastoralists

exclusive sale rights to livestock, and no requirement to do so appears in the AC surveyor manual.

5 According to three NSA surveyors, the translated phrase in the NHIES survey is *Muna ozongombe ngapi pe tundu ndi?*

6 In interviews with pastoralists in Kaokaland, it is generally understood that avoidance and subversion of the DVS vaccination programme is widespread.

7 Interview with George Haufiku, DVS vaccination field manager, 2016.

are legally required to register new cattle (acquired or born) with a specific individual, obtain permits for movements across constituency boundaries and register all changes in livestock ownership (Prinsloo and De Villiers 2016).

The measurement of livestock ownership by the DVS and NAMLITS is notable in that it is the only major livestock survey that focuses exclusively on *individual* livestock ownership. NAMLITS emphasises individual ownership because it was developed to satisfy the requirements of European and American trading partners for livestock traceability and disease prevention. However, the NAMLITS ear-tagging system has been applied to new purposes. For example, banks use cattle tags to assess the financial viability of creditors (Menestrey Schwieger 2019).

The application of NAMLITS data on measurement of livestock ownership outside contexts of disease prevention presents challenges for pastoralist communities. Pastoralist families often use one herd identifier for the entire family's herd in order to avoid the bureaucratic obstacles associated with individual brand registration.[8] However, when banks and agricultural cooperatives determine an individual's eligibility for a loan, they use the number of livestock linked to the individual's NAMLITS cattle tag.[9] As a result, some pastoralists with large individual livestock holdings are viewed by banks as owning no livestock whatsoever, significantly reducing their ability to obtain credit. This disjuncture parallels the conclusion of the previous section: even when a uniform definition of livestock ownership serves certain purposes effectively, it can significantly misrepresent important ownership relations when applied in different contexts and for different purposes. In the case of NAMLIT's measure of livestock ownership, the misrepresentation has particularly negative effects on pastoralists because pastoralist ownership practices do not align with standards in the formal economy

Programme evaluations by international aid and research organisations

The final group of large-scale livestock ownership surveys in Namibia are conducted by international donor and research organisations. These surveys are usually used to inform, target and evaluate conservation and development programmes. For example, as we elaborate in the sections that follow, both

8 For an individual to get a brand registered, they must secure a letter from the Recognized Traditional Authority or customary chieftainship; fill in a form required by the government; pay an application fee; wait for a brand certificate; take the brand to the local DVS office and get it linked to the grazing area; weld the unique brand mark corresponding to the ear-tag and brand all cattle with the mark. For pastoralist families consisting of many cattle owners, these steps are onerous, if not prohibitive, to carry out for each individual.

9 Interviews with loan officers from Agribank (a state-owned financial institution focused on agricultural development promotion) and several Ovahimba communities.

authors participated in an evaluation of a community-based resource management programme in the NCAs. To assess the programme's effect on livestock wealth and off-take, the evaluation team conducted baseline, midline and end line surveys of livestock ownership in 2010, 2014 and 2017 respectively. To make their findings comparable with existing data on livestock ownership in the NCAs, the research team mimicked previous surveys' emphasis on a single, static definition of livestock ownership. In line with the standard approach, enumerators asked respondents: 'How many total cattle does your household own', followed by a question about each member of the household: 'How many of the household's cattle does [the household member] own now?'[10] As with the AC and NHIES, the Ovahimba and Ovaherero translation, *muna ozongombe ngapi pe tundu ndi*, takes a meaning closer to 'how many cattle does your household *have*'. We discuss how both enumerators and surveyors interpreted this phrasing in the following sections.

Summary

The standard approaches to measuring livestock ownership employed by governments and international organisations consistently emphasise a uniform, static definition. The standard quantitative approach to measuring cattle ownership masks variation in the origination, usage rights and cultural valence of different ownership relations in Ovahimba and Ovaherero communities. We have shown how the assumption of uniformity generates economic and policy distortions when livestock ownership measures are applied to purposes (such as assessments of creditworthiness and overgrazing risk) for which they were not originally designed. In the next section, we show that the standard approach fails even at its directly stated goals: generating accurate measures of household livestock ownership.

10 These questions were translated for the Kaokoland survey team as *muna ozongombe ngapi pe tundu ndi?* and *ozongombe ngapi* [household member] *nde nazo nai?* respectively. The questions were asked of each household member. Household membership was defined as individuals who spent at least six months of the year in the given housing complex. In discussions with enumerators, there was a troubling level of variation in their understanding of ownership. These differences were often based on their own previous background as enumerators and livestock owners. One enumerator who kept cattle on a commercial livestock farm asked, 'How could I consider a loaned animal my own? Of course we only spoke of animals the family owned'. Another said, 'There was no confusion – I asked the question [with no distinctions] and they answered'.

Pastoralist conceptions of cattle ownership in Namibia's Kaokoland

Ovaherero and Ovahimba pastoralists have a rich vocabulary for categorising different ownership relations in their communities (Hangara 2017).[11] In this section, we explore the differences between these local concepts of ownership and the standard approaches to measuring livestock ownership described above.

Throughout the section we underscore two important implications of the divergence between standard measurement approaches and local understandings of ownership. First, overlooking diverse local conceptions of ownership biases measurements of central importance to researchers and policymakers: livestock wealth, off-take rates and inequality. Second, and perhaps more importantly, ignoring the complexity of pastoralist ownership practices blinds researchers to pastoralist strategies for taking advantage of ecological variability and providing social insurance. Table 1 summarises six distinct concepts that Ovahimba and Ovaherero pastoralists have for 'owning' cattle, how the concepts contribute to pastoralist strategies for harnessing ecological variability and how the failure of the standard approach to account for each concept biases measurements of central interest to policymakers and researchers.

Ozongonga: *owned livestock assets*

The Ovahimba and Ovaherero concept of cattle ownership that is closest to the concept assumed by the standard approach is *ozongonga*, which refers to cattle that are purchased on the open market rather than inherited. The term has gained more prominence alongside increased formal livestock market penetration in Kaokoland. Because *ozongonga* are not acquired through inheritance or loans, there are fewer familial and social pressures around their appropriate management, movement or sale. As a result, pastoralists are more likely to view *ozongonga* as a liquid economic asset than other cattle in their herd.

Ozondjumba: livestock loans

Alternatively, some cattle in pastoralist herds are better understood as loans rather than owned assets. Ovahimba and Ovaherero pastoralists use the term *ozondjumba* to refer to cattle that have been loaned from a wealthier pastoralist to a young or poor pastoralist. The livestock lender, or *omuyandje*, retains final decision-making power about selling, slaughtering or permanently moving

11 The primary insights in this section are based on Venoo's conversation with family and community members in his Himba community, and discussions with Dr Ngungaa Hangara about Ovaherero communities.

Table 1. Ovahimba and Ovaherero concepts of livestock ownership

Name	Definition	Associated social norms	How ownership relation helps pastoralists negotiate ecological variability	How ignoring ownership relation biases measures of interest
Ozongonga	Livestock acquired in market (not inherited)	Liquid economic asset not tied to inheritance or cultural rites	Allows fluid buying and selling in response to economic and ecological conditions	No distortion
Ozondjumba	Livestock loaned from wealthier pastoralist to pastoralist in need (e.g. because cattle died during drought).	Lender retains final decision about buying/selling/slaughtering Recipient makes everyday management decisions, pays for upkeep and is entitled to milk/manure	Spreads herd out, reduces drought and disease impact (*lender*) Builds social capital usable elsewhere (i.e. water rights) (*lender*) Reduces management costs (*lender*) Social insurance (*recipient*) Helps stocking/restocking (*recipient*) Builds genetic/extra-genetic diversity of herds (*both*)	Overstates wealth of poor households and understates wealth of wealthy households Overstates liquidity of livestock assets and understates effective off-take rate Understates inequality/differentiation (*If excluded*) Understates social insurance available to poor households
Eṭa	Inherited livestock (matrilineal line)	Social pressure not to sell	Sustains matrilineal kinship network	Overstates liquidity of livestock assets and understates effective off-take rate Understates cultural value of livestock assets
Ozongunga	Livestock pre-gifted/designated for inheritance (within household to avoid customary matrilineal inheritance)	Parents cannot sell because designated to children Children cannot sell because it is their future herd	Gives children an incentive for herding ('take good care, the next calf will be yours') Gives children an incentive to remain pastoralists	Overstates liquidity of livestock assets and understates effective off-take rate Understates value of cattle to ensuring family labour (*If child lives outside the household*) Overstates household livestock wealth
Ozonganda	Intra-family loan. Livestock left with deceased father's household by customary inheritors (the sons of the deceased man's sister).	Donor retains final decision about buying/selling/slaughtering Lender makes everyday management decisions, pays for upkeep, and is entitled to milk/manure	Strengthens kinship networks Spreads herd out, reduces drought and disease impact (*lender*) Reduces management costs (*lender*) Social insurance/help restocking (*recipient*) Builds genetic/extra-genetic diversity of herds (*both*)	Overstates wealth of poor households and understates wealth of wealthy households Understates inequality/differentiation (*If excluded*) Understates social insurance available to poor households
Ozomwaha, *ozongeker*	Sacred cattle, honorific cattle	Unique cultural valence, cannot be sold/used unless specific rites are performed	Symbolic cultural/spiritual value for families and communities, sustains kinship/community cohesion	Overstates market-valued cattle wealth of households Understates self-valued cattle wealth of households

the animal and any of the animal's descendants, but day-to-day management is overseen and paid for by the recipient, or *omupewa*. The recipient is also entitled to milk or meat from the animal in the event that it dies from natural

or accidental causes.[12] In principle, the original owner is entitled to reclaim the cattle at any time, and ownership is transferred to the lender's heirs if they have not reclaimed the cattle before they pass away. However, there are strong social norms against the original owner claiming back all loaned livestock at once unless the recipient mistreats the animals.

Ozondjumba plays an essential role in pastoral communities' strategies for responding to, and taking advantage of, ecological variability. First, *ozondjumba* allow poor pastoralists to sustain themselves and restock when they fall on hard times, and young pastoralists to build up their own herds.[13] Secondly, *ozondjumba* also enables high levels of 'process variance', namely the availability of multiple real-time management strategies, in the pastoralist production system (Roe 2020).[14] For example, *ozondjumba* allows wealthier pastoralists to spread their herd to different locations and reduce the risk that disease or drought will affect the entire herd simultaneously. Cattle loans also allow pastoralists to increase the genetic and extra-genetic diversity of the herd,[15] and to expose their cattle to different herding approaches (Krätli 2019). Finally, *omuyandje* (the *ozondjumba* lender) accrue social status in their community from their willingness to lend, which they can use to influence community decisions around other issues, such as water management (Menestrey Schwieger 2019).

The standard quantitative approach to measuring cattle ownership obscures *ozondjumba*, because recipients of *ozondjumba* include them when they report the number of cattle that they 'own', and benefactors do not count them among their livestock assets. Measurements that assume only standard household livestock ownership relations (*owini wozongombe*), then, systematically overestimate the livestock assets of poorer households and underestimate the assets of wealthy ones.

Eṯa: *livestock inheritance*

Uniform measurements of cattle ownership also obscure ownership relations that arise from rules of cattle inheritance in Kaokoland. The customary form of inheritance in Ovaherero and Ovahimba communities occurs through the matrilineal line: when a family patriarch passes away, his cattle are inherited

12 For example, during vaccination.

13 Pastoralist households further embed variance in their production process by borrowing from many different lenders to cushion against the risk that any one patron relationship sours.

14 Krätli (2008) describes analogous strategies for increasing process variance in Niger.

15 Extra-genetic inheritance, or 'extended inheritance', refers to animals' ability to harness their ecological/social environment to their advantage and to transmit the ability through social and kin networks.

by his brother or his sister's sons (*eṭa rongundwe*).[16] Pastoralists face strong social pressures against selling inherited cattle (*eṭa*) because there is an expectation that the cattle and their calves are meant for passing on to future generations. As a result, by ignoring the distinction between purchased and inherited cattle, the standard approach overestimates the liquidity of Ovaherero and Ovahimba cattle herds.

In addition to customary inheritance along the matrilineal line, male pastoralists in Kaokoland are increasingly embracing an alternative form of inheritance: *ozongunga*, or the distribution of cattle from parents directly to their own children.[17] Furthermore, many fathers pre-gift cattle to their children in order to circumvent social pressures to adhere to matrilineal inheritance norms at the time of the father's passing.[18] Pre-gifted *ozongunga* serve two additional purposes for Ovaherero and Ovahimba parents: they increase children's interest in livestock farming as a vocation and they reward children for help with managing the family herd.[19]

Ownership relations to livestock that is pre-gifted or designated for children are unique in two respects. First, although managed as part of the family herd, *ozongunga* are owned by the children to whom they have been gifted. Second, there are strong social norms against children selling *ozongunga* because they are seen as the basis of the child's future herd. When children move out of the household for school or urban work, households continue to refer to *ozongunga* as cattle owned by the household even though the cattle are legally tied to an individual living outside the home. Uniform measures of household livestock ownership ignore the social pressures against selling *ozongunga*, and overestimate household livestock wealth if the *ozongunga* owning son is living outside the home.[20]

Less frequently, household herds include *ozonganda* (*ozongombe zonganda*). When the father of a family passes away, his brother or his sister's sons (the customary inheritors) may leave their inherited cattle with the family of the deceased man in a kind of intra-family loan. These cattle are called *ozon-*

16 By way of example: if Tjiseua Venoo passed away, the first heirs to his cattle would be nephews from his mother's clan (*omeyanda ranyoko*). Next in line would be his brothers, then his sisters and finally his mother. When the mother passes away, her cattle are inherited by her son. However, female ownership of cattle is a relatively new practice and inheritance norms are less well developed.

17 When fathers give cattle to children born out of wedlock, the cattle are called *katjivereko*.

18 In some circumstances, a father will pre-gift a calf that is not yet born. For example, Venoo's father often told him, 'Watch after this cow closely, its first calf will be yours'.

19 For insight into the changing role of *ozongunga* we are indebted to discussions with Professor Jekura Kavari and Hermann Mupia.

20 Uniform measures of individual livestock ownership, such as the NAMLITS system, underestimate the cattle wealth of young pastoralists because cattle usually retain the parent's ear-tag even after they have been gifted to children.

ganda. The duration of loans of *ozonganda* vary with familial context. In Ovaherero and Ovahimba communities, *ozonganda* are still 'owned' by customary inheritors (the brother or sons of the sister of the deceased man). However, they are managed by the household of the deceased man. *Ozonganda* allow customary inheritors to assist the household of a deceased man, keep their cattle assets geographically dispersed and cement familial networks of reciprocal assistance. As with *ozondjumba* (livestock loaned by a wealthy community member), recipients of *ozonganda* loans can use the cattle for milk but cannot sell or gift the cattle without permission of the owner. The standard quantitative approach to measuring cattle ownership obscures this ownership relation. Under the standard approach, families claim *ozonganda* as part of their owned livestock assets (*owini wozongombe*), overestimating their cattle wealth and underestimating the wealth of the individuals who inherited the cattle along the matrilineal line. Additionally, as with intra-community livestock loans, obscuring intra-family loans causes researchers to underestimate the extent of intra-family economic differentiation.

Ozomwaha *and* ozongekera*: sacred cattle*

Finally, many herds include *ozomwaha,* sacred cattle, and *ozongekera*, cattle given to honour someone for committing a heroic act. Although standard quantitative measures of cattle ownership include *ozomwaha* and *ozongekera* under the umbrella term for owned livestock assets (*owini wozongombe*), this likening ignores two features of sacred cattle in Ovahimba and Ovaherero communities. First, sacred cattle carry cultural and emotional significance to the households that own them – they are 'worth more' than their market value suggests. Second, there are social prohibitions against the sale or slaughter of sacred cattle, and generally against their use for milk.[21] A definition of livestock ownership that ignores the unique role of sacred cattle will overestimate the economic value of a given herd while underestimating its cultural and emotional significance to the owner.

Summary

By focusing on a uniform ownership relation between pastoralists and their livestock, the standard quantitative approach to measuring livestock ownership masks at least six notions of ownership practices recognised by Ovahimba and Ovaherero communities. The distinctions are not merely semantic. They encode fundamental features of social structure in Ovahimba and Ovaherero

21 In some rare cases, *ozongekera* can be used for milk. In very rare circumstances, they can be sold, but beforehand a normalisation ritual is practised to remove their sacred designation.

communities, and often reflect strategies to take advantage of ecological variability and provide social insurance against economic hardship (Bollig 1997). Livestock loans allow pastoralists to embed variability in their production process and respond to hardship; inheritance norms strengthen kinship networks; and sacred cattle are powerful symbols within the cultural system that undergirds Ovahimba and Ovaherero social relations. As we show in more detail in the next section, ignoring these features of pastoralist social structure not only obscures pastoralist livelihood strategies, it undermines researcher's goals even on their own terms.

The measurement of cattle ownership in practice

To illuminate the challenges facing the standard approach to measuring cattle ownership, we draw on the authors' shared experience of working on a large-scale data collection effort in Namibia's Northern Communal Areas (NCAs) and its dissonance with the experience of one author – Tjiseua Venoo – of growing up and raising cattle in a pastoralist household.

Between 2013 and 2017, Dylan Groves worked for a non-profit research organisation to field surveys of kraal managers and cattle-owning households in 123 grazing areas spread across the NCAs. Approximately 42 of the grazing areas and 800 respondents were in Kaokoland. The data collection activities were part of a large-scale impact evaluation of a community-based natural resource management programme funded by a large international donor. The programme ended in 2014, and data collection for the evaluation ended in 2017.

Between 2015 and 2016, Venoo also participated in the research activities of the research organisation as both a surveyor and survey team assistant leader. He also grew up in Kaokoland, and continues to keep cattle with his family's herd in Ondevete. Venoo's proximity to the pastoralist communities being studied gave him a valuable opportunity to observe the disconnection between data collection strategies employed on the project and the lived experience of pastoralist households under study. In the years following the study, he also discussed how the survey was interpreted with respondents and his family members. The analysis below stems from experiences and conversations between Venoo and Groves during the project period and its aftermath, as well as qualitative follow-up discussions conducted by Venoo with surveyors, respondents and Ovahimba pastoralists in his community.

The survey that generated the research team's initial quantitative measures of livestock ownership and wealth was conducted in 2014. As discussed above, the survey hewed closely to the standard approach to measuring cattle ownership, which in translation comes closest to 'how many cattle does

your household have?'. Three rationale guided the research team's decision. First, the team sought consistency with previous surveys of cattle ownership in pastoralist communities to allow for comparisons across projects. Second, the team sought a stable definition of ownership so that findings about the impact of the programme would be commensurable across the NCAs (which include pastoralist and non-pastoralist communities).

Finally, the research team's measurement strategy also reflected the outcomes of perceived interest to the donor and research community. The primary goal of the Community Based Rangeland and Livestock Management programme, as stated in the original terms of reference, was to 'to enhance the productivity and sustainability of the livestock sector in the NCA through improved rangeland resource and livestock management that will result in an increase in income from livestock farming'. As a result, the research team's primary focus was on measuring the programme's impact on income-producing assets.

Dissonance between measurement and local understandings of livestock ownership

How did the research team's questions relate to the way Ovahimba and Ovaherero pastoralists understand their own livestock ownership relations? We identify three areas of dissonance. These differences first emerged during campfire conversations between Venoo (and other enumerators) and the survey management team during field data collection, in which enumerators puzzled over how they would categorise their own family's cattle holdings according to the survey's categories. The differences were confirmed by interviews with enumerators and pastoralist respondents between 2016 and 2019.

First, the ownership questions obscured livestock loans: *ozondjumba* (loans from wealthy pastoralists) and *ozonganda* (loans from customary inheritors). In all cases, pastoralists indicated that they would reply that they 'owned' *ozondjumba* and *ozonganda*, even though they did not have decision-making authority over the cattle, would not monetarily benefit from their sale and would give the cattle back to the rightful owner upon request. Similarly, respondents who loaned *ozondjumba* and *ozonganda* indicated that they would not report these cattle as 'owned' by their household even though they would accrue any income derived from their sale.

The reliance on the standard measure of cattle wealth undermined the goals of the evaluation in two ways. First, the research team overestimated the cattle wealth of poor pastoralists and underestimated the wealth of wealthy pastoralists in its 2014 survey.[22] Second, the research team underestimated average

22 This also affected measures of community-level inequality, a secondary outcome of the evaluation.

household off-take rates, which was defined as the number of cattle sold relative to the number of cattle owned.

The research team's approach to measuring cattle ownership also masked complex inheritance norms in Kaokoland communities. In Venoo's family, for example, most of the cattle are *eṭa*, implying strong social pressures against their sale. The father has also cut notches in approximately half of the cattle's ears to designate them for inheritance by his direct (non-matrilineal) descendants (*ozongunga* or *ozongombe ozongunga*). Because they have been designated for his children, the father's ability to sell, gift or move the cattle is constrained (similarly, the child cannot sell the cattle without the father's permission). During interviews, surveyors and respondents said that pastoralists report cattle designated for inheritance are 'owned' by the head of the household rather than the designated inheritor. As a result, the research team overestimated the proportion of cattle owned by the head of household vis-à-vis other household members. The research team also created a misleading measure of the household off-take rate because they failed to distinguish between cattle that were designated to help grow the children's future herd (a form of capital investment) from cattle available for sale.[23]

These methodological distortions are magnified when children live outside the household. For example, Venoo lives in Windhoek, Namibia's capital city. However, cattle designated for him to inherit remain in his family's kraal and carry his family's ear-tag. As interpreted by both the survey team and respondents, the study treated these cattle as belonging to the household head, even though Venoo maintains primary decision-making authority over the cattle and would accrue any financial gain from their sale or slaughter.

Finally, the research team's method of measuring ownership ignored the role of sacred cattle (*ozomwaha* and *ozongekera*). Sacred cattle confer unique cultural value on Ovaherero and Ovahimba pastoralists and can only be gifted or sold after a normalisation ritual is conducted to remove the sacred designation. Pastoralist survey respondents indicated that when asked about the livestock that they owned, they grouped *ozomwaha* and *ozongenkera* with other cattle belonging to the household (*owini wozongombe*). As a result, the research team overestimated the market value of household livestock assets by ignoring cultural prohibitions on the sale of sacred livestock, and underestimated the welfare value of livestock assets by ignoring sacred livestock's cultural and emotional worth.

23 The failure to distinguish between marketable and non-marketable livestock assets is reminiscent of a common problem in pastoralist livestock assessment: the failure to distinguish between livestock used as a means of production (breeding stock) and livestock used to generate income (Behnke 2010). However, formal marketing of cattle for income is recent enough in Ovahimba and Ovaherero culture that the production/income distinction is not embedded in the local vocabulary for cattle.

The dissonance between pastoralist communities and the research team's understandings of cattle ownership also suggests a deeper disconnection in their conceptions of pastoral livelihoods. To the research team, the relevant question was the number of livestock belonging to a household that could be exchanged for goods or converted to money through sale or slaughter.[24] Pastoralist communities conceived of cattle ownership differently. To Ovahimba and Ovaherero communities, different forms of cattle ownership affirm social relations between generations (through inheritance), between households (through loans) and with historical memory (through sacred cattle). These relations, in turn, are an integral part of pastoralist strategies for harnessing ecological variability.

The failure to engage local concepts of cattle ownership undermined the research design on its own terms. The approach replicated the problems measuring household wealth embedded in previous national surveys. These problems were magnified when the research team used the data to answer questions that the standard measurement approach was not designed to answer. For example, off-take rate calculations were hampered by the conflation of owned, loaned and inherited cattle, and community-level inequality measures were severely biased without accounting for intra-community livestock loans.

Conclusions and recommendations

The dissonance between the standard approach to measuring cattle ownership employed in the 2014 Community Based Rangeland and Livestock Management survey and the concepts of cattle ownership held by Ovaherero and Ovahimba communities generated significant challenges for its analysis of core programme outcomes, including household wealth, off-take rates and community-level inequality. It also obscured the strategies pastoralists employ to harness ecological variability to their advantage.

These challenges are just a microcosm of the ways that standard approaches to measuring livestock ownership distort policies and programmes that affect pastoralists. The long and mixed record of programmes designed to increase livestock off-take in Kaokaland are attributable, in part, to the failure of programme implementers to recognise the myriad social rules around loaned and inherited cattle. Further, these failure to recognise these nuances of ownership obscure the role those social rules play in matching high input variance (ecological variability) with high process variance in pastoralist strategies of ownership.

24 A stated goal of the project being evaluated was to motivate pastoralists to adopt a more 'market-oriented' mindset towards cattle.

Fortunately, the time horizon of the research project (seven years) and insights gleaned from parallel qualitative research offered the research team the opportunity to improve measures of cattle ownership in subsequent data collection activities. Two changes were particularly helpful, and have been recommend for future researchers. First, enumerators asked explicit questions about the number of livestock owned (with exclusive right to sale) and the number of livestock given and received as loans. Second, surveyors in subsequent surveys were trained to supplement their questions with concrete examples of ownership relations to avoid confusion. However, challenges remained. For example, the updated surveys still did not adequately capture inheritance relations, nor did they ask about sacred cattle.

How can these challenges and responses inform future large-scale data collection efforts? Large-scale surveys of livestock ownership in Namibia must ask questions that differentiate, at minimum, between livestock owned with exclusive right of sale, livestock on loan and sacred or honoured livestock. These represent fundamental differences in the nature of ownership and should be generally known by the household head. Surveyors should also be trained to offer concrete examples of differences in ownership relations to avoid confusion over abstract terms.

However, some efforts to make livestock ownership measures more nuanced may prove too time intensive or logistically difficult to justify. For example, asking household heads the precise designated inheritor of different cattle proved to be time intensive and increased reporting errors. Similarly, changing the NAMLITS ear-tagging system to account for variations in intra-family ownership would impose significant logistical burdens on government administrators and pastoral communities. In these cases, data 'producers' should be more transparent about these limitations and data 'consumers' should be critical of applying data for ulterior purposes. Researchers and government officials should be critical of market off-take rates, recognising that they cannot account for the fact that some cattle have been designated to build future herds rather than generate income, or that there are social prohibitions on the sale of some inherited cattle. Similarly, financial institutions should not rely on livestock ownership measures, developed for disease control, to assess individual pastoralists' creditworthiness.

More generally, research in dryland environments should narrow the gap between the measurement tools used by researchers and the concepts pastoralists use to understand their own communities. Attentiveness to local concepts of ownership and management are not only important for avoiding the biases described in this contribution, but they also reveal pastoralists' locally tailored strategies to manage ecological variability. There will always be a distinction between the vocabulary of individuals in a community and the vocabulary

of those who study it. These emic/etic dissonances feed into conceptual dissonances described in this article, and we suggest that these can be reduced if researchers pursue methodologies that bring them closer to the pastoralist communities they study.

References

Behnke, R. 2010. 'The contribution of livestock to the economies of IGAD member states'. IGAD Livestock Policy Initiative Working Paper No. **2**–10. http://www.celep.info/wp-content/uploads/2017/04/IGAD-LPI-Contribution-of-Livestock-to-IGAD-Economies-WP-02-10.pdf (accessed 12 June 2020).

Bollig, M. 1997. 'Risk and risk minimisation among Himba pastoralists in northwestern Namibia'. *Nomadic Peoples* **1**(1): 66–89. https://doi.org/10.3167/082279497782384758

Hangara, N. 2017. *Otuzo twOvaherero*. Windhoek: University of Namibia Press.

Krätli, S. 2008. 'Time to outbreed animal science? A cattle-breeding system exploiting structural unpredictability: The WoDaaBe herders in Niger'. STEPS Working Paper No. 7. https://core.ac.uk/download/pdf/19918163.pdf (accessed 12 June 2020).

Krätli, S. 2019. 'Pastoral development orientation framework: focus on Ethiopia'. MISEROR Working Paper. http://www.celep.info/wp-content/uploads/2019/09/2019-Misereor-pastoral-development-orientation-framework.pdf (accessed 12 June 2020).

Krätli, S., and N. Schareika. 2010. 'Living off uncertainty: The intelligent animal production of dryland pastoralists'. *European Journal of Development Research* **22** (5): 605–622. https://doi.org/10.1057/ejdr.2010.41

Menestrey Schwieger, D.A. 2019. 'Negotiating water on unequal terms: Cattle loans, dependencies and power in communal water management in northwest Namibia'. *Nomadic Peoples* **23** (2): 241–260. https://doi.org/10.3197/np.2019.230205

Prinsloo, T. 2018. 'Livestock traceability systems in Swaziland and Namibia: towards an impact-for-sustainable-agriculture framework'. PhD thesis, University of Pretoria.

Prinsloo, T., and C. De Villiers. 2016. 'Traceability systems in Swaziland and Namibia: Improving access to markets with digital information'. 2016 IST-Africa 2016 Conference. https://doi.org/10.1109/ISTAFRICA.2016.7530661 (accessed 12 June 2020).

Roe, E. 2020. 'A new policy narrative for pastoralism? Pastoralists as reliability professionals and pastoralist systems as infrastructure'. STEPS Working Paper No. 113. https://www.ids.ac.uk/download.php?file=wp-content/uploads/2020/01/STEPS-working-paper-113-Roe-FINAL-for-opendocs.pdf (accessed 12 June 2020).

Wint, W., and T. Robinson. 2007. 'Gridded livestock of the world 2007'. Rome: Food and Agriculture Organization. http://www.fao.org/3/a1259e/a1259e00.pdf (accessed 12 June 2020).

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