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SEEING CATTLE LIKE A STATE: SEDENTIST ASSUMPTIONS OF THE NAMIBIAN LIVESTOCK IDENTIFICATION AND TRACEABILITY SYSTEM

Max Mauerman, Venomukona Tjiseua and Dylan W. Groves

Abstract

Livestock identification and traceability systems (LITS) are an increasingly prominent component of national livestock development policies around the world. In theory, LITS allow governments to track and respond to disease and livestock theft efficiently. However, this paper argues that LITS are suffused with sedentist assumptions that are at odds with the livestock management practices of pastoralist communities. Drawing on qualitative interviews with implementing bureaucrats and affected pastoralist communities as well as one author's experience of growing up and managing cattle in a pastoralist community, we review the sedentist assumptions that animate the Namibian Livestock Identification and Traceability System (NamLITS) and describe how pastoralists in north-western Namibia perceive that NamLITS has affected their economic, social and political lives. We then show the strategies that pastoralists use to comply and circumvent NamLITS, and conclude with lessons for governments and development practitioners considering livestock tracing systems and mobile communities affected by them.

KEYWORDS: pastoralism, sedentism, livestock tracing, Namibia, Africa

Introduction

Livestock identification and traceability systems (LITS) are an increasingly prominent component of national livestock development policies around the world, particularly in lower-income and middle-income countries (Bosona and Gebresenbet 2013). Spurred on by international pressure to track and respond to livestock diseases, governments in South Africa, Namibia, Eswatini and Botswana have all implemented electronic LITS since 2000 (Bowling et al. 2008) and governments in Tanzania, Kenya, Uganda and South Sudan have launched livestock tracing pilot projects (Mutua et al. 2018).

Because livestock identification and traceability systems are often implemented in response to public health concerns raised by Europe and the United States, research has focused on livestock tracing's impact on (Prinsloo 2017,

2019). This research has generally neglected to document the influence of LITS on the economic, social and political lives of pastoralist communities.

However, the impact of LITS on pastoralist communities is potentially significant. Electronic livestock identification and traceability systems facilitate state surveillance and bureaucratic management of pastoralist communities that have historically resisted external infringement. LITS programmes permit state veterinary officers to electronically monitor the production, management and movement of pastoralist-owned livestock and oblige pastoralist communities to register all livestock production, sales and movements with the state. These requirements render pastoralist communities more legible to state bureaucrats, financial institutions, and international development and conservation organisations.

In this paper we investigate the introduction of livestock identification and traceability systems (LITS) to pastoralist communities in Namibia. We argue that LITS are suffused with sedentist assumptions, and that these sedentist assumptions are incongruent with the ways that Namibian pastoralists own and manage their livestock. As a result, LITS programmes have the potential to generate a range of unanticipated negative consequences for pastoralist livestock owners. More broadly, we show how LITS both exemplify and reify a sedentist *technics* in modern development practice (Rodgers and Semplici 2023). In a story reminiscent of the high-modernist schemes described by James Scott (1998), efforts to render livestock production legible to public health authorities in Europe and the United States may engender staticity and formality in pastoralist communities.

Our analysis is informed by the concept of ‘travelling models’, defined as analytical representations of reality that are transferred through a political process from one social context to another (Rottenburg 2009; Behrends, Park and Rottenburg 2014). Models are combined with material technologies to facilitate both interpretation and active intervention to shape reality (Schneegg and Linke 2016). Previous scholars have fruitfully applied the concept of travelling models to understand how concepts like Community Natural Resource Management (CBRNM), climate change adaptation and community-driven development moved from the Global North to north-western Namibia (Schneegg and Linke 2016; Weisser et al. 2014). In a similar manner, the LITS model originated in Europe and the United States before being exported to commercial farmers in southern Namibia and then to pastoralist communities in northern Namibia. Our analysis highlights the frictions in the process of translating models across political, economic and cultural borders, and to the ways in which the sedentist assumptions underlying the LITS model chafe against the lived realities of Namibian pastoralists.

We conduct our investigation in Namibia’s Northern Communal Areas,

where the Namibian Livestock Identification and Traceability System (NamLITS) has been implemented since 2010. We focus on the introduction of NamLITS in Namibia's north-western Kunene, home to Namibia's two largest pastoralist groups, the Ovaherero and Ovahimba. Drawing on the authors' qualitative interviews conducted between 2013 and 2022, as well as one author's (Tjiseua Venoo's) experience growing up and managing cattle as a member of an Ovahimba pastoralist community, we trace how sedentist assumptions embedded in NamLITS have constrained mobility practices and altered the economic, social and political lives of some pastoralist communities. We then show the range of strategies that mobile peoples have deployed to resist and circumvent livestock tracing programmes, and conclude with lessons for governments and development practitioners that are considering implementing livestock tracing systems and the mobile communities affected by them.

Background

Livestock traceability systems

Traceability systems are central to the global food safety apparatus (Verbeke 2001). Traceability systems are designed to ensure that consumers and regulators can link any food item to each step of the item's production process, from the point of sale to the original producer. The primary justification for traceability systems is that they facilitate accountability for and rapid responses to diseases and other threats to public health by ensuring that detailed information about the production and supply process of food items are accurate and publicly accessible (Hobbs 2003).

Contemporary LITS programmes rely on electronic animal identifiers, which capture the animal's country of origin, date of birth, place of slaughter and place of processing (Prinsloo and Villiers 2017). Electronic LITS are increasingly common in low-income and middle-income countries (LIMCs) (Van 2020). Traceability standards in LIMCs have been promoted to facilitate livestock exports to markets in Europe and the United States. Electronic LITS programmes are often developed and implemented in LIMCs by international development organisations in partnership with host governments. While LITS programmes remain voluntary and experimental in many countries, mandatory electronic livestock identification programmes have been implemented in Namibia, Uruguay, Eswatini and South Africa.

The Namibian Livestock Identification and Traceability System (NamLITS)

In 2004, Namibia introduced NamLITS to commercial farmers south of its Veterinary Cordon Fence (VCF) to meet livestock traceability standards imposed by the European Union and other trading partners. NamLITS was funded by the European Union and United States and implemented primarily by The Meat Board of Namibia (MBN), a para-statal organisation charged with managing Namibia's livestock economy. In 2010, NamLITS II was extended into Namibia's communal areas north of the VCF. As we discuss in more detail below, the extension of NamLITS II north of VCF was controversial because northern farmers incurred the cost of implementing the system without directly benefitting from its primary stated purpose: securing access to international livestock markets (*The Namibian Economist* 2012). Whereas livestock farmers south of the VCF are generally commercially oriented and depend on exports to South African and European markets, livestock farmers north of the VCF rarely export to international markets (Mendelsohn 2002).

The core of NamLITS is an ear tagging and branding system for tracking animal movements. All animals are given radio frequency identification (RFID) ear tags that encode information about the full names and details of the livestock owner/keeper, the unique animal identification number on the ear tag, date of tagging, and the cattle's age, breed, sex and production type (e.g. beef or dairy). During foot-and-mouth disease (FMD) outbreaks, NamLITS is designed to allow Namibian livestock exporters to differentiate between livestock that have recently been in proximity to the source of the outbreak and livestock that are not at risk of disease.

NamLITS also includes several documentation requirements related to animal movements. Whenever an animal is moved between an 'establishment' (a farm or registered communal settlement registered in the NamLITS system) the documentation for that animal must be updated on the government register by an animal technician. This rule, in turn, allows Namibia to enforce a 90/40 rule, whereby livestock cannot be slaughtered within 90 days of entering the country or 40 days since its last move between establishments. All information from NamLITS is kept in a centralised database overseen by the Namibian Department of Veterinary Services (DVS).

South of the VCF, NamLITS is enforced by annual visits to all farms by animal health technicians. North of the VCF, NamLITS is enforced by government officials at regional border points and by the DVS during its mandatory annual vaccination campaigns. During each visit, DVS animal technicians check for a cattle ear tag, scan the ear tag to check for appropriate vaccinations and documentation, and attach new ear tags to cattle that are missing appropriate documentation. Farmers, in turn, are required to register an individualised

brand and ear tag for each farmer, purchase ear tags for new cattle and provide updated information about cattle movements, health and ownership to the Namibian government.

Namibia's Veterinary Cordon Fence (VCF)

The decision to introduce NamLITS north of the Veterinary Cordon Fence was controversial, in part because of the controversial role of the VCF in Namibian politics. The VCF was drawn by colonial authorities during German colonial rule (1884–1915) to mark the extent of settler-controlled land and later to protect German-owned livestock from the spread of rinderpest, and continued to mark an important political barrier after Namibia's national independence from apartheid South Africa in 1990. Today, the primary stated function of the VCF is to demarcate northern communal areas at risk of FMD and southern 'FMD-free' areas. For more than a century, pastoralist communities north of the VCF have been subject to various external interventions to manage livestock numbers and mobility under the auspices of preventing livestock disease and environmental degradation, first by German colonial authorities, then by the South African apartheid government and most recently by the government of Namibia and international organisations (Bollig 2020). Some scholars argue that these interventions have instead 'served as a target and an alibi to sedentarise the (semi)nomadic population, isolate the region from the rest of the world, and to force the region's inhabitants into a subsistence economy and thus into contract labour. Cattle were a means to create good (read: obedient) subjects' (Van Wolputte 2004: 103).

Over time, the VCF has also come to define a critical economic boundary, especially as it relates to land ownership and the international livestock trade. With respect to land ownership, the VCF separates primarily privately held land to the south and primarily communally held land to the north. Commercial farms in the south range from 5,000 to as many as 50,000 hectares and usually have permanent water infrastructure, which facilitates seasonal livestock movements within a single commercial farm. As a result, livestock production south of the VCF usually occurs on one plot of land, while farmers north of the VCF regularly move their cattle between establishments throughout the year.

With respect to international livestock trade, the VCF separates livestock owners in the south, who are legally eligible to export livestock products internationally, from livestock owners in the north, who face arduous bureaucratic hurdles to export their products. Many analysts argue that restrictions on animal movements across the VCF represent a *de facto* ban on international livestock exports for farmers in the northern communal areas (Miescher

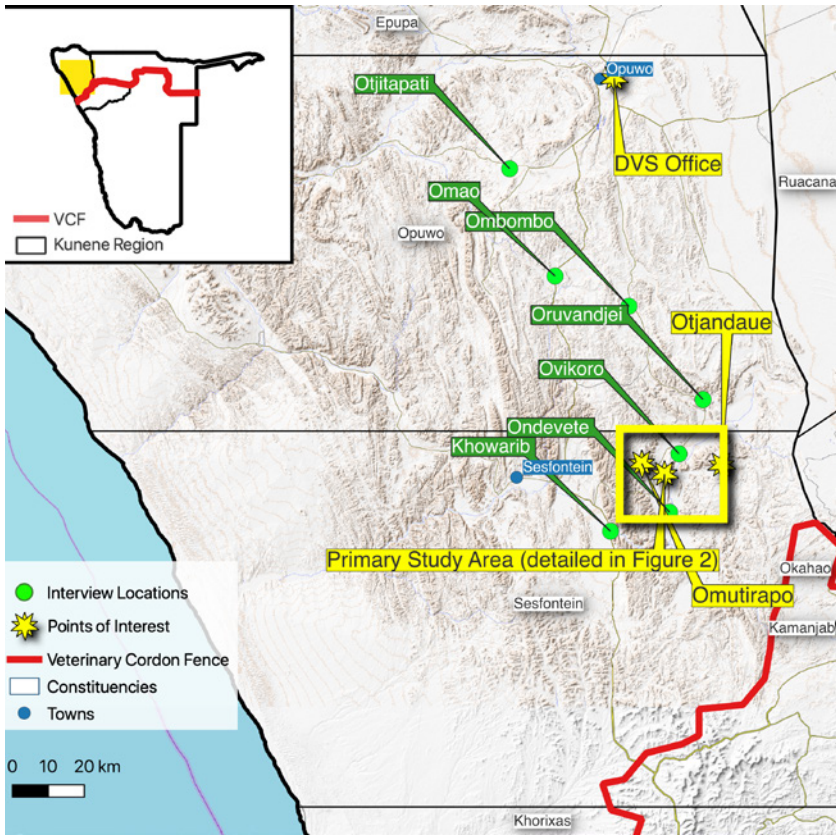
2012). Both because of its historical legacy and its contemporary impact on communal livestock production, the VCF is highly controversial in Namibia, especially among northern communities (Miescher 2012).

Study context

This study is focused on the introduction of NamLITS into Namibia's north-western Kunene region between 2010 and 2022, with a focus on pastoralists in the Opuwuo Rural and Sesfontein constituencies (see Map 1). Kunene is one of Namibia's poorest regions, with average annual per capita consumption (NAD 28,000, US \$1,500) that is slightly less than half of Namibia's national average and a literacy rate (65 per cent) that is the lowest in the country (National Statistics Agency 2016).

The predominant mode of livestock production in the study area is pastoralism. The evolution of the pastoralist production system in Kunene has been impressively documented by Bollig (Bollig 2006, 2020). Pastoralist production is constrained by Kunene's dryland environment, where precipitation is low and unpredictable (Bollig 1997; Bollig, Schnegg and Wotzka 2013). The movements of pastoralists were dictated by the availability of natural water sources until the 1960s, when the apartheid South West Africa administration began to invest in the development of boreholes. This proliferation of boreholes upended existing systems of grazing and water management by delinking grazing patterns from the availability of natural water sources and enabling the growth of human and livestock populations. However, efforts by the government of Namibia and international conservation organisations to surveil and manage rapidly increasing stocking rates in Kunene have been met with distrust and resistance from pastoralist communities, who link these efforts to a history of wealth dispossession enacted by the German and apartheid governments (Werner 1993; Van Wolputte 2004; Owen-Smith 2012). Since 2013, these challenges have been compounded by a multi-year drought that has significantly affected rangelands, pastoralist livelihoods and livestock management practices (Inman, Hobbs and Tsvuura 2020).

Map 1 shows the research areas in Kunene that are the focus of this study. The primary research site is Tjiseua Venoo's home community, Ondevete, located northeast of Sesfontein. Ondevete, like the other communal settlements in the research area, is inhabited by both Ovaherero and Ovahimba pastoralists. The Ovahimba live primarily in north-western Namibia and southern Angola, while Ovaherero are spread across north-western, central and eastern Namibia. Although there are meaningful differences between Ovaherero and Ovahimba customs and institutions, oral traditions emphasise



Map I.

Study area. Source: Authors' own records (interview locations and points of interest); ESRI Africa GeoPortal (administrative areas, towns and VCF boundaries).

the permeability of their identities, and movement between communities is common (Bollig 2020).

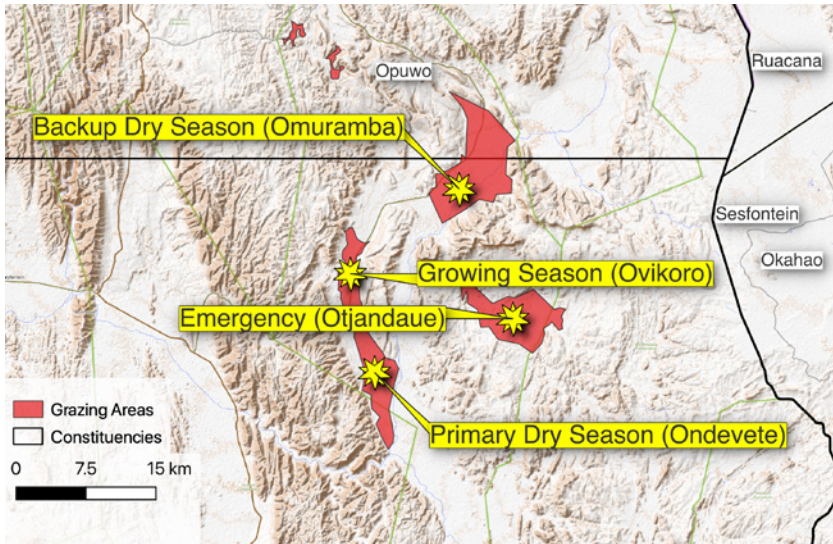
Households in the study area rely on livestock selling as a primary income strategy, although many households receive state pensions and remittances from family members who work in Opuwo or south of the VCF. Annual income from livestock sales is unpredictable because households sell livestock in order to meet variable needs such as school fees, medical costs and waterpoint repairs. During the study period, reported annal household income

from livestock sales in Ondevete ranged from NAD 15,000 (US \$700) to NAD 40,000 (US \$2,000). Wealth inequality is high, with some wealthy households owning as many as 200 cattle and many households headed by younger men or women owning as few as 5 or 10 cattle. The number of households in pastoralist villages usually range from 5 to 15, while the number of households in settlements range from 20 to 50.

Livestock is moved between households through sales, loans and inheritance. Livestock loans from wealthy livestock owners to young and materially precarious individuals is common and often embedded in a patronage relationship (Bollig 1997; Groves and Tjiseua 2020). Inheritance occurs through a system of double descent, where individuals are members of both a matrilineal (*eanda/ejanda*) and patrilineal (*oruzo*) line (Gordon 2005). Traditionally, livestock are passed between male members of the matriline, while sacred cattle tend to be passed from father to son (Scelza, Prall and Levine 2019). In contemporary practice, many parents circumvent these inheritance rules by gifting livestock to their children before they pass away (Groves and Tjiseua 2020). Women own and inherit cattle, but female-led households are typically less wealthy than households led by men (Schneegg and Linke 2016). Elders are highly respected both in the household and in the community, and livestock are herded by young men who are usually relatives of an older livestock owner (Bollig 2020).

Herding practices in Ondevete (see Map 2) offer a useful example of practices in other pastoralist communities in the Opuwo Rural and Sesfontein constituencies. Most households live in permanent dwellings in the dry season pasture, where there is permanent water infrastructure. This grazing area extends approximately 7.5 kilometres along the vertical axis and 2 kilometres along the horizontal axis, although cattle often move into bordering hillsides as grass availability diminishes. During the rainy season, most households move their livestock to a cattle post in Ovikoro, 10–15 kilometres to the north, to take advantage of a seasonal water pan. The pasture in Ovikoro is larger, but can only be accessed before the seasonal pan dries. When other pasture resources are exhausted, pastoralists in Ondevete may move to Omuramba, a pasture to the west that is settled by other pastoralist households, although it is commonly understood that use of this pasture should be limited to emergency situations, and movement to the area is typically decided communally. Each of these pastures is categorised as a separate ‘establishment’ under NamLITS, meaning that movements between them require a NamLITS movement permit. In practice, residents of Ondevete rarely obtain permits to move to Ovikoro, but almost always obtain a permit to move to Omuramba (Interviews 2022).

Despite these reserves, the multi-year drought in Kunene has forced some residents of Ondevete to seek pasture outside of the study area, usually by



Map 2.

Tjiseua Venoo's home community, Ondevete. Source: Authors' own records (grazing area boundaries); ESRI Africa GeoPortal (administrative areas).

seeking approval from distant relatives or acquaintances to keep cattle in their areas. In recent years, Ondevete's residents have sought alternative pastures between 45 and 120 kilometres away. Negotiations about these long-distance cattle movements can be tense, and many of the most significant community conflicts recounted in focus group discussions centred around rights to water and grazing resources (Interview 2013). Resolution of these conflicts is typically handled by local traditional authorities, although communities have increasingly turned to formal legal mechanisms to evict 'illegal grazers' (Olwage 2022; Jason 2023).

Materials and methods

Our analysis draws on three sets of data. One co-author (Tjiseua Venoo) grew up herding livestock in an Ovahimba family based in the Sesfontein constituency and continues to manage cattle there (see Map 2). Tjiseua Venoo draws on

both his personal experience as well as in-depth interviews he conducted with all eleven households in his community about the influence of the NamLITS programme between August 2021 and July 2022.

A second co-author (Dylan Groves) conducted field work in Namibia's Northern Communal Areas from 2013 through 2016. Dylan Groves designed and implemented 27 focus group discussions across the Northern Communal Areas and 11 in Opuwo Rural and Sesfontein constituencies. The focus group discussions in Kunene comprised between 5 and 10 pastoralists, included respondents from both genders, and were facilitated by trained enumerators from the region, Pinga Hoveka and Lionel Karamata. The focus groups lasted between 60 and 90 minutes and covered topics ranging from changing environmental conditions to livestock marketing, in addition to perceptions of NamLITS. Interviews were originally transcribed, translated and analysed in 2020.

Finally, between January and September 2022, Tjiseua Venoo conducted in-depth interviews with ten farmers and three agricultural extension officers in five pastoralist communities (see Map 1). Interviews were split between Ovaherero and Ovahimba respondents. The in-depth interviews comprised four sections: background and context, understanding and perceptions of NamLITS, personal experiences with NamLITS and pastoralist responses to NamLITS. Each interview took place in private and lasted between one and three hours. Interviews were transcribed and translated in November 2022. Interview data was compiled and analysed between September 2022 and November 2022 by the three co-authors. Because the study is based on observational data, causal claims should be treated with appropriate modesty – our aim is to investigate possible channels of NamLITS' influence rather than to defend general causal claims. Throughout the research process, utmost care was taken to ensure confidentiality of respondents. In-depth interviews were conducted in private, and any personal identifying information (such as name, profession, contact information) was scrubbed from interview transcriptions by the original enumerators before they were reviewed by other members of the analysis team. All original interview data was stored in an encrypted folder and removed from all personal electronic devices.

Sedentist assumptions in the NamLITS programme

Livestock identification and traceability systems are undergirded by a model of livestock production that is suffused with sedentist assumptions about the movement and ownership of livestock (Prinsloo 2017). Like many 'traveling models' before it, the LITS model both describes social and economic processes and facilitates active intervention into the processes it describes.

Our first empirical contribution is therefore to document the incongruities of the LITS *model* with the social and economic lives of pastoralists, as well as the impact of the LITS *intervention* on the pastoralist communities it ostensibly serves.

In this section, we review two sedentist assumptions that informed the design of NamLITS and how those design assumptions affected pastoralist communities in both predictable and unpredictable ways: assumptions about *boundedness* regarding the movement of cattle during the livestock production process, and assumptions about the desirability of *formalisation* in the process of registering ownership of cattle under the name of a single livestock owner.

Regularity and boundedness of livestock production

NamLITS is designed to trace the movement of cattle over the animal's life-cycle. However, the conception of 'movement' embedded in NamLITS assumes a standard sedentist model of livestock production (Prinsloo 2017). For sedentary livestock owners south of the VCF, 'movement' of livestock occurs at three predictable points in time: (1) livestock are sold and moved from one establishment (primary production site such as farm or communal settlement) to another; (2) livestock are moved from the establishment to the feedlot; (3) livestock are moved from the feedlot to the abattoir.

For sedentary livestock owners, the introduction of NamLITS reporting requirements had a limited impact because reporting requirements came into effect at a few distinct, well-recognised moments in the animal's life-cycle where reporting was already normalised: the transfer of livestock between farmers and feedlot owners and between feedlot owners and abattoirs. In other words, NamLITS was designed for livestock farmers who operate within a bounded production area and according to regularised movements. This is reflected in the basic design of NamLITS' bureaucratic infrastructure. First, when farmers register livestock movements, they are expected to be able to tell DVS officials a specific new location where livestock will be held; there is no framework for registering cattle movements between multiple areas at a time. Second, DVS facilities are located in major town centres, near livestock markets. These locations are sensible under the assumption that animal movements occur parallel to transfers of animal ownership.

Assumptions of regularity and boundedness were more questionable when NamLITS was introduced to pastoralist communities north of the VCF in 2010. The reason is simple: whereas animal movements between farms are predictable and relatively infrequent for sedentist livestock owners south of the VCF, animal movements among Ovaherero and Ovahimba pastoralist communities

are frequent and must be undertaken with flexibility and responsiveness to changing ecological conditions.

For example, as this paper is being written, one of the co-authors (Tjiseua Venoo) is splitting his livestock into two groups to respond to grazing shortfalls in his home region of Kunene. He will maintain this herd split until the return of heavy rains in March or April, and will move both herds between communal settlements, approximately 70 kilometres away from one another, in response to fodder availability. For each movement, Tjiseua Venoo secures approval from family members and/or local traditional authorities in the new community. Decisions about animal movements like Tjiseua Venoo's are far from infrequent. According to focus group discussions with more than 30 Ovahimba and OvaHerero farmers conducted in 2013 (Coppock et al. 2022), movements between pastures associated with different communal settlements are central to pastoralist livestock production strategies, which rely on animal movements to harness the benefits of ecological variability (Krätli et al. 2015). Many Ovahimba and OvaHerero pastoralists move animals between pastures on a monthly, weekly or even daily basis as ecological conditions demand. In many cases, these pastures are located in new conservancies or are registered with different communal settlements according to NamLITS records. Under such conditions, it is financially and logistically onerous for them to obtain permits every time they move animals. Tjiseua Venoo is among the relative minority of livestock owners in the NCAs who can afford to obtain permits for every livestock movement, as he works south of the VCF and moves his animals only once or twice a season.

For pastoralist communities who are used to moving livestock between production sites in response to ecological circumstances, the NamLITS' requirements to document livestock movements between establishments for the DVS are onerous and often insurmountable. To obtain appropriate documentation for animal movements, an OvaHerero or Ovahimba livestock owner must (1) obtain written approval from the 'approved' local traditional authority in the establishment where they want to move the cattle; (2) show the written approval to the DVS animal technical or agricultural extension officer, who is usually located in Opuwo or another major town; (3) obtain approval from DVS officials for animal movements; and (4) update animal ear tags to show the new grazing location of the animals (Interview 2022). These documentation requirements demand time, resources and bureaucratic knowledge that many pastoralist communities lack. Even when pastoralists can actively plan livestock movements over a grazing year, each movement must be registered independently with DVS.

NamLITS reporting requirements have severe material implications for pastoralists. For pastoralists who can meet the requirements, NamLITS

represents a significant new tax in the form of fees, transportation costs and lost time that were not required before 2010. A successful farmer in Kunene explained, 'For example, it is expected for a farmer in [farmer's village] have to go to [town 50 km away] to get a permit, and [later] come back to take the animal to [same town 50 km away] to sell. It is a whole crazy arrangement.' (Interview 2022) An agricultural extension officer noted 'To move to Omusati, you need a NamLITS permit. Some farmers are staying at the borders of Kunene and Omusati, yet they have to drive to Opuwo [Kunene's capital] which is tough for pastoralists' (Interview 2022).

For pastoralists who are unable to meet its reporting requirements due to a lack of money and/or time to obtain permits, NamLITS is a significant constraint on the degree to which they can move their livestock, even in response to difficult ecological conditions. The result is that NamLITS may curtail the systems of pastoralist livestock production that pastoralist communities have pursued for decades, and which are central to both pastoralist livelihoods and the ecological sustainability of north-western Namibia. As one farmer lamented, 'Once they stopped by at [my] road block because I did not have a NamLITS permit, only a letter from my village headman. We had returned home... it is a waste of time and waste of resources. I do not like it. They must use [NamLITS] out there at their [commercial] farms and leave us do our old way [of herding]' (Interview 2022).

By criminalising the actions of these pastoralists who are unable to meet the official reporting requirements yet must move their livestock, NamLITS has created a class of criminal livestock owners where none previously existed. These livestock owners live in a legal grey zone, where they hope to avoid interaction with the government out of fear that the government will impose fines and fees if the livestock are discovered to be grazing outside of their designated zone. (Government officers indicated that fines of pastoralists are relatively rare. More commonly, animals are prevented from moving or being sold until farmers pay for required ear tags.) This means that non-compliant livestock owners can only sell their cattle at lower prices through informal markets, often avoid participation in government-sponsored vaccination drives and post-drought restocking programmes, do not engage legal authorities when livestock are lost or stolen, and avoid being counted by the government when it tries to count livestock in order to assess ecological risks in different establishments (Interviews 2022). A farmer in Kunene complained, 'I wanted to sell cattle but everything was in my father's name and he was away at a funeral, so I could not sell. Luckily, we do not move such long distances. we only move between mountains... just move without notice' (Interview 2022). Many pastoralists reported leveraging personal connections to politicians and government bureaucrats to work around restrictions

on animal movements; this trades formal dependence on NamLITS bureaucracy for informal dependence on individual patrons. A university-educated livestock owner in Kunene explained, ‘in terms of livestock movement no one is complying, to be honest – if the police find people moving animals, [the people] normally call Kunene regional command. My uncle was moving for a wedding from one village to another and he was sent back, he called [and solved the problem].’

In short, NamLITS is designed based on sedentist assumptions about the boundedness of livestock production. When NamLITS was imposed on mobile livestock owners, it created an onerous system of fees and reporting requirements that, even a decade later, pastoralist communities still struggle to meet. Additionally, NamLITS has limited pastoralists’ ability to move livestock to take advantage of ecological variability and pushed some pastoralists into a legal grey zone where they must avoid interaction with formal livestock markets as well as the Namibian government.

Formality of livestock ownership

In addition to tracking movement of livestock over the course of the livestock production process, NamLITS endeavours to link every head of livestock in Namibia to an individual livestock owner (Prinsloo 2018). The design of NamLITS emphasises individual livestock ownership for two reasons. First, individual livestock ownership is the norm for sedentist livestock owners south of the VCF, where NamLITS was originally developed. Second, the DVS sought to ensure that they could hold individual livestock owners legally responsible for lost, stolen or diseased cattle (Prinsloo 2019).

NamLITS established a rule of individual livestock ownership through the Radio Frequency Identification (RFID) ear tagging system that forms the fundamental basis of NamLITS (Prinsloo and Villiers 2017). Every animal is legally required to have an ear tag that electronically identifies its current owner and encodes the animal’s ownership history. If the animal is sold or loaned to another individual, the new owner is legally required to change the ear tag.

However, the individualised conception of livestock ownership formalised in NamLITS is deeply at odds with the diverse concepts of cattle ownership held by pastoralist communities in north-western Namibia (Bollig 1997, 2020; Groves and Tjiseua 2020). Ovaherero and Ovahimba pastoralists have a rich vocabulary for categorising the origination, usage rights and cultural valence of different livestock ownership arrangements in their communities (Hangara 2017; Hangara, Kavari and Tutjavi 2020). These varied conceptions of livestock ownership include *ozongonga*, or livestock purchased at an open market and individually owned in a fashion analogous to sedentist livestock

ownership; *ozondjumba*, or livestock that have been loaned from a wealthier to a less wealthy pastoralist; *eta*, or livestock that are designated for inheritance; and *ozomwaha* / *ozongekera*, or sacred cattle with unique cultural value and usage restrictions.

These diverse conceptions of cattle ownership encode fundamental features of the Ovaherero and Ovahimba social structure (Hangara, Kavari and Tutjavi 2020). For example, designating livestock for inheritance by a specific family member (*ozongonga*) is seen as a way of inviting the younger family member to continue maintaining livestock in the community and ensuring their ability to continue raising livestock into the next generation. Similarly, livestock loans between wealthier and less wealthy pastoralists (*ozondjumba*) encode systems of patronage that are fundamental to the social and political fabric of pastoralist communities (Bollig 1997, 2010; Bollig and Menestrey Schwieger 2014).

In the case of inherited livestock, the processes of transferring ownership relations is gradual: cattle are first owned wholly by the older family member, then owned by the older family member but designated for future ownership by the younger family member, then increasingly controlled by the younger family member as the younger family member makes more and more management decisions for the animal, then finally transferred entirely to the younger family member when the younger family member moves to a new area or the older family member passes away. Crucially, these distinctions are socially negotiated and informal. They are therefore uniquely ill-suited to fit within an electronic and individualised ownership registration system.

Because of these multivalent conceptions of livestock ownership, many pastoralist families had challenges bringing their designations of livestock ownership in line with the single, static concept of ownership implied by the NamLITS RFID ear tagging system. If an animal was owned by a wealthier livestock owner but managed by a younger and less wealthy community member to whom it had been loaned, who ‘owns’ the animal for purposes of disease tracking? If an animal is designated for inheritance by a younger family member who is going to school in town, such that the animal could only be sold or slaughtered with the family member’s approval, should the animal be tagged as owned by the younger family member or the older family member who is managing the cattle?

These conceptual challenges are compounded by more basic bureaucratic difficulties. In order for an individual to secure an individualised brand that can be linked to a RFID ear tag, they must go through a burdensome bureaucratic process, including securing a letter from the local traditional authority; filling in a government form accessible only online or in a regional capital; paying an application fee; waiting for a brand certificate to be created by the DVS; taking

the brand to the local DVS office and getting it linked to their establishment; and finally welding the unique brand mark corresponding to the ear tag and branding all cattle with the mark. For pastoralist families who keep their cattle in one herd, these steps are onerous, if not prohibitively time-consuming and expensive. As a result, many pastoralist families link the entire family herd to one older family member who maintains a brand for the family, even as internal conceptions of livestock ownership remain fluid and variegated.

The result is a system in which NamLITS ‘sees’ a version of livestock ownership for many pastoralists that is at odds with pastoralists’ own understanding. For example, a family in Tjiseua Venoo’s community might manage 100 cattle. According to the family’s understanding, 60 head are owned by the family patriarch, 20 are split among two younger family members, 10 head are designated for inheritance by the patriarch’s grandchildren, and 10 head are loaned out to a cousin who lost his livestock in the previous years’ drought. According to the NamLITS RFID system, an elder female member of the family, who the family decided would hold RFID ear tag because she can read and write and does not work in town, owns all 100 cattle. The other family members, as seen by government agencies, banks and non-government organisations, own none.

The incongruence between the sedentist/individualised conception of cattle ownership assumed by NamLITS and the variegated conceptions of ownership held by pastoralists themselves creates a range of challenges for pastoralist communities. For example, because it is formalised and recognised by the national government, the NamLITS process for identifying ownership has become the standard model that banks use for determining the wealth and creditworthiness of farmers north and south of the VCF. Similarly, young pastoralists hoping to secure loans for school fees, health expenses or farming equipment often struggle to prove their creditworthiness because cattle that they have inherited have not yet been re-registered into their name.

Second, NamLITS ear tags are often used by the government for determining eligibility for post-drought restocking initiatives and other forms of government aid. As one pastoralist said, ‘I think recently many people are registered not because of movement or traceability but so they can benefit from government schemes which require people to have their own brand’ (Interview 2022). This also creates a perverse arrangement in which pastoralist communities are driven towards formalisation of animal identification (and thus livestock ownership status) during times of drought and scarcity, exactly when conceptions of ownership are most fluid. As one farmer described it:

[the government] said only farmers can apply and I could not apply because they said I was not a registered farmer. They even refused to give drought fodder because we did not have a brand, so we ended up buying

from other registered farmers who were registered and did not have animals. It disadvantaged us a lot. Since the drought, almost everyone got their brand registered, I have seen it in October during vaccination that everyone had their brand certificate. (Interview 2022)

Another farmer said,

the painful thing is when the government does not enrol us under re-stocking programme because we are not registered so we missed out on a very important programme that would have boosted us after the drought. Additionally, we have double ownership. For example, the owner might have a brand but the person tasked to sell has a different brand ... how does that get reflected? (Interview 2022)

Finally, formally registered counts of livestock ownership can influence community decisions about the management of common pool resources like grazing and water (Menestrey Schwiager 2017; Bollig 2020). Decisions about how much each individual or household in a community should contribute for communal water services, or what limitations should be placed on the number of livestock an individual/household should be able to hold in order to preserve grass, are often deeply contentious (Bollig and Menestrey Schwiager 2014; Menestrey Schwiager 2019). Many decisions depend in principle on the number of livestock held by an individual/household. As a result, households keep information about livestock holdings extremely private. However, NamLITS gives government officials a legible, if not always accurate, quantification of livestock holdings by different individuals. This enables them to influence contentious community debates about appropriate payment systems for water usage by disclosing information gathered through NamLITS (Menestrey Schwiager 2017).

In sum, the LITS ‘travelling model’ encodes a formal, individualised conception of livestock ownership that is incongruent with the way ownership is understood and enacted by many pastoralist communities. More broadly, the NamLITS conception of ownership has the potential to actively reshape ownership relations rather than merely recording them, pushing pastoralist communities to translate complex, socially negotiated forms of ownership into the static, individualised forms of ownership that NamLITS is designed to recognise.

The challenges introduced by NamLITS should not overshadow meaningful benefits. For example, some pastoralists contend that NamLITS deters cattle theft by making it more difficult to move unregistered cattle, and applaud the ease with which NamLITS enables stolen and lost cattle to be recovered. A farmer said, ‘The fact that you need authorisation for movement and change of ownership – I believe it is for the better. Normally young people will steal and move animals with ease without NamLITS’ (Interview 2022). Support

for NamLITS is especially strong among agricultural extension officers, who argued that that animal registration facilitates the efficient delivery of government services and drought relief because it becomes easier to identify farmers' livestock holdings and losses (Interview 2022). Finally, it remains possible that the NamLITS programme's efforts to meet international livestock safety standards will allow pastoralists to benefit from international livestock export opportunities in the future, although these opportunities have yet to be meaningfully realised (Rasmeni 2022).

Pastoralist responses

'Travelling models' are not imposed on passive subjects (Behrends, Park and Rottenburg 2014). Instead, affected communities decide whether, when and how to comply, avoid or actively resist the application of new development models to their communities (Schnegg and Linke 2016). Our second empirical contribution is therefore to document both compliance and circumvention strategies employed by pastoralist communities in Namibia in response to the introduction of NamLITS.

Compliance with the NamLITS is costly but not impossible for wealthier and more formally educated pastoralists. To comply with NamLITS, pastoralists must (1) register a brand/ear tag for the individual livestock owner; (2) secure approval from local traditional authorities for any livestock movements outside of a designated establishment or any livestock purchases or sales; and (3) use the letter from the traditional authority to secure a permit for movement/sale from the DVS office in Opuwo, Kunene's regional capital.

The author of this study, Tjiseua Venoo, has chosen to take these steps in order to comply with NamLITS. His decision is made possible by the fact that he has reliable transportation and a non-farm income, and it is made necessary by the fact that he works as a researcher and consultant in the formal economy and so needs to remain in compliance with federal law. However, the costs of Tjiseua Venoo's compliance with NamLITS requirements are significant. During a November–December 2021 movement of livestock from Omutirapo to Otjandaue, Tjiseua Venoo spent 3.5 days and NAD 3,500 (US \$214) securing approvals and facilitating transportation for a herd of 190 goats, 36 sheep and 28 head of cattle (Tjiseua Venoo's herd is considered small to mid-size in his Ovahimba community). Other farmers estimated costs between NAD 1,000 and 4,000, approximately 10 to 50 per cent of the monthly consumption of an average household in Kunene (National Statistics Agency 2016). Had Tjiseua Venoo's livestock been in more desperate condition, or had the cost been incurred at the same time as school fees were due, he may have

had to make a difficult choice between leaving his livestock in an area with insufficient forage to sustain his cattle for the dry season, moving his livestock without complying with NamLITS requirements, or forgoing other life expenses in order to move his livestock in compliance with NamLITS. He predicts that within the next two months, he will have to move the livestock once again, rehashing the same set of difficult choices.

Nonetheless, many pastoralists do comply with NamLITS to varying degrees. In interviews, pastoralists submitted a variety of justifications for compliance, ranging from a desire to avoid breaking the law to the belief that RFID ear tags reduce the likelihood of theft and increase the likelihood of lost livestock recovery. However, even these justifications for NamLITS were offered with tepid enthusiasm. According to one Ovaherero pastoralist:

maybe to start with the benefits. The benefits can be that it helped reduce the free movement of animals by people who have intention to steal animals. Each person is required to have a permit, and the person who is giving the permit must be convinced beyond a reasonable doubt that the animal is yours. And the other benefit would be ... what now? ... let me go to the challenges. (Interview 2021)

It is important to note that not a single pastoralist interviewed supported the NamLITS programme on the grounds by which it was originally conceived: the increased likelihood that traceable animals would be eligible for sale on international markets. Over a decade after the introduction of NamLITS in the north, the prospect of pastoralists in Kunene selling their livestock on international markets seems so remote that it is almost never mentioned. Farmers continue to face a range of structural obstacles to participation in the international livestock trade – and many do not express an interest in participating – even as they are required to meet onerous requirements for market participation. Among other obstacles, Northern cattle are frequently of too low a body condition grade for international export, many pastoralists distrust the state-run cattle auction institutions (which have existed since apartheid [Miescher 2012]), and many pastoralists value cattle for reasons other than their market utility, such as their significance as a customary source of wealth and status (Ferguson 1994; Coppock et al. 2022).

A second and more common response to the imposition of NamLITS in pastoralist communities is refusal or partial compliance. A particularly common strategy is exemplified by an Ovahimba pastoralist from southern Kunene. He said that he never uses a NamLITS permit when his cattle reproduce or are moved; most of his cattle are linked to him by traditional notches on the animal's ear designating the livestock owner, and he can differentiate his animals individually by their colour, body type and personality. He said that he and his herders knew the relevant history (for example, when and from whom the

animal had been bought, sold or moved) of the animals without electronic histories stored in ear tags, which he suspects are often incomplete and/or incorrect. However, the respondent strategically engages NamLITS in two ways. First, the pastoralist registered an individual brand identifier to his name so that he would become eligible for government services, such as drought relief and government vaccinations. Second, if the best available buyer for a given animal comes from the formal sector, the pastoralist will purchase an ear tag for the animal(s) to be sold and complete the necessary documentation to facilitate the sale. However, for most of the animals in his herd and the majority of the livestock movements he undertakes, the pastoralist simply ignores NamLITS requirements.

Pastoralists also refuse participation in NamLITS by registering large numbers of livestock to a single family member despite true ownership being divided between many members of the family network. This practice saves the family the time and expense of registering multiple ear tags and the subsequent requirement of registering intra-family livestock transfers. The result is that DVS officers often report finding one Ovaherero or Ovahimba family member with 200 or more cattle and many related family members or households with no cattle at all. As discussed previously, when these numbers are then used by the government, financial institutions or non-governmental organisations, they generate a distorted picture of the distribution of livestock wealth in pastoralist communities.

Another avenue for refusing participation in NamLITS is presaged by the earlier discussion about the ways in which NamLITS livestock registration is used by local government agencies, community-based natural resource institutions and non-governmental organisations. Because NamLITS offers the veneer of formality and objectivity, many institutions and communities use NamLITS registration numbers to determine eligibility for government drought relief and animal restocking programmes and contribution requirements for water point committees. Combined with deep historical mistrust towards government surveillance of livestock, these factors lead many Ovaherero and Ovahimba communities to keep the number of livestock owned by a given household a strictly guarded secret. Pastoralists report going to extensive lengths to prevent the government or other community members from observing their true livestock numbers, including splitting their herds, loaning out cattle to less wealthy family members and refusing to tag their cattle or register them formally with the government (Menestrey Schwieger 2017).

This can lead to awkward situations: a DVS official reported being told by a pastoralist that they own 10–15 cattle, only to have 250 cattle appear when DVS offered free vaccinations or anti-tick treatments. Pastoralist justifications for the discrepancy range from long silences to knowing chuckles

to references to (often non-existent) family members who ostensibly own the excess livestock. This strategy of obfuscating livestock holdings did not originate with NamLITS. Instead, these actions are best understood in the context of Namibia's recent colonial history, when the state used ledgers of livestock as a means of regulating Black households' movement and wealth. In the face of such policies, partial compliance and selective release of information have long been the only viable strategies of resistance available to Ovaherero and Ovahimba communities (Bollig 2020).

A final category of pastoralists who refuse full compliance with NamLITS are those who tag their cattle but do not register livestock movements. As discussed previously, formal permitting for livestock movements is onerous, if not impossible, especially during droughts. As a result, many pastoralists get approval for livestock movements from local traditional authorities but never submit the movement permits to the DVS office in Opuwo. For many such pastoralists, the idea that moving their cattle according to the same strategies they have used for decades, if not generations, is now illegal is difficult to understand. In interviews, two pastoralists offered a resigned acknowledgement that their movements do not comply with NamLITS requirements, followed by a slew of practical considerations that the pastoralists believed overwhelm legal obligations.

Legal enforcement against pastoralists who opt out of registering their livestock and livestock movements is challenging, if not impossible, for under-resourced bureaucrats in Namibia's DVS and Agricultural Extension offices. In interviews, one pastoralist described moving his cattle between establishments along informal routes that are seldom observed by government officials. The only time that government officials directly observe whether animals have been tagged, outside of points of sale, is during annual vaccination drives. However, while there are provisions available for DVS officials to conduct on-site ear tagging for registered livestock owners, new brands and ear tags cannot be registered to new owners. As a result, all a farmer needs to do to avoid ear tagging is indicate that his or her cattle are owned by a specific family member without a registered ear tag, and the local bureaucrat is powerless to act.

These simple forms of refusal challenge the fundamental justification of NamLITS in pastoralist communities. If cattle are only tagged at the point of sale, tags provide the pretence of traceability while ignoring the many movements and transfers (e.g. loans and sales) that the animal underwent prior to the final sale. If cattle are only linked to one family member rather than the true owner, it is impossible to hold the livestock manager accountable for illegal movements or sales. If NamLITS incentivises wealthy pastoralists to avoid vaccination drives because they would have to tag their livestock, this increases rather than reduces the risk of disease. Finally, if NamLITS creates a

large category of ‘criminal’ pastoralists who do not register the movements and production of their cattle, this generates a suspicion and division between pastoralists and DVS officials that undermines efforts to monitor and respond to livestock thefts and disease outbreaks. In interviews, DVS officials expressed frustration that NamLITS had introduced new frictions in their relationships with non-compliant pastoralist communities (Interview 2022).

Taken together, pastoralist responses to NamLITS suggest that pastoralists are far from passive recipients of state-imposed surveillance, bureaucratisation and taxation through animal traceability systems. Pastoralists are keenly aware of the ways that NamLITS assumes a sedentist mode of livestock production that is incongruent with their own lived reality. More often than not, pastoralists respond to these frictions by wielding ‘weapons of the weak’: refusing, undermining or actively avoiding participation in NamLITS, rendering it an incomplete if not actively distortionary picture of animal holdings and an ineffective if not actively counterproductive approach to disease mitigation in Namibia’s north-western communal areas (Scott 1987). Pastoralists’ strategies extend a centuries-long history of pastoralist resistance to interference and control by external actors (Van Wolputte 2004; Friedman 2007)

Conclusions and recommendations

This paper has analysed the sedentist assumptions underlying the Namibian Livestock Identification and Traceability System (NamLITS) and their implications for pastoralist communities. We argue that LITS represent a ‘travelling model’: an analytical representation of reality that is gradually transported across social, economic and political boundaries. NamLITS was conceived, designed and implemented for sedentist livestock owners to facilitate their participation in international livestock markets. As a result, NamLITS is designed around assumptions of geographically bounded livestock production and formal and individualised livestock ownership. When the ‘travelling model’ of LITS was taken out of commercial and sedentist settings and implemented in pastoral communities, there were limited efforts to reshape the model to suit the pastoralist context. Premising NamLITS on sedentist assumptions has resulted in a range of deleterious consequences for pastoralists, from onerous restrictions and fees to distortions of pastoralist creditworthiness by the financial sector. In response, pastoralists have engaged in a variety of practices to circumvent or undermine NamLITS requirements, often undermining the ability of the system to accomplish its original goal of limiting the spread of livestock disease. The tensions animating the NamLITS programme are the latest in a long history of contestation between external efforts to control

livestock mobility and diseases in north-western Namibia and pastoralists' efforts to resist them (Bollig 2020).

What should be done? We identify three important reforms. First, the Namibian government should identify, and reduce implicit fees associated with obtaining registration and animal movement permits, or compensate pastoralists for the cost. NamLITS as currently conceived represents a regressive tax, imposing fees on the poorest livestock owners in Namibia to the benefit of wealthier international exporters south of the VCF. One option is to allow local traditional authorities to provide registration tags, rather than requiring farmers to travel to regional DVS offices to obtain permits. A second option is to waive fees or make e-permitting processes more accessible to pastoralist communities. The government of Namibia has taken encouraging initial steps to reduce the administrative burdens of livestock registration (e.g. by reducing fees and supporting outreach by agricultural extension officers) (Interviews 2022).

Second, the Namibian government should change NamLITS policy to allow families or households to register one ear tag for multiple family members, rather than requiring individualised livestock ownership. The current policy forces pastoralist communities to misrepresent livestock ownership patterns, since livestock ownership in pastoralist communities is more complex than a simple individual ownership relation. This misrepresentation distorts how they are viewed by banks, community-based organisations and government welfare programmes. NamLITS should be modelled based on what pastoralist communities are already doing in practice.

Finally, the Namibian government should take actions to ensure that the benefits of animal traceability are returned to the pastoralist communities who shoulder a significant portion of the cost. Recent steps to identify international export opportunities for farmers north of the VCF are an encouraging step in this regard, although they were quickly undermined by commercial farmers warning about livestock disease despite NamLITS implementation (Rasmeni 2022). However, the government of Namibia should address the larger structural inequalities that separate pastoralist communities north of the VCF and sedentist farmers south of the fence. Most significantly, it means questioning the existence of the VCF itself, which continues to ensure that pastoralist communities in the north are unable to participate meaningfully in the livestock economy, even as they are increasingly surveilled, taxed and regulated in order to protect it.

Larger questions – about whether livestock traceability, international livestock exports, and integration of pastoralist communities into national livestock markets are inevitable and/or desirable goals for national livestock development policy – are beyond the current scope of the paper but demand careful consideration.

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Max Mauerman is a Research Staff Associate at the International Research Institute for Climate and Society, Columbia University Climate School. He is also an incoming PhD candidate at the Department of International Development, University of Reading.

Email: max.mauerman@gmail.com

Dylan W. Groves is an Assistant Professor at Lafayette College.

Email: dylanwgroves@gmail.com

Venomukona Tjiseua is a freelance researcher with a master's degree in Sustainable Agriculture from Kunene region, Namibia.

Email: tjiseuavenoo@gmail.com