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Indigenous Knowledge/s of Survival: Implications for Lifelong Learning among the Basotho Herding Fraternity

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Abstract

This article foregrounds Basotho male herders' interaction with their environment as a productive platform for informal learning activities poised to address the herders' immediate and context-specific needs. Indeed, understanding how the herders interact and learn through their daily engagements with their environments has a potential to provide substantive baseline insights that could inform Lesotho's nonformal education providers and policy-making forums. Drawing on indigenous knowledge theory, the article explicates the sociocultural perspective of indigenous knowledge with emphasis on how it is acquired and applied by male Basotho herders in order to improve their lives and address their daily herding challenges. The study adopted a qualitative research methodology with a sample of 30 snowball-selected Basotho male herders using interviews, transect walk, and photo voice as its methods of data collection. The data were analysed using the pattern coding method. The findings revealed two main forms of indigenous knowledge that the herders acquired through the herding practice namely, indigenous knowledge as local science and indigenous knowledge as local practice. The study recommends more scientific research that documents Lesotho's specific indigenous knowledge—to develop a holistic nonformal education curriculum and to nurture the rare indigenous knowledge skills of the Basotho male herders.

Keywords: indigenous knowledge, local practice, local science, nonformal education, male herders, Lesotho

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Introduction

Livestock herding is generally semi-nomadic in nature where families or herders relocate—temporarily or seasonally—from home together with their livestock to spend time away in cattle posts in search of pastures. (Dyer, 2014; Seno & Tome, 2013). The semi-nomadic nature of herding, and the inaccessible herding topography, limit access to social services such as education and basic health facilities for herders because mainstream provisions and policy making do not cater for herding (Makoa & Zwilling, 2005; Pitikoe, 2016; Pitikoe & Preece, 2016). However, the herders are intelligent—as evidenced by their resilience amidst uncomfortable and precarious circumstances. Stories on herding in Lesotho outline how males are initiated into herding at a young age, for example, six years old to look after sheep, goats, and calves within a reasonable distance from home (Pitikoe, 2016; Pitikoe & Preece, 2016) under a close mentorship of the elders. Generally, herding know-how skills are acquired informally through oral transmission from the elders and family members, and continue to be passed on, mainly orally, from one generation to the next.

Herding for Basotho males serves two main purposes. Firstly, to accumulate personal livestock wealth, whereby they either look after the family's livestock or get hired as herders and, in turn, are paid in livestock at the end of a minimum period of 12 months. Secondly, herding is a source of employment for most males (Makoa & Zwilling, 2005). In cases where the family's finances are compromised, the first born male becomes the first resort, by virtue of his social role as the provider, to seek employment from wealthy livestock owners as herder, regardless of age and education (Pitikoe, 2016). Pitikoe further noted that the herder and the employer enter into an agreement on the payment terms for each completed year—generally in the form of live animals, the number varying depending on the owner. For some herders, payment comes in the form of 12 live sheep per year, while others are paid with a live cow. Herders can choose to either keep the animals or sell them for cash in order to provide for family needs (Makoa & Zwilling, 2005). These herders also choose a personalised earmark as identification for their livestock kept as savings or for selling later for income generation.

Poverty is identified as a global impediment to education access, a reality from which Lesotho is not immune (UNESCO, 2012). The Government of Lesotho identifies rural areas as the most poverty-impacted sector of Lesotho, with specific reference to the child-headed, the elderly-headed, and the illiterate-headed households (UNESCO, 2012). Although in 2005, the Lesotho government introduced a pension for all citizens aged 70 years and older in an effort to bridge the poverty gap (Croome & Mapetla, 2007), Human Development Index (HDI) statistics have reported a rapid decline in Lesotho's key development areas of education, health, and life expectancy (UNDP, 2014). Lesotho has recorded a consistently low HDI ranking: 120 out of 162 countries in 2001, 162 out of 187 countries in 2014, and a ranking of 161 out of 188 countries in 2015 (UNDP, 2014; UNDP, 2015). This could be attributed to Lesotho's political instability and the continuing challenge to keep people in school despite the introduction of free primary education (FPE) in 2000. A decline in HDI adversely impacts on poverty-related illnesses, labour force, and the national economy. In an attempt to counter the effects of the escalating economic crisis, male Basotho are compelled to withdraw from their formal educational activities to look for employment, mainly as hired livestock herders because of their low literacy levels.

Lesotho's education system comprises both formal and nonformal education under the guardianship of the Ministry of Education and Training (MoET), with formal education receiving more support than nonformal education (NFE). However, NFE is considered a potential provision for herders in spite of it being the less favoured educational provision. There is an absence of clearly defined policy on NFE and open distance learning to support an effective implementation of NFE in Lesotho (MoET, 2005; MoET, 2008). The data presented by UNESCO (2009) on the planned age distribution of Lesotho's primary education system stipulated the age range for compulsory education as 6–12 years, which means that Lesotho's primary education level extends for 7 years. While Lesotho is applauded for higher reported female literacy in Africa, as well as for implementation of FPE in 2000, in the absence of a policy that

binds parents to compulsory education access for their children, the country's formal education continues to experience challenges pertaining to male retention. Most males drop out of the formal provision due to "lack of parental involvement and poverty" (Zeelen, van der Linden, Nampota, & Ngabirano, 2010, p. 1), to join the herding community. The age-old herding culture has, therefore, rendered formal education in some quarters in Lesotho, inferior to herding—due to the perception that the hardship it entails, better qualifies herding as a rite of passage into manhood for Basotho males (Mohasi, 2006).

The aim of this article is to understand the indigenous forms of knowledge that Basotho male herders have acquired, and to understand how this knowledge is utilised as survival strategies to overcome the challenging demands of their daily lives in rural Basotho communities. The main focus is the application of indigenous knowledge as a coping strategy for the herders' primary health care and nutritional purposes as well as for veterinary care. In particular, the article denotes two distinct but intricately intertwined logics by which the herders creatively engaged with and organised knowledge constructions in their contexts, namely, indigenous knowledge as local science and indigenous knowledge as local practice. These indicated how the herders engaged with the conceptual and theoretical abstractions of local knowledge as well as how they intentionally applied this in their daily practice as a survival mechanism. We also show the implications of the Basotho herders' indigenous knowledge, both as local science and local practice, for the nonformal education curriculum content and pedagogy in Lesotho.

Understanding Indigenous Knowledge

Indigenous knowledge theory (Lekoko & Modise, 2011; Schlee & Shongolo, 2014) guides this article. The concept of indigenous knowledge refers to context-specific knowledge, which is developed and embodied within the confines of culture, usually transmitted orally over time and generationally inherited (Ngozwana, 2015). Nyiraruhimbi (2012) identified three ways of looking at indigenous knowledge. First, as local science where knowledge is consciously developed over time using local technologies that bring about a significant change in the lives of the indigenous people, for example, the use of traditional herbs (Moteetee & Van Wyk, 2011). Second, as local practice where knowledge is developed unconsciously over time through trial and error—for example, arts and craft activities. Finally, the notion of knowledge as local memory, which denotes abstract and memorised knowledge as a result of the socialisation process—for example, folklore. The latest development on the global need to explore the role of indigenous knowledge as a meaningful contribution in development was raised in 2015 through the Sustainable Development Goals (SDGs) as highlighted, inter alia, by Osborne, Cutter, and Ullah (2015).

Indigenous knowledge is characterised as being oral, context-specific, and passed on through generations. The literature highlights that most adult males in Lesotho are either semi or complete illiterates, with higher numbers of illiteracy reported among Basotho herders. Some adult herders enrol in NFE programmes but they later drop out of the provision due to the semi-nomadic nature of the herding practice, coupled with the limited coverage of NFE learning posts reaching out to herders. Low literacy rates, coupled with an overall negative perception of the herders among the wider Basotho society, place the herders in a marginalised position. Nonetheless, their circumstances do not compromise their access to context-specific herding indigenous knowledge. As such, this article established deeper insights on resourcefulness and collectivism in the herder community as a tool for learning indigenous knowledge, and as a coping and survival mechanism among male Basotho herders, despite their low social status and literacy levels.

Methodology

This qualitative study adopted an interpretivist paradigm (Chilisa & Preece, 2005) in order to establish a better understanding of the indigenous knowledges that Basotho herders had acquired—and how

they were generated and applied in order to cope with their daily herding challenges. The study used interviews, visual participatory methods in the form of photo elicitation (Harper, 2002; Liebenberg, 2009; Wang & Burris, 1997), transect walk techniques administered in Sesotho (vernacular language in Lesotho), and the life history approach (Orton, Mitchell, Klein, Steele, & Horsburgh, 2013; Trahar, 2006) as methods of data collection. A group of 30 snowball-sampled herders aged between 18 and 45 years, from the three main geographic zones (lowlands, foothills, and highlands) participated in the study. The selected age range was intended to examine the herders' level of access to FPE, assuming that the younger herders (18–30 years) had stood a better chance of accessing FPE—with the likelihood of providing rich information on the dynamics of their lack of access in spite of the free provision in the country. Additionally, the study intended to explore whether the older herders (31–45 years) had been exposed to any forms of education other than FPE.

Scholars argue on photo elicitation in research, and how it is closely related to the emotional being of the photographer. For instance, Harper (2002, p. 13) posited that visual presentations such as photography "evoke . . . human consciousness," while Liebenberg (2009) argued on how the use of pictorial representations in research places the less empowered participants in the upper positions of "control and self-representation" of the understudied phenomenon (p. 13). However, Wang and Burris (1997) argued on the use of photo voice in research as serving three basic objectives. Firstly, the photo voice provides a recorded reflection of the capabilities and limitations that exist in the community. Secondly, photo voice in research provokes a dialogue on social issues of concern to the society. Thirdly, photo voice is a mechanism that disempowered communities can use to make their voices heard by policy makers. Based on the marginalisation of the participants, the study hoped to use the photo voice technique with an anticipation that we would have enough budget to purchase 30 disposable cameras, one for each herder, followed by a crash course on how to operate the cameras before we left the herders with the cameras to take pictures that would be discussed at a later stage. However, due to financial challenges, we could not buy the cameras—hence the approach diverted from photo voice into photo elicitation (Harper, 2002; Liebenberg, 2009).

Therefore, we engaged in a tedious training exercise using a digital camera and an iPhone on which the herders took turns to be trained. After that, every herder was allowed to take a sample picture to ensure that the instructions were well understood. We also identified a lead herder who facilitated that each herder took at least two pictures depicting their indigenous knowledge experiences and their application in their daily herding lives. The pictures were then uploaded, saved on a laptop in different folders labelled with the names of the herders; then we developed a laptop slide show of the pictures. Next, we gathered the herders around to view the slide show, and gave each herder an opportunity to explain the importance of his pictures. We also processed the sample pictures, labelled them with the herders' names, and handed them to the herders as a token of appreciation for their participation in the study. Most of the herders had taken pictures of themselves and their friends, stating that they had never taken pictures before, and that it was their first time to see what they (the herders themselves) looked like, because most of them did not have access to a mirror. This process was carried out throughout each of the three geographical regions of the study.

The transect walk empowers communities with context-specific problem solving skills (Shar, Kambou, & Monahan, 1999), while also helping the researcher to probe the community's perspective on the historical background of local resources, how the resources are used and distributed, and how they foresee the future of their land use. In this study, three transect walks were conducted—one per geographical region. In each of the transect walks the researchers were accompanied by one herder who was very familiar with the place being toured. The researchers linked the transect walk to the other techniques—interviews and photo elicitation—by explaining that the purpose of the transect walk was to see the reality of what had been discussed about the herding practice during the interviews, and to be more familiar with the herders' work places. CARE (2002) identified the transect walk as a potential ice-breaking tool to kick-start a research process. However, in our study, care had

to be taken for the safety of the female researcher around the herders, to protect her from being hurt; and for the male researcher too, especially in the foothills and highlands, to avoid him being taken to isolated places known for male initiation schools where he could have been forcibly captured to join a Basotho initiation school, as per the local custom. Culturally, males who have not gone through the initiation school can never be seen around the initiation school area while they are in session.

This therefore called for establishing a more solid rapport with herders before going out into isolated environments known to them alone. Before the transect walk, there was a mutual agreement that the herders would reveal the herding environment in as much detail as possible, identify the main resources and interesting things about herding that the herders would like to be known to the outside world, and ensure that the route was safe and accessible. The walks started from the lowest point to the highest, where we could see most of the resources such as cattle posts, grazing areas, dams, and forest trees, to mention a few examples. During the walks, we paused and probed anything emerging that might have not been discussed prior to the tour. We drew a sketch of the route we took, reported the conversation in the field journal, and audio recorded it. At end of the tour, we gathered the herders together to discuss the findings of the tour, and followed this with a schematic mapping of the tour using local resources.

The following steps were undertaken to seek the necessary ethical clearance for the study. One, securing a written ethical clearance from the UKZN Ethical Committee written prior the commencement of the field activities. Two, consulting the relevant stakeholders to seek their consent in conducting the study: the Non-Formal Education inspectorate and the Lesotho Distance Training Centre of the Ministry of Education and Training, the Lesotho Association for Non-Formal Education, and *Monna ka Khomo* [a man by cattle] Herdboys Association, the gatekeeping organisation of herders' issues in Lesotho. Three, observing the rights of the participants: consent to free participation and withdrawal, anonymity, consent for recording the proceedings of interviews and taking notes for future coding.

The different methods build an in-depth picture of the herding lifestyle. The descriptive nature of life history narratives explored the herders' coping mechanisms and ways of learning while herding. The steps we followed in the data analysis were as follows: first, we transcribed the raw data into the vernacular language and translated into English. Second, we engaged an English language teacher to reverse translate in order to ensure coherence in the meaning of the English and Sesotho versions. Third, pattern coding method was used to identify patterns and themes and, deductively, as cited in Arthur, Waring, Coe, and Hedges (2012), through the theoretical lenses to categorise the themes and explain the findings at a more abstract level using English language.

Findings

The lonely and semi-nomadic nature of herding practice limits opportunities of access to social services for herders and hence facilitates a close contact between the herders and the herding environment. As such, they tend to maximise the use of the limited resources in order to cope with their predicament. The findings also revealed that basic numeracy and literacy skills were an important requirement in herding for purposes of livestock monitoring and record keeping. Nyiraruhimbi (2012) asserted that indigenous knowledge could be conceptually organised into three main categories. These are indigenous knowledge as local science, indigenous knowledge as local practice, and indigenous knowledge as local memory. Local science in this case refers to consciously generated knowledge using local technologies for the purposes of improving the lives of those who have access to such knowledge; local practice refers to unconsciously developed knowledge over time through trial and error. We found two distinct categories in how the herders in this study engaged with indigenous knowledge, namely, indigenous knowledge as local science and indigenous knowledge as local practice. We elaborate on these in more detail in the following sections.

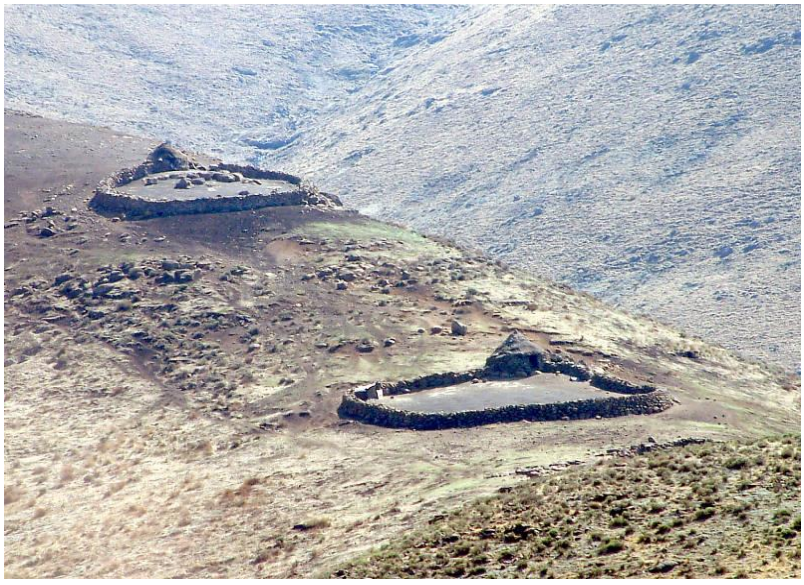
Indigenous Knowledge as Local Science

Local science underpins the role played by the elders and other herders in teaching and learning about traditional herbs for various purposes. Much of the herders' knowledge revolved around naming the different traditional herbs as well as their curative use both for human and animal health care. The findings were indicative of how herders' interaction with their herding environment facilitated the acquisition of new knowledge. The subthemes under the local science section included knowledge of traditional herbs for human medicinal use, animal medicinal use, and human nutritional supplements.

Traditional herbs for human medicinal use

The topographical and environmental challenges surrounding herding practice in Lesotho contribute to limited access to social services, including health. Figure 1 features a perspective of the cattle post terrain identified during a transect walk.

Figure 1: The Characteristic Cattle Post Terrain



The situation required equipping oneself with necessary primary or personal health care coping mechanisms by using available traditional herbs. The living conditions, shown in Figure 2, and the harsh weather also posed a health hazard for the herders. This meant the herders had to devise access to, and utilisation of, traditional herbs as immediate curative measures. The significance of these findings has a broader implication for the herder and nomadic populaces of India, Kenya, Tanzania, Nigeria, and other southern African contexts. Indeed, the notion of using traditional herbs both for human and veterinary purposes has wider implications beyond the context of this study. The findings indicated that the herders were also able to harness the use of traditional herbs to cure livestock ailments. The curative potential of some traditional herbs makes a special case for the need to document Lesotho-specific herding indigenous knowledges, and the extent to which these could be tailored and applied in other contexts where livestock herding is an important part of the society.

Figure 2: *Motebo* [A Cattle Post House]

The herders pointed out that the structure of the house was uncomfortable to live in and that, during heavy winter snowfalls, the risk of the roof falling into the house because of the weight of the snow, was high. The topography and the harshness of the weather motivated herders to learn about the traditional herbs and methods of preparation in which their peer herders as well as the elders had become resourceful.

Through photo elicitation (Harper, 2002; Liebenberg, 2009), herders presented that they used traditional herbs for human medicinal purpose:

> *Alex: The other herders have taught me about the various traditional herbs that I can use to cure some minor illnesses. This bunch [Figure 3] is ralikokotoana [dried and hardened] or monna motšo [a black man] and we mainly use it for servicing the body: curing gall-related problems and discharge. If chewed, it becomes a mild purgative.*

Figure 3: A Bundle of Ralikokotoana

> *Alex: This one [Figure 4] is called* moli *[African potato]. This one is good for cleaning the blood, promoting good blood circulation and opening the veins.*

Figure 4: A Bundle of Moli

Comrade: I use hloenya *[a locally well-known and trusted Basotho gall cleansing medicine—see Figure 5] when I feel dizzy or I suffer from gall, aloe when I suffer from stomachache or gall. I mix* letapisa *[closest English meaning for the name of this herb could be illness pacifier, see Figure 7],* hloenya*, and* lengana *[Figure 6, a minty Basotho herbal plant, often used as a nebuliser to treat flu or common cold-associated illnesses] to induce* ho k'hapha *[forced vomiting]. I learned to take care of myself this way from my parents.*

Figure 5: Hloenya Plant

Figure 6: Lengana Plant

Figure 7: Letapisa

While Bourdieu (1985) argued for the resourcefulness of a high number of networks for sharing among the members, he further identified the importance of *habitus*—which are the male herders' socially attained and habituated dispositions, informing the ways they behave, act, and think. The herders lacked social power and hence benefited from the social networks that existed among themselves, particularly the bonding social capital. It was through the cohesive nature of the herding community and the bonding social capital that existed among the herders that the local science indigenous knowledge was generated. This knowledge included the different preparation and administration methods to provide much-needed curative care for the herders' various primary health needs. The effectiveness of these herbs was evidenced by the fact that none of the herders in this study had ever visited a modern doctor or hospital for medical attention. We understand, however, that the herders used these herbs as part of their traditional Basotho indigenous knowledge—not specifically that of herders—as illustrated above when Comrade explained that he learned how to use these medicines from his parents.

Traditional herbs for animal medicinal use

The findings further provided several examples of how herders combined and used herbs as alternative means to provide for veterinary health care needs. These combinations were mainly based on the symptoms of the sick animal. Seemingly, the herders were able to interpret symptoms in relation to a diagnosis and prescribe accordingly. As it was with humans' health procedures, the herders used different methods to administer the medications. The data from the interviews below illustrate:

> *Linakaneng: I mix the following:* mohalalitoe *[Figure 8],* makhona-tsohle *[medicine that cures all diseases, Figure 9], and rough salt, and this mixture is either given to the sheep* komisa *[in its dry form] or mixed with water . . . alternatively, depending on the illness, I mix* sehala-hala-sa-matlaka *[vultures' plant] and* monatja *[popularly believed to be poisonous when swallowed by humans]*.
>
> *Taiwan: He [my father] also taught me that, since the animal cannot speak for itself, I have to look for the signs in order to be able to help it before the sickness overwhelms it. . . . I then ask the other herders what I can give to the goat, depending on what we [herder community] think it is suffering from.*

Figure 8: Mohalalitoe

Figure 9: Makhona-tsohle

Some herders had learned about animal healthcare from their peers and their fathers, and this included the herders' vigilance from the onset of the symptoms and signs of illness. However, as part of the herding community, consultations were made with other herders prior to the administration of the identified herbal mixture, and especially in the absence of established knowledge about the effectiveness or procedural use of a particular herb or combination of herbs.

Generally, learning and knowledge among the herders was not individualistic, but was more a shared collaborative effort (Bourdieu, 1985) in that, regardless of how much one knew, there was still room for consultations among community members for further verification and guidance. This mutual communal interdependence served as a powerful resource for survival because it allowed for errors committed to be rectified not only by the herders who committed them, but also by the whole herding community. Additionally, it ensured that the effective herbs were widely known, free of charge, and used to preserve the livestock. In fact, herders who possessed knowledge of these herbs were more likely to be hired to look after livestock for gainful purposes than those who did not. Moteetee and van Wyk (2011) have also observed that traditional herbs can be used successfully for both human and animal consumption, and that some are specifically for animal or human consumption while others can be used for both purposes. They further posit that the administration of such herbal mixtures may

differ depending on the ailment of the human being or animal and, therefore, possession of knowledge regarding their use was a powerful resource of survival for the herders.

Furthermore, as indicated in the interview extracts below, local science knowledge among the herders extended beyond herbal care into the application of local techniques as seen fit to improve health conditions of the animals.

> *Ducks: My grandfather taught me how to treat a fractured leg of an animal without using traditional herbs. . . . If it's a rear leg, I take some sticks and place them around the fractured area then I take a thin cloth and wrap it around the fractured area and then tie the covered fracture with a thin rope. After sometime when it is able to walk using the broken leg, I loosen the ropes and remove the sticks leaving only the cloth and the rope so that it can be able to bend the tissues in order to prevent permanent muscle tissue paralysis.*

In these accounts, the herders explicitly elaborated on the role played by the others in facilitating acquisition of the local science knowledge they had. The herders further explained that they also learned how to mix and administer different herbs based on the requirements presented by the signs of the sickness. Additionally, a revelation was that local science was not only through herbal practice but also extended into the independent diagnosis and application of local technologies.

Traditional herbs for human nutritional supplements

The interviews data below indicated that the herders were generally entitled to two meals a day: breakfast (in the morning before a long day in the field looking after livestock) and dinner (in the evening when they came back from the livestock grazing pastures). The stories further indicated how challenging it was for the herders to cope with this eating habit, and that it called for the herders to come up with coping strategies through a variety of supplementary herbs that were prepared in different ways before consumption in order to curb their hunger during the day.

> *Semonkong: The herders eat only twice a day: in the morning and in the evening. It is not easy to get used to having only two meals in a day. Therefore, we have our own coping strategies.*

> *Linakaneng: I also ate monatja at times, which can be fatal if eaten raw. However, in my experience, we used to braai it over the fire until kokomoha [it swells]; it is delicious and healthy. . . . I also learnt other different nutritious herbs from the herding practice. During the day we braai likhung-khung, we eat monakalali, we also cook sheqe. Sheqe is bolila [sour plant], which is prepared using fresh milk . . . other wild vegetables such as makhabebe [a rose-like red delicious flower], tjoetla [root that looks like a carrot], monokotšoai [black berries], mabelebele [tiny fruit that commonly grows in the bushes of Lesotho], lioete [a carrot-like root, different from tjoetla], montsokoane and lenolo.*

The interviews further revealed some alternative ingredients supplementary to what was available in the community as a way of ensuring that herders still ate a healthy diet:

> *Linakaneng: I collected bobatsi [Figure 10, thorny wild vegetable found only in distant livestock posts] for relish. . . . In the absence of cooking oil, I used fresh milk instead of water and added a pinch of salt.*

Figure 10: Bobatsi

The findings indicate that the herders were a rich resource of indigenous knowledge, which provided them with more options for decision making in that, despite the known toxicity of some of the traditional herbs, their environment encouraged them to develop their own survival coping mechanisms. Another discovery was the herders' ability to adapt to the different contexts of the herding environment and their level of innovation to ensure that in spite of their circumstances, they still managed to devise means for healthy living. This indicated congruence in part to the literature that argues that there is no absolute truth, and that wisdom provides options to cope with life's uncertainties (Sternberg, 2001). Earlier, this section identified local appropriate technology as another form of local science that the herders used to heal the fractured bones of animals. Seemingly, appropriate technology was also applied in the herders' food preservation and preparation, as illustrated in the interview data below.

> *Semonkong: During harvest time, we select* poone-ea-matšohlo *[partly matured maize] and then bury it deeply in the soil to keep it* letsete *[moist] until the winter season passes. When winter season is over, we identify an anthill and drill some holes, then make a fire for roasting the maize.*

Indeed, the context and the environment equipped the herders with coping mechanisms to supplement their nutritional needs. This shows how the environment influenced learning among the herders (Makoa & Zwilling, 2005). We identify indigenous knowledge as local science where there is the use of technical expertise. This did indicate an existence of local technology in the form of food preservation where the herders used their own strategies to moisten and roast the maize out in the veld. It is one example of indigenous knowledge being a localised form of knowledge and closely linked with wisdom. It implies the need for Lesotho's nonformal education to reevaluate the contribution that indigenous knowledge can make in development (Osborne et al., 2015) and its possible inclusion in curriculum development.

Indigenous Knowledge as Local Practice

We found that knowledge among the herders was acquired through their daily interactions, and required repeated practice until they had fully mastered the skill. Additionally, the herders mainly learned basic numeracy skills through the assistance of their peers—basic numeracy was a requirement for livestock motoring. We further found that the herders compensated for their illiteracy by devising other traditional means of knowing and identifying their livestock for the same purpose of monitoring. The findings under local practice are divided into the following two subthemes: herders' unique counting acumen, and informal learning of basic literacy and numeracy.

Herders' unique counting acumen

The study discovered that the herding lifestyle coupled with their low literacy rates greatly influenced what the herders learned and how they learned it. The herding context also builds herders' capacity in problem solving skills, resilience, and wisdom that could be applied in practical ways and have immediate relevance to their lifestyle. In spite of their inability to read and write, most of the herders were tasked with the responsibility to skilfully look after large flocks of animals. While it could be argued that their illiteracy posed a potential danger of loss of the animals, the findings indicated how the herding environment had capacitated the herders with unique skills that enabled them to carry out their responsibilities with ease. One such skill revealed in the findings was the herders' unique non-numeric acumen in identifying and counting their livestock. When the herders were asked how they were able to effectively manage the records of their livestock, they indicated that because they could not count the animals, they were able to identify the livestock with the earmarks, which were usually unique to each livestock owner.

However, in cases of large flocks (see Figure 11), hundreds of sheep or goats in particular, the herders had learned to become so intimate to the animals that they could tell without necessarily counting, that a sheep was missing. Indeed, the herders had developed advanced identification capacities enabling them to spot the different shapes of the animals so closely that, at first glance, without going into the numeric, they could establish whether one of the flock was missing or not. This unique skill was evidenced during the transect walk where two illiterate herders were probed.

Figure 11: Caring for Flocks of Sheep this Large Is Common for Herders

Semonkong: I know them [animals]; I check the ears for my personal marks [Figure 12]. I also learn their shapes so that I can distinguish them, especially when they are so many,

you can't hold all of them each to check the ear marks. Learning the shapes is better and quicker, because sheep of the same person have similar ear marks, so I need to know them by looking at their shapes. If one is missing, I can tell by just looking at them.

'Matšooana: Herders are obliged to keep the correct records of our flock regardless of your education level. Therefore, our daily interaction with the animals gives us an opportunity to identify their uniqueness and attach those specifics to the relevant animal. This makes it easy for us to immediately identify a missing one at first glance. . . . You must know that it is not possible to identify even 50 sheep using numeric, because they are moving all the time after you count it moves this way, another one that way . . . so you won't finish, unless you have other people to help separate the sheep in one direction and count as they pass. Learning to identify them is better because most of the time I am alone—so this works for me.

Figure 12: Ear marking Is Another Strategy for Livestock Monitoring

While to the ordinary eye, the sheep look alike, for the herders their level of intimacy developed overtime through looking after the animals daily, established a relationship equated to that of a baby–parent or friend relationship; this enabled them to assimilate the uniqueness of each sheep and further identify a missing one without necessarily counting the whole flock.

The above excerpts indicate the herders' unique learning strategies for personal and alternative learning methods, and their ability to work out solutions by themselves. Their self-determination and self-motivation became powerful survival coping strategies that could be a resource, even in modern society, in helping us understand the dynamics and complexities of life without overreliance of numerical counting. Nurturing and integrating such skills in the nonformal education curriculum in Lesotho would create a broader learning environment of mutual lifelong learning based on indigenous knowledge and skills transference in order to enhance life experiences of the herders in these contexts.

Informal learning of basic literacy and numeracy

Informal learning is identified as a form of learning in its own right, and highlights the importance of collaborative participation as an enabler for learners to become familiar with the subject matter and in the process, acquire relevant skills; it is also a form of emotional support for the herders. As illustrated in the interview excerpts below, the study revealed complex and socially mediated ways in which the herders learned both numeracy and literacy skills through the support of others around them, including friends and family members, with locally available resources facilitating such learning.

> *'Matšooana: T-bose [name of his neighbour] told me how important it was for a herder to know how to count so that I can monitor the numbers of my livestock . . . he taught me to count from one up to ten using the sheep droppings. It was not difficult because I combined my skill to recognise my sheep without [numerical] counting and what he taught me, so within a week I was able to count without assistance.*
>
> *Linakaneng: The other herder taught me how to count. . . . I picked up some stones from around and stood by the entrance of the kraal to count the animals as they entered: for each animal entering the kraal I would drop a stone until they had all entered . . . twice a day—morning and evening.*

In the case of Linakaneng, the learning was different from that 'Mantšooana in that while 'Matšooana learned the numbers, Linakaneng learned through visual matching where he matched the number of livestock with the number of stones that he had dropped. The findings revealed, therefore, that herders learned different forms of both numeracy and literacy. However, their learning styles were different. For some, the numeracy skills were acquired through the actual counting from one up to a certain number. For others, numeracy was learned through visually matching stones with live animals as they exited and entered a kraal. Their basic literacy learning was further reinforced through context-specific repetition and practice. Their engagement with numeracy illustrated unconventional ways of numeracy practice. Their informal way of acquiring local practice knowledge implies the need for Lesotho's NFE to creatively draw on the existing ways through which herders are already creatively grappling with issues of numeracy in their daily lives, to inform curriculum content and pedagogies aimed for the herding fraternity.

Discussion of Findings

The herders' types of knowledge revolved around their herding role and the environment in which they worked. Their expertise was in developing an understanding of the value of local science, which was used both for human and animal medicinal care as well as for nutritional purposes. In spite of the difficulties that come with herding practice, there was a strong sense of learning and sharing of coping mechanisms to overcome environmental challenges. The findings further indicated the cohesive nature of the herding community, and how this became a resource of learning reinforcement for the herders.

One of the critiques of indigenous knowledge is its oral nature and being context-specific. Yet the findings indicate a close relationship between learning and the immediacy of results to address their daily, specific survival challenges. Likewise, the value of the herders' local science was highly relevant and adapted to local technologies in ways that enhanced the herders' lives. Additionally, there was knowledge and skills transference across specific local contexts within the herding fraternity, which denoted applicability of the herders' indigenous knowledge in broader similar contexts. Indeed, the findings corroborate evidence from Lekoko and Modise (2011) who also opined for the need to apply the African indigenous learning framework as a tool for creating a better understanding of the educational needs of a local society.

While livestock herding is arguably carrying a wealthy resource of indigenous knowledge, limitations lie in the lack of documentation of the knowledge. As such, it is relegated to a much lower status than that of formal education. Secondly, not much effort is made to recognise indigenous knowledge as a resourceful form of learning that could be allotted a considerable amount of resources and political will. Integrating the herders' indigenous knowledge into Lesotho's NFE curriculum would help divert the criticism of overreliance on oral transference of this knowledge. This supersedes current monetary capitalism that is considered the basis for human survival, with its concomitant families' and communities' disintegration—many Basotho men migrate in search of jobs and have shortened life expectancy due to HIV and AIDS, risking an erosion of herding-specific indigenous knowledge systems. The dire need for preserving Basotho-specific indigenous knowledge systems—and their founding value of *Ubuntu Botho* [virtue of humanness], which acknowledges the collective African nature—found to have the potential to enhance the learning opportunities among the herders, is underscored.

Conclusion

This paper argues that for one to know where one is going, one has to understand where one came from. This notion also accentuates the universality of ways through which indigenous knowledge is acquired, and that indigenous knowledge is the root of all forms of knowledge; hence it forms a key to the underpinning cultures. The herders learned and applied indigenous knowledge through the bonding social capital, hence herding lifestyle is regarded as lifelong learning in its own right. However, this knowledge poses a danger of loss due to its susceptibility to memory decay.

The study makes the following recommendations:

- The Lesotho NFE programmes should consider the potential resourcefulness of the herding lifestyle for learning indigenous knowledge and strategise for its preservation.
- The collective nature of herding social networks calls for a collection of Lesotho-specific herding indigenous knowledge documented both in English and Sesotho for inclusion in the mainstream education and wider replication.
- Active engagement of herders in the indigenous knowledge collection and documentation process in order to promote ownership and sustainability.
- An holistic NFE curriculum development that broadens learning into the rare skills found within the herding domain.
- Sustenance of indigenous knowledge skills through relevant programmes and nurturing.

These recommendations are made in cognisance of the limitations of indigenous knowledge that many scholars have identified—oral inheritance, lack of written records, and its cultural and context-specific nature—which makes the knowledge mainly accessible to local communities, relegating indigenous knowledge to a subservient status. They also call for further research on inclusion of indigenous knowledge into the mainstream scientific knowledge systems, as begun by this article.

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