Southern African Journal of Environmental Education, Vol. 21, 2004

The Role of Indigenous Knowledge in Biodiversity Conservation in the Lesotho Highlands: Exploring indigenous epistemology

Tšepo Mokuku
National University of Lesotho, Lesotho

Chaba Mokuku
Maloti-Drakensberg Transfrontier Conservation and Development Project, Lesotho

Abstract

This paper is based on part of a broad study to investigate indigenous knowledge applied by the Lesotho Highlands communities to conserve biodiversity. A questionnaire was administered in 12 villages, to a population of 139 interviewees. It guided interviews on conservation of selected faunal and floral species with various community groups in the highlands: men, women, herd-boys and school pupils. It is illustrated that there are practices and beliefs about certain species that contribute towards their conservation. Through these beliefs species are perceived to have powers to cause certain awesome consequences for humans if destroyed, seen or encountered, and some species are believed to have abilities to communicate some messages to humans. It is argued that these beliefs and practices reflect evidence of the existence of a complex epistemological framework characterised by physical and spiritual interconnections of humans with other species. Some implications of the emergent epistemology for educational and conservation approaches are discussed.

Theoretical Framework

Marimba Ani's (1994) cross-cultural thesis *Yurugu. An African-centred critique of European Cultural Thought and Behaviour* provides useful concepts for interrogating the nature of epistemologies in post-colonial contexts. Postcolonial and postmodern theories have given rise to indigenous knowledge research (Morgan, 2003), which provides rich material for in-depth exploration of coherent indigenous theories and epistemologies. Ani alludes to the majority of non-Euro-American worldviews, such as the African, Amerindian and Oceanic, as typically spiritual and holistic:

> ... they have spiritual bases and thereby reject rationalism and objectification as valued epistemological modes... they do have rationalistic and pragmatic aspects but these do not dominate. These views generate an authentic cosmology, *the interrelatedness of all being*... We who have been educated in European societies have grown up assuming that it is only with the triumph over such worldviews that 'true knowledge' begins (1994: 98–99, our emphasis).

This perspective differs from the reductionist worldview of western science. Drawing on De Lubicz's (1982) *The Sacred Science*, Ani describes the African worldview as characterised by 'revealed' knowledge, a knowledge form that De Lubicz has referred to as 'Sacred Science'. She further draws on De Lubicz to explain that the African worldview is

> ... founded on an irrational basis and therefore not a rational science. It rests on the assumption of a 'common energetic origin of all bodies', an ultimate spiritual source 'which alone is able to animate matter', 'an undefined cosmic energy' (Ani, 1994:99).

This view of knowledge is comparable to the concept of '*ho bonts'oa*', 'to be shown', usually in a dream, in the Basotho traditional medical practice, which provides, for example, a plausible account of how the Basotho came to know about 400 listed species of medicinal plants (Jacot-Guillarmod, 1971).

Based on Vine Deloria in *God is Red* (1957), Ani sees commonality of the Native American world-view with the African:

> In the worldview of the Native Americans, all living things share a creator and creative process and, therefore, relate to one another. Their spiritual quest is to determine the proper relationship that people have with other living things. The universe manifests life energies, 'the whole life-flow of creation'. The person is dependant on everything in the universe for his/her existence. Rather than the determination to subdue nature... 'the awareness of meaning of life comes from observing how the various living things appear to mesh and to provide a whole tapestry' (1994:102).

From this perspective some common key tenets of the African and Native Americans worldviews include connectedness and interdependence of all creation, and presumption of a harmonious relationship between all living things that only needs to be discovered.

Some research work in the African context (Emereole *et al.*, 2001; Fakudze, 2003a; 2003b; Asabere-Ameyaw & Anamuah-Mensah, 2003) provides evidence of the existence of indigenous worldviews as characteristically rational, spiritual and mystical. However, most of the research approaches tend to be 'euro centric' (Ani, 1994:101), which results in simplistically oppositionalising the Western 'scientific' worldview with 'traditional worldviews', often reflecting the latter as 'naïve', 'superstitious' and 'magical'. The overall quest in these studies is to investigate 'traditional knowledge forms' to determine their validity from the scientific viewpoint (Emereole *et al.*, 2001), to establish the extent to which they inhibit or could enhance the learning of science (Fakudze, 2003b; Emereole & Maripe, 2003), and the knowledge is tacitly reflected as inferior to science in that it conditions people's behaviour by instilling 'fear' (Emereole *et al.*, 2001). In general the research reflects indigenous knowledge as archaic, and there is little or no apparent attempt to use the researched indigenous knowledge to articulate coherent theories and epistemologies.

However, some indigenous knowledge discourse has crystallised the nature of the Western modernist epistemology, and Morgan articulates this:

> Western science, ontology and epistemology are underpinned by concepts of universality. Important principles include objectivity, true/false dichotomies, and notions of Cartesian-Newtonian science that *the nature of reality is mechanistic – a series of compartmentalized systems which together combine to form a whole*. Central to this is the belief that any of these systems can be reduced to causally significant parts which can be isolated, manipulated, altered or reconfigured, and that as long as the output is consistent with what is expected then the whole remains unaffected. *Thus reality becomes in essence only those factors deemed causal to an outcome; all else is irrelevant* (2003:38, our emphasis).

Morgan further illustrates how indigenous knowledge differs from Western scientific thought. He describes indigenous knowledge, in ways that parallel Ani's conceptualisation of African worldviews, as 'systems which make no distinction between fields of understanding of the *physical and spiritual*', and '(d)espite its dynamic and diverse nature, indigenous thinking is mostly *holistic and contextual*' (Morgan, 2003:43–44). He argues that 'a new age' of inquiry into indigenous knowledge, began in the 1960s and that it was driven by postmodern, postcolonial theories, as well as Eastern philosophies. The recent emergence of indigenous knowledge research in southern African environmental education discourse – as noted in the works of Masuku (1999), O'Donoghue and Janse van Rensburg (1999) and O'Donoghue and Neluvhalani (2002) – may be seen as a postcolonial resurgence to explore and document valuable cultural practices and knowledge that have historically been marginalised from mainstream institutional knowledge. The research work on which this paper is based was in part inspired by similar sentiments.

Research Methodology

Purpose of the study

The study is based on the assumption that over many years of interaction with their local environment, communities have acquired valuable practical knowledge about the local natural resources and therefore to some unknown extent actively manage and conserve their resources guided by indigenous epistemology. The study therefore sets out to investigate aspects of the prevailing indigenous knowledge in the Lesotho Highlands and its significance in biodiversity conservation. The present paper further attempts to construct worldview(s) underpinning the established knowledge.

Research goals

The broad study goals were to explore the following in the Lesotho Highlands:

- Local knowledge on conservation of natural resources.
- Local knowledge on monitoring of natural resources that could foster the capacity of the communities to monitor and conserve their resources.

This paper forms part of the exploration of the first goal of the study, and is based on only part of the collected data found relevant for the exploration of indigenous epistemology.

Research participants and data collection

A questionnaire was administered in 12 villages to a population of 139 interviewees. The 12 villages were situated in the rugged highlands terrain of the Mohale Catchment area and were selected on the basis of their accessibility to researchers. The interviewees represent 1.9% of the Mohale catchment population estimated at 7 435 (LHDA 1994) and 0.03% of the total Mountain Ecozone population estimated at 480 468 (Sechaba, 2001) at the time of research. Due to the overall homogeneity of language, cultural practices and beliefs within the mountain ecozone of Lesotho, it is assumed that the established findings would largely be transferable to other contexts in the highlands. A questionnaire guided interviews with different key social groups including: men, women, herdboys and schools pupils in the catchment. Respondents were randomly selected and interviewed individually by one of the authors with the assistance of a research assistant, and responses recorded in the questionnaires. The questionnaire was formulated by the authors on the basis of their awareness of the possible existence of the indigenous knowledge of the form investigated. Part of the questionnaire, on which the paper is based, investigated whether there were animals or plants that if when used or killed (*bolaea*) would result in misfortune (*bo-malimabe*), or if when 'seen' (*bona*) or protected (*baballoa*), would result in good luck, (*Mahlohonolo*). This rationality was informed by the authors' awareness of its existence in this context. After mentioning the name of the species the respondents' knowledge on the *food chain* concerning the species was established, and respondents were asked to state what the organism lived on/preyed on and to name its predator (animal that ate it).

Findings

Below is a discussion on several species of plants, birds, reptiles, amphibians and insects that seem to be conserved for biophysical and possibly spiritual reasons. The respondents' explanations on how one might be affected by the use of or encounter with the species are classified in the tables below, under the column 'Possible Conservation Basis/Strategy'. The column on 'Apparent Biophysical Rationale' reflects the interviewees' expressed knowledge on the food chain involving the identified species, and is regarded as the plausible 'biophysical' basis for species conservation.

Plants

Six plant species seemed to be conserved through application of the investigated form of indigenous knowledge. There was no evidence of apparent biophysical rationality, from the interviewees' responses, as a basis for conserving the plant species. However, *Gnidia burchelii* (Moomang) is reported to contain a poison that affects the mucous membrane (Schmitz, 1982), and this could be a basis for the explanation that its use as firewood in the house makes people quarrelsome, and also that its use causes mental illness. The association of the use of *Heteromorpha* sp., Monkhoane, with an adverse impact on livestock, signifies a strong deterrent to use the plant, given the cultural and economic value of cattle in the Lesotho context.

The association of the use of the plants with some form of adverse impact on humans reflects perceived non-physical, perhaps spiritual, connections between humans and flora.

Table 1. Local conservation knowledge of plants

Sesotho Name	English Name/ Scientific Name	Possible Conservation Basis/ Strategy	Apparent Biophysical Rationale*
Moomang	*Gnidia burchelii*	Using it as firewood, especially at home, calls for starvation/brings bad luck/one does not prosper/ causes mental illness/causes quarrels amongst the family. If eaten by livestock they 'dry up'/ 'omella'.	Contains poison that affects the mucous membrane.
Monkhoane	*Heteromorpha arborescens*	If cut and used to hit a cow, your cattle will not multiply/'ha li sa tla khona ho ata' that is, 'lia ts'eha'.	Emits toxic smoke when used as firewood.
Phefo	*Gnaphalium undulatum; Helichrysum odoratissimum; H. splendidum*	If used as firewood, it causes wind/'*e tsosa moea*'.	–
Moferefere	*Senecio asperulus*	Causes bad luck (not specified).	–
Morara	Vines/Capsular fruits	Causes bad luck when used (not specified).	–
Sehloko	*Euphorbia clavarioides*	Causes some form of bad luck (not specified).	–

* The rationale is a postulation by authors drawing from the literature, and not stated by interviewees.

Birds

Twelve bird species seemed to be conserved on the basis of established local knowledge rationales. The apparent biophysical rationale for conserving four bird species is based on their (biophysical) role in the food chain/web. The association of a human with the bird species by bringing about fortune, bad omen and death is also epistemologically significant in that it alludes to the perceived interconnectedness of humans with bird species, in more than just physical ways.

Table 2. Local conservation knowledge of birds

Sesotho Name	English Name	Possible Conservation Basis/ Strategy	Apparent Biophysical Rationale
Khoale	Greywing Francolin	Encounter with it points to a safe journey/'*tsela-ts'oeu*'.	Preys on butterflies, etc. Eaten by people and dogs.
Khoho-ea-lira	Spotted Dikkop	It warns about death ('*e belietsa mokhohlane*), if it is heard in the village. If one kills it, she/he will always have a dry skin/ '*e tla o tlabola ke lefafatsane le sa feleng*'. If one kills it, she/he will die.	Preys on rats.
Sephoko	Owl	Its call warns about/causes death in the family.	Preys on rats.
Mankhane	Bat	Seeing it brings good luck.	Preys on mosquitoes.
Seotsanyane	Rock Kestrel	Seeing it brings good luck.	Preys on rats and worms.
Maeba (a maputsoa/ a thaba)	Rock Pigeons	Seeing them brings good luck (e.g. could get money, visitors).	–
Likhaka	Helmeted Guinea-fowl	Seeing it brings good luck (e.g. could get money).	–
Mokhotlo	Bald Ibis	Indicates time/*O tsebisa motho nako.*	–
Mokhoabane	Black Crow	Seeing it brings good luck (e.g. one may get money).	–
Lengangane	Hadeda Ibis	Its call brings rain.	–
Mafokotsane	Swallow	Indicates rain (*A bolela pula*).	–
Motjoli	Cape Wagtail	It causes lightening (when/how?).	–

Reptiles

Six species of reptiles appeared to be conserved on the basis of the form of indigenous knowledge explored. The word *Mosenene* in Table 3 may loosely be used to refer to either Spotted Skaapsteker (*mosenene-poli*) or Cross-marked Grass snake (*mosenene-khomo*) (Ambrose, 1999). *Mosoa* is usually a name for Brown House Snake or Aurora House Snake, but could also

be used to refer to Spotted House Snake and Yellow-bellied House Snake (Ambrose, 1999). The Brown House Snake has overt biophysical significance in the household, though not suggested by interviewees, by commonly occurring in places where food or grain is stored where it preys on rodents (Ambrose, 1999). *Mokholutsoane-ao-marako* literally means a lizard that occurs on rocks, and seems to refer to the commonest Lesotho skinks, *Mokholutsoane* or Striped Skink (Ambrose, 1999).

The apparent basis for conserving the species is for their role in the (biophysical) food web/chain. It is noteworthy that Rhinkals is lethal, and can eject venom that can cause blindness (Ambrose, 1999), yet it seems to be valued and conserved as a mice predator. The reptiles are also seen as capable of affecting people's lives if seen, encountered or killed, suggesting perceived forms of spiritual connectedness.

Table 3. Local conservation knowledge of reptiles

Sesotho Name	English Name	Possible Conservation Basis/ Strategy	Apparent Biophysical Rationale
Mosenene	Spotted Skaapsteker or Cross-marked Grass Snake	Seeing it brings good luck, e.g.: • Points to a good journey/ *'o supa tsela ts'oeu*'. • One may get a job. • One may have a baby if in need of it. • A woman may get pregnant. • One may get money.	Preys on mice and frogs.
Masumo	Rinkhals/Red-necked Spitting Cobra	Seeing it brings good luck, e.g. points to a good journey.	Preys on mice and frogs.
Mokholutsoane-oa-marako	Striped Skink	If one kills it, one will laugh till one dies.	Preys on house-flies.
Mampharoane	Southern Rock Agama	If killed, the tits of the family cow will develop cracks.	Preys on house-flies, grasshoppers and butterflies.
Checheiki	Cape Gecko	Seeing it brings good luck.	Preys on mosquitoes.
Mosoa	Brown House Snake or Aurora House Snake	If on encounter it shifts into one's way (*soaela ka tseleng*) it points to problems ahead, but if it shifts out of the way (*soaela ka kantle ho tsela*) it points to a good journey.	Preys on rodents.*

* The rationale is a postulation by authors drawing on Ambrose (2001), and not stated by interviewees.

Amphibians

Four amphibians appeared to be conserved on the basis of the investigated indigenous rationality. There is no sharp distinction in Sesotho names for frogs and toads (Ambrose, 2001). The Sesotho name *Marokolo* is used to refer to toads in general, and in some cases to the Giant Bullfrog. The word *Senqaqana* is commonly used for any large frogs and toads. From the literature it seems the word *Letlametlu* may be used for the Clicking Stream Frog, the Bullfrog and the Aquatic River Frog or the Umbraculate Frog, and for the Cape River Frog (Ambrose, 2001).

The apparent biophysical rationale for conserving two of the four species, namely the frog (*Senqaqana*) and the Clicking Stream Frog, is based on the biophysical role they play in the food chain/web. A further plausible biophysical basis for valuing the Aquatic River Frog (*Letlametlu*) is its function as a 'good indicator of water quality' (Mouton, cited in Ambrose, 2001). The apparent valuation of Toads or Giant Bullfrog for 'bringing rain' may better be understood in terms of the croaking of the organisms when it rains, and the association of rain and the organisms with good harvest. The association of the amphibian species with humans in non-physical ways suggests a perceived spiritual linkage between humans with the organisms.

Table 4. Local conservation knowledge of amphibians

Name/ Description	Common English Name	Possible Conservation Basis/ Strategy	Apparent Biophysical Rationale
Senqanqana-se-setala	River Frog	Killing it results in the cow dying or its tits cracking.	–
Senqanqana	Frog	Lightening will strike one's house/home if one kills it.	Preyed on by Hammerhead (*Mamasianoke*)
Letlametlu	Clicking Steam Frog or Cape River Frog or Aquatic River Frog	If one kills it, she/he dries up till she/he dies. '*Le ea o omeletsa o be o fele o lesokokotoana*'.	Preyed on by Blackheaded Heron (kokolofitoe). Indicator of water quality.*
Marokolo	Giant Bullfrog or Toad	Brings rain	Associated with rain and good harvest.*

* The rationale is a postulation by authors, and not stated by interviewees.

Insects

Six species of insects seemed to be conserved on the basis of the indigenous rationality explored. There was no evidence from the interviewees' responses of any possible biophysical

rationale for conservation of all six species. It is not clear in all the cases whether the species could possibly be conserved for any biophysical reasons. The mentioned accounts about the species suggest perceived spiritual connections between humans and the insects, which could constitute the basis for their conservation.

Table 5. Local conservation knowledge of insects

Sesotho Name	English Name	Possible Conservation Basis/ Strategy	Apparent Biophysical Rationale
Seloma-matsoele	Beetle	Brings bad luck when killed.	–
Malehlohonolo	Ants	Brings good luck when seen.	
Maroana	Red Ants	Their emergence in the house means that food must be cooked for the ancestors or bring good luck.	– –
Mohalajoeng*	–	Seeing it brings good luck.	
Kholoabolokoe	Dung Beetle	If found in the house brings good luck.	– –
Ts'uts'ulupa	Black Ant (*Streblongnathus aethiopicus*)	If seen brings good luck.	–

* It has not been possible to identify the common English or scientific name for this species.

Discussion

It seems plausible that the application of knowledge that the people constructed, in relation to the species discussed above, as reflected under the 'possible conservation basis/strategy', conserves them, even in cases where the 'apparent biophysical rationale' was not evident in the interviewees' responses. This knowledge could be so deeply 'embedded' in the culture that the people are unconscious of its practical ecological benefits. It is noteworthy that the aforementioned knowledge concerns a particular domain of indigenous knowledge, as elicited by the questions outlined under the research method above. From this viewpoint there were more species of birds than any other species conserved through the indigenous knowledge, and the amphibian species were the least conserved. However, the amphibians were comparatively the most conserved in relation to the total number of species occurring in Lesotho (See Table 6). There was no knowledge mentioned that seems to conserve fish and mammals. This could be due to the communities' limited interaction with the aquatic species, and the inclination to use mammals as a meat source.

Table 6. Number of species conserved* compared to the total number of species

Classification	Estimated Number of Species in Lesotho National Environment Secretariat (2000)	Number of Species Conserved Through Indigenous Knowledge
Plants	2169	6
Vertebrates		
Mammals	63	0
Fish	14	0
Reptiles	40	6
Amphibians	19	4
Birds	319	12
Invertebrates		
Insects	1 279	6

* As explored in this study only.

Emerging Epistemology

The beliefs about the discussed plants and animals reflect the complex physical and spiritual connection of the people with the natural world. Animal behaviour, calls, occurrence at certain places and encounters with certain species all seem to communicate some messages or trigger certain beliefs, creating a basis for their reverence. The association of some organisms with fearsome consequences if destroyed and providence if seen or encountered, shrouds them with spiritual powers, sacredness and awe, creating a basis for their respect. These credulous, scientifically 'irrational' beliefs about species allude to an integration of the spiritual and biophysical systems. Within the same thought system, organisms seemed to be conserved for pragmatic biophysical reasons, but this rationalistic feature was comparatively limited, and this analysis parallels Ani's (1994) observations that 'rationalistic and pragmatic aspects' do not assume dominance in African worldviews. In this emerging worldview humans and other species are in a 'horizontal web' of interdependent connections. This relationship of species deviates from the dominant Western scientific thought wherein species are hierarchically classified evolutionarily into different families and levels of sophistication, with humans perceived as distinct from and superior to other species. Kassas traces indigenous worldviews to early civilisations:

> The culture of kinship with other creatures on Earth is old, spiritual environmental ethics was part of the ancient civilizations that was fostered through teachings of religions. This may have been subdued through societal transformation, associated with industrialization and urbanization, processes that fostered societal dependence on power-machines and technologies and have apparently blurred the sense of intimacy with, and dependence on nature... (2002:349).

Some Recommendations

As indicated above, the results discussed here are partial at this point in time. However, there are some early indications of emerging recommendations. Educational approaches that foster real and complex integrated spiritual and physical relationships between people and other living things could be explored for effectiveness in biodiversity conservation. This approach would constitute a shift from detached and rather mechanical ways of learning about the relationship between humans and other living things, an orientation informed by the dominant Western epistemology.

It is apparent from this study that Sesotho names, particularly in the case of amphibians and reptiles, tend to lack the specificity desirable for species identification. This could be achieved through collaborative work and dialogue between local scientists and the communities, to construct Sesotho names to complement the indigenous knowledge with the detail of scientific knowledge as part of the process of advancing peoples' knowledge on local biodiversity, and their capacity to monitor and conserve it. This would be an essential step if conservation were to become the prerogative of those who live with and amongst the plants and animals to be conserved.

Further research and documentation of indigenous knowledge that promotes conservation is necessary for a deeper understanding of the knowledge (and associated epistemology) in this context. Given the apparent link between language, worldviews and biodiversity, the promotion of indigenous knowledge for conservation a in postcolonial context could also represent a significant dimension of cultural resurgence.

Limitations of the Study

In view of the fact the indigenous knowledge is contextual and localised, the established knowledge could represent only a small part of similar body of knowledge held by the highlands people, since the study involved inhabitants of a particular locality in the Lesotho Highlands. The discussed findings also need to be understood as partial in relation to the broader goals of the study.

Notes on the Contributors

Tšepo Mokuku is a lecturer in the Faculty of Education at the National University of Lesotho. He holds a PhD in Environmental Education, and his research interests include Curriculum Development and Indigenous Knowledge. E-mail: tmmokuku@nul.ls.

Chaba Mokuku is the Lesotho Project Coordinator for the Maloti-Drakensberg Transfrontier Project on Biodiversity Conservation and Ecotourism covering Lesotho and South Africa. He holds a Masters Degree in Tropical Resource Ecology. Email: cmokuku@maloti.org.ls.

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