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Using local experts as benchmarks for household local ecological knowledge: Scoring in South African savannas

Melita Z. Steele, Charlie M. Shackleton*

Department of Environmental Science, Rhodes University, Grahamstown 6140, South Africa

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ABSTRACT

It is well recognised that local ecological knowledge is an important facet of natural resource management in rural regions of the developing world. However, techniques to assess levels and to integrate it into formal or informal management approaches require further development. In particular, quantitative tools are missing, which would allow more robust analysis of the factors that positively or negatively affect local ecological knowledge and vice versa. This paper reports on a quick assessment approach that provides a quantitative score of generalist local ecological knowledge at the household level. It does so by comparing responses to the knowledge of local people identified as experts within the community. In this way it is both locally constructed and contextualized, and thereby avoids pitfalls of trying to score local ecological knowledge relative to conventional scientific knowledge which frequently cannot account for local constructs. The approach is applied at eight villages throughout the savanna biome in South Africa.

1. Introduction

Whether or not environmental resources are used sustainably depends upon a host of local and wider contextual factors. With respect to the sustainability of rural livelihoods based on extraction of forest products in India, Shankaar et al. (2004) developed a conceptual model in which levels of local ecological knowledge (LEK), participation in markets for resources and livelihood dependency on forest resources were the major attributes. Evaluation of such models requires assessment across a range of sites, and a quantitative or scoring approaching if the relative magnitude of the contextual variables is to be elucidated. However, many contextual variables are not easily quantified. Of interest in this paper is LEK.

Internationally, the level of interest in indigenous knowledge systems has been increasing (Berkes et al., 2000; Godoy et al., 2005; Chalmers and Fabricius, 2007). Indigenous communities are frequently among the world's poorest people (Godoy et al., 2005). They account for a major proportion of the population in some countries, hold most of the world's traditional knowledge and have ownership rights to some of the world's most biologically diverse areas (Berkes et al., 2000; Godoy et al., 2005). The rights of indigenous people are increasingly recognised in international conventions. This has resulted in the constructed representations of certain kinds of knowledge as being local and authentic, and distinct from modern conventional science. In turn, LEK, a term used to describe the knowledge that is held by indigenous cultures regarding their immediate environments, has begun to acquire greater importance (Ford and Martinez, 2000; Leach and Fairhead, 2002). LEK represents multiple bodies of knowledge, which are the basis for local-level decision-making in natural resource management by rural communities (Agrawal, 1995; Berkes et al., 2000; Drew, 2005) and may represent the information necessary for survival (Drew, 2005; Pierotti and Wildcat, 2000). LEK is shared among users of a resource (Agrawal, 1995; Berkes et al., 2000; Huntington, 2000). It is generally deeply socially embedded, as knowledge and beliefs in rural areas are often closely tied to cosmology, local religion and social order (Leach and Fairhead, 2002) and must therefore be seen in its political, cultural and economic contexts (Briggs, 2005).

According to Briggs (2005), viewing indigenous knowledge as a pristine, untainted knowledge system is simplistic. LEK is undoubtedly mediated by external influences. The levels of LEK within a community depend upon a variety of demographic characteristics, including gender, age, kinship relations, ethnicity, position in a social network and distance from natural resources or cities (e.g. Quinlan and Quinlan, 2007). There is also a consistently negative association between LEK and characteristics generally associated with acculturation, like externally designed and imposed schooling and academic skills (Berkes et al., 2000), although there

* Corresponding author. Tel.: +27 46 603 7001; fax: +27 46 622 9319.
E-mail address: c.shackleton@ru.ac.za (C.M. Shackleton).

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are exceptions (e.g. Quinlan and Quinlan, 2007). Far from being static, LEK is continuously evolving as the needs of rural communities change in response to local and external cues (Agrawal, 1995; Ford and Martinez, 2000; Pierotti and Wildcat, 2000; Allison and Badjeck, 2004). This fluidity is a reflection of the ongoing re-negotiations that occur between people and the environment upon which they survive (Briggs, 2005). It relates to knowledge of species as well as deeper ecological processes and relations.

Researchers generally describe LEK in scientific terms (Huntington, 2000) because there is a pervasive belief that LEK must in some way be related to formal science and for LEK to be accepted, there must be a way to test it scientifically (Briggs, 2005; Gilchrist et al., 2005). However, using the scientific method to assess the validity of indigenous practices implies a belief in the superiority of conventional science (Agrawal, 1995). According to Agrawal (1995) a number of authors have downplayed the distinctions between LEK and scientific knowledge, but then asserted the need to collect and evaluate a community's level of environmental knowledge using the scientific method. This means that for all the respect accorded to LEK systems, they must first pass a "scientific criterion of validity before being recognised as usable knowledge" (Agrawal, 1995: 430). Agrawal (1995) summarised the three main arguments distinguishing LEK from conventional science as (i) Substantive – there are differences in the characteristics and subject matter of indigenous versus scientific knowledge; (ii) Methodological and epistemological – the two knowledge systems possess different world-views and use different methods to investigate reality, and (iii) Contextual – conventional scientific and local knowledge differ because local knowledge is more deeply rooted in its own context.

It is, however, increasingly appreciated that neither knowledge system is necessarily superior (Briggs, 2005), and that conventional science is just as socially constructed as LEK (Agrawal, 1995; Briggs, 2005). If all knowledge is socially produced the barriers between scientific and indigenous, and lay and expert knowledge are dissolved and instead a plethora of site-specific practices and partial perspectives in a wide range of social situations are created (Leach and Fairhead, 2002). Both systems are in fact influenced by a myriad of different factors, including each other (Agrawal, 1995; Allison and Badjeck, 2004). Fundamentally, both LEK and conventional science should be seen as developing and emerging through historically located practices, in specific institutional and social contexts, which subverts any fundamental theoretical divide between them (Agrawal, 1995; Leach and Fairhead, 2002). Acknowledging this level of similarity and equality requires that conventional science explores and recognizes the validity of alternative explanations (Briggs, 2005).

Within increasing recognition of the potential contributions of LEK there is greater need to derive quantitative estimates or indices of the relative levels to allow examination of relationships between LEK and contextual variables of interest (e.g. Quinlan and Quinlan, 2007). Within this context, we sought to test a simple, quantitative approach to score LEK at several sites as part of a broader study to determine the factors that contribute to sustainable use of Non-Timber Forest Products (NTFPs) (Shankaar et al., 2004; Steele, 2008). Assessing LEK is difficult because it is heterogeneous and pertains to knowledge of species, ecological processes and change gleaned through direct interaction with the environment (for utilitarian, recreational and traditional/spiritual purposes) as well as interaction with others (Drew, 2005; Reyes-Garcia et al., 2006). This poses methodological difficulties and is further complicated by the fact that knowledge is not shared equally across all members of a community (Briggs, 2005; Drew, 2005; Chalmers and Fabricius, 2007). In fact, LEK is distinctly uneven and often mediated and fragmented in nature (Briggs, 2005), which means that the person who is interviewed may not be the member of the household or group with the highest level of LEK. Consequently, it is important to differentiate expert LEK from generalist LEK (Davis and Wagner, 2003; Chalmers and Fabricius, 2007).

2. Study sites

Eight villages (Ntilini, Tidbury, Fairburn [Eastern Cape Province], Finale A, Mabins B, Willows, Thorndale and Mogano [Limpopo Province]) were selected (Table 1). They represent a range of rural settlements from small, remote and poorly serviced ones to large, better serviced ones on major secondary routes (Shackleton et al., 2002a, 2002b; Dovie et al., 2002; Twine et al., 2003; Shackleton and Shackleton, 2004). The villages are located within the savanna biome of South Africa, within communal tenure areas and are situated in areas with low mean annual rainfall ranging between 488 mm and 600 mm. Land is allocated into arable and residential plots and residents are allowed free access for grazing and the extraction of NTFPs in the remaining areas (Dovie, 2006).

The three Eastern Cape villages are located in the Kat River valley in the Mpofu district of the former Ciskei homeland. Ntilini (approximately 180 households) is located closest to Fort Beaufort in the south, Fairburn (approximately 100 households) is situated closest to Seymour in the north and Tidbury (approximately 40 households) is positioned midway between the two. Employment levels are low, and basic infrastructure is unevenly and inadequately distributed. Ntilini and Fairburn have access to electricity, while Tidbury does not (Shackleton et al., 2002a).

Three villages (Finale A, Mabins B and Willows) are located in the Mametja Traditional Authority in Limpopo Province, which formed part of the homeland area of Lebowa under apartheid. Willows (approximately 1000 households) is a well serviced village on a major secondary route and Finale A (approximately 300 households) is small, remote and poorly serviced. Mabins B (approximately 550 households) is intermediate between the two (Twine et al., 2003). Mabins B and Willows were electrified in the mid-1990s and Finale has no electricity (Twine et al., 2003).

Thorndale (approximately 70 households) is situated in the Bushbuckridge Lowveld in Limpopo Province and is bordered by the Manyeleti Game Reserve to the south. It is a remote village which is cut off from major commercial centers and has limited access to social infrastructure (Dovie et al., 2002). Mogano (approximately 300 households) is situated 32 km southeast of Polokwane in Limpopo Province. This village is fairly well developed and has relatively good employment opportunities and incomes (Shackleton et al., 2002b).

3. Methods

Our assessment of LEK is based on household and individual key-informant (expert) interviews and proxies of individual ecological knowledge. A very specific assessment of LEK was made, focusing on knowledge of the species of trees used for fuelwood and wild fruit as a quantitative index of broader multifaceted LEK at each site. The assessment of household LEK was based primarily on species identification and classification and did not focus a great deal on ecological processes and their relationships with the environment (Berkes et al., 2000).

Several authors have commented or shown that individuals participating in harvesting and marketing of specific NTFPs as their primary means of livelihood show greater LEK and skills pertaining to the species and systems in question (Godoy et al., 2005; Reyes-Garcia et al., 2007) and this increases with time spent in the trade (Ballard and Huntsinger, 2006). Therefore, people selling local resources (in our case, fuelwood or wild fruits) can be regarded as experts relative to the general population. Consequently, our study