Seeing the wood for the trees: the role of woody resources for the construction of gender specific household cultural artefacts in non-traditional communities in the Eastern Cape, South Africa

M. L. Cocks, L. Bangay, K. F. Wiersum , A. P. Dold

Rhodes University, P.O. Box 94, Grahamstown 6140, South Africa
e-mail: m.cocks@ru.ac.za
Forest and Nature Conservation Policy group, Wageningen University, P.O. Box 47, 6700 AA Wageningen, The Netherlands

Abstract
There is a growing wealth of data capturing the direct-use values of the environment and recognition of forests and wild resources as representing ‘‘the poor man’s overcoat’’. This focus has however resulted in an emphasis on the utilitarian values of wild resources for rural livelihoods and has for the most part overlooked their cultural values. In tangent to these developments within the field of anthropology there has been increased attention directed towards the relationship between biodiversity and human diversity over the past decade. This has resulted in the recognition of what the Declaration of Belem calls an ‘inextricable link’ between biological and cultural diversity. The term bio-cultural diversity has been introduced as a concept denoting this link. Consequently there is a need for more elaborate assessments of the various ways in which different groups of people find value in biodiversity. The aim of this paper is to demonstrate the cultural significance of wild harvested plant resources for the maintenance of two gender specific cultural artefacts for *amaXhosa* people in South Africa, to assess the persistence of these practices in rapidly modernizing communities. We demonstrate the endurance of these ancient cultural artefacts in present-day peri-urban communities and suggest that they point to the need for improved understanding of the significance of bio-cultural diversity. The findings of the study should not be interpreted as illustrating stagnation in the traditional past, but rather as pointing at the need for improved understanding of the significance of bio-cultural diversity in a dynamic sense.

Introduction

Environmental scientists have attempted to determine the Total Economic Value of the environment (Pearce & Moran, 1995) so as to provide the means to integrate the cost of using and conserving biodiversity into the current global economic system (Dovie & Witkowski, 2000). The focus of many of these valuation studies has been predominantly on the subsistence and ‘‘safety-net’’ functions of wild resources for rural livelihoods; this has resulted in the recognition of forests as being ‘‘the poor man’s overcoat’’ (Wunder, 2001).

These approaches have however failed to fully account for the various ways in which different groups of people make use of, and find value in forest environments and biodiversity. In a recent review it was stated ‘‘The importance of forests as places of worship, burial sites and historic interest is recognised, and reflected in the attitudes of rural communities to the conservation of these sites; more research is required to capture

these cultural, religious and social aspects in economic terms'' (Lawes et al., 2004). This statement reflects the growing recognition that conservation efforts should not only focus on biological diversity itself, but also on the relationship between biodiversity and cultural diversity (Posey, 1999). The concept of biodiversity conservation needs to be broadened to include conservation of bio-cultural diversity. Initially, the concept of bio-cultural diversity was related specifically to indigenous people, who as part of their traditional lifestyles are often conserving forests and biodiversity. Recently it has been argued that the prevailing interpretation of the concept of bio-cultural diversity needs reconsideration (M. Cocks, personal communication) as it is often incorrectly assumed that increased impacts of urban lifestyle would entail a loss of traditional cultural values and hence bio-cultural diversity, but this is not necessarily the case as demonstrated by studies conducted by Cocks and Wiersum (2003), Cocks and Møller (2002) and Cocks and Dold (2004) in South Africa.

The aim of this paper is to illustrate the enduring significance of wild plants for cultural purposes, and to demonstrate that the direct-use values of wild plants do not only relate to utilitarian uses for physical needs, but also to cultural uses which helps to provide a sense of belonging and identity amongst community members (Wiersum, Singhal, & Benneker, 2004). The paper describes the importance of two cultural artefacts constructed out of wild plants, i.e., *ubuhlanti* and *igoqo,* for the *amaXhosa* and *Mfengu* people in the former homeland of Ciskei in South Africa. First, the cultural significance of these gendered cultural artefacts as reported in the literature is described. Next the results of a study to ascertain the present status of *ubuhlanti* and *igoqo* are presented. This study focused on the following questions:

- What is the present socio-cultural status of *ubuhlanti* and *igoqo*? For what cultural purposes are they used? How many households still maintain these cultural artefacts and what is the socio-economic profile of these households?
- What are the economic values of the *ubuhlanti* and *igoqo*? How much woody biomass is used in maintaining these artefacts and what are the economic costs of this material?

Ubuhlanti and *igoqo* as cultural artefacts

Ubuhlanti

The livestock enclosure (*isiXhosa—ubuhlanti*; South African English—*kraal*) features prominently in Xhosa and Zulu folklore (Broster & Bourn, 1981), idioms, and expressions (Mahlasela, 1982) and even appears in San rock art (Lee & Woodhouse, 1970). *Iinthlanti* (plural) are most commonly represented in environmental literature in the Eastern Cape as an enclosure for livestock. In several studies their economic value has been estimated by measuring the amount of wood used in their construction and calculating the value of this material by shadow-pricing it on the basis of prevailing market prices (Palmer, Timmermans, & Fay, 2000; Shackleton & Shackleton, 2004). Various anthropologists have documented that these cattle enclosures are important cultural as well as practical artefacts (Berglund, 1975; Cook, 1931; Poland et al., 2003). Berglund (1975) describes the enclosure as a temple where the ancestral shades (ancestral spirits) reside and ''brood'' over their descendents with ''a benevolent eye''. Within these 'temples' ritual sacrifices are performed, which form the most important and

effective form of communion with the ancestral spirits. These rituals are performed to elicit ancestral blessings and protection from malevolent forces such as sorcery. Rituals invariably involve the slaughter of a domestic animal, usually an ox or a goat (Poland et al., 2003; Wilson, Kaplan, & Maki, 1952;). Typically a single erect wooden pole (*ixhanthi*), usually from the *umnquma* tree (*Olea europaea* subsp. *africana*), is a permanent fixture in the centre of the enclosure to serve as an anchor for the sacrificial animal. This pole is also a symbolic point of contact with the ancestral spirits (Cook, 1931; Poland et al., 2003).

The *ubuhlanti* is also a venue for purging (*ukugaba*). The ritual expulsion of bodily fluid by means of an emetic is common practice amongst the *amaXhosa* to purify the body. This practice is often the first recourse to treatment of an illness of any sort; it is also performed repeatedly if sorcery is suspected (Cocks & Møller, 2002). Male members of the household engage in their purging activities against the inner far wall of the *ubuhlanti* under the guardianship of the ancestral spirits.

Igoqo

A nondescript household woodpile in the homestead is most commonly represented in literature documenting use of forest products as a fuel wood stockpile. In a similar way as for *ubuhlanti*, its value is assumed as being utilitarian and is represented by assigning a shadow price to the woody material stocked in it (Palmer et al., 2000; Shackleton & Shackleton, 2004). In the anthropological literature no mention of its cultural significance was found. The most comprehensive account of Xhosa material culture to date (Shaw & van Warmelo, 1972) makes no mention of *igoqo* although it incidentally illustrates an example in a photograph of a cooking hearth taken in 1948. Kropf (1915) describes *igoqo* in his Xhosa language dictionary as ‘‘a heap of firewood outside the hut’’ and Cook (1931) repeats this explanation verbatim. However it was recently reported that married women attach great cultural value to their *amagoqo* (plural) as it is considered to be where the female ancestors reside. Furthermore an *igoqo* is also an important social venue for women and provides the women of the household with dignity because it signifies their status within the community (Cocks & Wiersum, 2003). The lack of attention to the cultural role of *igoqo* in contrast to the *ubuhlanti* may reflect a gender bias in former anthropological studies as noted by Howard (2003)

Research location and methodology

Information on the presence and economic value of *ubuhlanti* and *igoqo* was collected within the framework of the study on the use of wild plants in the Eastern Cape Province of South Africa. This study was carried out in six villages in the Peddie and King Williamstown Districts (Pirie Mission, Chata, Woodlands, Ntloko, Benton and Crossroads) in the former Ciskei homeland (Fig. 1). The homelands are the result of resettlement policy implemented by the former apartheid government. They are characterised by poor infrastructure, high population densities, and high poverty levels (De Wet & Whisson, 1997; Palmer, 1997) and a heavy dependence on urban earnings and Government welfare payments. The people living in the study sites are predominantly from the *amaXhosa* and *amaMfengu* ethnic subgroups within the Nguni group.

A 100% questionnaire survey of households (n = 1,011) in all six villages documented household demography, household wealth and the amounts of wild plant

material collected for utilitarian use and maintenance of cultural artefacts. Criteria used for ascertaining the economic wealth conditions were: number of formal jobs in the household, number of pensions/grants in each household, types of household assets and appliances owned (fridges, stoves, cars etc.), and whether or not the household owned livestock. The analysis of these indicators indicated a high diversity in households' conditions. Many households with no formal income indicated to have a lot of household assets, and many households with access to formal income indicated to have very few or no household assets. Statistical techniques, such as principal components, for grouping the households proved fruitless in light of this diversity. Ultimately cluster analysis techniques were used to identify wealthy and poor households. The households were found to cluster into four groups ranging from poorest to richest. However, the middle two groups proved not to be significantly distinct enough in terms of their wealth. Consequently only the two extreme clusters representing the ''richest'' and ''poorest'' were selected for use in further statistical testing. The cluster of 'poorest' households included 215 households and the cluster of 'richest' households 180. Thus, due to the large variety of access to livelihood resources, only one-third of all 1,011 households in the survey have been used for statistical comparison.

Information regarding the amounts of woody plant use was collected by recording the quantity and frequency of collection and use for different types of resources for each household. The local measurement units for collection were transferred to weight units on the basis of the average weight and dimensions of each unit as determined in the field. Information regarding the life span of the resource was gathered to enable a replacement estimate to be calculated. Set retail prices exist for standard amounts of specific resources, such as per head load or per donkey cartload and these were recorded to determine their direct-use value. These were ascertained from household members who could afford to purchase these resources rather than collect them.

For the analysis of the amounts of wood used for maintenance of the *ubuhlanti* and *igoqo*, only households who collected this material themselves were used. Most households collected resources for their individual use, but some collected for resale to others. In this last case, it proved difficult to partition the collected amounts into units used for individual consumption and units for sale. Many households did not provide details on the replacement time of the resources collected but rather mentioned when the artefact was constructed. The data from these households were not included in the analysis regarding the maintenance of the artefacts.

Where the data are very right-skewed, which occurs frequently in the dataset, robust estimators of the centre and spread are used in numerical summaries and the Kruskal–Wallis test used in inference. The median is used as a more robust estimator of the centre of the distribution, and the MAD (Median Absolute Deviation) is used instead of the usual standard deviation where the data are very right skewed (Venables & Ripley, 1999, p. 128).

In addition to the household surveys, in-depth interviews were held with key informants to determine which rituals still hold significance and are still being performed by local community members.

Results

Socio-economic conditions in six Eastern Cape villages

A summary of the household demographic profiles is provided in Table 1. Summaries of the socio-economic conditions of the two clusters are shown in Table 2. Key distinct variables distinguishing the ‘‘rich’’ and ‘‘poor’’ households are access to either gas or electricity and ownership of livestock. Also the ‘‘richer’’ household heads tend to have higher levels of education (x^2 = 6.3718, df = 1, P = 0.01159) and therefore greater access to formal jobs (t = -5.0674, df = 310.146, P < 0.000001); most were male headed (x^2= 2.4, df = 1, P < 0.001).

Cultural status of *ubuhlanti* and *igoqo* in six Eastern Cape villages

Ubuhlanti

In the six villages 79% (n = 800) of the households own and maintain an *ubuhlanti*. Of these households, only 47% (n = 375) own livestock, demonstrating that *ubuhlanti* are not just a livestock enclosure. There are two main types of *ubuhlanti* that are different in shape. The shape is determined by the ethnic identity of the family. *Ama Mfengu's ubuhlanti* are square in shaped (Fig. 2), whereas those of the *amaXhosa* are round in shape.

The important cultural significance of the *ubuhlanti* is demonstrated by the performance of several rituals in these enclosures. The most important are:

- *Ukubuyisa* and *ukukhapha*, requiring the sacrifice of an ox to appease the paternal ancestral spirits (*izinyanya*) soon after the death of the family patriarch, repeated on the first anniversary of his death;
- *Imbeleko*, requiring the sacrifice of a goat (male or female) to introduce a newborn member of the clan to the ancestral spirits;
- *Intambo*, the solicitation of the ancestral spirits at the time of serious illness of a family member.

The customary initiation of Xhosa teenagers into manhood by means of ritual circumcision (*umkwetha*) is also conducted in the *ubuhlanti* and is followed by the ritual sacrifice of a goat (*ukungcamisa*). Occasionally also other ritual sacrifices of animals are made in the *ubuhlanti*; these are either undertaken by traditional healers on behalf of the family for specific reasons or by family and clan heads for purposes such as the initiation of traditional healers. Rituals were performed by 72% of the households (n = 690) with each household having a ceremony approximately every 2.3 years (–2.0). The greatest restriction on performing a ritual is money for the purchase of the sacrificial animal and provisions for the hosting of the ritual.

Between households owning and not owning *ubuhlanti*, several statistical differences in household conditions were found (Table 3). Households owning an *ubuhlanti* were predominately male headed (58%, n = 461), pensioners (48%, n = 385) and had a primary level of education (38%, n = 311). In contrast, amongst the households without an *ubuhlanti*, a greater proportion are female-headed (66%). There is also a significant relation (x^2 = 44.8, df = 1, P-value < 0.00001) between *ubuhlanti* ownership and wealth status: amongst the ‘‘poorest’’ households 60% own an *ubuhlant*i, and

amongst the ‘‘richest’’ 90%. There is no statistical relation between education level and *ubuhlant*i ownership.

Igoqo

Forty percent (n = 402) of the households owned an *igoqo*. There are two main types of *igoqo*, which are different in shape. The shape is determined by the ethnic identity of the family. *Ama Mfengu* women construct *amagoqo* vertically (Fig. 3), whereas those of *amaXhosa* women are stacked horizontally (Fig. 4). Occasionally a homestead will feature both types of *amagoqo* to show that the family is part *Mfengu* and part *Xhosa*.

The *igoqo* is a sanctuary for married women. The dimension and neatness of the *igoqo* is an important social status symbol signifying a housewife’s status within her community as a hard working housewife and her commitment to her family and ancestral veneration. It is the place to announce the gender of a newborn child as ‘‘*ngumntu wasegoqweni*’’ (child of the *igoqo*, meaning a girl), or ‘‘*ngumntu wasebuhlanti*’’ (child of the livestock enclosure, meaning a boy). Also some rituals are held at the *igoqo*. These include the female equivalent of the *Ukubuyisa* ritual called *Inkobe* that requires the sacrifice of a goat to appease the maternal ancestral spirits (*izinyanya*) after the death of the family matriarch. Another ritual called *ukutyiswa amasi* concerns the welcoming of a new bride to her husband’s home and clan. A goat is sacrificed to introduce the new family member to the ancestral spirits. These rituals take place in the presence of women only.

The *igoqo* is also an important informal social gathering place for female visitors and a formal venue where women from foreign clans will congregate when a ritual sacrifice is performed in the livestock enclosure. Women also undertake purging activities at the *igoqo*. In the past when home births were frequent the placenta and stillborn infants would be buried under the *igoqo*.

The cultural significance of the *igoqo* is also demonstrated by the fact that the wood of the *igoqo* is normally not used for other purposes. Only occasionally it is used during times of emergency, such as during prolonged rain when it has not been possible to collect fuel wood. However, under no circumstances will all of the wood be used and the used portion will be replaced as soon as possible.

The characteristics of the owners and non-owners of *igoqo* are given in Table 4. Households who owned and maintained an *igoqo* were predominantly male-headed households (56%), pensioners (46%) and had primary level of education (38%). There is no statistically significant relationship between the gender of the household head and presence/absence of an *igoqo*, (x^2 = 0.23, df = 1, P = 0.6314), however households with an *igoqo* have significantly more adult females (t = -3.08, df = 858.4, P = 0.0022) than those without an *igoqo*. There was a statistical significant difference (x^2 = 8.4, df = 1, P = 0.00381) in wealth status between *igoqo* owners and non-owners. Of the poorest households 33% owned an *igoqo*, and of the ‘‘richest’’ households 48% own an *igoqo*. Although the heads of *igoqo* owning households tended to have primary level of education (38%), in cases where they had secondary or higher education, the household was less likely to have an *igoqo*. A similar relationship was not found in the case of ownership of an *ubuhlanti*.

Amount and economic value of woody material used

Ubuhlanti

For the construction of *ubuhlanti* two types of plant material are needed, i.e., poles forming the upright frame and branches for packing between the poles. For poles 49 species were used, preferred species included: *Ptaeroxylon obliquum* (288)[1], *Acacia mearnsii* (181) and *Olea europaea* L. subsp. *africana* (159). The median number of poles used to construct an *ubuhlanti* is 32; these poles are replaced approximately between 6 and 8 years (Table 5). For each household owning an *ubuhlanti* this represents a median woody biomass use of 39 kg per annum. Branches are tightly packed between the poles to form the walls of the *ubuhlanti*; these walls are on average replaced every 3 years. Forty-eight species were used as wall material; the preferred species are *Coddia rudis* (337), *Acacia mearnsii* (181) and *Pappea capensis* (80). The median amount of branches used per user household is 1,344 kg per annum. In economic terms, the median gross annual value per user household is $5.30[2] for poles and $24 for branches. Thus, the average annual amount of woody biomass used for maintaining an *ubuhlanti* is 521 kg per household; this use can be valued at $29 per user household (Table 5). The ‘‘richest’’ households tended to use more poles and branches in the maintenance of their *ubuhlanti* than the ‘‘poorest’’ households (Table 6). The weights per annum were significantly higher for both poles and branches to construct the *ubuhlanti*, which ultimately resulted in the richer households having better constructed *ubuhlanti*. Consequently the wealthier households replace their material more regularly.

Igoqo

For the construction and maintenance of the *igoqo* only stem wood is used. Specific dimensions of selected species are used for this purpose. In total 49 species were recorded as being selected, the main ones being *Acacia karroo* (106), *Olea europaea* subsp. *africana* (95) and *Gymnosporia capitata* (65). The mean amount of material used per household is 1,043 kg per annum (Table 7). Some households maintain their *igoqo* by replacing at least some material weekly, whilst others wait as long as 16 years before replacing some or all of the material resulting in very large variations in annual cost of maintenance between households. This appears to be based only on personal preference. The amounts of resources used by the ‘‘richest’’ and ‘‘poorest’’ households are shown in Table 8. Even though wealth seems to have an impact on whether or not a household owns an *igoqo*, there is no statistical difference in the amount of material collected by the ‘‘richest’’ and ‘‘poorest’’ households. The gross net annual value of the woody biomass required to maintain an *igoqo* is $44 per annum per user household. It is clearly more costly to maintain an *igoqo* than an *ubuhlanti*.

Comparison to fuel wood use

The annual amounts of the woods used for maintaining the *ubuhlanti* and *igoqo* are considerable when compared to the amounts of fuel wood use. In a separate analysis of the overall biomass use in one of the study villages it appeared that the average annual

[1] This figure reveals the number of times this species was selected in the household survey.
[2] These values have been converted at exchange rate of $1 = R6.70, August 2004.

amount of fuel wood use was 1,627 kg per household against 835 and 517 kg of wood used for the maintenance of *ubuhlanti* and *igoqo* respectively (Cocks & Wiersum, 2003).

Species used

In total 72 species were selected for the maintenance of these cultural artefacts, confirming the importance of biodiversity for cultural purposes. *Acacia mearnsii*, *Eucalyptus* sp. and *Pinus* sp. were the only alien species selected.

Discussion and conclusion

The study clearly demonstrates the significant role that wild plants play in the construction and maintenance of cultural artefacts. An *ubuhlanti* is foremost a sacred temple for the male lineage of the homestead to communicate with their ancestors and receive their blessings and protection. The maintenance of a livestock enclosure is also a visual display of household tribal affiliation and the significance occupants attach to the ancestral belief. Similarly, an *igoqo* represents a sacred venue for the women of the household and is a visual presentation of tribal affiliation and prowess as a hardworking housewife. The significance attached to *ubuhlanti* and *igoqo* results in a visual display of the persistence of cultural practices amongst modernised communities.

Although the study was carried out in a region with non-traditional conditions and where most people depend on urban-based jobs or welfare grants, still 79% and 40%, of the households owned an *ubuhlanti* or *igoqo*. Moreover, no statistical relationship was found between the education level of the household head and the maintenance of an *ubuhlanti* and a high proportion of ‘‘wealthy’’ households maintained an *ubuhlanti* and an *igoqo*. This demonstrates the endurance of these cultural artefacts in the livelihoods of the communities. In other studies on cultural dynamics in the study area, it was noted that such adherence to cultural traditions should not be considered as a retreat into cultural essentialism, but rather as involving subtle interactions between traditional and modern cultural orientations and experiences; this process involves a re-articulation of tradition (Bank, 2002, p. 649). Consequently, the findings of this study should not be interpreted as illustrating stagnation in the traditional past, but rather as pointing at the need for improved understanding of the significance of bio-cultural diversity in a dynamic sense.

The findings of the study also demonstrate that the direct-use values of wild plants do not only relate to utilitarian uses for physical needs, but also to the fulfillment of important cultural functions. The estimated economic value per household is $47 per year, which is equal to approximately 3% of the average state pension received by people in the study area. However, this economic value only reflects the use value of wild plants as expressed in market prices. Such economic valuation does not give full credence to the cultural significance attached to the artefacts constructed by these plants (Ferguson, 1988). In addition to valuing biodiversity on the basis of market prices reflecting utilitarian needs, there is a need for extended valuation methods that reflect affective needs such as belongingness and identity (Douglas & Isherwood, 1997). The use of wild plants need to be represent not only referring to ‘‘socially neutral units of exchange’’ (Appaduria, 1988), but rather as being wrapped in the user’s belief system (Strang, 1997). This is necessary to fully appreciate the scope of bio-cultural diversity conservation. It is

therefore of paramount importance that bio-diversity conservation programs develop awareness campaigns which illustrate the link between cultural and biodiversity conservation as well as the diversity and dynamics of cultural values regarding biodiversity. Biodiversity conservation programs should include a careful adaptation of the multitude of cultural values regarding biodiversity to newly emerging socio-economic conditions. This message needs to become a central thrust in biodiversity programs.

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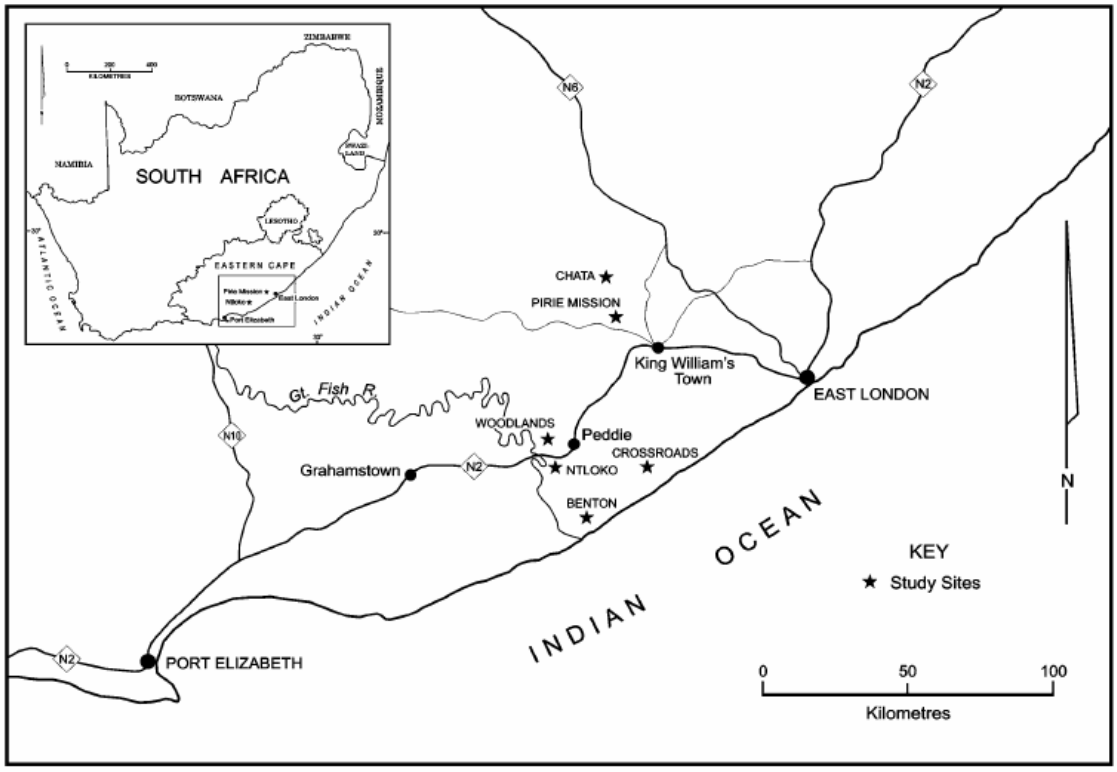

Fig. 1 Map showing locality of study sites

Fig. 2 Square kraal of *Mfengu* homestead (Photo A. Dold)

Table 1 Demographic profile of the household surveyed

	Male	Female			
1. *Household head (n = 1011)*					
Gender	554 (55%)	457 (45%)			
Occupation	Pensioner	Professional	Unemployed	Low/Med Skilled	Other
	473 (47%)	17 (2%)	328 (32%)	181 (18%)	12 (1%)
Education level	None	Primary	Secondary	Further	
	278 (28%)	384 (38%)	327 (32%)	21 (2%)	

2. *Household members (n = 1,006 households)*

	Frequency			Percentage of the household		
	Mean	Median	Range	Mean	Median	Range
Adults females:	2.3	2	0–11	39.5	37.5	0–100
Adult males:	1.1	1	0–7	30.5	28.6	0–100
Children (<18 years):	2	2	0–11	30	33.3	0–83.3
Pensioners/Grants:	0.7	1	0–4	14.1	10	0–100
Formally Employed:	0.5	0	0–5	8.3	0	0–100
Informally Employed:	0.6	0	0–6	9.5	0	0–100

3. *Agriculture products and livestock (n = 1,011 households)*

	Yes	No	Subsistence	Commercial
Agriculture	638 (63%)	373 (37%)	612 (96%)	26 (4%)
Livestock	414 (41%)	597 (59%)	406 (98%)	8 (2%)

Table 2 Demographic profile of the households representing the "poorest" and "richest" households

		Household wealth cluster		Test statistic		
		Poorest cluster Frequency (% of column)	Richest cluster			
Household head (n = 395)						
Gender	Male	89 (41%)	122 (68%)	$\chi^2 = 26.3$, df = 1, $P < 0.0001$		
	Female	126 (59%)	58 (32%)			
Education level	None	82 (38%)	46 (26%)	$\chi^2 = 6.371$, df = 1, $P = 0.0116$		
	Primary	77 (36%)	62 (34%)			
	Secondary	42 (20%)	50 (28%)			
	Further secondary	11 (5%)	21 (12%)			
	Higher	3 (1%)	1 (< 1%)			
Household income						
		n	Mean ± SD	N	Mean ± SD	Test statistic
Number of:	Formal jobs	215	0.2 ± 0.6	178	0.7 ± 0.9	$t = -5.0$, df = 310.1, $P < 0.0001$
	Pensions/Grants	215	0.7 ± 0.6	179	0.8 ± 0.8	$t = -0.15$, df = 348.2, $P = 0.1000$
Agriculture and livestock (n = 395)						
		Frequency (% of column)		Test statistic		
Agriculture	Yes	111 (52%)	140 (78%)	$\chi^2 = 27.8$, df = 1, $P < 0.0001$		
	No	104 (48%)	75 (22%)			
Livestock	Yes	0 (0%)	180 (100%)			
	No	215 (100%)	0 (0%)			

Table 3 A comparison of households owning and not owning an *ubuhlanti*

		Ubuhlanti		Test statistic and *P*-value
		No (n = 211) Frequency (% of column)	Yes (n = 800)	
1. *Household Head: (n = 1,011)*				
Gender	Male	93 (44%)	461 (58%)	$\chi^2 = 2.4$, df = 1, $P < 0.001$
	Female	118 (56%)	339 (42%)	
Occupation:	Pensioner	88 (41%)	385 (48%)	$\chi^2 = 3.8$, df = 4, p = 0.4
	Professional	4 (1.9%)	10 (1%)	
	Unemployed	77 (36%)	251 (31%)	
	Low/Med Skill	40 (19%)	142 (17%)	
	Other	2 (0.9%)	12 (1%)	
Education level:	None	54 (25%)	224 (28%)	$\chi^2 = 5.4$, df = 3, $P = 0.2$
	Primary	73 (34%)	311 (38%)	
	Secondary	78 (37%)	249 (31%)	
	Further	6 (2%)	15 (1%)	
2. *Household Members: (n = 1,006)*				
		Mean ± SD	Mean ± SD	
Adult females		1.9 ± 1.2	2.3 ± 1.4	$t = -3.9$, df = 377.4, $P = 0.0001$
Adult males		1.3 ± 1.2	1.8 ± 1.3	$t = -5.1$, df = 361.7, $P < 0.0001$
Children (< 18 years)		1.7 ± 1.9	2.1 ± 2.2	$t = -2.0$, df = 369.6, $P = 0.046$
Pensioners/Grants		0.5 ± 0.6	0.7 ± 0.7	$t = -3.6$, df = 370.8, $P = 0.0004$
Formally employed		0.4 ± 0.7	0.5 ± 0.9	$t = -2.2$, df = 382.6, $P = 0.0261$
Informally employed		0.4 ± 0.8	0.5 ± 0.95	$t = -1.3$, df = 355.0, $P = 0.1972$
3. *Agriculture products and livestock (n = 1,011)*				
		Frequency (% of column)		
Agriculture products	Yes	110 (52%)	528 (66%)	$\chi^2 = 13.7$, df = 1, $P = 0.0002$
	No	101 (48%)	272 (34%)	
Livestock	Yes	39 (19%)	375 (47%)	$\chi^2 = 55.7$ df = 1, $P < 0.0001$
	No	172 (81%)	425 (53%)	

Fig. 3 Vertically stacked *igoqo* of *Mfengu* housewife (Photo A. Dold)

Fig. 4 Horizontally stacked *igoqo* of *Xhosa* housewife (Photo A. Dold)

Table 4 A comparison of households owning and not owning an *igoqo*

		Igoqo		Test statistic and *P*-value
		No (n = 609) Frequency (% of column)	Yes (n = 402)	
1. *Household head: (n = 1 ,011)*				
Gender	Male	330 (54%)	(46%)	$\chi^2 = 0.2$, df = 1, $P = 0.6314$
	Female	279 (46%)	178 (44%)	
Occupation:	Pensioner	289 (47%)	184 (45%)	$\chi^2 = 4.3$, df = 4, $P = 0.3605$
	Professional	11 (1%)	3 (0.7%)	
	Unemployed	186 (30%)	142 (35%)	
	Low/Med skill	114 (18%)	68 (16%)	
	Other	9 (1%)	5 (1%)	
Education Level	None	143 (23%)	136 (33%)	$\chi^2 = 17.8$, df = 3, $P = 0.0005$
	Primary	232 (38%)	152 (37%)	
	Secondary	217 (35%)	110 (27%)	
	Further	17 (2%)	4 (1%)	
2. *Household Members: (n = 1,010)*				
		Mean ± Sd	Mean ± Sd	
Adult females		2.1 ± 1.4	2.4 ± 1.4	$T = -3.0$, df = 858.4, $P = 0.0022$
Adult males		1.7 ± 1.3	1.8 ± 1.3	$T = -0.9$, df = 829.7, $P = 0.3671$
Children (<18 years)		1.9 ± 2.2	2.1 ± 2.2	$T = -1.3$, df = 843.9, $P = 0.1699$
Pensioners/Grants		0.6 ± 0.7	0.7 ± 0.7	$t = -0.8$, df = 834.4, $P = 0.3967$
Formally employed		0.5 ± 0.8	0.5 ± 0.9	$t = 0.08$, df = 835.3, $P = 0.9334$
Informally employed		0.6 ± 0.9	0.5 ± 0.9	$t = 1.39$, df = 840.7, $P = 0.1658$
3. *Agricultural products and livestock (n = 1 ,0 11)*				
Agriculture products	Yes	363 (59%)	275 (68%)	$\chi^2 = 8.0$, df = 1, $P = 0.0045$
	No	246 (41%)	127 (32%)	
Livestock	Yes	214 (35%)	200 (49%)	$\chi^2 = 21.3$, df = 1, $P < 0.0001$
	No	395 (65%)	202 (51%)	

Table 5 Woody biomass needed per user household for maintenance of *ubuhlanti*

	Mean ± SD	Median ± MAD	Range
No. of poles	37.4 ± 22.7	32 ± 19.3	1–160
Replacement time (in years)	7.7 ± 4.2	5.6 ± 0.9	1–30
Weight (kg) per annum	55.1 ± 53.6	39.5 ± 30.1	1.1–595.7
Economic value per annum ($)	7.7 ± 7.2	5.3 ± 4.4	0.1–44.7
Weight (kg) per annum	1,347 ± 1,023	1,344 ± 698	0–9,268
Replacement time (in years)	3.2 ± 2.8	2.9 ± 1.6	0.5–23
Economic value per annum ($)	24.0 ± 28.0	17.9 ± 15.8	0–208.9
Weight (kg per annum)	759.0 ± 771.4	521.5 ± 418.2	2.6–4,745.8
Economic value per annum ($)	31.8 ± 28.6	24.1 ± 16.5	0.1–210.9

Table 6 Maintenance of *ubuhlanti* for each household by wealth

	Household wealth cluster		Test statistic
	Poorest Cluster (n = 130) Mean ± Sd	Richest Cluster (n = 157) Mean ± MAD	
Weight (kg) per annum	39.4 ± 31.3	51.6 ± 44.4	$t = -2.6$, df = 278.1, $P = 0.0094$
Economic value per annum ($)	5.8 ± 5.3	8.2 ± 7.9	$t = -3.0$, df = 273.0, $P = 0.0025$
Weight (kg) per annum	559.1 ± 574.9	893.6 ± 881.2	$t = -3.9$, df = 271.0, $P = 0.0001$
Economic value per annum ($)	20.4 ± 20.7	26.9 ± 24.1	$t = -2.4$, df = 284.5, $P = 0.0145$
Weight (kg per annum)	598.5 ± 579.3	994.7 ± 889.9	$t = -3.9$, df = 270.7, $P < 0.0001$
Economic value per annum ($)	26.2 ± 21.3	35.1 ± 26.4	$t = -3.1$, df = 284.8, $P = 0.00174$

Table 7 Woody biomass needed per user household for maintenance of an *igoqo*

Collected material ($n = 387$)	Mean ± St. Dev	Median ± MAD	Range
Replacement time (in years)	2.2 ± 2.8	1.0 ± 0.7	0.02–16
Weight (kg) per annum	1,043.0 ± 909.1	750.0 ± 784.3	4.6–4 500
Economic value per annum ($)	44.3 ± 57.4	25.0 ± 27.4	0.4–402.8

Table 8 Maintenance of *igoqo* for each household by wealth

Collected material ($n = 153$)	Household wealth cluster				Test statistic
	Poorest cluster		Richest cluster		
	n	Mean ± Sd	n	Mean ± Sd	
Weight (kg) per annum	69	1,193.0 ± 983.9	84	1,025.3 ± 893.9	$t = 1.0$, df = 139.0, $P = 0.200$
Economic value per annum ($)	69	55.5 ± 70.5	84	37.5 ± 42.5	$t = 1.8$, df = 106.8, $P = 0.066$