



Published in final edited form as:

Soc Nat Resour. 2007 ; 20(4): 337–350. doi:10.1080/08941920601161353.

“The Bush is No More”: Insights on Institutional Change and Natural Resource Availability in Rural South Africa

Tracy Kirkland,

University of Colorado at Boulder, Boulder, Colorado, USA

Lori M. Hunter, and

University of Colorado at Boulder, Boulder, Colorado, USA

Wayne Twine

University of the Witwatersrand, Johannesburg, South Africa

Abstract

The past decade has brought substantial transition to South Africa. The introduction of democracy in 1994 has yielded important political and socioeconomic transformations affecting millions of people. Here, we explore the impact of institutional and structural changes on the availability and management of fuelwood, a key natural resource in rural South Africa. As in other developing regions, many households depend on natural resources for both sustenance and energy needs. Drawing on qualitative data from 32 interviews, our objective is to describe, from the perspective of the respondents, (1) resource scarcity, (2) the underlying causes of resource scarcity, (3) the role of traditional authority in managing resources, and (4) strategies used by community members in the face of resource scarcity. The results have important implications for the well-being of both social and natural systems in many transitional, rural developing societies.

Keywords

common property resources; fuelwood; institutional transition; natural resources; South Africa; traditional authority

In 1994, the first fully democratic elections in postapartheid South Africa ushered in a new era characterized by optimistic expectations that new political and economic systems would rectify social inequities that persisted under the previous segregated regimes. Such inequalities are felt intensely in rural areas, where access to natural resources still plays a vital role in the livelihoods of poverty-stricken households (Twine et al. 2003b; Hasting-King 2004). Although many rural communities have indeed undergone substantial political transformations since 1994, meaningful social and economic change has been much slower to follow (Hasting-King 2004). In general, the benefits that have accompanied the new

Copyright © 2007 Taylor & Francis Group, LLC

Address correspondence to Lori M. Hunter, Department of Sociology & Institute of Behavioral Science (IBS), Program on Environment and Society, University of Colorado at Boulder, 468 UCB, Boulder, CO 80309-0468, USA. lori.hunter@colorado.edu.

Publisher's Disclaimer: Full terms and conditions of use: <http://tandfprod.literatmonline.com/page/terms-and-conditions>
This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan, sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.
The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

postapartheid democratic government have had little impact on villages located outside of more urbanized areas. Many rural areas continue to lack economic opportunities, access to basic health care, electricity, and dependable water supplies. Although the South African government is committed to developing rural services and infrastructure through various national programs, there is a substantial backlog, and issues such as affordability of housing and services remain problematic. These issues are particularly worrisome in light of increasing population pressures, which heighten the strain on already overstressed social relations and natural environments.

Given the past decade's political shifts, South Africa presents an interesting and important opportunity for considering the implications of changes in institutional and structural factors affecting social and ecological well-being. In this article, we focus on changes related to the availability and management of fuelwood, a key natural resource in rural South Africa. As in many other developing regions, a large portion of rural South African households depend upon a range of natural resources for basic living requirements (Griffin et al. 1993; Shackleton and Shackleton 2000). Even in rural villages where electricity is readily available, often over 90% of households use fuelwood as their primary energy source for cooking and heating due to the prohibitive costs of electricity and electrical appliances (Twine et al. 2003a). In such cases, fuelwood is a key "common property resource," as it is typically gathered from communal lands surrounding villages.

Drawing on qualitative data from 32 interviews with rural South Africans, our objective is to describe the respondents' perspectives on the state of proximate natural resources and transitions related to shifting institutional and social relations. Specifically, we describe residents' perceptions of (1) resource scarcity, (2) the underlying causes of resource scarcity, (3) the role of traditional authority in managing resources, and (4) strategies used by community members in the face of resource scarcity. As elaborated in the article's concluding section, the results have important implications for the well-being of social and natural systems in rural South Africa, while also providing more general insight into the implications of institutional change in a variety of transitional cultural contexts.

Background

Two key areas of literature have informed this research and are reviewed here. First, evidence is summarized on the centrality of natural resources to rural livelihoods in much of the African context. Second, we explore the role of traditional authority in managing common property resources, and the shifts in authority resulting from political and socioeconomic changes.

Contributions of Natural Resources to Rural Livelihoods

Savanna woodlands cover more than one third of South Africa and are home to 9.2 million rural people (Shackleton 2000). Apartheid-era resettlement programs, in which 75% of the population (Black) was allocated 13% of the country's land, resulted in the degradation of woodlands in Black "homeland" districts due to unsustainable agricultural development. In addition, deforestation has resulted from the excessive fuelwood harvesting driven by the energy demands of an impoverished, growing population (Department of Water Affairs and Forestry 1996).

Although apartheid has been abolished, resource shortages persist in the former homeland areas where biomass represents a fundamental energy source and where political freedom has not substantially altered dire economic circumstances (Griffin et al. 1993; Levin and Weiner 1997). Many rural households struggle to meet daily sustenance needs and cannot afford electricity for cooking and/or heating (e.g., Twine et al. 2003a). In fact, South

Africa's Department of Water Affairs and Forestry (1996) estimates that in 20 years, 1.5 million rural households will continue to be without electricity because of harsh economic circumstances. Estimates suggest that wood is the primary fuel source for over 17 million people, comprising 90% of rural households in South Africa (Gandar 1991; Griffen et al. 1993; Shackleton and Shackleton 2000; Twine et al. 2003a).

In the face of difficult economic conditions, common property resources bring substantial value to the household economy. Natural resources offer a financially inexpensive alternative to otherwise purchased goods (Griffen et al. 1993; Letsela et al. 2002; Twine et al. 2003a), and present opportunities for poor, rural households to generate income from trade in raw or processed natural products (Shackleton 1996). For example, in Nigeria, individual earnings from common property resources ranged from US\$817 to \$5200 per annum (Osemeobo 1991). Similarly, disaggregation of resource value in Lesotho revealed that the highest annual values of household income are derived from fuelwood (\$1492), crops (\$1363), and wild vegetables (\$774) (Letsela et al. 2002). In our study area, Shackleton and Shackleton (2000) calculated the annual direct use value of natural resources to be \$386 per household, or \$141 per hectare. Edible herbs accounted for the highest proportion of this value (33.3%), followed by fuelwood (21%), while fuelwood was valued at \$311 per household per annum in a nearby area (Dovie et al. 2004).

Since fuelwood is the primary, and often only, energy resource option for rural African households, local supplies are in high demand, often resulting in unsustainable harvesting. Mean annual per capita consumption of fuelwood in rural South Africa ranges from 491 kg to 1173 kg (Twine et al. 2003a). Overall, between 9 and 11 million tons of wood are used for fuel per year in South Africa, of which 6.6 million tons is estimated to be harvested from natural wood (Department of Water Affairs and Forestry 1996). Logically, as the stock of proximate resources decline, harvesting takes additional time. In the early 1990s, the average time spent collecting wood was estimated at 5 hours per household per week (Department of Water Affairs and Forestry 1996), compared to 10 hours per week 10 years later (Twine et al. 2003a). Importantly, there are gender dimensions to resource collection; women typically collect the resources necessary for household sustenance and therefore pay the price in additional collection time (Department of Water Affairs and Forestry 1996; Dovie et al. 2004). Overall, it is clear that the state of woodland resources in South Africa suggests an urgent need to create long-term institutional structures that support sustainable management (Department of Water Affairs and Forestry 1996). Further, within these institutional structures, it is important to acknowledge that both gender and class shape natural resource access and dependence.

Traditional Management of Common Property Resources

The restoration of traditional common property resource (CPR) regimes is believed by some to be the most efficient means of returning effective control to the use of proximate natural resources. However, the concepts of CPR, or more broadly community-based natural resource management (CBNRM), also have critics who argue that although theoretically attractive, these common property strategies have proven less successful than anticipated (Campbell et al. 2001; Dore 2001). This lack of success is often attributed to ambiguities of authority and power struggles between state and local institutions, as well as the pressures of poverty that lead to unsustainable extraction rates of resources for sustenance (Campbell et al. 2001; Nemarundwe 2004; Twine et al. 2003b).

These ambiguities and power struggles certainly characterize resource management regimes in many parts of postapartheid South Africa. Campbell et al. (2001) argue that institutional breakdowns in common property resource management most frequently occur in communal woodland areas, and that ecological, social, and economic factors contribute to this

phenomenon. In South Africa, postapartheid democracy has created new social relations, often resulting in the demise of community values and a rise of individualism and household-centered behaviors (Campbell et al. 2001). Some contend this has led to a deterioration of traditional values and behavior patterns, and declines in interpersonal cooperation (Twine 2003b).

The rural villages of our study area were created from the 1950s to the 1970s when Black South Africans were forcibly removed from land set aside for White settlement. The Black South Africans were resettled in newly formed villages in Black “homelands,” with each village allocated common property of roughly 500–1000 hectares. These surrounding common property resources were to be used by village residents for grazing livestock, cultivating fields, and harvesting natural resources. The boundaries of the village commons typically coincide with surveyed farm boundaries, but occasionally follow other landmarks or topographical features such as railway lines or streams. The natural resources within these village commons were, and still are, common property resources to be used by the local community under the jurisdiction of the village headman, and ultimately, the local chief. However, as we show later, these resources have in effect become open access.

As noted, prior to democratic change in South Africa, local traditional authorities, each headed by a chief, controlled unallocated land used communally by villagers (King 2005; Twine 2005). As King points out, the traditional authorities became agents of “indirect rule” by the colonial and Apartheid governments, possibly having greater powers and authority over the land and its resources than was historically the case. Their legitimacy during the apartheid era was thus frequently challenged by villagers, particularly the youth. Nevertheless, they played an important role in regulating use of common property resources even as they became bureaucratized by the prevailing government (Twine 2005). CPR management was achieved through various institutional mechanisms, such as issuing permits to harvest particular natural resources (such as poles), and enforcing taboos and laws by the application of fines or other forms of punishment (King 2005; Twine 2005). The chiefs were also given a budget to employ tree “police,” with this oversight acting to moderate human impact on the proximate resource base (Twine 2005).

In contemporary South Africa, however, breakdowns in the traditional management of communal woodlands have been attributed to a decline in respect for traditional authorities by local constituents (Campbell et al. 2001; Twine 2003b; 2005). Specifically, based on observations in 10 rural villages, Twine et al. (2003b) argue that residents perceive that respect for traditional authority has eroded with the introduction of democracy and freedom in postapartheid South Africa. Also, within these transitional contexts, some traditional authorities have been partially integrated with formal governing bodies and are, therefore, vulnerable to political shifts. For example, the effectiveness of traditional authority in some areas of rural South Africa appears undermined by budget cuts by the national government that hamper enforcement of traditional regulations. In interviews, rural village residents described how budget cuts had reduced the chief’s “tree police” from 20 to 3 persons, essentially disabling an effective “traditional” resource governance system, while villagers from a second community suggested that the new state government should provide money to reinstate the chief’s police force in order to enforce laws prohibiting the illegal harvesting of live trees (Twine 2003b).

Another concern voiced by these villagers (Twine 2003b) and elsewhere in southern Africa (Cocks et al. 2001; Mandondo 2001; Nemarundwe 2004), is that there is confusion over the roles and responsibilities of traditional authority figures. The introduction of democracy at the national level has created a complex interface between traditional and modern authority structures, resulting in overlapping responsibilities and conflicting mandates (Nemarundwe

2004; King 2005). This is demonstrated most poignantly in issues of land allocation and management. Nemarundwe (2004) illustrates the disconnect between traditional and modern institutions in a story of a young man condemned by the modern village development committee for turning a common property area into his vegetable garden; the traditional leader had approved his action, justifying it as necessary to take care of his family.

In another case offered by Nemarundwe (2004), a man was determined to keep his field after his wife's death although traditional law would require that he return the land to his wife's family. The man quickly reported the situation to the Rural District Council officials, the Zimbabwean state's modern authority system, which ruled that the man was entitled to keep the land. As a result, this confusion allows the opportunity for residents to oscillate between two locally recognized authority systems. In this case, the poor relationship between the two authority systems was used to the landholder's advantage.

Finally, unclear boundaries between villages also add to confusion in regards to traditional authority and natural resource management. Contestations often arise over boundaries demarcating a village's woodland resource use area, boundaries that constantly shift over time and space (Nemarundwe 2004). In the former homelands of South Africa, boundaries of village communal land were demarcated by the government when villages were created during the process of land reallocation and forced removals. This was done without participation by the local residents. In some instances, people lay claim to land falling under two adjacent villages while retaining allegiance to only one headman or chief. With regard to resource management, this is a difficult situation and community members have been documented to take advantage of this situation by extending their rights of access to woodland resources (Nemarundwe 2004). Moreover, based on research in Zimbabwe, McGregor (1995) contends that national-level policies governing natural resources do little to ensure sustainable harvesting at the local level. This can be extrapolated to South Africa, where national policies promote sustainable resource use although extraction within communal areas is likely unsustainable (Shackleton and Shackleton 2000).

Of course, shifting institutional structures only affect the ways in which resource demand is *met*; demand itself is the product of other forces, notably poverty. Since wood resources are often viewed as "free," requiring only extraction labor, these resources have become focal components of many emerging livelihood strategies, such as woodcarving (Campbell et al. 2001). Many rural African households have come to rely on a wide range of income-generating activities, some of which are acknowledged to be socially or environmentally detrimental. Indeed, some resource collection activities are illegal by traditional rules governing woodland use, such as the cutting of live trees or the theft of wood harvested by others. In short, many "traditional" rules governing woodland use are ignored when fundamental concerns arise with regard to meeting household needs (Campbell et al. 2001).

Research Setting

Our fieldwork was undertaken in the rural northeast of South Africa, in the field site of the Agincourt Health and Population Unit (AHPU) of the University of the Witwatersrand, during May–June 2004. The Agincourt field site, situated in the Bushbuckridge local municipality, encompasses 400 km², and is approximately 500 km northeast of Johannesburg (Figure 1). The area includes 21 villages and over 11,000 households. The smallest village has 755 residents, while the largest has nearly 9,000. On average, villages have approximately 3,800 residents. The region is semi-arid (annual rainfall 550–700mm) and fairly heavily populated (~170 persons/km²), with household plots too small to fully support subsistence agriculture. The settlement pattern is typical of rural communities across South Africa, and there is widespread poverty and substantial dependence on remittances of

income derived in urban areas by a large migrant population. In addition, a significant proportion of households depend on the state pension of an elderly resident as the only reliable source of household income. With regard to the natural environment, the vast majority of households exhibit a strong dependence on natural resources for a wide range of uses, including grazing for livestock, fuelwood, wild foods, thatching grass, construction timber, and other domestic products (Shackleton and Shackleton 2000). These resources are used for both household consumption and for generating income (Shackleton 1996).

Data and Methods

We conducted 32 interviews, lasting 30 to 90 minutes, with the individuals most engaged in their household's resource collection, particularly fuelwood collection. The sampled households represented a subsample of a larger sample of 240 households randomly chosen, for a broader study, from 8 villages in the Agincourt field site. The eight villages were chosen to represent a range of environmental context along the region's east–west rainfall gradient, with the selection of a subset of villages necessitated by logistic and budgetary constraints. An interview guide structured the discussions in order that similar lines of inquiry were pursued for all interviewed households. Due to objectives of the larger project, the interviewed households had all experienced the death of an adult household member during the past 2 years. Prior to reviewing changes in resource use related to the household's mortality experience, we discussed perceptions of the state of the natural environment, the availability of resources, and shifts in management regimes over the past decade. It is from these conversations that the following evidence is drawn.¹

We interviewed men and women from households ranging in size from 1 to 18 (mean = 7.9). Household socioeconomic status is discerned from the demographic surveillance data through an “asset index” based on an asset register including presence of a water connection and toilet on the household stand, ownership of appliances (e.g., radio) and equipment (e.g., wheelbarrow), and income for a given census year. Values of the asset index range from 1 (least assets) to 5 (most assets), with 3.25 being the mean value for interviewed households during the 2004 census year.

The second author of this article conducted the majority of the interviews, making use of a 5-page interview guide to structure the discussions, although participants were allowed the opportunity to expand upon their thoughts as desired. Each interview was recorded and transcribed (in translation) in entirety for analysis. The first two authors of this article reviewed the transcribed text of each conversation. For the purposes of this article, the analytical focus was on resource collectors' perceptions of resource context, as related to both resource availability and changes in institutional structures. Kirkland and Hunter worked collaboratively to determine general patterns in the data as related to the study objectives, and the results reported represent these general patterns. The incorporated quotes have been deemed to be especially illustrative of these patterns. All names are pseudonyms.

¹Concerns logically arise as to bias introduced by the fact that our sample households have all experienced an adult mortality within 2 years prior to the survey. In order to contrast mortality-impacted households with those in our sample not having recently experienced an adult mortality, we explored differences in household size and socioeconomic status across households along this dimension. Mortality-impacted households were not different, in a statistically significant sense, along either of these lines. Mortality-impacted households had, on average, one household member *more* than their non-mortality-impacted counterparts (8.2 members versus 7.3, respectively, $p < .12$). They were also comparable with regard to SES based on an asset index ranging from 1 (least assets) to 5 (most assets). Mortality-impacted households ranked, on average, 3.25 on the asset scale, with their non-mortality-impacted counterparts ranking 3.15 ($p < .63$).

Results

The results are presented in order of our primary research objectives.

Perception of Resource Scarcity

Fuelwood was used by 90% of the households interviewed. Among the respondents questioned about the availability of fuelwood resources, 90% agreed that scarcity of fuelwood is a problem in and around their village. Nearly half (48%) reported traveling long distances in order to harvest fuelwood to meet daily energy needs, and an additional 37% of respondents purchase wood regularly or intermittently specifically due to nearby scarcity. Alternative energy sources such as electricity or paraffin are used by 11% of the respondents. Charcoal is not produced in the region, and is therefore seldom used.

A common response to questions pertaining to fuelwood collection and availability within one's own village was the severity of nearby scarcity and the necessity of traveling increasingly longer distances to reliable supplies. For example, as described by Tsakani, a resource collector in an 8-person household (asset index = 4), "in the past we used to harvest from around the village ... but now we walk a long distance" to another village. Others walk long distances to the mountains in search of fuelwood because there are no longer trees nearby, which means additional collection time. Tintswalo, a resource collector in a 9-person household (asset index = 4), spoke of these difficulties: "It's not easy to find them [fuelwood] and we get them from far and we take a long time to find them. We spend 1–2 hours trying to find them." Indeed, individuals (mostly women and children) must devote a substantial amount of time searching for fuelwood, leaving less time for other household chores or for studies. As an illustration, Zodwa, who is the primary resource collector in an impoverished 6-person household (asset index = 2), expressed frustration that fuelwood collection inhibits her ability to attend school, a substantial opportunity cost: "I'm a registered learner, but because of fuelwood [scarcity] I am unable to attend regularly...we [are supposed to] attend 3 times per week, but you find that one [of those days] is always occupied." Many of the respondents expressed similar situations, citing household chores, studying books, and making marketable crafts as activities they would like to pursue if they did not have to spend time collecting fuelwood.

Purchasing fuelwood is one alternative to spending time collecting wood. Several interviewed households (37%) chose to buy fuelwood, and their reasons for doing so further suggest that there simply is not enough proximate fuelwood or time for collecting wood to meet the needs of the local population. As such, despite other fundamental needs (e.g., health care), meager incomes are spent in purchasing fuelwood. Niko is the head of a large 16-person impoverished household (asset index = 2). In describing the household's resource strategy, he laments, "There is no longer fuelwood, that is why we purchase it. The bush is no more, we don't have anywhere to harvest."

As a result of increasing demand and growing scarcity, competition for fuelwood resources has increased because the remaining sources are now shared among residents from many different villages. It is, therefore, no surprise that tensions between individuals and villages are rising. Of the respondents queried about competition and conflicts, 64% suggested that competition over fuelwood resources exists, while slightly less (57%) felt that conflicts often arise while harvesting. Conflicts include accusations, quarreling, and even stealing. Busi suggested that conflicts over fuelwood resources are due to recent realignment of village boundaries. She collects fuelwood from around a different village for her 6-person household (asset index = 2), and in thinking about competition for resources, she describes: "Yes, [conflicts] happen. Like now there are territorial demarcations, so you find people from other villages quarreling when we collect wood from their areas." Also describing

conflict is Virginia, who collects wood for her 7-person family (asset index = 4). She has been engaged in several incidents, describing “when you try to put your woods together sometimes you find that other people can steal one of your bundles. The worse part of it is when you know the person who has stolen your wood and in that situation there would be a quarrel.”

Underlying Causes of Resource Scarcity

Many reasons were given for why fuelwood supplies have dwindled, and the cause most commonly cited (80%) is an increase in residents cutting live trees for fuelwood, despite regulations by traditional authority against such behavior. Furthermore, 17% indicated that residents chop down *marula* trees (*Sclerocarya birrea*), which bear fruit traditionally used to make jam and beer. The marula plays a central role in the livelihoods of rural households in the northeastern savanna woodlands of South Africa. The marula is a medium-sized deciduous tree, and the highly prized fruits are consumed in large amounts, with the pulp being used to produce jam, jelly, and beer. Traditional taboos prohibit the felling of live *marula* trees. Niko sadly explains, although in exaggeration: “There are no longer marula trees, all marula trees have been chopped down. These young ones would not know the marula tree when they grow up.” In addition to these cultural effects, Zodwa emphasized the environmental impacts of marula harvesting: “We feel bad about that because it destroys nature and we will run short of marula beer, and trees are there to protect us from heavy winds.”

Of the respondents, 77% recognized that there are rules and regulations in place that prohibit chopping down living trees, but many respondents suggested that although village residents understand the rules and acknowledge the consequences, they disregard the restrictions simply because they have no choice. Specific consequences include fines, appearing before the tribal chief, jail time, and confiscation of cutting tools and gathered wood. Even so, Sibongile, the head of a destitute (asset index = 1) 6-person household, acknowledges, “Yes, it is forbidden to cut live trees, but we need them for our day to day life, hence the cutting.” Such sentiment was commonly expressed among many interviewees whose households could not afford to purchase fuelwood or alternative energy resources (i.e., electricity or paraffin).

Nearly 30% of the respondents placed some blame for the fuelwood shortage on the increase in rural population, and several suggested that the influx of Mozambican refugees had added to the resource stress. As perceived by Niko, the “Mozambicans chop a lot of trees which they used to build houses.” It is important to note, however, that the influx of refugees was at its height during the mid 1980s due to civil war in Mozambique. Other reasons for the scarcity of fuelwood include poverty, unemployment, and commercial cutting of wood. A number of respondents also suggested that unaffordable electricity forces people to continue cutting down living trees. As an example, Clara, a resource collector in a 9-person household (asset index = 4), explains, “Some people use electric stove, but some don’t, then they are forced to cut down living trees. And sometimes, when you have money to buy, you are still purchasing chopped living fuelwood.” Even faith, from a large (household size = 16) and relatively well-to-do household (asset index = 5), contends, “Electricity is so expensive, hence we chop down living trees despite restrictions.”

Role of Traditional Authority in Managing Natural Resources

The respondents were divided on the role of traditional authority in resource management; half felt that village residents no longer respect traditional authority, while the other half disagreed.

The reasons given as to why people are no longer respecting traditional authority include: People have no choice due to resource scarcity, rising incidence of commercial harvesting, people want to undermine authority, and authorities are corrupt. Sibongile explains why she believes people continue to cut down living trees despite restrictions: “I think people have no choice because it is not the situation of their own making, but I think they no longer respect the authorities.” This was a common sentiment among many of the respondents, especially among those who are unable to purchase electricity or paraffin. Only a few (3) of the respondents felt that people cut down trees for commercial reasons. Sara, a resource collector in a 5-person household (asset index = 3), believes that those who continue to chop down living trees despite restrictions seek to undermine traditional authority, but this was not a common perception. Another respondent suggested that the authorities are corrupt, and accused them of helping people smuggle fuelwood out of Kruger National Park; however, corrupt authorities do not appear to be a concern among the majority of respondents.

Strategies in the Face of Resource Scarcity

The most commonly mentioned strategy in the face of resource scarcity was to chop down living trees despite restriction from the traditional authority. One woman who works in a local protected area admitted smuggling small pieces of fuelwood out in her handbag, at the risk of being arrested and presumably losing her job. Another woman described how she harvests living trees from neighboring villages: “When they get you they arrest you, you only survive when you harvest opposite the patrol side.”

However, many of the respondents felt that this was not the only solution. Several argued that if affordable electricity were made available, people would stop harvesting live trees for fuelwood. Moreover, two respondents suggested that job opportunities would allow people to pay for electricity, thereby decreasing the need to harvest fuelwood. When asked why people cut down living trees and what could be done to stop people from doing so, Michael, the head of a 7 person-household (asset index = 3), stated, “I think it happens this way because we don’t have electricity, maybe if we had it people would stop.”

Discussion and Conclusion

In our rural South Africa study setting, the harvesting of live trees for fuelwood, despite restrictions established by the local traditional authority, appears widespread. This conclusion is based on the high number of respondents who claim to engage in the cutting of live trees, or who report witnessing others doing so.

Although many villagers acquire resources primarily from their own CPR pool, others are forced to collect resources such as fuelwood from outside their village boundaries, often encroaching on the resource areas of other villages. As reflected in other literature, institutional shifts have brought uncertainties with regard to communal property boundaries, uncertainties that are sometimes used to one’s advantage while also occasionally yielding social conflict.

Several respondents further reported “stealing” fuelwood and/or devising strategies to avoid being caught by the authorities (e.g., hiding harvested wood for later pickup). This observation also coincides with other evidence. For example, Lynam et al. (1996) found that, on average, 86% of households in their study area harvested from common property resources outside village boundaries, and they concluded that resource constraints were often overcome by “spillover” use of neighboring villages’ resources. Likewise, Twine et al. (2003b) found that resource harvesting by village “outsiders” has increased in South Africa, creating a cause for concern among residents and traditional authorities.

“Outsider” harvesting in South Africa may be partly attributed to recent social and political transitions. More specifically, it is suggested that harvesting from other CPR pools is closely linked to political freedom, which translates to a perception that implies “unbounded freedom in which people are entitled to harvest as they wish” (Twine et al. 2003b, 273). Traditional systems of implementing and regulating guidelines surrounding CPR management have changed with the decentralization and structural readjustment process in postapartheid South Africa. Traditional authorities now share responsibility with village-level local governance structures (community development forums), district municipalities, and provincial authorities. However, there is a lack of clarity with respect to the roles of each authority system, resulting in competition and ambiguity. Our results provide additional support that traditional authorities have experienced some decline in authority. Still, in addition to being related to shifts in the power of traditional authorities, the research presented here suggests that many rural residents disobey harvesting rules and regulations due to poverty and a lack of access to alternative energy sources.

Approximately 40% of South Africans live in rural towns and villages, with many rural residents living at or below the national poverty level. Moreover, women and children constitute the majority of poor households since men often leave to find work in neighboring urban areas (Department of Water Affairs and Forestry 1996). The majority of poverty-level households do not have access to basic services, such as nearby tap water or electricity, and fuelwood is a critical energy source. Indeed, in an assessment of the contribution of environmental resource to rural livelihoods, Shackleton and Shackleton (2000, 45) argue:

Resource harvesting is probably the safety net that allows many households to survive in areas of poor agricultural potential, high human populations and low employment. These activities should receive the same level of extension support from governmental agencies that arable and livestock agriculture do.

The evidence presented here substantiates the centrality of natural resources in rural livelihoods. Although our data were gathered only from households recently impacted by an adult mortality, the interviews also clearly reveal that rural residents are forced to resort to illegal harvesting practices as a result of poverty and lack of access to alternative energy sources. Given the similar socioeconomic status and household sizes characterizing mortality-impacted and non-mortality-impacted households, we have no reason to believe that these results do not have broader applicability. Further, respondent households perceive resource scarcity as a critical issue facing communities, with poverty and population growth both noted as driving forces in the decline of fuelwood.

Across Africa, new forms of conservation planning and development are emerging in response to similar pressures, especially where dense rural populations abut conservation areas. These initiatives seek to achieve the dual objectives of conservation and rural development through sustainable resource use, and are often broadly termed integrated conservation and development projects (Alpert, 1996). They include contractual parks, conservancies, joint wildlife management areas, community-based natural resource management (CBNRM), and biosphere reserves. In rural South Africa, communal woodland resources are being depleted by unsustainable fuelwood harvesting (Banks et al., 1996) with serious implications for both biodiversity and rural livelihoods. This suggests a desperate need for critical consideration of various resource management options. Local institutions, including traditional authorities, should be key players in such initiatives.

Growing empirical evidence provides insight into how individuals involved in situations of resource depletion devise restoration and conservation strategies that are based on their intimate knowledge of the local environment (Gautam and Shivakoti 2005). With the appropriate resources, such as rural funding, communities such as those studied here would

be better poised to protect and manage their natural resources. In this study, as well as elsewhere (see Twine et al. 2003b), residents claim that the “tree police” were an effective deterrence from cutting live trees; however, state budget cuts have significantly reduced the number of tree police, resulting in an increase in harvesting live trees for fuelwood. With adequate funding, traditional authority structures would be better positioned to develop management plans, such as tree police, best suited for the pressures incumbent upon a given local environment.

Other recommendations to help lessen harvesting pressures include managed rotational harvesting of coppice regrowth (e.g., Shackleton 2001) and development projects aimed at encouraging the use of sustainable energy (e.g., solar cooking boxes). Even so, while these projects may lessen proximate resource depletion, they do little to address the root cause of the problem—an inequitable economic system that results in unequal opportunity especially to Black South Africans while also generating high levels of reliance on natural resources to meet basic human needs. Unfortunately, despite major institutional transformations of the judicial, educational, health, housing, and governance sectors, income disparity in South Africa continues to rank among the highest in the world. According to the World Bank Gini Index of Income Distribution, South Africa has one of the highest wealth disparities in the world, with a Gini coefficient of 59.3, ranking it seventh in the world (World Bank 2004).

Indeed, efforts to decrease overall inequalities, including fostering rural economic opportunities, would allow residents to afford alternative fuel sources such as electricity or paraffin, and decrease reliance on fuelwood. In fact, economic opportunities, thereby yielding increased household income, represented a primary avenue by which many of our respondents believe overharvesting of trees could be lessened. As such, this is an association clearly made by those most directly involved. Of course, a shift of this magnitude requires prioritization at the national level, as well as potentially requiring deference to the local level and traditional authority. Indeed, misconceptions regarding the true drivers of overexploitation of common property resources need to be recognized at the highest levels of governance, since this clearly informs appropriate intervention. Although shorter term fixes may deal with environmental shortages in the near term, the association is inherently much more complex. It is our hope that this analysis provides insight into the complexities arising from social and political transitions from the perspectives of impoverished, resource-dependent individuals living in the midst of these profound changes.

Acknowledgments

This research has been supported by the Programme on Population, Environment, and Development (PRIPODE) of the Committee for International Cooperation in International Research in Demography (CICRED). Supplemental funding was received through the Population Aging Center at the University of Colorado at Boulder. We thank Aaron Johnson and Elly Mokoena for their assistance with fieldwork, and the staff and residents of the Agincourt Health and Population Unit for their support and participation in this project.

References

- Alpert P. Integrated conservation and development projects: Examples from Africa. *BioScience*. 1996; 46(11):845–855.
- Agrawal A. Sustainable governance of common-pool resources: Context, methods, and politics. *Annu. Rev. Anthropol.* 2005; 32:243–262.
- Banks BI, Griffin N, Shackleton CM, Shackleton SE, Mavrandonis J. Wood supply and demand around two rural settlements in a semi-arid savanna, South Africa. *Biomass Bioenergy*. 1996; 11:319–331.
- Barnes DF, Floor WM. Rural energy in developing countries: A challenge for economic development. *Annu. Rev. Energy Environ.* 1996; 21:497–530.

- Campbell B, Mandondo A, Nemarundwe N, Sithole B. Challenges to proponents of common property resource systems: Despairing voices from the social forests of Zimbabwe. *World Dev.* 2001; 29(4): 589–600.
- Cocks, M.; Dold, A.; Grundy, I. [accessed 22 September 2004] Challenges facing a community structure to implement CBNRM in Eastern Cape, South Africa. *African Stud. Q.* 2001. <http://web.africa.ufl.edu/asq/v5/v5i3a4.htm>
- Department of Water Affairs and Forestry. Sustainable forest development in South Africa: The policy of the government of national unity. Forestry White Paper. Pretoria, South Africa: Department of Water Affairs and Forestry; 1996. <http://dwafapp4.dwaf.gov.za/webapp/?page=focuments&subPage=legislation>
- Dore, D. [accessed 22 September 2004] Transforming traditional institutions for sustainable natural resource management: History, narratives and evidence from Zimbabwe's communal areas. *African Stud. Q.* 2001. <http://web.africa.ufl.edu/asq/v5/v5i3a4.htm>
- Dovie DBK, Witkowski ETF, Shackleton CM. The fuelwood crisis in southern Africa—Relating fuelwood use to livelihoods in a rural village. *GeoJournal.* 2004; 60:123–133.
- Gandar, MV. The imbalance of power. In: Cocks, J.; Koch, E., editors. *Going green: People politics and the environment in South Africa.* Cape Town, South Africa: Oxford University Press; 1991. p. 94-109.
- Gautam AP, Shivakoti GP. Conditions for successful local collective action in forestry: Some evidence from the hills of Nepal. *Society Nat. Resources.* 2005; 18:153–171.
- Griffin NJ, Bank DI, Mavrandonis J, Shackleton CM, Shackleton SE. Fuel use in six rural settlements in Gazankulu. *J. Energy South Africa.* 1993; 4:68–73.
- Hasting-King, B. Doctoral dissertation. University of Colorado at Boulder; 2004. In the shadow of Kruger: Community conservation and environmental resource access in the former Kangwane Homeland, South Africa.
- King B. Spaces of change: tribal authorities in the former Kangwane homeland, South Africa. *Area.* 2005; 37:64–72.
- Letsela T, Witkowski ETF, Balkwill K. Direct use values of communal resources in Bokong and Tsehlanyane in Lesotho: Whither the commons? *Int. J. Sustain. Dev. World Ecol.* 2002; 9:351–368.
- Levin, R.; Weiner, D. *No more tears: Struggles for land in Mpumalanga, South Africa.* Trenton, NJ: Africa World Press; 1997.
- Lynam, TJP.; Chitsike, J.; Howard, M.; Hodza, P.; Khumalo, MA.; Standa-Gunda, W. Assessing the contributions of renewable natural resources to the livelihoods of communal area households in the Zambezi Valley of Zimbabwe. In: Christoffersen, N.; Campbell, B.; Du Toit, J., editors. *Communities and sustainable use: Pan African perspectives.* Harare, Zimbabwe: IUCN, Regional Office for Southern Africa; 1996.
- Mandondo A. Use of woodland resources within and across villages in a zimbabwean communal area. *Agric. Hum. Values.* 2001; 18:177–194.
- McGregor J. Gathered produce in Zimbabwe's communal areas: Changing resource availability and use. *Ecol. Food Nutr.* 1995; 33:163–193.
- Nemarundwe N. Social charters and organisation for access to woodlands: Institutional implications for devolving responsibilities for resource management to the local level in chivi district, Zimbabwe. *Society Nat. Resources.* 2004; 17:297–291.
- Osemeobo GJ. Effects of common property resource utilization on wildlife conservation in Nigeria. *GeoJournal.* 1991; 23(3):241–248.
- Shackleton CM. Potential stimulation of local rural economies by harvesting secondary products: A case study of the central eastern transvaal lowveld. *South Africa. Ambio.* 1996; 25:3–38.
- Shackleton CM. Woodlands in South Africa and the National Forests Act. *South African For. J.* 2000; 187:19–28.
- Shackleton CM. Managing regrowth of an indigenous savanna tree species (*Terminalia sericea*) for fuelwood: The influence of stump dimensions and post-harvest coppice pruning. *Biomass Energy.* 2001; 20:261–270.

- Shackleton CM, Shackleton SE. Direct use values of secondary resources harvested from communal savannas in the Bushbuckridge lowveld, South Africa. *J. Trop. For. Products*. 2000; 6:28–47.
- Twine W. Socioeconomic transitions influence vegetation change in the communal rangelands of the South African lowveld. *African J. Range Forage Sci*. 2005; 22:93–99.
- Twine W, Moshe D, Netshiluvhi T, Siphugu M. Consumption and direct-use values of savanna bio-resources used by rural households in Mamejja, a semi-arid area of Limpopo province, South Africa. *South African J. Sci*. 2003a; 99:467–473.
- Twine W, Siphugu V, Moshe D. Harvesting of communal resources by ‘outsiders’ in rural South Africa: A case of xenophobia or a real threat to sustainability? *Int. J. Sustain. Dev. World Ecol*. 2003b; 10:263–274.
- World Bank. 2004 World Development Indicators. Washington, DC: World Bank; 2004.



Figure 1.
Study Area, Agincourt Health and Population Unit, Limpopo Province, South Africa.