

The role of non-timber forest products in household coping strategies in South Africa: the influence of household wealth and gender

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Abstract The prevalence and ranking of non-timber forest products (NTFPs) as safety-nets has been well discussed, but rarely quantified. We report on group discussions and household interviews in two South African villages to assess the frequency and nature of shocks and stresses over a 2-year period and the coping strategies employed, stratified by household wealth and gender of the de jure household head. Overall, kinship was the most widely adopted coping strategy, and NTFPs were the fifth most prevalent (employed by 70% of households). There were relatively few differences in the nature of shocks or responses between male- and female-headed households. Wealth influenced the experience of shocks or stresses as well as responses. Poorer households have fewer options with the increased use or sale of NTFPs being the second most commonly adopted strategy. Increased use and sale of NTFPs is a common manifestation of the safety-net function. To reconcile long-term economic development and biodiversity conservation, it is important to understand people's use of natural resources and the factors that affect this use, including their responses to shocks and stresses.

Keywords Coping strategies · Gender · Non-timber forest products · Shock · South Africa · Wealth

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Introduction

Vulnerability in rural livelihoods

Poverty reduction remains a challenge within the developing world (Sunderlin et al. 2005), and especially within sub-Saharan Africa, where the general nature of poverty is chronic (Sen 2003). For many living in these areas, poverty and insecurity persist (Dercon 2002; Günther and Harttgen 2009), exacerbated by unstable economies, HIV/AIDS (Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome), civil unrest, biodiversity loss, climate change, etc. Poverty in rural sub-Saharan Africa results from vulnerability to a range of external and local shocks and stresses with vulnerability defined here as the level of the risk of future poverty experienced by a household at any given point in time (Calvo and Dercon 2005; De la Fuente 2010). Households faced with increased poverty levels (and therefore increased vulnerability) due to such events become less resilient to future events, whereby resilience is the “extent to which the society or households can recover” (De Waal and Whiteside 2003, p. 3). The complex nature of vulnerability, together with the heterogeneity of rural communities, implies that different individuals and groups experience differing frequencies, types, and degrees of vulnerability (De Waal and Whiteside 2003; Maxwell et al. 1999). Female and elderly-headed households, young households, poor households, and those affected by HIV/AIDS are especially vulnerable (De Waal and Whiteside 2003; Posel 2001).

Assessing vulnerability is complex (Block and Webb 2001; Dercon 2002; Günther and Harttgen 2009): it is temporally and spatially dynamic and depends upon the scale of analysis (Skoufias 2003). Nonetheless, the multi-dimensional nature of vulnerability communicates more than simple economic measures common in poverty assessments. The “vulnerability context” highlights a mix of influences, responsible for hardship, that impact directly on a household’s asset status and livelihood options and over which households have limited or no control (DFID 1999). Shocks are generally unpredictable in nature and include human, crop and livestock health, and natural and economic shocks (DFID 1999). Trends are more predictable, not necessarily negative and include population, resource, technological, economic, and governance trends. Seasonality of prices, production, health, employment opportunities, etc. is described as one of the greatest enduring sources of hardship in developing countries (DFID 1999). Household response may vary depending on the frequency, nature, and intensity of the shock as well as on household characteristics (e.g., wealth, gender, social networks, age) and its asset base (Pattanayak and Sills 2001). Poor and female-headed households are often constrained by poor access to assets restricting their ability to escape from poverty and to react positively to beneficial trends (DFID 1999).

Coping with vulnerability and risk

A shock’s impact is determined by the nature of the shock and the resources households have at their disposal. Households aim to maintain and secure a sustainable livelihood where they are able to cope with adversity by drawing on

available assets. However, the rural poor are often insufficiently insured and therefore vulnerable (Wong and Godoy 2003). Furthermore, in many developing countries, public safety-nets and private insurance options are weak, forcing households to rely on informal or local insurance strategies (Baland and Francois 2005; Delacote 2009; Dercon 2002; Skoufias 2003). The range of coping strategies households may employ is diverse (Heemskerk et al. 2004; Wong and Godoy 2003) and forms part of the broader livelihood system, especially in terms of risk management as opposed to risk-coping strategies (Dekker 2004; Dercon 2002). This study focused on the latter, i.e., strategies employed in the wake of a shock rather than individual prevention and mitigation strategies (Dekker 2004). Some coping strategies are common to communities irrespective of their location, characteristics or the shock experienced, while other strategies are used more specifically for coping with particular types of shock (Maxwell et al. 1999). There is mixed evidence of the effectiveness of these informal safety-nets, suggesting they insure against small or medium shocks but are often inadequate in the face of larger, covariate shocks (Dercon 2002; Günther and Harttgen 2009; Heemskerk et al. 2004; Wong and Godoy 2003). Included in the range of possible coping strategies is the use and sale of NTFPs (Delacote 2009; McSweeney 2004).

The safety-net function of NTFPs

Most poor, rural households derive multiple benefits from the goods and services available in their immediate environment (Shackleton and Shackleton 2004; Twine et al. 2003). Households rely on an array of products, whose contribution extends beyond the direct-use value and associated cost saving, to include indirect benefits and an important “gap-filling” and “safety-net” function (Delacote 2007; Hunter et al. 2011; McSweeney 2004; Paumgarten 2005; Shackleton and Shackleton 2004). Wood (2003) explains the livelihoods of the rural poor are continuously moving between troughs and peaks of security whereby households are involved in improving their livelihood outcomes or coping with vulnerability. Rural safety-nets could be viewed as the link between the troughs and the peaks; that is, they seldom offer a long-term solution to insecurity but they are essential in helping households mitigate the troughs. NTFPs as a rural safety-net offer both consumption and income smoothing options (Delacote 2009; Jodha 1986; Nkem et al. 2010; Pattanayak and Sills 2001). Consequently, it is argued that the safety-net function of forests must not be endangered without providing viable alternatives (McSweeney 2005). Large-scale land degradation or privatization therefore undermines livelihood security (Belcher et al. 2005; Scherr 2000).

Despite increasing awareness of the potential role of NTFPs in helping households cope with periods of vulnerability the empirical evidence of this function, its prevalence and how it manifests remains case study driven and descriptive in nature (Baland and Francois 2005; Godoy et al. 1998; McSweeney 2005; Wunder 2001). Furthermore, less attention has been paid to the semi-arid savannahs in southern Africa (Twine et al. 2003). In this context, this paper reports on a study of NTFPs as safety-nets within two South African rural villages, drawing on both qualitative and quantitative methods. The use of both qualitative and

quantitative assessments of vulnerability could help inform policy (Dercon 2002). Specifically examined were the range of coping strategies employed in relation to a variety of shocks and stresses identified by respondents. The following key questions were addressed: (1) What is the prevalence and nature of shocks experienced, (2) What were the main coping responses, (3) How prevalent is the use of NTFPs as a rural safety-net, (4) What is the nature of such use, and (5) Do household wealth or gender of the household head influence use of NTFPs as a safety-net? The following sections describe the selected study sites followed by the methods used, both qualitative and quantitative, to address the questions outlined above. Thereafter, the results are presented and discussed, focusing on household vulnerability and coping (more specifically on the safety-net function of NTFPs), with household wealth and gender of the de jure household head used for comparison. Recommendations are presented in the concluding section.

Study area

Two study sites were selected on the basis of prior knowledge of the activities in the areas and general differences in aspects of their ecological setting, location, social, and economic characteristics (Table 1). We view them as case studies rather than representative samples. The village of Dyala lies in the Kat River valley of the

Table 1 Summary profile of Dyala and Dixie

Municipal ward level attribute	Village		Village level attribute	Village	
	Dyala	Dixie		Dyala	Dixie
Province	Eastern Cape	Limpopo	Latitude and longitude	32°32.0'S 26°40.3'E	24°41.7'S 31°28.5'E
Local Municipality	Nkonkobe	Bushbuckridge	Distance to regional centers	16; 38 km	55; 25 km
Ward population density (people/km ²)	36.3	26.8	Approx. MAP	997 mm	600 mm
Average number people/household	4.8	4.0	Vegetation type	Amatole Montane Grassland	Granite Lowveld
Females (%)	55.5	54.8	Ethnic group	Xhosa	Tsonga
Males (%)	45.5	45.2	Total No. of households	135	98
Education: none (%)	21.6	9.9	Av. household size (sampled hhs)	4.5 ± 0.3	3.6 ± 0.3
Proportion formally employed (%)	3.7	9.8	Proportion of female-headed households (sample) (%)	34.0	16.0
Proportion with no formal cash income (%)	41.3	25.7	Average years of education per household	5.8 ± 0.4	5.8 ± 0.3

Eastern Cape province (Fig. 1a). Dixie is in the Bushbuckridge Municipality that spans Limpopo and Mpumalanga provinces with Dixie falling in the Limpopo section (Fig. 1b). The Limpopo and Eastern Cape provinces are the two poorest in South Africa.

The biophysical environment

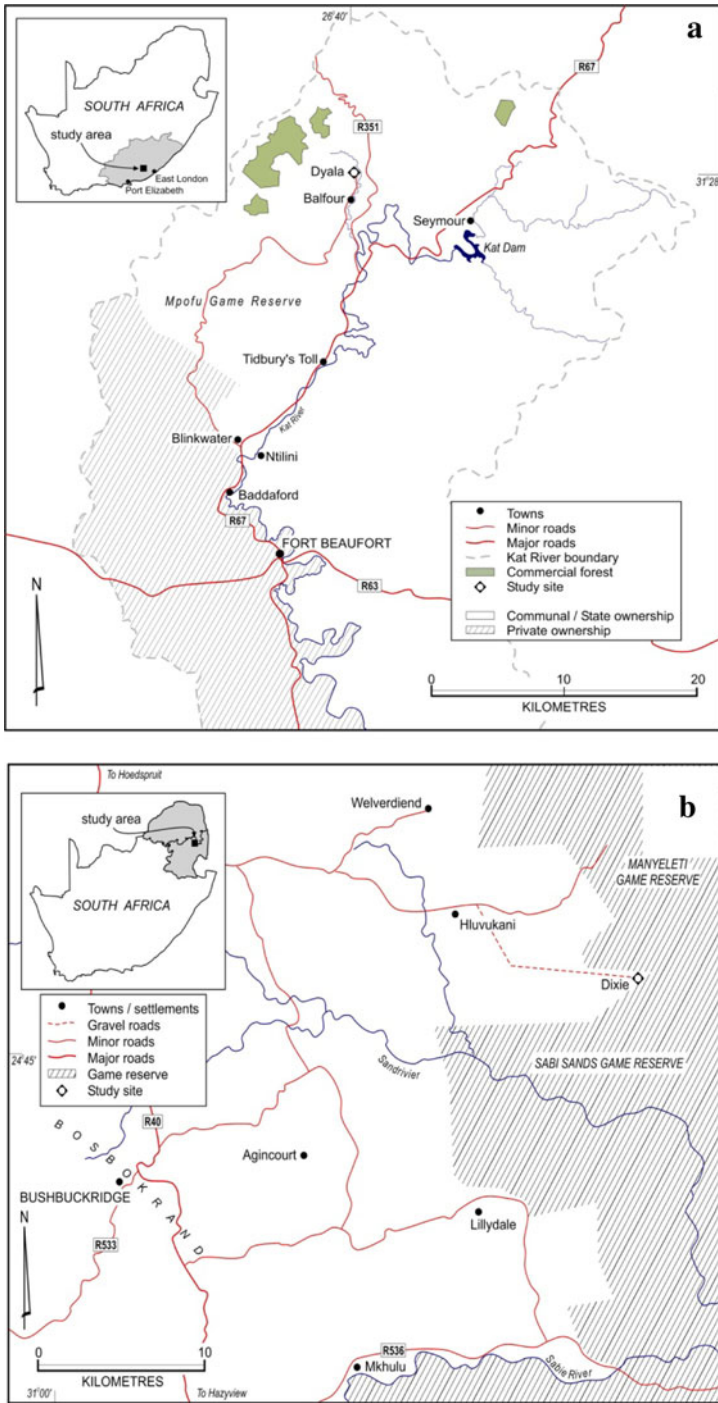
The climatic conditions in Dyala include warm, wet summers, and cold winters. Mean annual rainfall is 997 mm. The surrounding landscape, classified as Amatole Montane Grassland (Mucina and Rutherford 2006) is a mosaic of grasslands and indigenous forest patches, with some commercial timber plantations. Several streams ensure a supply of water. Dixie is characterized by dry, frost-free winters and warm, wet summers. The mean annual rainfall is approximately 600 mm. Erratic rainfall, frequent droughts, poor soils, and limited land make cultivation difficult and crop failure common (Paumgarten 2006). Dixie falls within the Granite Lowveld (Mucina and Rutherford 2006), a savanna type dominated by the tree genera of the *Acacia*, *Albizia*, *Combretum*, and *Sclerocarya*.

The socioeconomic environment

In common with all former homeland areas throughout South Africa, the study sites are characterized by poor service provision and low levels of development (Hunter et al. 2011; Twine et al. 2003). Both villages have limited infrastructure with no electricity, potable water or sewage reticulation. People rely primarily on river and rainwater, while fuelwood and paraffin constitute the primary energy forms. Both villages have primary school facilities, but no secondary schools. Mobile clinics service both villages; however, poor roads often hinder these services. Both communities rely on nearby regional centers for more diverse services although transport is a limitation in terms of access.

General economic activity in the areas surrounding both villages is low, with high unemployment. For Dyala residents, there are limited employment opportunities in the forestry sector, small-scale tourism ventures and as seasonal farm laborers. In Dixie, tourism is the major employer followed by the informal economy. There is a high dependence on government welfare grants for cash income. Land-based strategies, including arable agriculture, animal husbandry, and NTFP use, contribute to households in both villages and their surrounds (Paumgarten 2006; Shackleton 2004; Shackleton and Shackleton 2006; Twine et al. 2003).

The community of Dyala has open access to land, including indigenous forest, except for the surrounding State forests where access is controlled. Land-use in and around Dixie is a mix of residential plots, arable fields, communal grazing areas, and up-market private conservation areas. Communal grazing lands provide access to NTFPs. Dyala consists of approximately 135 households and Dixie 98. Average household size is 4.5 ± 0.3 and 3.6 ± 0.3 , respectively. The majority of sampled households in both villages were male headed (66 and 84%, respectively; Table 1). The villages are contained, making village membership easy to identify.



Methods

Participatory rural appraisal (PRA) techniques and household interviews were employed with the former used to gain a baseline understanding to guide the design of the interview questionnaires. PRA techniques were employed to establish an understanding of people's livelihoods, particularly with respect to their use of NTFPs (both as a livelihood strategy and as a safety-net) and the vulnerability context of the communities in question. Wealth ranking exercises were performed (Paumgarten 2006). Historical profiles, time trend exercises, and seasonal calendars were used to identify periods of increased vulnerability and people's means of coping as well as fluctuations in the availability, use, and sale of NTFPs (Paumgarten 2006). The survey focused on stated responses rather than actual behavior and although there are challenges associated with such an approach, the use of household interviews, PRA, and a review of the relevant were used to triangulate the responses and garner a thorough understanding of household vulnerability and means of coping (Dercon 2002).

The primary sampling frame for the household surveys was determined in a participatory manner. Terms related to wealth and gender were not defined in advance, but were identified by the community. For the wealth ranking exercise, the communities' own criteria (established through PRA) of household wealth were determined and used. These included livestock ownership, employment, government grants, the use of alternative cooking fuels, the health of household members, the ability to pay school fees, the size and style of house, and the quality of assets owned (Paumgarten 2006). According to Hunter et al. (2011), such possession indices are a reflection of household economic well-being. All households were ranked and after ranking, a list of wealthiest and poorest households (determined by times voted during ranking) was compiled and used to target the household interviews. One hundred households were sampled: fifty households in each village consisting of 50% poor households and 50% wealthy. A principal components analysis (PCA) was performed retrospectively to corroborate the wealth ranking exercise based on the attributes of specific interviewed households (Paumgarten and Shackleton 2009). In addition to household wealth, gender of the *de jure* household head was noted, with female-headed households often reported as more vulnerable than their male-headed counterparts. In Dyala, thirty-three of the fifty selected households are male-headed. In Dixie, forty-two have male-heads.

Although there are numerous factors and a range of population dynamics that can be considered when analyzing rural livelihoods, including the role of NTFPs in rural livelihoods and the safety-function of these resources, this study focused on household wealth and gender of the *de jure* household head. Numerous commentators have explored the relationship between household wealth and the use and sale of NTFPs with various interactions noted (Cavendish 2000; Shackleton and Shackleton 2006; Wunder 2001). With respect to gender, in many rural areas, gender is an aspect of social differentiation, with women (and female-headed households) generally being poorer. NTFP use is often determined by gender with some NTFPs labeled as "women's goods" while others are used and controlled by men (Shackleton 2004). Although studies have considered the relationship between

household wealth and gender of the de jure household head and the use and sale of NTFPs, the implications of these variables on vulnerability and the selection of coping strategies need further consideration.

The interview schedule included structured and semi-structured questions and focused on the 2-year prior to the fieldwork to avoid inaccurate recall and because an unrestricted timeframe may have yielded too many shocks to analyze in sufficient detail. With respect to NTFPs, we followed the definition of de Beer and McDermott (1989) where they consider NTFPs to include all biological resources extracted (with the exception of commercial timber), for human use. Where nominal categorical data were recorded, a Pearson's chi-squared test was used to determine significant associations between variables. Numerical values (both continuous and discrete) were analyzed using a t-test for independent samples (where the data were normally distributed) or the nonparametric Mann–Whitney U Test if the data failed normality and homogeneity tests. Data from the two villages were combined because the sample size of households that positively reported experiencing specific crises was reasonably small (although the total was high). Therefore, while household wealth and gender of the de jure household head are considered, this is a composite view. Paumgarten (2006) shows that despite their geographical differences, there were not many differences with respect to prevalence and nature of shocks and use of NTFPs between the two sites. Those households that relied on NTFPs to provide natural insurance were compared with households that reported no reliance on these products.

Results and discussion

The prevalence and nature of shocks in rural livelihoods

Households in both villages associated increased vulnerability with unanticipated shocks, anticipated periods of hardship, and with trends such as increasing living costs (DFID 1999). Although the study focused on the previous 2 years, broader, historical trends, and changes in the social, economic, and biophysical environments in which households operate, provide the context. In particular, respondents identified (1) natural shocks related to climatic variability, (2) political instability and change that have affected access to land and resources as well as infrastructural development, (3) human health shocks and increasing mortality due to HIV/AIDS, tuberculosis, and malaria, and (4) economic shocks including increasing unemployment (Dahlberg 2000; Hunter et al. 2011; Paumgarten 2006). Seventy-eight percent of households indicated an increasing trend in living expenses, to which they have to constantly adapt. Superimposed on these trends are stochastic shocks. Each household's vulnerability context results from a unique combination of crises, livelihood strategies, the asset base, lifecycle stage as well as socioeconomic class (McSweeney 2004; Pattanayak and Sills 2001).

During the PRA, respondents identified a range of crises to which households are vulnerable. These were divided into anticipated stresses and unanticipated crises. Anticipated stresses were events that impact negatively on the household but for

which the household is able to plan in advance. Unanticipated crises were unexpected shock events. Four anticipated stresses and seven unanticipated shocks were identified (Table 2). During the 2-year period, all of the sampled households experienced at least one stress or shock, with some experiencing several, which emphasizes the often reported vulnerability of rural livelihoods (DFID 1999; Wood 2003). Our study shows that households can face multiple shocks in a reasonably short period, suggesting the need for either a few highly effective means of coping or a diversity of strategies to promote resilience (Godoy et al. 1998; Maxwell et al. 1999; Sauerborn et al. 1996; Wong and Godoy 2003). Households may have limited recovery time between crises. It is hypothesized that in the face of this potentially limited recovery time and with each crisis potentially associated with different impacts, a diversity of strategies promotes robustness. Dercon (2002) identifies both idiosyncratic and covariate risks and notes that small, more frequent shocks are easier to deal with than large, infrequent shocks. Furthermore, while idiosyncratic can be insured within the community, covariate shocks cannot as all members are affected, thereby often requiring external intervention to avoid community-wide increases in vulnerability (Dercon 2002).

Of the anticipated stresses, the most common is the payment of annual school fees in January, which has previously been identified as period of increased hardship for poor households across South Africa (Shackleton 2004; Twine et al. 2003). This was followed by the cost of social ceremonies, seasonal crop shortfalls, and agricultural expenses. According to Pattanayak and Sills (2001), arable agriculture is subject to multiple risks. For each anticipated stress, a significantly greater proportion of wealthy households were affected (Table 2). This is possibly a reflection of the initial wealth ranking and the households' lifecycle stage. For example, in Dixie wealthy households consisted predominantly of established households with adults of working age and children of school-going age, while poor households consisted of younger households with no or young children. The greater proportion of wealthy households prone to anticipated stresses suggests that the impact of these and households' ability to cope are more relevant than the experience itself. With respect to wealth, although the common adage is that the poorer households are more vulnerable to risk this study suggests that by way of their social position and asset base, wealthy households experience greater frequency of certain stresses and expenses. Günther and Harttgen (2009) postulate that as household consumption is variable over time a household's current poverty status is not a true reflection of their vulnerability. The prevalence of anticipated stresses was not influenced by gender of the *de jure* household head (hereafter termed gender) although female-headed households are commonly reported as more vulnerable (Posel 2001).

Considering unanticipated shocks, the greatest proportion of households reported illness or injury to household members, while loss of income was experienced by the smallest proportion (Table 2). All the identified shocks were experienced by both male- and female-headed households with no significant differences noted. Similarly, there were few wealth effects, except for livestock diseases or death being reported by a significantly greater proportion of wealthy households (Table 2). As with anticipated stresses, this is a reflection of the household asset base, since poorer

Table 2 Proportion of all households (%) in both sites experiencing anticipated and unanticipated crises over a 2-year period—stratified by household wealth and gender of the de jure household head

Nature of the shock/stress	Total (<i>n</i> = 100)	Wealthy (<i>n</i> = 50)	Poor (<i>n</i> = 50)	χ^2	Significance	Male-head (<i>n</i> = 75)	Female-head (<i>n</i> = 25)	χ^2	Significance
Anticipated									
Annual expenses	72.0	84.0	60.0	7.1	<0.05	70.7	76.0	0.3	>0.05
Social expenses	67.0	82.0	52.0	10.2	<0.05	68.0	64.0	0.1	>0.05
Agricultural expenses	44.0	54.0	34.0	4.1	<0.05	49.3	28.0	3.4	>0.05
Seasonal crop shortfalls	45.0	58.0	32.0	6.8	<0.05	49.3	32.0	2.3	>0.05
Unanticipated									
Livestock diseases/death	38.0	58.0	18.0	16.9	<0.05	42.7	24.0	2.8	>0.05
Crop loss/damage	43.0	48.0	38.0	1.0	>0.05	46.7	32.0	1.7	>0.05
Total crop failure	33.0	36.0	30.0	0.4	>0.05	36.0	24.0	1.2	>0.05
Loss of/damage to property	50.0	52.0	48.0	0.2	>0.05	48.0	56.0	0.5	>0.05
Illness/injury to household members	66.0	72.0	60.0	1.6	>0.05	66.7	64.0	0.1	>0.05
Death/funeral expenses	39.0	48.0	30.0	3.4	>0.05	41.3	32.0	0.7	>0.05
Loss of income	24.0	16.0	32.0	3.5	>0.05	24.0	24.0	0.0	>0.05
Increasing living costs	78.0	80.0	76.0	0.2	>0.05	76.0	84.0	0.7	>0.05

households either do not own livestock or own relatively few (Shackleton and Shackleton 2006). The experience of crop damage or loss and livestock disease or death emphasizes the risks involved in arable agriculture and animal husbandry. The other unanticipated crises are less “asset driven” and show no significant differences for wealth or gender, suggesting that it is a household’s ability to cope with shocks rather than the experience of the shock that influences vulnerability. Dekker (2004) explains that the severity of a shock depends on what assets and livestock are lost, the length of the shock and the associated expense. The findings of this study suggest livelihood diversification is a catch twenty-two: by being more diverse, households open themselves up to a greater range of potential shocks. However, it is unlikely that all strategies are affected simultaneously giving households various fall-back options.

Coping with shocks

According to DFID (1999), a household’s response to crises may vary depending on the nature of the shock, its intensity, and household attributes and assets. The results of this study indicate that for a range of shocks, there is a range of possible responses that households employ. For each type of shock, households employed a range of coping strategies although certain responses were more common irrespective of the shock (Table 3). The coping strategy used by the greatest proportion of households was kinship (85%), followed by reduced spending (74%), changed diet (72%), mobilization of savings (72%), use of NTFPs (70%), selling

Table 3 Proportion of households (%) that employed general coping strategies in response to anticipated and unanticipated shocks

	Total (<i>n</i> = 100)	Wealthy (<i>n</i> = 50)	Poor (<i>n</i> = 50)	X^2	Significance	Male- head (<i>n</i> = 75)	Female- head (<i>n</i> = 25)	X^2	Significance
Invoke kinship ties	85.0	80.0	90.0	1.9	>0.05	84.0	88.0	0.2	>0.05
Reduce spending	74.0	84.0	64.0	5.2	<0.05	73.3	76.0	0.1	>0.05
Reduce quality or quantity of diet	72.0	84.0	60.0	7.1	<0.05	74.7	64.0	1.1	>0.05
Draw on savings	72.0	88.0	56.0	12.7	<0.05	76.0	60.0	2.4	>0.05
Use NTFPs	70.0	68.0	72.0	0.2	>0.05	66.7	80.0	1.6	>0.05
Sell livestock	44.0	58.0	30.0	7.9	<0.05	42.7	48.0	0.2	>0.05
Cash in stokvels	41.0	64.0	18.0	21.9	<0.05	42.7	36.0	0.3	>0.05

livestock (44%), and cashing in of group saving schemes (41%). Kinship has been highlighted by previous works (Dekker 2004; Heemskerck et al. 2004; Wong and Godoy 2003), and described by DFID (1999) as an important resource of last resort particularly for the poor and vulnerable, compensating for a lack of alternative insurance options. Infrequently used strategies mentioned in the interviews and the PRA included agricultural adjustments and increased cultivation, selling assets, borrowing from loan-sharks, leaving the village to look for work, providing labor within the community in return for money or food and, and removing children from school (to save the cost of the fees, as well as increase household labor).

Social capital, networks, and relationships of trust and reciprocity, between family and community members, make an important contribution to household security, and maintaining these ties is often a crucial livelihood strategy that can be drawn on both regularly and during times of need (DFID, 1999). McSweeney (2003) found kinship and soliciting loans from family and friends to be the primary form of insurance for households in Eastern Honduras in the wake of Hurricane Mitch. These reciprocal relationships can vary from assisting neighbors with labor, borrowing/loaning household items/food or assisting financially. In this study, kinship was reported as a coping strategy for all the identified crises. Kinship and NTFPs share a common feature of not requiring any capital outlay and are therefore diversification and coping options available to all households irrespective of wealth or gender of the *de jure* household head. Respondents noted various forms of support ranging from people assisting each other to pay school fees, to contributing toward funeral expenses, and helping with food, money, and labor with the relationships generally being reciprocal in nature. Kinship and NTFPs may both, however, have shortcomings when it comes to covariate shocks (Dekker 2004).

After kinship, a reduction in household spending was the most prevalently reported strategy. Reduced spending may be associated with the increased use of NTFP substitutes, a common manifestation of the rural safety-net function of NTFPs. Skoufias (2003) refers to extreme cases of spending reductions when households can no longer afford to feed or educate their children. This has implications for the future of the household, perpetuating poverty, and undermining the household's human capital. The third most prevalent strategy involved changes to household food consumption, ranked equally with a reliance on savings or budgeting in advance. Changes to household consumption may frequently be associated with the increased extraction of wild foods (Baland and Francois 2005; Fisher et al. 2010; Maxwell et al. 1999; McGarry and Shackleton 2009a, b). According to Maxwell et al. (1999), for households where a high proportion of the budget is allocated to the provision of food, even small shocks can lower household consumption. The findings of this study suggest that the sale of livestock is a common strategy in response to both anticipated and unanticipated crises, as shown by others (Sauerborn et al. 1996; Dekker 2004; Dovie et al. 2006). Fisher (2004) and Dovie et al. (2006) both noted that households with livestock were therefore less dependent on NTFPs. Thus, wealthy households with a greater variety of assets as well as higher value assets such as cattle are more secure in using the sale of assets as a coping strategy. Households in both villages were found to have invested in a variety of saving schemes including burial societies, stokvels, bank accounts, and

insurance schemes (Paumgarten 2006). Lukhele (1990) documented widespread membership in burial societies and stokvels throughout South Africa. Different schemes fulfill different functions with burial societies helping households cover funeral costs while stokvels contribute through both the payouts and the credit function offered. Bouman (1995) explains that stokvel loans are given out primarily for emergencies and then for consumption and production purposes. A significantly greater proportion of wealthy households reported membership of these groups, probably because they had greater levels of disposable cash than poorer households. The use of NTFPs as a coping strategy is discussed in detail in the sections below.

The identified strategies were reported by both male- and female-headed households with no significant differences noted. However, all strategies, other than NTFP use and kinship, were noted by a significantly greater proportion of wealthy households. Unsurprisingly, these two strategies are the most accessible for poor households whose existing asset base and coping options are constrained (Dasgupta and Maler 1993; Pattanayak and Sills 2001). Skoufias (2003) highlights that by relying on NTFPs for minor crises; households can save cash and assets thereby promoting future welfare. Moreover, our results demonstrated a significant positive correlation ($X^2 = 6.7$; $p < 0.05$) between the proportion of households relying on NTFPs as a coping strategy and those who rely on support from non-relatives. Assistance offered by non-relatives is likely to be less secure than that offered by relatives. Households without alternative options and with no relatives to rely on may rely to a greater degree on NTFPs for a range of crises even though NTFPs may not offer the best insurance. Findings by Dekker (2004) show that the greater the diversity of coping strategies the less the reliance on kinship. For wealthy households, the three most common strategies were mobilization of savings, followed by reduced spending and changes to diet. Use of NTFPs was the fifth most common strategy. In comparison, the top three strategies for poor households were kinship, the reliance on NTFPs, and reduced household spending. In general, the responses include individual and risk-sharing strategies as well as risk-management and risk-coping strategies (Dekker 2004). The coping strategies identified in this study have been noted by other commentators (De Waal and Whiteside 2003; Heemskerk et al. 2004; McSweeney 2004; Skoufias 2003; Smith et al. 2001; Wong and Godoy 2003), suggesting they are common forms of informal insurance. They are used either in combination, constituting a portfolio of strategies, or in isolation, depending on the context and the crisis in question. McSweeney (2005) noted coping strategy substitutability with one form of insurance being replaced with another in response to constraints offered by the initial strategy. Despite the range of strategies households invest in securing their livelihoods, Godoy et al. (1998) conclude that households remain poorly insured against unanticipated crises.

Matching responses to specific crises

Households reported having a range of possible coping responses for any particular type of shock, although there was some differentiation according to wealth and gender (Tables 4 and 5). Responses to unanticipated shocks only are discussed in this section. Both poor and wealthy and male- and female-headed households

Table 4 Proportion of households (%), stratified by household wealth, that employed coping strategies in response to unanticipated shocks

Coping	Livestock diseases/ death (n = 38)		Crop loss/damage (n = 43)		Damage to/loss of property (n = 50)		Illness and injury (n = 66)		Death and funeral expenses (n = 39)		Income loss (n = 24)		Increasing cost of living (n = 78)	
	Wealthy (n = 29)	Poor (n = 9)	Wealthy (n = 24)	Poor (n = 19)	Wealthy (n = 26)	Poor (n = 24)	Wealthy (n = 36)	Poor (n = 30)	Wealthy (n = 24)	Poor (n = 15)	Wealthy (n = 11)	Poor (n = 20)	Wealthy (n = 40)	Poor (n = 38)
Kinship	6.9	44.4	12.5	68.4	3.8	37.5	38.9	63.3	66.7	80.0	36.4	70.0	5.0	34.2
Reduced spending	10.3	0.0	54.2	21.1	11.5	16.7	-	-	25.0	13.3	72.7	80.0	95.0	78.9
Changed diet	6.9	0.0	58.3	73.7	15.4	12.5	-	-	25.0	13.3	-	-	77.5	89.5
Sold livestock	10.3	0.0	4.2	5.3	-	-	16.7	0.0	-	-	-	-	10.0	5.3
Relied on NTFPs	17.2	44.4	12.5	31.6	7.7	16.7	25.0	46.7	8.3	13.3	9.1	40.0	65.0	63.2
Purchased medicine/ pesticide	55.2	4.4	29.2	15.8	-	-	97.2	73.3	-	-	-	-	-	-
Saved/budgeted	-	-	16.7	5.3	15.4	16.7	16.7	6.7	-	-	-	-	-	-
Stokvel/burial society	-	-	-	-	-	-	8.3	0.0	58.3	33.3	-	-	-	-
Savings/insurance	-	-	-	-	-	-	-	-	45.8	20.0	9.1	15.0	-	-
Bought vegetables	-	-	79.2	63.2	-	-	-	-	-	-	-	-	-	-
Used crop for fertilizer	-	-	29.2	10.5	-	-	-	-	-	-	-	-	-	-
Labored for food/ money	-	-	0.0	21.1	-	-	-	-	-	-	0.0	30.0	-	-
Replaced assets	-	-	-	-	34.6	25.0	-	-	-	-	-	-	-	-
Free health	-	-	-	-	-	-	36.1	50.0	-	-	-	-	-	-
Contribute money	-	-	-	-	-	-	-	66.7	46.7	-	-	-	-	-
Other	65.5	44.4	50.0	42.1	15.4	0.0	27.8	30.0	16.7	26.7	9.1	20.0	10.0	13.2

Table 5 Proportion of households (%), stratified by gender of the de jure household head, that employed coping strategies in response to unanticipated shocks

Coping	Livestock diseases/ death (<i>n</i> = 38)		Crop loss/damage (<i>n</i> = 43)		Damage to/loss of property (<i>n</i> = 50)		Illness and injury (<i>n</i> = 66)		Death and funeral expenses (<i>n</i> = 39)		Income loss (<i>n</i> = 24)		Increasing cost of living (<i>n</i> = 78)	
	Male- headed (<i>n</i> = 32)	Female- headed (<i>n</i> = 6)	Male- headed (<i>n</i> = 8)	Female- headed (<i>n</i> = 14)	Male- headed (<i>n</i> = 36)	Female- headed (<i>n</i> = 14)	Male- headed (<i>n</i> = 50)	Female- headed (<i>n</i> = 16)	Male- headed (<i>n</i> = 31)	Female- headed (<i>n</i> = 8)	Male- headed (<i>n</i> = 25)	Female- headed (<i>n</i> = 6)	Male- headed (<i>n</i> = 57)	Female- headed (<i>n</i> = 21)
Kinship	9.4	50.0	37.1	37.5	19.4	21.4	42.0	75.0	67.7	87.5	56.0	66.7	17.5	23.8
Reduced spending	6.3	16.7	42.9	25.0	11.1	21.4	-	-	16.1	37.5	72.0	100.0	87.7	85.7
Changed diet	6.3	0.0	65.7	62.5	13.9	14.3	-	-	16.1	37.5	-	-	80.7	90.5
Sold livestock	9.4	0.0	5.7	0.0	-	-	12.0	0.0	-	-	-	-	10.5	0.0
Relied on NTPPs	28.1	0.0	20.0	25.0	5.6	28.6	36.0	31.3	9.7	12.5	24.0	50.0	10.5	66.7
Purchased medicine/ pesticide	50.0	66.7	22.9	25.0	-	-	84.0	93.8	-	-	-	-	-	-
Saved/ budgeted	-	-	11.4	12.5	19.4	7.1	16.0	0.0	-	-	-	-	-	-
Stokvel/burial society	-	-	-	-	-	-	4.0	6.3	48.4	50.0	-	-	-	-
Savings/ insurance	-	-	-	-	-	-	-	-	41.9	12.5	16.0	0.0	-	-
Bought vegetables	-	-	71.4	75.0	-	-	-	-	-	-	-	-	-	-
Used crop for fertilizer	-	-	22.9	12.5	-	-	-	-	-	-	-	-	-	-
Labored for food/money	-	-	11.4	0.0	-	-	-	-	-	-	12.0	50.0	-	-
Sold assets	-	-	-	-	36.1	14.3	-	-	-	-	-	-	-	-
Free health	-	-	-	-	-	-	36.0	62.5	-	-	-	-	-	-
Contributed money	-	-	-	-	-	-	-	-	61.3	50.0	-	-	-	-
Other	56.3	83.3	51.4	25.0	11.1	0.0	26.0	37.5	22.6	12.5	12.0	33.3	12.3	9.5

reported relying on kinship and NTFPs for the range of unanticipated shocks, with the exception of livestock diseases or death. No female-headed households relied on NTFPs in response to this. In the event of livestock diseases or death, crop loss or damage, damage or loss of property, and the increasing living costs, a greater proportion of poor households relied upon kinship than wealthy households. There were no significant differences between wealth groups regarding the use of NTFPs for any of the crises. Other prevalent strategies included reduced spending and changes to the household diet. There were no significant differences for changes to diet irrespective of the crisis; however, a significantly greater proportion of wealthy households reported spending reductions in response to both crop loss or damage and increasing living costs. Other significant differences were noted for the sale of livestock, the purchase of medicines and pesticides, providing labor in return for food or money. In response to family illness or injury, a significantly greater proportion of wealthy households reported selling livestock and purchasing medicine. In response to crop loss or damage and income loss, a significantly greater proportion of poor households reported providing labor in return for food or money (Table 4). For most crises, the reliance on NTFPs was neither the most nor least reported strategy with the exception of livestock diseases or death, family death, and funeral expenses. With respect to the former, the reliance on NTFPs was the most prevalent strategy reported by poor households. With respect to the latter, it was the least prevalent strategy for both wealth groups.

A significantly greater proportion of female-headed households reported relying on kinship for livestock diseases or death and family illness or injury (Table 4). Other significant differences between genders were noted for the sale of livestock, the reliance on NTFPs, the provision of labor in exchange for food or money, and in hiring people to assist. The sale of livestock was favored by male-headed households, whereas a significantly greater proportion of female-headed households reported relying on NTFPs, hiring labor in response to damage to or loss of property, and on providing labor in return for food or money in response to loss of income (Table 5). For most crises, the reliance on NTFPs was neither the least nor most prevalent coping strategy with the exception of livestock diseases or death, damage to or loss of property, death, and funeral expenses, and increasing living costs. For livestock diseases or death, no female-headed households reported relying on NTFPs. For damage to or loss of property, it was the most prevalent strategy for female-headed households while for death and funeral expenses, and increasing living costs it was the least prevalent strategy for male-headed households.

NTFPs as a rural safety-net

The prevalence of use

In common with reports elsewhere in southern Africa (e.g., Campbell et al. 2002; Cavendish 2000; Shackleton and Shackleton 2006), all the sampled households reported using at least one NTFP (Paumgarten and Shackleton 2009). As all households rely on NTFPs as part of their livelihood portfolio, the safety-net option is available to all. Yet, only 70% used NTFPs as a coping response to shocks within

Table 6 Proportion of all households (%) that have used NTFPs as a rural safety-net and how this use manifested (including NTFPs used/sold)—stratified by household wealth and gender of the de jure household head

	Total (<i>n</i> = 100)	Wealthy (<i>n</i> = 50)	Poor (<i>n</i> = 50)	X^2	Significance	Male- head (<i>n</i> = 75)	Female- head (<i>n</i> = 25)	X^2	Significance
Form of NTFP use									
Increased NTFP use	36.0	34.0	38.0	0.2	>0.05	42.7	16.0	5.8	<0.05
Use of different NTFPs	10.0	6.0	14.0	1.8	>0.05	8.0	16.0	1.3	>0.05
Increased sale in NTFPs	8.0	2.0	14.0	4.9	<0.05	8.0	8.0	0.0	>0.05
Sale of different NTFPs	8.0	6.0	10.0	0.5	>0.05	10.7	0.0	2.9	>0.05
	(<i>n</i> = 70)	(<i>n</i> = 34)	(<i>n</i> = 36)	X^2	Significance	(<i>n</i> = 50)	(<i>n</i> = 20)	X^2	Significance
NTFPs used									
Medicinal plants	40.0	38.2	41.7	0.1	>0.05	46.0	25.0	2.6	>0.05
Wild edible herbs (fresh)	30.0	29.4	30.6	0.0	>0.05	32.0	25.0	0.3	>0.05
Fuelwood	25.7	41.8	11.0	8.3	<0.05	26.0	25.0	0.0	>0.05
Wild edible herbs (dried)	17.1	14.7	19.4	0.3	>0.05	16.0	20.0	0.2	>0.05
Wild edible fruits	11.4	8.8	13.9	0.4	>0.05	10.0	15.0	0.4	>0.05
Sells fuelwood	10.0	0.0	19.4	7.4	<0.05	10.0	10.0	0.0	>0.05
Building materials	8.6	2.9	13.9	2.7	>0.05	4.0	20.0	4.7	<0.05
Sells other NTFPs	8.6	0.0	16.7	6.2	<0.05	6.0	15.0	1.5	>0.05
Bushmeat	7.1	0.0	13.9	5.1	<0.05	10.0	0.0	2.2	>0.05

the 2-year period. If the substitution of purchased products with NTFPs in response to increasing living costs is included, then the safety-net function was reported by 82% (Table 6). Households rely on this safety-net function irrespective of household wealth or gender. Wunder (2001) debates whether NTFP extraction constitutes a safety-net or poverty trap—the high proportion of wealthy households in this study that rely on NTFPs as a safety-net suggests that using these resources amounts to a cost-saving, allowing the households to invest in other assets thereby contributing to their overall livelihood security rather than trapping them in poverty. However, as Delacote (2009) notes, if the population in need and the capacity of the resource are not compatible, the use of NTFPs as a safety-net may exceed sustainable levels, resulting in a poverty trap. Households in our study reported relying on NTFPs in response to each of the identified crises by either increasing their use of NTFPs, substituting purchased products with NTFPs or selling NTFPs. For each crisis, the use of NTFPs was not the most, nor the least, prevalent strategy. Kinship was the most prevalent strategy substantiating findings by McSweeney

(2004) who noted the sale of NTFPs as a safety-net in response to hardships resulting from Hurricane Mitch (Eastern Honduras) but found kinship to be the primary means of coping.

With respect to household wealth, the findings suggest that both wealthy and poor households make extensive use of NTFPs as a safety-net but that this coping option is more important to poor households. For wealthy households, a reliance on NTFPs was the fifth most prevalently reported strategy, while for poor households NTFPs was second. Kinship and NTFPs are the two coping strategies not influenced by household wealth or assets although aspects such as existing social capital or NTFP availability may determine their use. As such the safety-net option offered by NTFPs is available to both wealth groups while other strategies present barriers to poor households as a result of their economic position. Poor households with fewer alternative strategies are therefore more dependent on both kinship and NTFPs (Pattanayak and Sills 2001). As described above, a comparison of households that do rely on NTFPs as a safety-net with those that do not revealed only one significant difference: almost two-thirds of NTFP-using households also relied on community support networks, which was significantly greater than the one-third of households that did not use NTFPs ($X^2 = 6.7$; $p < 0.05$). Important to note though is that for this result, reliance on family within the community and reliance on neighbors or friends was disaggregated: the difference is significant for households relying on neighbors or friends. If these are combined with those that rely on family, the difference is no longer significant. Those with no family support are therefore more reliant on NTFPs as “free” insurance. For female-headed households, NTFPs were the second most prevalent strategy, while for the male-headed households it was fifth. Although, overall households rely on this safety-net function irrespective of household wealth or gender, there are, however, differences with respect to the nature of use and the resources used.

Nature of use of NTFPs

The use of NTFPs as a safety-net is manifest through either direct household provisioning or through the sale of products (Shackleton and Shackleton 2004). The dual manifestation allows for both consumption and income smoothing. In addition to considering whether households had relied on NTFPs in response to the selected shocks, households were questioned as to whether there had been other times during the 2-year period when their household had either: (1) used more NTFPs than normal, (2) used NTFPs other than those they usually use, (3) sold more NTFPs than normal, and (4) sold NTFPs other than those they usually sell (Table 6). Overall, the greatest proportion of households (36%) reported increasing their use of NTFPs, 10% reported using different NTFPs, while both increasing the sale of NTFPs and selling different NTFPs was reported by 8% of households. When disaggregated by gender or wealth, only the increased sale of NTFPs showed a significant difference for wealth with a greater proportion of poor households selling NTFPs, while increased use was significantly different for gender (Table 6). Male-headed households increased their use of NTFPs that were already used. Fourteen percent of poor households compared with only 2% of wealthy households reported

increasing their sale of NTFPs in response to household shocks. Overall, the results show the use of NTFPs to be a more prevalent manifestation of the safety-net function than the sale, which could well be a reflection of market accessibility as both of the study villages are relatively remote. According to Nkem et al. (2010), markets change safety-nets as commodities for safety-nets in cash liquidity. In comparison, Shackleton et al. (2008) report on a number of situations where people took up trading of NTFPs on local markets catalyzed by an initial household shock.

NTFPs used by households in response to household shocks included wild edible herbs (fresh and dried), medicinal plants, wild edible fruits, bushmeat, fuelwood, and building materials. In many cases, the initial reliance on NTFPs as a safety-net had transformed into a more permanent livelihood strategy while increasing living costs have increased the reliance on NTFPs generally. The primary resource sold was fuelwood, while a few households sold reed mats, bushmeat, and grass hand-brushes. Of the households that reported relying on NTFPs, 40% used medicinal plants, 30% used fresh wild edible herbs, 25.7% used fuelwood as a replacement for paraffin, 17.1% used dried wild edible herbs, 11.4% relied on wild edible fruits, 10% sold fuelwood, 8.6% used construction materials (e.g., thatch, sand, and housing poles) and sold various NTFPs, and 7.1% used bushmeat. With respect to wild foods, there were no significant differences in the proportions of households relying on wild edible herbs and fruits for either wealth or gender. However, no wealthy or female-headed households reported using bushmeat while 13.9 and 10.0% of poor and male-headed households, respectively, reported this use. The difference is significant for wealth. Wild foods have been identified as both a nutritional supplement and a gap-filler particularly during times of low agricultural productivity (De Merode et al. 2004; Dovie 2003; Fisher et al. 2010; McSweeney 2004), as well as in response to long-wave shock events such a death of a breadwinner or HIV/AIDS impacts (McGarry and Shackleton 2009a, b). De Merode et al. (2004) highlight that the unsustainable use of particular wild foods (with a focus on bushmeat) is a matter of concern, not only for conservation, but also because the depletion of these foods may exacerbate food insecurity, vulnerability, and poverty. Gender had little influence on which NTFPs were used, other than increased use of construction materials. For construction materials, there was no significant difference as determined by wealth, but a significantly greater proportion of female-headed households reported relying on NTFP building materials to repair damaged houses. A significantly greater proportion of wealthy households reported relying on fuelwood than their poor counterparts while gender had no influence. Wealthier households took up the use of fuelwood, predominantly as a substitute for paraffin (Paumgarten 2006). Fuelwood is already the primary source of energy for poor households and hence there is only limited room for increased use. In comparison, poor households increased consumption of bushmeat and increased the sale of fuelwood and other NTFPs (such as thatch grass and reed mats). No wealthy households reported selling fuelwood or other resources in response to shocks, while 19.4 and 16.7% of poor households sold fuelwood and other NTFPs, respectively. This difference is significant in both cases but is not significant for gender (Table 6). The sale of NTFPs in response to a range of crises has been noted

by other commentators (Dovie 2003; Shackleton et al. 2008). The wealth differential is not only at times of shock; Shackleton and Shackleton (2006) showed that on the basis of random household interviews, a greater proportion of poorer households sold NTFPs than did wealthier ones, and a greater proportion of wealthier ones purchased NTFPs than did poor ones. McSweeney (2004) noted approximately 9% of households relying on the sale of NTFP, and those that did had more female laborers, more experience of commercial extraction, less land and fewer assets. With regard to the wealth differentiation in the use of bushmeat as a coping strategy, numerous respondents stated hunting is illegal and they feared of arrest. It is possible that wealthy households are not prepared to enter into illegal activities to cope as they have other alternatives. Poor households have fewer alternatives and so may discount the risks involved.

Opportunities and constraints offered by NTFPs as a rural safety-net

The various coping strategies are associated with both opportunities and constraints (Mock et al. 2003). During the PRA, groups ranked the different coping strategies in terms of importance/effectiveness and detailed their associated advantages and disadvantages. The use of NTFPs was ranked third and eighth in Dyala and Dixie, respectively, while the sale of NTFPs was ranked fourth and sixth (out of ten). The opportunities offered by NTFPs as a safety-net, identified by the respondents, include (1) the range of products available for consumption and sale, (2) the financial independence associated with relying on NTFPs, (3) the essentially “free” nature of NTFPs, and (4) the possibility of entering into NTFP-based activities without requiring start-up capital (Paumgarten 2006). There are, however, constraints, such as (1) restrictions on use or access, (2) opportunity costs of collection, (3) weak or absent markets, (4) the loss or change of knowledge and skills, and (5) resource scarcity, seasonality, and over-use (Paumgarten 2006). Other commentators have noted similar constraints. For example, McSweeney (2005) noted the impact of harvesting restrictions on the use of NTFPs as a rural safety-net in Eastern Honduras, while according to Scherr (2000), continued and well-managed systems of access to natural capital should be considered crucial in promoting poverty alleviation and sustainable use. Illness, injury, HIV/AIDS, age, physical disabilities, and labor availability have been identified as constraints to the collection of NTFPs (De Waal and Whiteside 2003; Pattanayak and Sills 2001). It is also hypothesized that the opportunity costs restrict wealthy households with labor constraints, from relying on NTFPs as a coping strategy. McSweeney (2004) identified environmental knowledge as a factor that influences the way households deal with crises and the strategies they rely on. Respondents in this study identified the loss of knowledge of available NTFPs and the loss of skills associated with the collection and use of NTFPs to be a limitation to the safety-net function. For example, respondents indicated that they could not rely on the sale of grass hand-brushes or reed mats because they did not have the skills to make these. McSweeney (2005) found that longer established households with an accumulated knowledge of NTFPs relied on NTFPs more than younger households with less knowledge and changing preferences. The respondents in this study expressed that the sale of

NTFPs as a safety-net was often constrained by weak or absent markets. With respect to the overall trade in NTFPs, the local context plays an important role (Shackleton et al. 2008). For example, the sale in Dyala was predominantly restricted to intra-village trade while households in Dixie were selling to visiting tourists as well as at monthly pension points in surrounding villages (Paumgarten 2006).

Conclusions

Our findings corroborate previous work indicating that rural households employ a range of coping strategies in response to shocks, with certain strategies being more prevalent, but go further in indicating the prevalence and use of NTFPs. Increased use and sale of NTFPs was a common strategy. Wealth and gender of the *de jure* household head influenced susceptibility to particular shocks as well as the coping strategies used. Wealthy households reported significantly greater prevalence of shocks although this does not give an indication of the impact on household well-being. The most prevalent strategies used by poor households were kinship and increased NTFP extraction and sale. Wealthy households relied to a greater extent on internal strategies, making economic adjustments to household spending and food consumption, selling livestock and relying on stokvels. While poor households also used these strategies to some extent, they are constrained by way of their economic position and limited asset base. Wealthy households, however, still rely extensively on NTFPs and kinship and it is argued that this allows wealthy households to maintain their alternative strategies for more severe crises (Skoufias 2003). With respect to gender, there was no difference in reported strategies reported by either group. Households identified both opportunities and constraints to the safety-net function of NTFPs yet despite the constraints the reliance on this form of insurance is prevalent.

Understanding households' own strategies for combating poverty and vulnerability is important for the effective targeting of public safety-nets (Skoufias 2003). Angelsen and Wunder (2003) argue that while the "static" role of NTFPs is understood, questions regarding the "dynamic" role need consideration, including at what opportunity cost these safety-nets should be maintained, and whether other forms of insurance are replacing NTFPs as a safety-net. Communities, poverty and natural resource use are inherently complex therefore development policies that consider natural insurance need to bear in mind the potential for different degrees of receptivity within communities (McSweeney 2003). There are few barriers to NTFP use and commercialization thereby enhancing their potential function as a safety-net (Baland and Francois 2005; Jodha 1986); however, policies aimed at the sustainable use of natural resources need to take into account that unless rural communities are offered alternative forms of insurance, they will invariably increase the use of NTFPs during times of shock. Consequently, compliance with restrictions on natural resource use is unlikely, especially when households are in crisis. Delacote (2009) highlights the potential poverty-trap implications of this if the demand for the resource exceeds the supply resulting in resource depletion. In the former homeland

areas of South Africa, increasing poverty and vulnerability, increasing population densities and the failure of authorities (both traditional and government) to control access to natural resources, increases the risk of overutilization (Twine et al. 2003). To reconcile long-term economic development and biodiversity conservation, it is important to understand people's use of natural resources and the factors that affect this use (McSweeney 2005). Based on this understanding, recommendations can be set out that ensure continued access to NTFPs (given their important safety-net role especially for poor households) within sustainable limits or that suggest alternative strategies to ensure ability to cope. These recommendations include (1) improved appreciation of the vulnerability of rural households and the role of NTFPs in cushioning households against both anticipated stresses and unanticipated shocks, (2) informed policies to ensure equitable access and sustainable use of the resource base (Twine et al. 2003), (3) policies that support the strengthening of local institutions and increased community participation for the management of common property resources (including NTFPs; Hunter et al. 2011); and (4) policies and actions that recognize and support the development and maintenance of various alternative insurance mechanisms including cooperative insurance mechanisms and private insurance schemes (Delacote 2009; Dercon 2002). More recognition is needed of the range of risks to which rural households are vulnerable and of their existing means of coping. An improved understanding of these issues is needed to ensure that appropriate measures are taken not only to address the causes of vulnerability but also to strengthen households' ability to cope, including through the use and sale of NTFPs.

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