

Using a gender perspective to explore forest dependence in rural HIV/AIDS-affected Malawian households

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Abstract Throughout Sub-Saharan Africa, forest resources play a crucial role in enabling households to control and adapt to HIV/AIDS; however, little is known about how the disease impacts the gendered use of forest resources. This exploratory study characterizes how the dependence on forest resources changes for female and male respondents in HIV/AIDS-affected households in Malawi through three phases: before HIV was known to be present; during HIV-related morbidity; and after AIDS-related mortality. The results presented for female and male respondents in this paper are strikingly similar, and many respondents report that there are no longer any traditional gender roles for household tasks due to HIV/AIDS. Therefore, we question the thinking around gender-specific forest-related interventions for HIV-affected people. Moreover, given the gendered knowledge base that must surround resource use, what do these changes in traditional roles mean for sustainable forest resource use in the future? Further research on knowledge transmission around these resources is warranted.

Keywords Forest resources · Gender · Africa · HIV/AIDS

Introduction

Across rural Sub-Saharan Africa, forest resources play a crucial role in enabling a household to mitigate the impacts of the immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) (Villarreal et al. 2006). In this region,

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health care is predominantly a forest-based service (Barany et al. 2001); traditional healers are the dominant providers of medical care in forested areas, often providing between 70 and 95 % of primary health care (Colfer et al. 2006). Trees and non-timber forest resources can help rural people to alleviate some of the burden of HIV/AIDS by producing nutritious foodstuffs (e.g., fruits, berries, leaves) that can boost the immune system and help protect against disease; providing medicinal relief and other products that can help treat infections; and offering a safety net of subsistence and income-generating opportunities (e.g., firewood for consumption and for sale, animal fodder, potentially high-value tree products, building and thatching materials) (Lengkeek 2005; Villarreal et al. 2006). Forests are particularly important in regions where HIV/AIDS is acute, such as in Sub-Saharan Africa, where 35 of the 45 most highly affected countries in the world are found (Drimie and Gandure 2005).

There is a purported correlation between HIV and forest degradation and deforestation. In some regions of Sub-Saharan Africa, HIV/AIDS has been said to have had “insidious and negative impacts on the environment” as the pandemic has spread (De Souza et al. 2008: 240). Malawi is a country in which HIV/AIDS is not only particularly prevalent, but is now among the countries with the highest rates of deforestation (Barany et al. 2005; Frank and Unruh 2008). Although there is a general dearth of evidence in this domain, a recent systematic analysis of the literature pointed to an increased dependence on forest biodiversity by households affected by HIV/AIDS in Sub-Saharan Africa (Timko et al. 2010), and several studies have explored links between AIDS-related morbidity and mortality and the use of forests and other natural resources in Africa. For instance, Barany et al. (2005) found that 23 % of their Malawian study households affected by prime-aged adult mortality reported an increased importance in forest product collection following the death. Hunter et al. (2008a) found that recent adult mortality was associated with an increased likelihood that a household would use wood, while Hunter et al. (2007) and Twine and Hunter (2008) reported that mortality-affected households demonstrated a greater dependence on local vegetation and were more likely to turn to natural resources as cost-saving substitutes, such as using insects, fruit, and fuelwood. Timko (2013a) differentiated the impacts of HIV/AIDS on the dependence of forest dependence in Malawian households, demonstrating that affected households depended more on firewood, water, and medicinal plants during the morbidity phase, with a decreased need post-mortality.

Given the centrality of forest resources in the lives and livelihoods of rural people across much of Africa, and indeed in many developing nations, HIV/AIDS further complicates how effectively affected households can obtain these important resources. HIV/AIDS impacts how much labor is available and how it is structured within a household, which can affect and intensify the already tenuous economic, social, and nutritional coping strategies that households may be employing (Timko 2013b). That said there remains a paucity of information regarding the disease’s impacts on the use of forest resources by both genders. Within a household, men’s and women’s access to and use of forest resources are affected by a variety of external economic and environmental pressures. Women are especially dependent on non-timber forest products (NTFPs), while men have often been able to diversify

their livelihood strategies (Brown and Lapuyade 2001). Therefore, the impacts of HIV/AIDS-related morbidity and mortality can be expected to have differential impacts on a household depending upon which member of the household contracts the disease.

The purpose of this exploratory study was to gain insight about how the dependence on forest resources changes for female and male respondents in HIV/AIDS-affected households through three phases: before HIV was known to be present; during HIV-related morbidity (while someone in the household or the respondent themselves were ill); and after AIDS-related mortality. This study addresses an important research gap, given the extent of prime-age adult mortality attributable to the HIV/AIDS pandemic in Sub-Saharan Africa (Hunter et al. 2008b).

A few key terms used throughout this paper must be clarified. The term *forest resource* in this paper means “any wild biological resource (animal or plant) harvested from forested lands...by rural households for domestic consumption or small-scale trade, with no, or limited capital investment” (Shackleton et al. 2007: 560). These can include roots, fruits, medicinal plants, resins and essential oils, and fibers such as bamboos, rattans, and other palms used for weaving and structural applications (Belcher 2005). The *importance* of each forest resource was a subjective designation made by each respondent in this study according to how they perceived that resource’s role in their household, whether for nutrition, health, or income-generating purposes. *Dependence* refers to the frequency with which a forest resource is collected or purchased (Timko 2013a). Responses indicating an increased frequency of use in this study are therefore taken to mean an increased dependence on that forest product in that time period. We also differentiate between those resources that are *collected* from a forest, woodland, river, or home garden, and those that are *purchased* from a market or neighbor. In the interviews, we asked respondents about their perceptions of the *availability* of particular forest resources, that is, whether they were easily found when collecting from the forest, home garden, and so on or by purchasing them in markets or from neighbors.

Methods

Selection of Malawian case study sites

Malawi was selected as the country in which to situate this study as it can shed crucial insight into the linkages between HIV/AIDS and forest resources given its rural nature, dependence on forest resources, high HIV/AIDS prevalence, and a remarkable openness to discussing the impacts of HIV/AIDS. The government’s “Forestry and HIV and AIDS Strategy” (Malawi Government 2007) reflects this awareness.

Variation according to three main characteristics was used to select case study sites across Malawi: proximity to forest resources in either protected forest reserves or village forest areas (VFAs) under customary land tenure; HIV prevalence; and regional representation. National HIV prevalence in Malawi is high at

approximately 12 % and has been estimated at 6.5 % in the north, 8.6 % in the central region, and 16.5 % in the south (National Aids Commission 2008). Four districts (rural study site names appear in brackets) were included in this study: Zomba (Domasi) and Chiladzulu (Milepa) in the south; Mzimba (Mbalachanda) in the north; and Mchinji (Kamboni) in the central region of the country. Forest cover tends to be higher in the north than in the south of the country.

Interviews

A total of forty semi-structured interviews, ten per study site, were conducted with representatives of HIV/AIDS-affected households. Households were broadly deemed “affected” if prime-age adult members were presently infected or chronically ill (afflicted), or if it was a widow-headed household where the spouse had died from AIDS (Barany et al. 2005). Twenty two of the interviewees were female. Of these, thirteen were themselves afflicted while the other nine were affected. Sixteen were widows whose husbands had succumbed to AIDS. Of the eighteen male respondents, three were themselves afflicted, and the remaining were affected. Four of these were widowers whose wives had succumbed to AIDS. Interviews were conducted between June and September 2010 in the ChiChewa language by two Malawian field assistants at a time, and location deemed safe and convenient to the interview respondents. All interviews were recorded on digital voice recorders and transcribed immediately afterward. Each respondent was characterized according to age, gender, ethnic group, and number and composition of people living in the household.

Interviews were exploratory in nature; they were not meant to be inferential, but rather to provide insight into the use of forest resources by HIV/AIDS-affected households. Respondents were asked to think back to a time before HIV was known to be present in their household and to identify the forest resources (e.g., firewood, medicinal plants) deemed to be most important to the household including a rank order preference for each resource; whether these resources were collected (from the forest/rivers/home gardens) or bought (from markets, neighbors, etc.); the frequency with which they were obtained; and the perceived availability of each resource. Respondents were then asked to answer further questions regarding the impacts of HIV/AIDS-related morbidity and mortality on their forest resource use. These questions sought to differentiate the impact of having a prime-aged (aged 18–49) member of the household fall ill (*herein* morbidity phase) or die (*herein* mortality phase) from HIV/AIDS on their use of forest resources (i.e., which forest resources became more or less important, and if their use and availability increased or decreased).

Data analysis

The data from each interview were transcribed into individual Microsoft Excel spreadsheets, which were then compiled into one master spreadsheet. The data were disaggregated according to gender, and further, according to which member of the household in relation to the respondent had succumbed to AIDS [e.g., widowed

females, females with “other” (such as adult children) death]. Data were summarized to assess forest resources according to the proportion of times that they were listed as the first, second, or third most important resource; changes in their frequency of use and perceived availability; and changes in their collection and purchase.

As this is an exploratory study with a small sample size, our goal is to identify possible trends regarding the use of forest resources by HIV/AIDS-affected households and to look for commonalities rather than divergences. As such, we grouped together several categories of forest resources to illustrate how the importance of broad, rather than narrowly defined, types of forest resources changes. Specially, we grouped three of the original interview categories into one broad category called construction materials: grass (meaning grass used for thatching houses, latrines, and livestock enclosures in rural settings); poles (timber in the round used in a vertical or standing position erected in the ground, whether on a house, barn, kitchen, latrine, etc.); and structural wood materials (other wood materials from the forest used as rafters, purlins, cross-bars that support the roof of a structure). Likewise, we grouped bushmeat, fruit, and mushrooms together into a broad category called foodstuffs. Two forest resources that could have been lumped into one of these broader categories were deliberately kept as discrete categories. Sawn wood—non-structural wood materials used in their sawn state mostly as plank doors, door frames, coffins, and furniture—was kept separate given its pertinence to HIV/AIDS-suffers for use in building coffins. Honey was also left as its own category as it is used locally in Malawi as both a foodstuff *and* a medicine. Where, appropriate, specific results pertaining to the component forest resources of these grouped categories (e.g., bushmeat) are discussed.

Results

This section presents the results for the forest resources considered most important to each gender. The impacts of HIV were considered in three phases: pre-HIV; during HIV-morbidity; and after AIDS-related mortality. A total of nineteen forest resources were mentioned by respondents; however, only ten were ranked as one of the three most important forest resources by at least one male and one female respondent. The order of the ranked resources in these lists varied according to gender, and by which member of the household had succumbed to AIDS. Regardless of gender, the four most important forest resources were firewood, water, medicinal plants, and construction materials. Those resources that were rarely or never ranked as one of the three most important forest resources are excluded from further discussion in this paper and include bamboo, hoe handles, rope fiber, edible caterpillars, elephant grass, and charcoal.

Changes in the importance of forest resources to female and male respondents

Female respondents ranked firewood, water, medicinal plants, and construction materials as the most important forest resources (Fig. 1). Firewood was the most

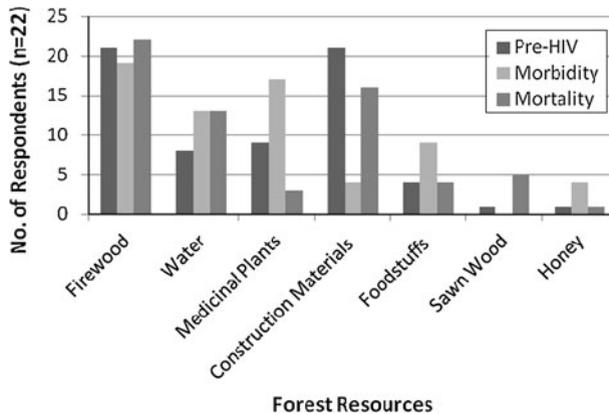


Fig. 1 Changes in the importance of forest resources by household phase of HIV/AIDS as ranked by HIV/AIDS-affected female respondents

highly ranked forest resource, with almost all of the female respondents identifying it as one of the three most important forest resources, regardless of HIV-phase. The importance of water to female respondents increased slightly in the morbidity and mortality phases. Females considered medicinal plants to be very important during the morbidity phase, while their importance decreased substantially after mortality. In comparison, the importance of construction materials decreased considerably during morbidity, but rebounded to near pre-HIV levels after mortality. Foodstuffs and honey became more important during morbidity than they were in either of the other two phases. Sawn wood increased in importance for a few respondents after mortality even though it was not considered important in the morbidity phase.

As with the female respondents, the forest resources ranked as most important by male respondents were firewood, water, medicinal plants, and construction materials (Fig. 2). Similar to the female respondents, firewood was ranked by the male respondents as one of the most important forest resources, regardless of HIV-phase. Water increased slightly in importance through the morbidity and mortality phases. Most of the male respondents identified medicinal plants as very important during the morbidity phase, but its importance decreased substantially after mortality. Construction materials were not important to many male respondents during the morbidity phase, but rebounded in importance after mortality. Sawn wood was not at all important during morbidity, but became strikingly important to half of respondents in the mortality phase.

Changes in frequency of use and availability of important forest resources by female and male respondents

A strong majority ($\geq 75\%$) of female respondents reported an increased frequency of use for firewood, water, medicinal plants, and sawn wood in the morbidity phase,

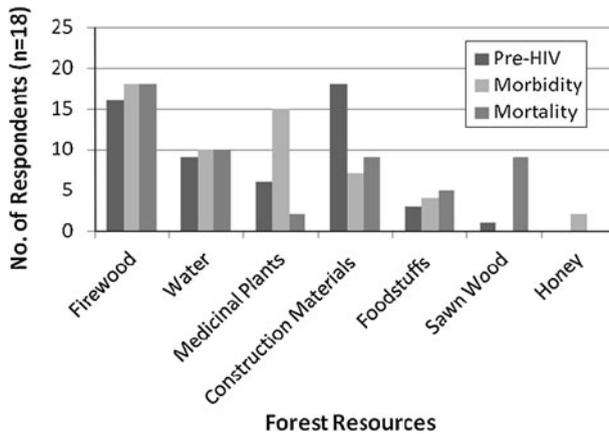


Fig. 2 Changes in the importance of forest resources by household phase of HIV/AIDS as ranked by HIV/AIDS-affected male respondents

Table 1 Trends in the frequency of use of important forest resources by HIV/AIDS-affected female and male respondents

	Forest Resources						
	Firewood	Water	Medicinal plants	Construction materials	Foodstuffs	Sawn wood	Honey
Women							
Morbidity phase	↑↑	↑↑	↑↑	↔	↑	↑↑	↑
Mortality phase	↓↓	↓↓	↓↓	↓↔	↑	↑	↓↓
Men							
Morbidity phase	↑↑	↑↑	↑↑	↓	↑	↓↔	↑
Mortality phase	↓↓	↓	↓↓	↔	↓↓	↑	↓↓

Two identical arrows indicate that a strong majority ($\geq 75\%$) of respondents gave that response. A single arrow indicates that a majority ($\geq 50\%$) of respondents gave that response. Two different arrows indicate that no trend exceeded 50% of the responses, but the two most prevalent responses are shown. (Legend ↑ = increase; ↓ = decrease; ↔ = no change)

while the majority ($\geq 50\%$) also increased their use of foodstuffs and honey (Table 1). The majority of females reported no change in their frequency of use of construction materials in the morbidity phase. A strong majority ($\geq 75\%$) of female respondents reported a decreased frequency of use for firewood, water, medicinal plants, and honey in the mortality phase. The majority ($\geq 50\%$) of females reportedly increased their use of foodstuffs and sawn wood in the same phase. Just less than half of the female respondents reported a decreased use of construction materials in the mortality phase, while roughly the other half noted no change in the frequency of use.

A strong majority ($\geq 75\%$) of male respondents increased their use of firewood, water, and medicinal plants, and a majority ($\geq 50\%$) increased their use of foodstuffs and honey during the morbidity phase (Table 1). The frequency of use for each of these resources decreased after mortality, with a strong majority ($\geq 75\%$) reporting a decreased use of firewood, medicinal plants, foodstuffs, and honey, and a majority ($\geq 50\%$) reporting a decreased use of water. The use of construction materials by males decreased during the morbidity phase and did not change during the mortality phase. Half of the male respondents noted their use of sawn wood decreased in the morbidity phase, while the other half reported no change. Almost half of the male respondents noted an increased use of sawn wood after mortality.

With one exception (data not shown), a majority (and very often a strong majority) of all female and male respondents noted a decreased availability in all the important forest resources, regardless of HIV-phase. The only exception was for honey in the mortality phase; half of the male respondents reported an increased availability of honey, while half reported a decreased availability.

Changes in the collection and purchase of important forest resources by female and male respondents

The data show that HIV-affected male and female respondents increasingly rely on the purchase, rather than the collection, of important forest resources as the impacts of HIV on their households progress (Figs. 3, 4). Except for firewood and water, females and males increasingly purchased medicinal plants, construction materials, foodstuffs, sawn wood, and honey in both the morbidity and mortality phases. Sawn wood, in particular, was purchased by all of the female respondents in the mortality phase (Fig. 3), while the same resource was purchased by all of the male respondents in the morbidity phase (Fig. 4).

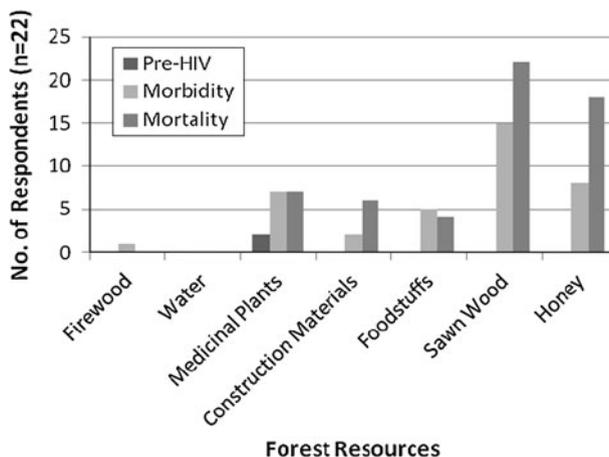


Fig. 3 Changes in the purchase of important forest resources by HIV/AIDS-affected female respondents

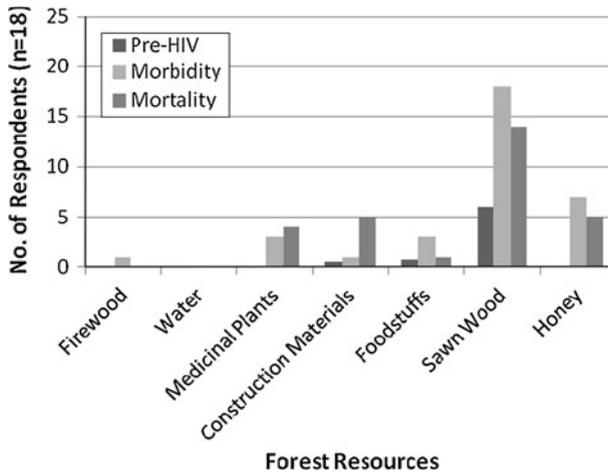


Fig. 4 Changes in the purchase of important forest resources by HIV/AIDS-affected male respondents

Discussion and conclusion

The results of this study in rural Malawi support the claims that HIV/AIDS-affected households increasingly rely on important forest resources (Barany et al. 2005; Holding-Anyonge et al. 2006; Torell et al. 2006; Topouzis 2007; de Sherbinin et al. 2008). While acknowledging the exploratory nature of this study, the data enable three key insights regarding the dependence of HIV/AIDS-affected female and male respondents on important forest resources. First, and perhaps most obviously, not all forest resources are equally important all of the time (Figs. 1, 2). Some resources, such as firewood and water, are important regardless of a respondent's HIV-phase or gender, while other resources are more important in one phase than another. Likewise, the majority of male and female respondents reported an (often substantial) increase in the use of some forest resources in the morbidity phase, such as firewood, water, medicinal plants, while reporting a (often substantial) decrease in the use of these same resources in the mortality phase (Table 1). Second, with the exception of honey, a majority (and most often a strong majority) of all respondents noted a decreased availability for all the important forest resources, regardless of HIV-phase. Third, HIV-affected male and female respondents increasingly rely on the purchase, rather than the collection, of important forest resources as the impacts of HIV on their households progress (Figs. 3, 4). de Sherbinin et al. (2008) note that natural resources can have an important cushioning effect when households experience morbidity and mortality by replacing goods that might otherwise be purchased, and research by Hunter et al. (2008a) and Hunter et al. (2007) support this assertion. In contrast, our results indicate that disease progression is accompanied by an almost universal increase in the purchase of resources that were previously collected. While the bulk of each individual resource is indeed still collected, most resources are (to some extent) being increasingly obtained through purchase.

The collection of firewood is generally a very time-consuming task, almost exclusively falling to women (Bishop-Sambrook 2003). In many places, women must walk for several hours before even starting the search for firewood which can itself take several hours (Bishop-Sambrook 2003). Malawi is certainly no exception; women and girls are generally given the task of collecting firewood, which our results show is arguably the most important forest resource for all respondents, regardless of gender or household affectedness (Figs. 1, 2). Various respondents reported that firewood is increasingly needed by morbidity-affected households because HIV-affected people require more nutritious cooked foods and a warmer environment, and the wood can be sold in order to pay to transport the ill to hospitals or to buy food for the ill such as soda (commonly seen as a convenient source of sugar/energy), salt, and sugar. Holding-Anyonge et al. (2006) also reported that adult mortality increased the demand for firewood, in part, to prepare food for frequent funerals. It should, therefore, be a concern that the majority of respondents in this study reported a decreased availability of firewood, and that several respondents turned to purchasing firewood in the mortality phase (Figs. 3, 4). Twine and Hunter (2008) reported that male heads of households are more likely to take over collection duties for wood after an adult household member dies. Our results support this finding. Although the raw data underlying the trends seen in Table 1 are not given, it is worth noting that higher proportions of males increased their use of firewood during the morbidity phase and decreased their use after mortality. This possibly indicates that female-headed households are able to find another member of the household to assist in collecting firewood, whereas males may become solely responsible for collecting firewood when a female adult member of the household falls ill or dies.

Like firewood, the collection of water is a task that falls mainly to women in Malawi and can be one of the most burdensome chores that take place on a daily basis for women (Bishop-Sambrook 2003). Water is also one of the most important forest resources to the respondents from the rural Malawian case communities. Not surprisingly, the majority of respondents, regardless of gender, reported an increased need for water during morbidity and a decreased need after a death in the household (Table 1). This is logical as more water is required for cooking nutritious foods for affected individuals, as well as for washing both the patient and dirty linens (given the disease's unpleasant side effect of diarrhea). While our results are inconclusive about the perceived availability of water, given its centrality to well-being in general, and to HIV/AIDS-affected households more specifically, its sustainability should be a priority for resource managers.

Medicinal plants are relied upon to treat HIV-related symptoms such as diarrhea and shingles (Holding-Anyonge et al. 2006). Our results clearly demonstrate that affected households, regardless of gender, consider medicinal plants to be more important during the morbidity phase than during the other phases (Figs. 1, 2). A strong majority ($\geq 75\%$) of respondents reported both an increased use during morbidity and a decreased use after mortality (Table 1). Again, the vast majority of respondents in this study perceived there to be a general decrease in the availability of medicinal plants in their region and were therefore increasingly reliant on the purchase of these goods after the onset of HIV (Figs. 3, 4).

Disentangling the components of the foodstuff category highlights the small, but present, importance of bushmeat and mushrooms to local respondents. None of the female or male respondents considered bushmeat to be important in the pre-HIV-phase. However, several respondents noted that it became more important after the onset of the disease and that it was increasingly purchased during the morbidity phase by both genders (data not shown). Its increased importance is logical, and results support the findings of Hunter et al. (2007), who found that mortality-affected households collected more wild edibles, such as locusts, to replace previously purchased foodstuffs. Numerous respondents in our study noted that the ill often have voracious appetites for meat. Wild meats can provide high-quality protein to those afflicted with HIV as they typically require up to 15 % more energy and 50 % more protein (Kaschula 2008). Demand for bushmeat by HIV-sufferers could present a new and potentially formidable challenge to HIV/AIDS prevention as other diseases in wild animals could infect those hunting them (Avasthi 2004). Therefore, some level of capacity building may be needed to ensure that hunters are aware of these risks. Similar to an increased preference for bushmeat, a few female respondents noted the increased importance of mushrooms in the morbidity phase. Interviewees in this study use mushrooms as a source of relish and also sell them for income to buy commodities such as sugar or notebooks for school children. These results support the findings of Barany et al. (2005).

While the broad scope of this exploratory study enabled us to begin to disentangle the interactions between forest resources and HIV/AIDS in rural Malawi, there are important limitations to the study design that we must acknowledge. Given the exploratory nature of this study, we combined households experiencing a recent death (e.g., within the last 2 years) with those with a more distant death (e.g., one respondent lost their spouse to AIDS 9 years prior). A larger sample size would have enabled us to disaggregate the impacts of time elapsed since spousal death on the respondent's use of forest resources. Likewise, this study did not account for changes in resource use according to the phases of the disease, such as from onset of HIV, stabilization of HIV, early versus prolonged morbidity, progression into AIDS, immediate aftermath of mortality, and post-mortality resource use in the near, medium, and long term. Finally, we acknowledge the challenges of relying on data based on the ability of respondents to recall the past. While we have not found any discrepancies in our data set used in this paper, it is possible that those respondents experiencing a household death or very long-term illness have less ability to recall accurate details as compared to those with a current household death or recent illness.

All that said, the value of the research presented in this paper is that it highlights how the dependence on forest resources appears to change for female and male respondents when a member of their household progresses through HIV and AIDS. Three salient research topics emerge from the results of this study. First, how can these already impoverished, HIV-affected households afford to purchase important forest resources that are otherwise unavailable? What, if anything, are females versus males selling (e.g., livestock, gardening implements, land, sex) in order to be able to pay for these forest resources? Second, what tradeoffs are these households making with respect to forest resources? For instance, our results show that

construction materials, while considered very important, are used less frequently during morbidity and mortality in spite of their importance to the ill. Does this perhaps indicate that other important resources, such as medicinal plants, which also require labor intensive collection, displace the collection of construction materials during these phases? How does this affect females and males differently? Third, given that the results presented for female and male respondents in this paper are strikingly similar, do forest-related interventions for HIV-affected people need to be gender-specific? This topic is particularly salient in Malawi as many respondents reported that traditional gender roles for household tasks have changed due to HIV/AIDS and that, as one respondent noted, “there are no specific gender roles, everybody is doing whatever they can”. Several respondents commented on the fact that, because of HIV/AIDS, women are busier now: constructing bathrooms and digging pit latrines; hunting bushmeat; roofing houses; and cutting building materials like grass, poles, and reeds. Likewise, men must now collect grasses for thatching and collect and even sell mushrooms, edible caterpillars, firewood, and fruits. Given the gendered knowledge base that must surround resource use, what do these changes mean for sustainable forest resource use in the future? Further research is warranted to uncover how resource-specific knowledge is transmitted and thus retained regarding these crucial resources.

Given that the present responsibility of collecting firewood and water generally falls to women in Malawi, interventions that support the adoption of labor-saving practices and technologies could also help to reduce women’s work burden (Mather et al. 2005; Slater and Wiggins 2005; Timko 2013b). For example, the development and promotion of fuel-efficient stoves (such as the innovative low-fuel clay stove made locally called the *Chitetzo mbaula* stove) can reduce the time women spend collecting firewood, while making more water points available reduces the distance the women must walk to fetch water (Mutangadura et al. 1999). Other interventions targeted at the important forest resources arise from this exploratory study and include providing seedlings of fast-growing species of firewood trees [such as various species of *Eucalyptus* and *Pinus*, *Senna siamea*, and *Neem* (*Azadirachta indica*)] for planting in home gardens or on common lands; reforestation of degraded lands to replenish firewood species; and providing households with storage tanks or rainwater harvesting systems and/or, and installing new or repairing degraded village boreholes and water pumps.

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