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Cattle, Livelihoods, and Coping with Food Insecurity in the Context of Drought and HIV/AIDS in Rural Zimbabwe

John Mazzeo

This article offers a case study from rural Zimbabwe in which a combination of recurring droughts, a severe HIV/AIDS epidemic, and a national economic crisis have contributed to widespread food insecurity. The article examines household level coping responses to the food security crisis affecting southeastern Zimbabwe, a semi-arid region, during a 2004-2005 agricultural season drought. Specifically, this study seeks to understand how the convergence of these events contributed to the decision by rural households to sell cattle in response to immediate food shortages. It argues that the sale of cattle, important for maize cultivation and soil fertility, threatens the sustainability of this agriculturally-oriented livelihood system and reduces a household's adaptive capacity to recover from future crises. Furthermore, the presence of HIV/AIDS exacerbates these problems, causing AIDS-affected households to experience greater food insecurity and to resort to cattle sales more frequently. This research has the potential to inform development programs aimed at strengthening livelihoods and mitigating the impact of crisis events by understanding the ways in which rural, HIV/AIDS affected populations are impacted by and respond to drought.

Key words: livelihoods, coping strategies, HIV/AIDS, drought, cattle, Zimbabwe

This article offers a case study from Zimbabwe that examines household level responses to a complex and ongoing food security crisis caused by a combination of recurring drought, a severe HIV/AIDS epidemic, and a national economic crisis. Declines in food security measured by a household's ability to access food, whether produced domestically or purchased on the market, and the strategies they use to mitigate shortages of food can have far reaching consequences on the survival of households and future livelihood activities (Barnett and Whiteside 2006). Studies about the combined impact of drought and HIV/AIDS on agricultural livelihoods have emphasized the importance of understanding how these events place populations at risk and the strategic use of resources to access food and to care for the health of individuals (Baro and Deubel 2006).

The challenges created by these concurrent events in the context of rising food costs were the primary causes for the 2002 food crisis in southern Africa (Hanrahan 2002). In the wake of this crisis, scholars have revisited models for understanding the causes of food insecurity. The "new variant famine" hypothesis proposes an alternative way of

understanding the food crises affecting southern Africa. This hypothesis attributes the severity of the crisis and the long recovery time to a generalized HIV/AIDS epidemic combined with other shocks, such as drought. The use of damaging coping strategies, such as asset sales, as a response to food shortages hurts the capacity of households to recover because it erodes the resource base upon which they depends for their livelihood (de Waal and Whiteside 2003). One potential approach to preventing new variant famine scenarios is to integrate support for livelihood activities and to strengthen existing safety nets. A livelihood model is different from food aid approaches because it aims to improve food and cash producing activities and to assist households to build wealth, potentially through livestock acquisition, that can serve as a buffer against future crises.

Of those countries most affected by the 2002 crisis, the general problem of food insecurity persists in Zimbabwe. Responses to this crisis have come largely in the form of agricultural development projects and food aid. In 2010, the country received international humanitarian aid in the form of subsidized agricultural inputs and food assistance for 1.68 million people (WFP 2010). This article offers insights into the causes of food insecurity in southeastern Zimbabwe in the context of a severe drought and an ongoing HIV/AIDS epidemic. It suggests that unsustainable coping strategies used to overcome food shortages have eroded the resource bases of households and made future food production difficult.

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Figure 1. Map of Zimbabwe and Location of the Districts Included in the Study Area

The article describes the gradual erosion of an agriculturally-oriented livelihood system based on maize production and cattle ownership. In this system, cattle play a pivotal role in maize production because they provide draft power for cultivation, manure to maintain soil fertility and moisture. The declining number of cattle in this region since 2001 was one of the fundamental reasons for declining maize production among rural households (FAO/WFP 2007).

The purpose of this article is to demonstrate a dynamic between HIV/AIDS and drought that leads to a progressive intensification of poverty that compounds the vulnerabilities of households (Gillespie and Kadiyala 2005). It uses a livelihood model to account for the processes that contribute to household food insecurity or the ability of a household to access sufficient quantities of food. Originally developed in the 1990s, a livelihood model addresses the social, environmental, and economic conditions at the household and community levels contribute to poverty and food shortages in rural parts of the developing world (Chambers and Conway 1991). The benefit of this model for this particular study comes from its ability to help discern sociocultural processes governing the organization and decision making of production, consumption, and exchange activities that influence food access at the household level.

The analysis examines how the impacts of drought and HIV/AIDS have promoted the use of cattle sales as a coping strategy and why this poses a challenge to the sustainability of current livelihood strategies. Coping with a crisis ideally involves activities, actions, decisions, and attitudes undertaken over time to maintain the capacity to respond to future change without significantly compromising the function, structure, or identity of the social unit (Nelson, Adger, and Brown 2007). As a coping strategy to overcome food insecurity, cattle sales threaten the long-term sustainability of maize production, the staple food of Southeastern Zimbabwe.

The analysis also aims to assess whether households affected by HIV/AIDS were at heightened risk for food insecurity, participated in cattle sales more frequently, and as a result, were more vulnerable to future crisis events. Nevertheless, the findings reflect the difficulty of distinguishing the impact of HIV/AIDS in a scenario where multiple variables influence food security outcomes (Murphy, Harvey, and Silvestre 2005). Detecting large differences in food security and coping strategies attributed to HIV/AIDS is difficult in a situation where most households lost their maize crop to drought, have had to contend with the high and rising costs of food, and owned few cattle to begin with.

Research Design

Research for this article was conducted in communal areas of the Masvingo and Midlands provinces in southeastern Zimbabwe during 2004 and 2005.¹ Parts of this research were in collaboration with an international Non-Governmental Organization (NGO) to assist them in assessing the potential impacts of HIV/AIDS on food security.² A livelihood framework informed the design of research tools to capture a range of variables associated with production, exchange, and consumption activities at the household level (Maxwell and Frankenberger 1992). Households, as a social and analytical unit, were a useful and convenient way of examining food security in this study because they provide for the basic needs of their members using a livelihood strategy employing resources of land, labor, and capital. Although households were the primary unit of analysis, this article does not suggest that they were socially isolated units. A patrilineal kinship system binds multiple households, and these clusters often live, work, and share resources as a group (Drinkwater 2000). The mutual dependence between households was included in the design of the research tools.

A concurrent mixed methods research design provided an opportunity to observe and discuss livelihood activities with households and to statistically measure these practices and outcomes at the population level (Driscoll et al. 2007). Mixed methods in this study involved qualitative household interviews, focus group discussions, and key informant interviews with community leaders such as traditional healers, representatives to local AIDS-action committees, and staff at clinics in the study area. NGO staff familiar with the area facilitated the purposive selection of households for in-depth interviews. A stratified sampling frame using the gender of the household head and the HIV/AIDS status of the household as the strata criteria generated four strata: (1) female headed, AIDS-affected households, (2) female headed, non-affected households, (3) male headed, AIDS-affected households, and (4) male headed, non-affected households. Overall, 35 households participated in interviews with approximately eight to nine from each strata. The selection criterion for focus groups was general (adults between ages 18 and 70) and 173 individuals were present in over 20 focus group discussions. Additionally, key informant interviews were conducted with

10 community leaders and included representatives from government AIDS-Action Committees, traditional healers, nurses, and community health volunteers.

The mixed methods design also included quantitative data collected through a household livelihoods survey.³ The author was involved in all stages of this survey including its design, the training of surveyors, data entry, and preparing the final report. The survey design allowed the collection of data for research purposes and for the planning and evaluation of projects implemented by the collaborating NGO. Sampling for the survey relied on a random design and was statistically representative at the ward level and included 3,045 households.⁴

Classifying households in the survey dataset as AIDS-affected and non-affected helped to measure the combined impact of drought and HIV/AIDS. A household was classified as AIDS-affected if any member of the household died in the past 12 months due to a chronic illness lasting three or more months or if there was an adult member aged 18 to 60 years who presented symptoms associated with HIV/AIDS (Grant and De Cock 2001). NGO staff assisting in survey work had received prior training in basic identification of AIDS-related symptoms for the purposes of monitoring and evaluation activities through workshops offered by the NGO. The dataset includes 2,321 (76%) non-affected and 518 (17%) AIDS-affected households. The status of another 206 (7%) households was unclear and excluded from the analysis. The term non-affected distinguishes households for the purpose of a comparative analysis. It does not suggest that non-affected households were unaffected by the HIV/AIDS epidemic in some other way. The close relationships between households in a social network bound by kinship ties involves sharing resources and caring for the ill. Households classified as “non-affected” may encounter difficulties similar to “AIDS-affected” households because of the regular flow of resources between related units. This comparison serves the needs of the NGO collaborator and made classification of household simpler. The qualitative portion of this research helped to identify ways in which HIV/AIDS affects households and their social networks.

Causes of Zimbabwe's Food Crisis

Zimbabwe has gone from southern Africa's largest food exporter to a nation dependent on food imports and international aid. The food crisis was a product of several factors including economic decline, persistent droughts, and HIV/AIDS (Kinsey, Burger, and Gunning 1998). Zimbabwe's economic decline has been linked to land redistribution and economic mismanagement. Land redistribution in Zimbabwe was chaotic and fraught with corruption. The government's Fast-Track Land Reform Program redistributed much of Zimbabwe's commercial lands; however, the type of agriculture practiced in these resettled areas does not resemble former commercial enterprises. Crop production on resettled lands has been far lower than pre-land redistribution levels and has been found to be similar to the small scale, subsistence-orient-

ed production activities on communal lands (Chimhowu and Hulme 2006). The declining value of the Zimbabwean dollar and ongoing economic instability caused prices of imported food to soar and supplies to dwindle.⁵ Massive inflation combined with reductions in employment opportunities outside of agriculture has made food, education, transportation, medication, and other necessities expensive. Zimbabwe's economic decline has taken a toll on rural populations who depend on maize cultivation for food and have few options for income diversification (Bird and Shepherd 2003). Increased costs of hybrid maize seed and commercial fertilizers create financial difficulties for rural households who depend on them.

A generalized HIV/AIDS epidemic also contributes to the ongoing food crisis, especially in rural areas where the loss of adult labor power poses a significant challenge for agricultural production. Rural households depend on labor intensive agriculture for survival, so the loss of household members to illness and death drains the capacity of households to mobilize sufficient labor during key points of the agricultural cycle. The prevalence of HIV/AIDS among adults in Zimbabwe during the time of the research was 18.4 percent (2005), a decline from the peak of the epidemic in 1997 when the rate was 26.5 percent (UNAIDS 2010). The greatest number of infections was among adults aged 15 to 49 years, women, and people living in rural areas (UNAIDS 2006). Life expectancy at birth has dropped to 44 years from 60 years in 1990 as a result of AIDS-related deaths (UNICEF 2010). The availability of antiretroviral (ARV) therapy was limited and insufficient in rural areas. In 2005, the number of people living with HIV/AIDS (PLWHA) on ARV medication was 25,000. This number increased to 218,589 at the end of 2009, but still represents a small fraction of the total population in need of medication. Most of those receiving treatment live in urban areas. Declines in HIV prevalence have been associated with changes in sexual behavior among youth. HIV/AIDS remains Zimbabwe's most serious public health problem. It was responsible for half of the country's total disease burden in 2009 (Chapman et al. 2006; Gregson et al. 2006; UNAIDS 2010).

Severe and frequent droughts contribute to food insecurity and punctuate the history of this region. Annual rainfall estimates in the study site of southeastern Zimbabwe range from 650 mm to as little as 300 mm, with most rainfall occurring between October and December (Vincent and Thomas 1960). This environment is better suited for cattle grazing than for rain fed maize agriculture, and the dependence on maize as a staple food where drought conditions are common creates a constant threat of food shortages. Several droughts over the past two decades, occurring in 1991-1992, 1997-1998, 2002-2003, and 2004-2005, caused widespread crop failure, livestock loss, and a national food security crisis. One of the most severe droughts occurred in 1991 and 1992, killing more than one million cattle and resulting in the complete loss of livestock for 68 percent of all households (SADC 1994).

Increased frequency and severity of drought in southern Africa are attributed to the El Niño-Southern Oscillation or

Figure 2. National Rainfall From December 2004 to March 2005

ENSO phenomenon. Warming of the equatorial Pacific Ocean can influence atmospheric circulation and shift rainfall patterns, causing these climate events. Consequently, increased frequency in this type of weather pattern is responsible for declines in rainfall in southern Africa during its rainy season from December to February (Nicholson and Kim 1997). Climate change scenarios for the study region predict further declines in rainfall over the next decade that could lead to the expansion of semi-desert areas (Hulme and Sheard 1999). The implications of climate change in this region means less recovery time for households between droughts.

Cattle, Maize, and Livelihoods in Southeast Zimbabwe

This analysis begins with examinations of both the livelihood system practiced in the study site and the dependence on cattle and rainfall for food production. Households in the study area practice a mixed livelihoods strategy based on maize agriculture and livestock husbandry and complemented by local wage labor, small gardens for cash crops, and labor migration. The practice of rain fed maize cultivation as a core livelihood strategy in the study area has created a fundamental dependency on cattle for both draft power and soil quality (Barrett 1991; Scoones 1997; Wolmer and Scoones 2000). The dependence on rainfall and cattle was created under British colonial rule with the introduction of cattle drawn plows, maize seed, and the forced movement of populations into dry areas with few water sources for irrigation (Drinkwater 1991). Traditionally, cattle served as a source of wealth for social transactions, such as part of bride price and religious ceremonies. A breed of indigenous cattle was the most common and offered a natural resistance to drought conditions (Hall 1998). Cattle are an important source of savings and when households need cash, they are sold to small butcher shops or to neighbors. Cattle sales offer the highest return compared to all other livestock (Scoones 1992). Given their productive, social, and financial value, cattle are rarely slaughtered for household consumption (with the exception of funerals).

During the time of the study, an unfavorable climate and ecology makes maize cultivation risky, but despite this, large investments of cash, labor, and time were made into its cultivation. Households make investments of manual labor, cash for inputs of seed and fertilizer, and draft power for plowing. Preparing fields for planting requires a large amount of manual labor in combination with draft power from cattle to clear and plow maize fields as the soil softens with the seasonal rains. Households were beset with the challenge of mobilizing sufficient labor and draft power before the first rains end in order to improve the success of their harvest. Compounding these challenges, inputs of hybrid maize seed and commercial fertilizer were expensive.

During 2004, the heavy rains that were supposed to mark the beginning of the planting season did not arrive until December, several months after they were expected. Even this rainfall, however, was sporadic or spotty, and farmers were skeptical about how long the rains would last. The heaviest rains arrived late during the first 10 days of December, and most farmers decided to plant. Meaningful rainfall only continued in the northern half of the country while the southern provinces experienced little or no subsequent rainfall. Besides the fact that rains arrived extremely late, the driest parts of southern Zimbabwe had only between 30 and 60 percent of their average rainfall with deficits between 200 and 600 mm (USAID and FEWS-Net 2005b). Rainfall distribution was uneven with neighboring areas receiving widely differing amounts. Following the December 2004 rainfall, a long dry spell affected the area until March. Consequently, the maize crop suffered severe moisture stress resulting in widespread loss or stunting (FEWS-Net 2005).

The presence of heavy rains led many to believe that the rainfall would continue and provide a productive growing season leading to a large number of households trying to plow and plant at the same time. The late arrival of rains further compounded the problems and costs of planting since there was a sense of urgency to plow and plant quickly. In an environment where timing is critical, households that owned cattle were at a distinct advantage. Half of all households in the study area did not own cattle and either hired someone

to plow for them or borrowed cattle from a relative or friend. Hiring other households to provide draft power was expensive during the 2004-2005 season when demand was high. By the time draft cattle arrived, it may have been well after the early rains had ended. Borrowing cattle from kin, especially between male kin who shared a common male ancestor, was another option; however, cattle are becoming scarcer in rural areas, and the large number of requests placed on a small herd can quickly deplete their strength. Requests to borrow cattle or have a field plowed were filled according to the relationship between lender and borrower. A hierarchy of kinship relations guides these decisions. Parents, elder uncles, and brothers have priority over cousins, in-laws, and friends. Depending on the number of requests, a borrower may receive the loan of cattle too late into the season. The following case is of a young, single male without paternal kin nearby and who relied on the assistance of his maternal relatives for help:

In December, I cultivated one and a half acres, and in return, we managed to harvest nothing. My grandmother gave us seed and my [maternal] uncle let us borrow his plow and draft cattle. Nevertheless, we managed to plant too late. He could not let us have them since he was using them, and by the time they came, the [cattle] were exhausted. We harvested barely anything. We got only 10 kilograms from the field, and we have already consumed that.

Ownership of cattle, as compared to hiring or borrowing cattle had a positive influence on the proportion of land planted, maize harvested, and chance of total crop failure during the 2005 drought. When compared to households that hired or borrowed cattle, households that owned draft power experienced the greatest rates of success in maize cultivation as measured by the quantity of land under maize cultivation, maize harvest, and rate of total crop failure. Households owning cattle cultivated on average 2.2 acres, harvested a total of 105 kg of maize, and had a crop failure rate of 32 percent. In comparison, households that hired or borrowed draft power planted 1.7 acres, harvested 65 kg, and had a crop failure rate of 40 percent.

Cattle ownership had positive influences on decisions to place land under cultivation and on the quantity of maize harvested. The decision to plant was the outcome of a complex agricultural decision making process that depended on several variables. Households did not plant all of their land, and the most common reasons not to plant were low rainfall (40%) and insufficient draft power (28%).

Data from the 2005-2006 season offers a comparison to the 2004-2005 drought season and demonstrates the productive value of cattle during years with more rainfall. The 2005-2006 agricultural season received substantially more rainfall, and these data show a positive correlation between cattle ownership and production. Households that owned cattle produced 495 kilograms of maize as compared to 250 kilograms or half that amount for households without draft power. Additionally, the proportion of land brought under cultivation for cattle owners was higher, 78 percent

or 2.4 acres, compared to 72 percent or 1.6 acres among those who were not cattle owners.

Food Security in the Aftermath of the 2005 Drought

In the study area where ecological and climatic conditions made maize production risky, there were few opportunities for income diversification outside of agriculture. Household livelihoods were highly vulnerable in the 2004-2005 drought and were unable to generate the cash necessary to purchase sufficient quantities of food in the marketplace to bridge shortfalls in production. The damage to maize crops caused by the drought combined with the high market price for ground maize meal was responsible for the severe food shortage. By April 2005, it was clear that drought had destroyed nearly all of the maize across the study site. The maize that remained was short and, at best, bore stunted cobs. With adequate rainfall, households in the study area were able to produce the majority of maize needed for domestic consumption. Household maize production, which usually accounts for more than half of a household's total consumption needs in years with sufficient rainfall, contributed less than one-quarter of its total consumption needs in 2004-2005. The words of a 45-year-old male encapsulate this predicament:

This year [December 2004] we planted, but we don't have any maize from our harvest. We get help from family who live nearby. They helped us during the plowing season and in return, my wife helped them weed their fields. From our efforts, we only managed to harvest a little maize. Because of the drought, nearly everything died. Last week we took the last bucket of maize kernels to the grinding mill. From this, we were left with only 10 kilograms. This can last us for two weeks. We have already eaten half and have one week of food left.

Assessing the food security crisis in the study area depended on an estimation of household food security. A food security variable estimated both the number of months a household would be able to access sufficient quantities of food from different sources and the household's consumption needs.⁶ Sources of food included harvested maize and an estimate of future maize access using information about the past 12 months for income, gifts of food, food for labor payments, and remittances. Data were aggregated at the ward level, and the average number of months of household food security by ward was generated for the entire study region (Figure 3). Within most wards, households were able to meet between three and nine months of their annual food requirement.

When the data on food security were compared by household AIDS status, AIDS-affected households were impacted disproportionately. Total maize production measures the quantity of production and equals the weight of grain that has been ground into maize meal combined with an estimated weight from standing crops.⁷ Total maize production in AIDS-affected households

Figure 3. Months of Food Security for the 2004-2005 Agricultural Season

was 77 kilograms and in non-affected households 93 kilograms. The difference in food security attributed to HIV/AIDS was lower than anticipated. During a crisis year where most crops were lost to drought, the margin of difference between households affected by AIDS was less pronounced than during years with better rainfall.

Overall, the paucity of food production meant that all households had to rely more on market purchases. Consumers, however, faced widespread market shortages of maize meal on both the Zimbabwe's official Grain Marketing Board (GMB) and informal markets. The GMB was the preferred place to purchase maize because the government regulates the price and the cost of maize meal was cheaper than maize sold on the informal market. During this drought year, farmers were far more reluctant to sell to the GMB because of their own consumption needs and the fact that informal sales could fetch higher prices. As a result, maize meal prices doubled on the informal market between March and August 2005 from Z\$2,800 per kilogram to Z\$5,700 per kilogram [Z\$10,000 = \$1 in March 2005] (USAID and FEWS-Net 2005a). Despite these high prices, survey data showed that households accessed the majority of their maize meal from purchases. Households had to rely on coping strategies to meet their unforeseen need for cash to cover large expenditures on food.

Coping with Food Insecurity

The increased dependence on purchased food following the low harvest placed substantial pressure on households to

acquire cash. Cattle sales were one type of coping strategy households used to alleviate the need for cash to purchase food and other commodities. The sale of cattle was perhaps the most damaging coping strategy for the long-term sustainability of rural livelihoods because of the strong dependence on cattle for maize production. Additionally, the recovery of cattle was difficult given the frequency of drought events and Zimbabwe's worsening economic condition. The last part of the analysis explores cattle sales as response to food and livelihood insecurity caused by the double-crisis of HIV/AIDS and drought.

According to other surveys conducted in the study area, there has been a gradual decline of household cattle holdings in the study area between 2002 and 2009. Table 1 provides figures for cattle ownership, sales, purchases, and hiring/borrowing. These data show that there has been a decline in both the proportion of households owning cattle from 56 percent in 2002 to 41 percent in 2009 and the average number of cattle owned from 2.7 head in 2002 to 1.9 head in 2006. The number of cattle owned for each year was skewed positively with a minority of wealthy households who have large cattle holdings. Over time, however, this skew has decreased as the maximum herd size decreases and the number of cattle rich households declines.

Parallel to the decline in household cattle holdings, the proportion of households that sold cattle more than doubled from 6 percent in 2004 to 15 percent in 2009. Food purchase was the primary reason for sales in all of the reported years. The effect of the drought on cattle sales was observed in the 2006 data when the proportion of households reporting

Table 1. Cattle Figures for Household in the Study Area, 2002-2009

	2002	2003	2004	2005	2006	2009
% Households Owning Cattle	56%	58%	52%	54%	51%	41%
% Households Sold Their Cattle	—	—	6%	9%	20%	15%
% Purchased Cattle	—	—	—	>1%	3%	1%
% Borrowed Cattle for Draft Power	—	—	11%	18%	43%	—
Mean Cattle Owned	2.7	2.5	2.1	2.0	1.9	—
SD	4.5	4.1	3.0	2.8	2.6	—
Min	0	0	0	0	0	—
Max	84	90	27	29	19	—

[—] indicates that data were not available for that year

Source: 2002, 2003, 2004, 2005, 2006 and 2009 Household Livelihood Survey Reports

sales peaked at 20 percent. Because the survey in 2006 was administered in April and households were asked to report on the past 12 months, their responses reflected a time when food shortages were most severe from the 2004-2005 season drought. Even in non-drought years, livestock sales were a common source of income among households. There has been very little change in the low proportion of households purchasing cattle, indicating minimal reinvestment into building herd sizes. Low replacement of cattle and the sharp rise in sales might help explain why the proportion of households borrowing or hiring cattle for draft power rose from 11 percent in 2004 to 43 percent in 2006.

AIDS-affected households suffered additional losses of cattle following the 2005 drought. The data suggests that for AIDS-affected households cattle herds were smaller and the decision to sell cattle was greater for AIDS-affected households. During several focus group discussions, participants emphasized divestment of livestock as a coping strategy to cover long-term medical care expenditures. These decisions about how to pay for care depleted most of their savings:

People are becoming poor and poorer because all their assets are disposed of in trying to care for the patient. When my wife died, there was nothing left for my family. I sold my livestock to buy food and pay for medical expenses. I used to have three cattle, but I had to sell them all.

Figures for cattle ownership and sales from the 2006 household livelihood survey report are summarized in Table 1 and best reflect the condition of households following a year of high food insecurity due to the drought and failed harvest in 2005. In early 2006, mean cattle ownership for AIDS-affected households was significantly lower, although this difference was relatively small (0.4 head).⁸ Additionally, the decision to sell cattle was higher among AIDS affected households (24%) as compared to non-affected households (19%).

The use of cash provided by cattle sales for household expenditures also differed by household type. Medical expenses for AIDS-affected households accounted for 24 percent of the reasons for selling cattle. In many of the households interviewed, providing medical care for the chronically ill consumes considerable amount of household wealth. Cattle sales, as discussed above, were one way in which households cope with this cost. A woman living with AIDS explained how her household had already consumed most of its resources caring for her ailing husband:

I used all our money when my husband was sick. We even sold all our cattle. Now I am sick and I have nothing. We have no food. We are selling what livestock we have left, especially chickens, in order to buy food. I refuse to sell my assets because I want them for the future of my children. I get remittances from my daughter to send my grandchildren to school, and my sister is the one who looks after me since I have become very sick.

Many female interviewees described that during the course of a husband's illness, they sold much of what they owned leaving little wealth to fall back on. The cost of care can quickly consume most available cash and assets.⁹ According to 2005 data, spending on medical care for AIDS-affected households during the previous 30 days was on average Z\$165,000 (\$8) or 15 percent of a household's total income over the previous 12 months. This only represents a single month of medical care and not the total annual cost of care. The actual cost could be far higher, placing greater strain on the household to make food purchases and helping to explain higher rates of cattle sales among AIDS-affected households.

Conclusions

This article has examined the implications of cattle sales as a coping strategy against chronic food shortages

Table 2. Cattle Ownership and Sales by Household AIDS Status, April 2006

	AIDS-Affected	Non-Affected
N, Households	475	5,745
% Own Cattle	47%	51%
Mean Cattle Owned	1.5	1.9
SD	2.3	2.7
% Sold Cattle	24%	19%
Use of Cash From Sale		
Food	41%	53%
Medical Expense	24%	4%
School	22%	23%
Funeral	8%	3%

Source: 2006 Household Livelihood Survey Report

on the long-term sustainability of the mixed livelihood system practiced by households in rural southeastern Zimbabwe. The analysis has demonstrated that although cattle played an important role in maize cultivation, many households relied on the sale of cattle as a way to cope with the intense food security crisis during 2005. Despite the losses in agricultural production associated with the loss of cattle, selling cattle was still a common coping strategy as a means to access cash for purchasing food. Cattle sales as a coping strategy to food insecurity have a direct relationship to the decline in household food production and an erosion of a household's ability to respond to future crises.

The new variant famine hypothesis (de Waal and Whitside 2003) predicts that households doubly affected by HIV/AIDS and drought experience greater food insecurity and more often rely on damaging coping strategies. In this study, the differences in food security according to household AIDS status were not as great as anticipated. The magnitude of impact by HIV/AIDS on food security and coping strategies was reduced by the deep and widespread economic, political, and climatic problems facing the entire population. Nonetheless, slight differences suggest that the concurrence of AIDS and drought gradually reduced household well-being over time. These findings do not negate the arguments made in the new variant famine hypothesis and suggest that the erosion of livelihood is less pronounced and more gradual than anticipated. Despite this, NGOs working in this part of Zimbabwe should consider specific livelihood support activities for households for the purposes of improving food access, income generation, and building wealth that can be used to buffer households to future crisis events. The strengthening of livelihoods is a critical component in preventing a new variant famine scenario from developing in southeast Zimbabwe.

The findings of this article confirm and contribute to existing research from the region that has documented the shrinking of Zimbabwe's cattle herds and correlated this with the decline in agricultural productivity (Chibudu et al. 2001). Other studies have attributed this loss to a combination of drought, disease, and livestock sales. Between 2001 and 2006, cattle holdings among rural households have declined 23 percent, from 6.43 million to 4.97 million heads of cattle (FAO/WFP 2007). Because land redistribution broke up most commercial cattle ranches, these figures largely represent household herds (Mavedzenge et al. 2008). The loss of commercial farms has also accelerated the decline in livestock infrastructure, such as water tanks and cattle dips used for disease control (Alwang, Ersado, and Taruvinga 2001; Ersado 2005; IDS 2003; Marquette 1997).

Although this research has not examined the loss of cattle to drought or disease, it has helped to confirm that part of the decline in cattle holdings in southeastern Zimbabwe stems from cattle sales as a response to food insecurity. A prior study of HIV/AIDS-affected households in Zimbabwe also supports the findings in this article that cattle were used to bridge income shortfalls among households affected by HIV/AIDS (Mutenje et al. 2008).

Findings from this study have implications for programs designed to alleviate food insecurity in southern Zimbabwe and elsewhere. They suggest that a comprehensive support model based on the range of livelihood activities practiced by households would best protect household food security. In order to meet household expenses, such as food, health care, and education, a significant percentage of households sell productive assets, including livestock. One recommendation is for programs to support households by helping them acquire and care for livestock. In light of declining food availability, the increase in crop yields brought about by conservation farming or other improved techniques may offer improved resilience to drought. Another recommendation is to expand agricultural extension activities among households located in the most drought prone areas. Households commonly cited a lack of seed, draft power, labor, and money to purchase inputs as reasons for not cultivating available land. Programs could target interventions to address these constraints through such initiatives as seed banks and draft cattle sharing arrangements. Projects should also build opportunities for diversifying livelihoods through community-based savings and loans, increased access to markets to improve income generation from crop sales, and training for micro-enterprises. Each of these recommendations suggests direct support to households as a means to stem the loss of cattle and other assets through damaging coping strategies.

Households affected by HIV/AIDS would benefit from programs that improve the quality of care by the chronically ill and by providing support to the dependents of PLWHA as well as AIDS orphans. Community and household members are among the primary sources of support for the chronically ill, and there should be investment into building capacity of these care providers to support HIV-positive individuals

through proper nutrition and the treatment of symptoms. Support to offset education expenses, such as the provision of block grants to schools for fee-waivers, are important for HIV/AIDS affected households with school age children or households caring for AIDS orphans.

In conclusion, this case study has helped to demonstrate one of the mechanisms by which drought and HIV/AIDS affect long-term food security and livelihood sustainability in rural southeastern Zimbabwe. The occurrence of drought in combination with a widespread HIV/AIDS epidemic has a significant effect on agricultural production, the mainstay of the rural livelihood system, and can erode the resource base from which households draw their adaptive capacity. Hopefully, these findings will help to improve existing knowledge and help to inform policy and programs aimed at mitigating the impacts of drought and strengthening livelihoods in this region of Zimbabwe.

Notes

¹Communal wards are home to the majority of Zimbabwe's population and are usually the least desirable for agriculture while the best lands are under commercial control or are resettled areas as a part of the land reform act. The Communal Lands Act of 1982 establishes conditions regulating communal land use. According to this act, all land is property of the State and controlled by the President. The government and traditional authorities entrust parcels of arable land to individuals. Land use rights are inherited and, although individuals are not permitted to purchase or sell land, this practice does occur.

²The identity of the NGO has been kept confidential for this article at their request.

³I participated in the 2005 and 2006 household livelihood surveys, and the NGO has made available information from other years. The survey design and the same sampling approach have been similar for each year. The absence of a survey for 2007 and 2008 was due to a heightened political crisis in Zimbabwe that prevented work in rural areas. The survey used in 2005 is available online at the AIDS and Anthropology Research Group website (<http://groups.creighton.edu/aarg/research/index.html>).

⁴The administrative units in Zimbabwe, from largest to smallest, are province, district, ward, and village. As an example, in the 2002 census, Masvingo Province had a population of 1,318,705 and covers an area of 56,566 square miles. While Zaka district, one of seven districts located in Masvingo Province, had a population of 184,814 in its 30 wards.

⁵In September 2008, the Government of Zimbabwe legalized the United States dollar as an official form of currency as the Zimbabwean Dollar became virtually worthless after inflation rates reached 11 million percent in July that year.

⁶Food security was measured by the estimated number of months a household can provide sufficient food to its members from all sources. Household food requirements established by the NGO in consultation with the World Food Program is 10 kg of ground maize meal per person per month.

⁷Interviewers estimated the weight of post-processing maize meal from standing crops on the basis of an estimate provided by the household.

⁸A single-tailed, non-parametric test for independence (Mann-Whitney *U*) was used and generated a *p* value of 0.56.

⁹A 2010 *New York Times* article reported a hospital in Chidamoyo, located in the north, accepting barter payments of livestock in exchange for medical care. Cattle were worth \$150 in medical care (Dugger 2010).

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