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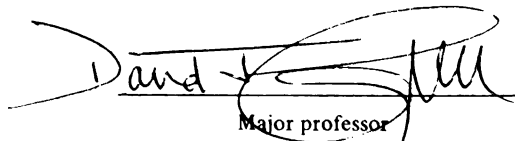
COPING MECHANISMS OF RURAL HOUSEHOLDS DURING
FOOD SHORTAGES IN KWAZULU-NATAL, SOUTH AFRICA

presented by

Brent McCusker

has been accepted towards fulfillment
of the requirements for

M.A. degree in Geography


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COPING MECHANISMS OF RURAL HOUSEHOLDS DURING FOOD SHORTAGES
IN KWAZULU-NATAL, SOUTH AFRICA

By

Brent McCusker

A THESIS

Submitted to

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Abstract

Food shortages are common throughout Africa. South Africa's unique political economy has hindered research on food security in that country. This study examines the food security of a rural area of the KwaZulu-Natal province. It first uncovers some basic information on the area then proceeds to analyze relationships in the data. The use of GIS in food security studies is explored and spatial relationships are explained.

The food security situation was found to be similar to other parts of Africa. Food shortages occurred after droughts in the 1980's and 1990's. Political institutions were found to have impact on the food security equation, as well as the loss of hunting rights due to encroachment of game wardens from the nearby Hluhluwe-Umfolozi Game Reserve. Basket making provides a significant source of money for food in times of shortage.

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Acknowledgments

Many individuals made this work possible, but none more than my wife, Eileen. Through those long winter nights alone, she persevered and encouraged me regardless of my absence. I would like to extend my thanks to my advisor, Dr. David Campbell whose constant support and comments gave this thesis direction and meaning and to the Department of Geography for extending their financial support. I owe a great debt to Dan Weiner who helped me pursue my interest in Africa, Cathy Oelofse, Peter Schmitz, Shirley Brooks, Thokazani Xaba, Annie Maharaj and Dr. David Hemson- without their help I never would have survived the UDW experience, and to Rebecca Manyoni for her wonderful and endless knowledge of Zidonini and the English language. To Ella Fitzgerald for her wonderful voice which sustained me during the many trips up and down N-2. And finally to my parents, who have always supported me despite the fact that they could never understand why I would ever want to go to Africa.

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Terms Used in this Thesis

(As read in the interview)

Dwelling – a single house.

Household- the members of the family that live in a particular dwelling.

Homestead – a group or cluster of dwellings.

The Tree – a site name given to the center of Zidonini, used for clarity given that “Zidonini” also refers to the entire study area.

The Ridge- a given site name near “The Tree”.

The Nduna – the site where the Nduna of the area lives.

Coping mechanism – a response to a food shortage intended to increase the family food supply.

(Food) Shortage – a time when you or your family were hungry because you didn’t have enough food or money to buy food.

Severe (food) shortage – a shortage that was far worse than all the others. You went for many months very hungry.

*** ALL REFERENCES TO “SHORTAGES” REFER TO FOOD SHORTAGES**

Introduction

Human relationships with the environment range from the manipulation of raw materials into complex machinery to production of food to an aesthetic appreciation of landscapes. The production of food for subsistence occupies the daily routine of millions of people throughout the world. Food security is a contentious issue in most of Africa as it is bound up in politics, societal relations, and relations with outside organizations. As a percent of total employment, farming is by far the most important activity in Africa. These farmers manipulate their environment to produce their daily subsistence, generate cash, and provide their families with the basics of life.

South Africa is no exception to this pattern. Although systematically neglected by the apartheid government, subsistence farmers comprise a large proportion of the population. Their relationships with their environments are becoming ever more the focus of attention of researchers and the new South African government. The new government has initiated a series of upliftment, or poverty alleviation and empowerment, programmes aimed at providing relief to the often-neglected rural smallholder. This upliftment, however, must come through an understanding of the rural context. Patterns of food shortage, coping mechanisms, and expectations are issues that need to be examined when studying rural livelihoods.

Food security is defined by the World Bank (1986) as "access by all people at all times to enough food for an active and healthy life". As a component

of environmental security (the cumulative physical and social processes which provide livelihoods), food security can not be overlooked or marginalized because agro-businesses provide large stocks of food. The loss of soil fertility, hunting rights, food security, biodiversity, and rural livelihoods are all interrelated.

In addition, global climate forces are acting on southern Africa, as the 1997 El Nino promises to be one of the strongest of this century. If past El Nino events are any indication, the upcoming two years could be disruptive of southern African food securities, economies, and agricultural progress.

This thesis focuses on issues of food security including the history of food shortages and drought, the coping mechanisms and sources of food during times of stress, and expectations/preparations for future shortages. The type of information presented in this study is significant in formulation of policies to combat rural hunger in South Africa. Furthermore, few detailed descriptions of food security in the rural areas of South Africa exist. Without detailed knowledge of the processes behind food insecurity, mistakes may be made in the rural development process. I will focus first on the setting in which the study takes place, then describe the methods used to gather data, followed by a review of the literature, analysis of the data, and finally a discussion of findings.

Statement of the Problem Food security in Africa is elusive for the majority of poor, rural people. Particularly pressing is the need to identify the level of food security in the Republic of South Africa. Access to food was systematically and purposely understudied in the apartheid era resulting in a lack of even rudimentary information on the food situation in the rural areas of South Africa. The cycle of drought in southern Africa and entitlement failure often catches relief institutions off guard leaving people vulnerable to hunger and famine. Coping strategies need to be identified and famine indicators must be studied to prevent disaster on a widespread scale. A strong El Nino began developing in the summer of 1997 in the eastern Pacific. Historically, El Nino events have led to drought in southeast Africa (both the 82-84 drought and the 91-93 drought were results of El Nino). The potential for drought and hunger is high for late 1997, 1998, and early 1999, making the type of information presented in this study critical for effective policy making.

The impetus of this study is two-fold. I conducted a small study in the rural farming uplands in the KwaZulu-Natal province has collected first, basic information on the level of food security in South Africa. General information on recent hunger periods, coping mechanisms, and people's expectations of and preparations for potential drought in the near future has been gathered using a short quantitative questionnaire and informal interviews. Second, I addressed questions regarding *spatial* patterns in the data. Relations between local political

structures and the distribution of food during hunger, access to markets, and proximity to a game reserve have been examined to determine relevant patterns.

In summary, this study will provide information on the level of food security in one community representative of rural Kwa-Zulu Natal. Identification of coping mechanisms and discussion of recent hunger and drought history will factor heavily in this work. Spatial patterns will be examined to gain a greater understanding of the *geographic* processes behind the relations of production and distribution.

Some General Hypotheses Based on a review of the literature, several hypotheses related to the main themes are postulated. First, because of South Africa's level of development and unique history, coping mechanisms should be different from those found in the rest of sub-Saharan Africa. Methods of coping with food shortage are set in the context of the locality and in turn the nation. South Africa's unique political economy should have a large affect on the coping strategies of rural inhabitants as this political economy shapes opportunities and challenges. Second, the cycle of drought in the study area should be significantly similar to general patterns in the rest of southeastern Africa. Particularly, droughts should have occurred in 1981-84 and 1992-94. Environmentally induced shortages may follow a similar pattern, but will vary according to local and regional conditions, however, drought does not always lead to entitlement failure.



Thirdly, rural people's expectations of the role of the government in the next food shortage period will be high. The newly elected government of the African National Congress will be relied on to provide services often neglected in the past. Finally, preventative measures for the next famine should complement coping mechanisms. Preparation for famine is not a reaction governed simply by the onset of famine, especially in southern Africa where drought can be expected one or twice every ten to fifteen years. The interview schedule is designed to provide information needed to support or reject these hypotheses.

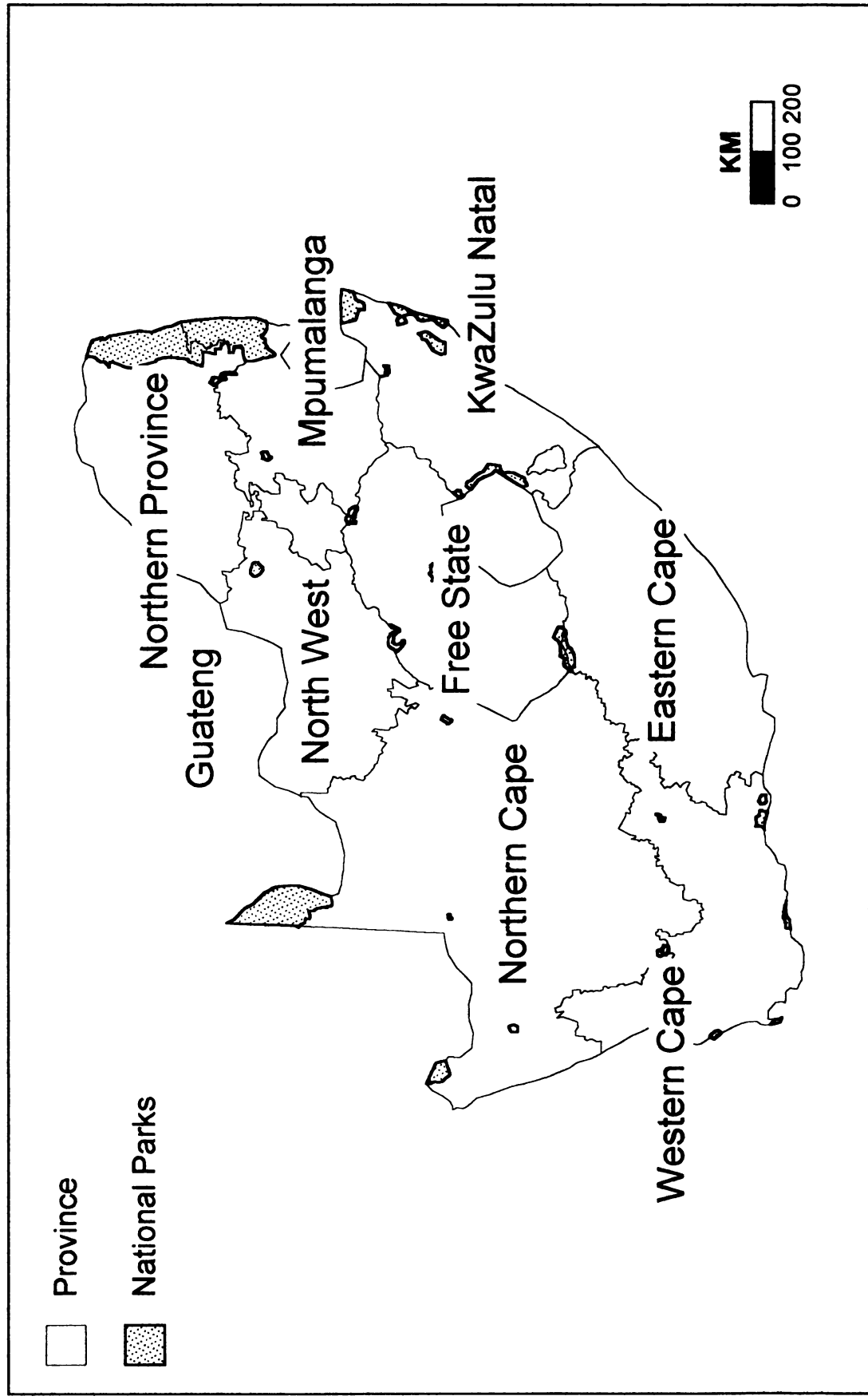
Specific Hypotheses Specific research questions include:

- What is the history of drought and famine in the Zidonini study area?
- Is drought or entitlement failure more responsible for food shortages in Zidonini?
- How do the local and provincial political structures influence the level of food security?
- What are the coping mechanisms to entitlement failure?
- What is the role of labor migration in the food security equation in Zidonini? Does it hold to the convention wisdom on homeland areas (the homelands were/are primarily labor reserves)
- What are the people expecting from the government regarding food?
- What do the people believe will help them secure food?

The Setting – South Africa South Africa is located at the very southern tip of Africa between 22 and 35 degrees South, 17 and 33 degrees east. Climate of the nation varies according to altitude, latitude, and proximity to the Indian and Atlantic Oceans. The western portion of South Africa is drier and warmer than the east most of the year. The southwest coast, with a Mediterranean climate is an exception. The eastern and northern plateau, commonly known as the Vaal, is slightly moister than the western semi-arid region. The east coast and slopes of the Drakensberg Mountains are the wettest parts of South Africa, receiving approximately 100 cm of precipitation annually compared to the drier western average of under 25 cm per annum. The Drakensberg Mountains rise in the east transecting the nation.

Vegetation is primarily savanna in the North and East, except along the coast where more tropical vegetation can be found, and in the west where desert-like shrub can be found. Agricultural production in general is highest in the East and North. Sugar cane and silviculture predominate along the KwaZulu-Natal coast and heavy industrial farming predominates in the North. Smallholders are most commonly found in the Eastern Cape and the uplands in KwaZulu-Natal.

Figure 1: South Africa, 1997





Drought is recurrent in southern Africa's climate. Southern African droughts are cyclical in nature, rather than endemic as in the Horn and Sahel, primarily due to circulation patterns. The region can expect to experience a major drought once ***about*** every five to ten years. The last such event was in 1992-3. The previous dry spell in the early 1980's was rather protracted and by some accounts it did not end until 1988. A review of drought history shows that major below average rainfall periods occurred in 1910-12, the late 1930's, 1968-9, 1978, and 1982-4 (Tyson, 1987).

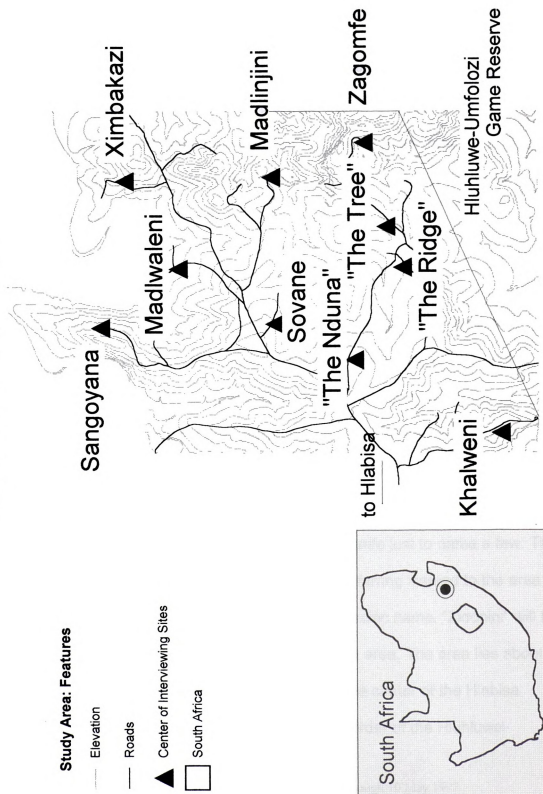
Historical Background South Africa emerged in 1994 from over 300 years of colonial rule. The first inhabitants were Bantu speakers from the north. The Dutch arrived on the scene in the early 17th century and their ancestors remained in power until the first free and democratic elections were held in 1994. Political structures instituted in this century severely handicapped the African smallholders. Years of dispossession culminated in the 1913 Native Lands Act, which stripped away from Africans their few remaining rights to land. Legal segregation began in 1948 with the election of the National Party. As part of the segregation plan, blacks were herded onto "homelands" and "townships" in a grand scheme entitled "apartheid". They were relegated to the least productive areas of South Africa and were kept there through the use of strict pass laws and other methods of a police state. Population densities in the homelands were extremely high. Coupled with poor soils and lack of access to modern farming techniques, smallholders lived on the brink of famine and hunger. Migration to the

urban areas was the only option left for many, however, this too was strictly controlled. Often, critics of the apartheid regime accused the government of “dumping” urban residents into the rural homelands, exacerbating the situation. Through this entire period, agricultural improvements and innovations centered on the white community with very few resources allocated for indigenous agriculture.

Current Politics The freely elected government of Nelson Mandela has begun to address issues important to the disadvantaged African community. The Reconstruction and Development Programme (RDP) promises corrections to the historical injustices committed under apartheid. The ruling African National Congress has not gone unchallenged, however. The Inkatha Freedom Party has a very strong following in parts of KwaZulu-Natal. Political violence has plagued the region in recent years.

Smallholders in the KZN uplands are, in summary, faced with three main problems – recurrent drought, the legacy of apartheid, and political instability. Any attempt to understand KwaZulu-Natal’s smallholders must address all three issues.

Figure 2 : Zidonini Study Area



The Setting – Study Site The fieldwork component of this study was undertaken between 28 February and 30 March 1997 in the KwaZulu-Natal province of South Africa¹. Several suitable sites existed at the time of study, however, one was selected for its exemplary attributes. Criteria for selection included the following: access to the site had to be open at all times, rural small holders had to dominate the economic infrastructure, and access had to be granted by the local traditional authorities.

The Site - Background and History After reviewing several possible areas, I determined the site most suited for the study was an area just west of the border of the Hluhluwe-Umfolozi Game Reserve in northern KwaZulu-Natal. Several other sites in the same area were chosen as alternates. The area is referred to generally as Zidonini, but in reality is a series of concentrated settlements including Zidonini proper (referred to henceforward as “The Tree”), Ximbakazi, Madlinjini, Sovane, Madlwaleni, and Zagomfe just to name a few. The orthophotos of the area do not show these names, referring instead to the area as Zidonini, however, each settlement area has a specific name. “Zidonini” will be used throughout as a generic descriptive of the entire area. The area lies about 15 kilometers to the east of Hlabisa, the administrative center of the Hlabisa magisterial district, of which Zidonini is a part. The border of the Hluhluwe-

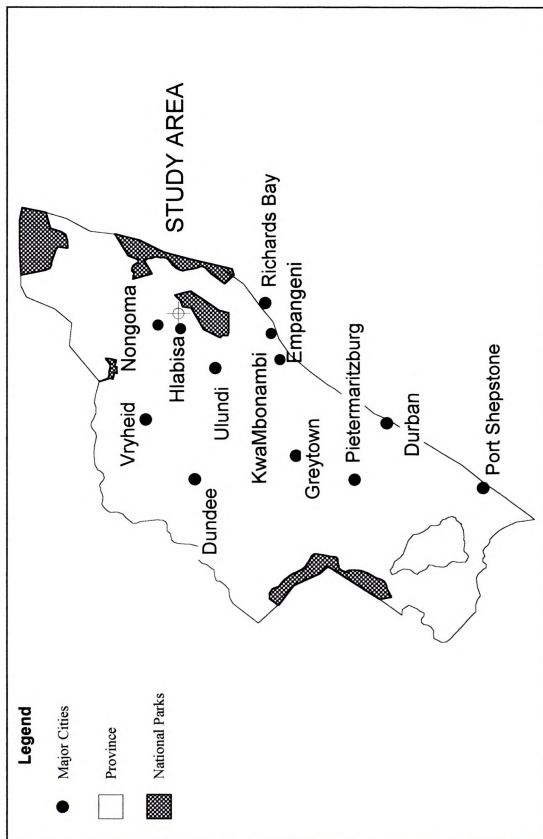
¹ Fieldwork was also conducted on several weekends and holidays through 10 May 1997.

Umfolozi Game Reserve was in clear view from Khalweni, Zidonini proper ("the Tree"), and Zagomfe. Access to the area was open and controlled by the local Nkosi (chief) and Nduna (sub-chief). After speaking with the Nkosi and various Ndunas I was allowed to conduct research in an area of about 6-8 square kilometers described above. My study was the first major research in the area. A researcher from the University of Durban-Westville, South Africa had interviewed two local residents and introduced me to the area. Outside of this, no researchers had been to the area in the time span of local knowledge. Several potential sites were discounted after the discovery of extensive research operations. Many areas in northern KwaZulu-Natal have been overburdened with research, as local academics from Durban find it convenient to drive a few hours north for research projects.²

² This "insight" provided by Shirley Brooks, Cathy Oelofse, Peter Schmitz, and Ann Vaughan.



Figure 3: KwaZulu-Natal with Cities and Study Site



The infrastructure of the area is typical of rural South Africa. All roads in the area were dirt, yet passable as the rainy season was late. The KwaZulu homeland government provided electricity to the area in 1989 and 1990. Primary and secondary schools were established in the mid-seventies along the main road through the area. Transportation is provided primarily by private transportation companies using either commercial buses or "combie" mini buses. Certain areas have been provided with windmill driven water pumps and storage tanks. Water pumps are present in Zidonini and Sovane.

The Hluhluwe portion of the Hluhluwe-Umfolozi Game Reserve abuts the eastern edge of the research area. The reserve was established as a protected area for game in 1897 and was expanded in 1989. Some of the residents in the Zidonini area were pushed off their lands in 1989 when the Hluhluwe and Umfolozi reserves, then separate, were joined.

The sale of Zulu handwork - basket, mats, skins, etc. - contributes somewhat to the annual income of the residents. At the time of my arrival the residents of the Zidonini area had not engaged in basket trade in over eight months. Residents on the main north - south road, in contrast, had several encounters a month with outsiders seeking Zulu handicrafts. The women of the

area were primarily responsible for the production of grass mats and baskets, while a few men carved wood and worked skins, even though hunting is restricted in South Africa without permits. The residents of the area report having been harassed by local game wardens when hunting game that escaped from the reserve. Reports of livestock damage due to lions or other predators were rare, the largest complaint being the loss of grazing land due to alienation for the reserve.

Members of the Manyoni lineage from Nongoma (80 km to the north-west) settled the Mpembeni area late in the last century. Elders report that intense droughts in the Nongoma area forced several families south-east in an attempt to find better grazing and farming areas. Other residents report arriving in the 1920's as a result of expansion of the Hluhluwe reserve.

Figure 4 : Hlabisa Study Region

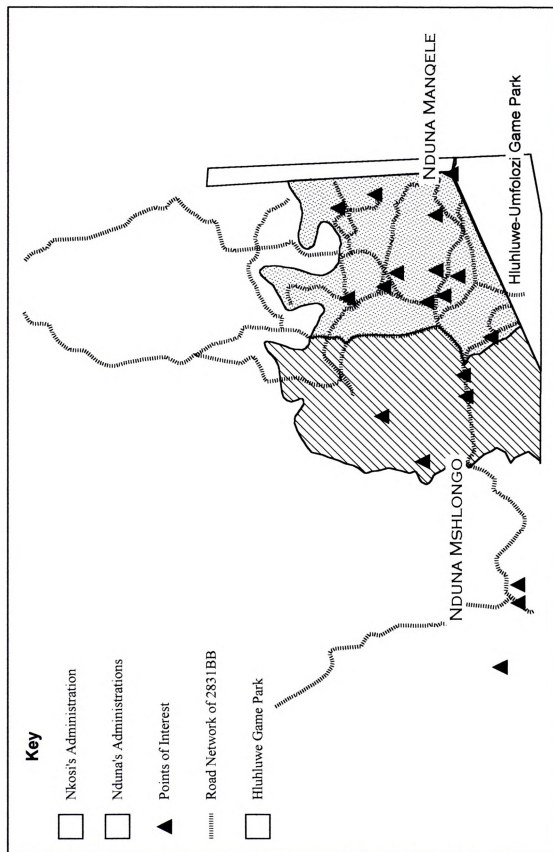
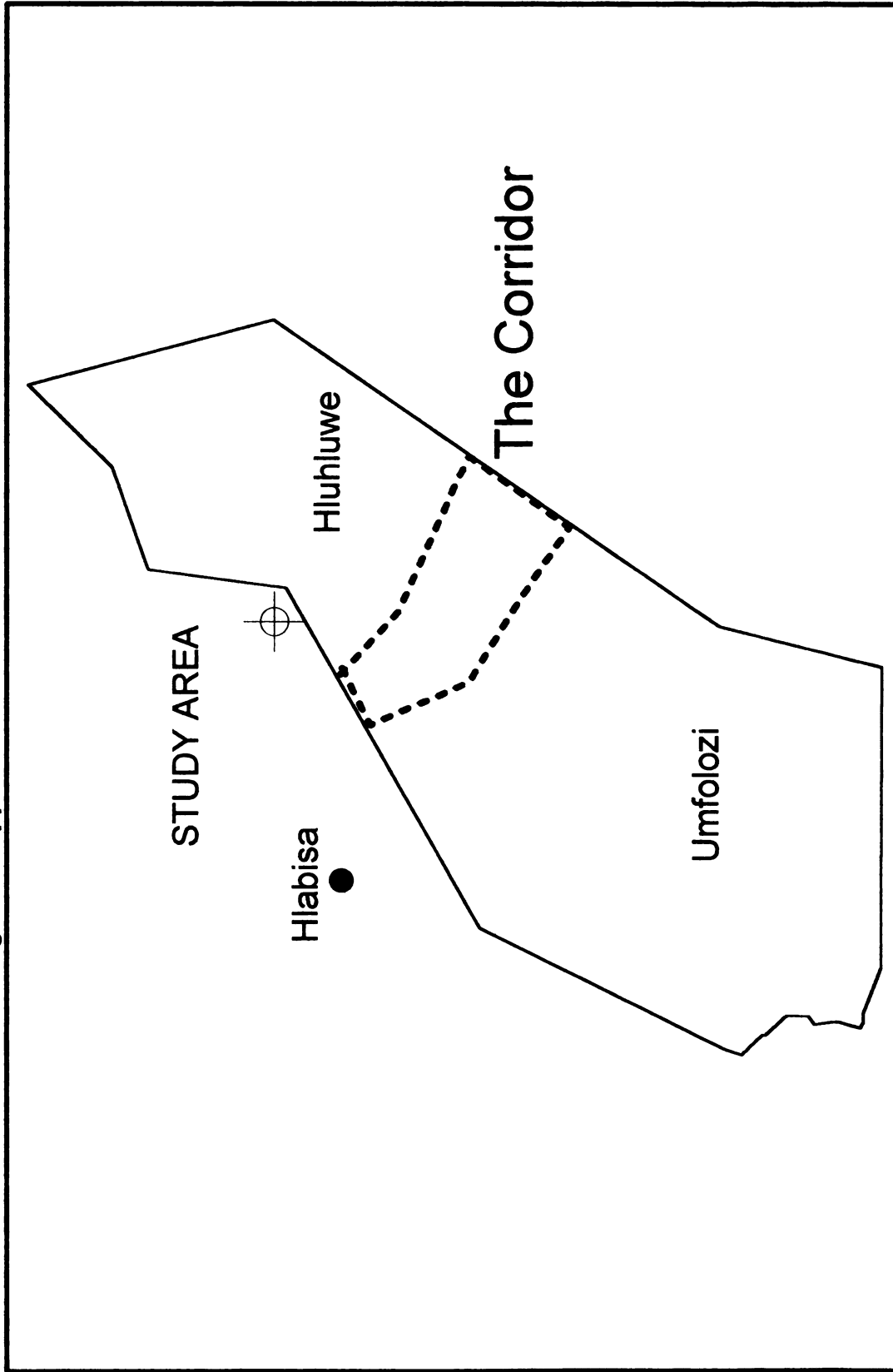


Figure 5: Approximate Area of "The Corridor"



The area was incorporated as part of the KwaZulu homeland in the early 1970's and the KwaZulu government undertook various "betterment schemes" throughout the 1970's and 1980's. Political authority was exercised through a parallel administrative system. The KwaZulu government sited officials in the seat of the Hlabisa magisterial district, Hlabisa, and worked with the local Nkosi. The KwaZulu government reinforced the Nkosi's authority, and government services were often provided through the traditional leadership. The Nkosi of the Mpembeni area held court along the main road about 5 kilometers south of Zidonini. The Nkosi ruled through sub-chiefs (Nduna) in outlying areas. I had approval of the two Ndunas in the far east of Nkosi Hlabisa's authority zone. Authority to conduct research was granted by the Nkosi through the Nduna.

Chapter 2

Methods

Data Collection Several methods were utilized in the collection of data for this project. Because no primary data existed for the area under study, both a quantitative interview schedule and a qualitative participant observation routine were undertaken. Archival data collection was limited to gathering information on general food issues and collection of air photographs (orthophotos). A GIS was used to identify spatial patterns.

Sampling the area proved to be a special challenge. No complete lists could be found detailing all of the residents in the study area, however, my interpreter was helpful in mapping the area for use in random sampling. Each of the research areas was driven through in order to make comparisons against the orthophotos. The orthophotos dated from 1982, but most dwellings were represented. The missing homes were added on a sketch map created for each area. A number was assigned to each dwelling in the area to be sampled and households were then drawn. The goal was to interview the male and female heads of the household. The sketched maps from which the samples were drawn were double-checked with local residents to make sure everyone in the area had been included. The sample was stratified by dwelling clusters or homesteads. A total of 20 clusters were identified and sampled. The dispersal of homestead clusters for sampling.

was fairly uniform throughout the study area. Dwellings not immediately in a given cluster were assigned to the nearest homestead.

The direct refusal rate for the survey portion of the field research was exceptionally low³. Only twenty-two people out of 145 refused to participate (15.17%). Out of this number eighteen were men and four were women. A non-response test was conducted on eight of the refusals in an attempt to identify reasons for refusal. All eight were men and attributed their refusal to the fact that the interpreter was female and they thought the questions were going to be about “women’s work”. Of the remaining fourteen refusals, six were “too busy”, two people thought I was a “spy” for the parks board and the other fourteen gave no reason for their refusal.

The relatively low refusal rate can be attributed to the selection of an interpreter from the area. All respondents appeared to know, or know of the interpreter, which greatly aided in obtaining interviews. Each interview was conducted with only one person. Usually the group selected by random sample would gather at a tree or other common meeting site to begin interviews. Each person would be taken aside and asked questions. Often interviews were conducted in a home, but most respondents preferred to meet outside their homes. Each interview took between eight and fifteen minutes. The interpreter

³ Interviewing men was exceptionally problematic. In some cases men were not at home, but more often men avoided being interviewed by leaving when they saw us or got word of our imminent arrival. After several discussions with my interpreter and the mens’ wives, it was discovered that men thought that since I had a female interpreter I was only asking about “women’s issues” or they didn’t want to be interviewed by a woman interpreter. I compensated for this bias by hiring a male interpreter for informal, qualitative interviews.



conducted every interview in Zulu. The interpreter was trained in the first six days after onset of the study. After translation by the interpreter, data was recorded and some information was then gathered outside the interview schedule. Often a group would be asked questions about the history of the area, the basket trade, or hunting, among other topics. This informal session usually took place after the interviews had been conducted. Questions and concerns from the respondents were addressed either before or after interviews. In following the Human Subjects requirements, each respondent was informed that they could, at any time, refuse or terminate an interview and that their names were not being recorded in any way. Each respondent was told how to contact the author and for whom the author was working.

The qualitative portion of the research provided critical information on the history of the area and local conditions, attitudes, and expectations. The interpreter and the Nduna were interviewed extensively before the onset of interviewing. Older respondents as well as community leaders and a researcher from the University of Durban-Westville who was working in nearby areas were interviewed qualitatively.

The Interview Schedule and Informal Interviews The interview schedule was designed to highlight basic food security issues in South Africa (see Appendix A for the complete schedule). The scope of the study precluded extensive analysis. The main objective of the research was to identify the presence or absence of food security in a fairly “typical “ rural area of South Africa. The interview schedule was designed to accomplish three major goals.

The first was to identify periods of food shortage and their causes. The second was to discern coping mechanisms, and the third was to understand individual expectations regarding food shortage.

The qualitative routine was incorporated to collect valuable data outside of the rigor of a structured questionnaire. Key informants provided substantial information on issues both in the structured interview and many that were not. Some respondents felt the need to continue after the structured questionnaire. Information provided outside of the questionnaire was both substantial and relevant and was incorporated into the study.

A small pilot study was conducted before the actual sampling was undertaken to identify problems in the interview schedule. Twenty people were questioned with the interview schedule and then a follow up qualitative session was conducted for back translation, identification of misunderstandings, and differences between expected and actual responses.⁴

⁴ This difference refers to general topics, not specific answers. For instance, when asked about government assistance to the area, many respondents said that the government had never helped them, although power lines hung overhead.

Quantitative Data Analysis Analysis was conducted on 145 cases drawn through a stratified random sample mentioned above to provide both summary statistics and tests for relationships. Each interview (case) was assigned a record number and a site location for spatial analysis. After collection, the data was coded, crosschecked, and analyzed in SPSS for Windows version 7.5. Summary statistics and Chi-Squared tests were performed on pertinent variables.

The purpose of this thesis to understand the causes of food insecurity and related coping mechanisms. The indicators of food insecurity most often cited were discussed in the Review of Literature, including environmental, social, and political conditions. In the operationalization of the interview schedule these were represented as distinct variables/questions. However, the vulnerability of persons or groups in society must be viewed together, not separately. The conditions of vulnerability (few fields, no access to political power, poor implements, etc.) are not independent of each other. A family with little land will rarely have large farm implements and conversely, a family with political power is more likely to have better maintained fields and to perhaps have even diversified into other non-farm activities. The idea of a "package" of vulnerabilities needs examination to determine whether or not the assumptions are valid.



A "Vulnerability Index" was created to test just such assumptions. Six variables were categorized and recoded to create an approximation of the level of vulnerability of each respondent. The six variables - the number of fields, the number of shortages, the length of time as a resident in the study area, hunting patterns, the number of severe shortages, and receipt of help from the KwaZulu government, were aggregated to highlight the most vulnerable respondents. The criteria for the index are presented in Table One. Testing of the index can be found in the Data Analysis chapter.

Table 1. Components of the Vulnerability Index

Variable Under Consideration	Qualifying Condition (Considered "Highly Vulnerable")
Number of Fields	Less than one field
Number of Shortages	Greater than 3
Length of Residency in Area	Less than 10 years
Hunting	Non hunting respondent
Number of SEVERE Shortages	Greater than 2
Assistance from KwaZulu Government	No help



Chapter Three

Review of the Literature

Theoretical Setting: Political Ecology Complex political, economic, social, and environmental conditions all play a role in the level of food security in any given area. At times, one of these factors may weigh more heavily on the food security equation, but nonetheless all are issues that need close examination. The political ecology of land degradation is particularly useful when examining food security. Agricultural production links the two issues firmly together. This thesis is predicated on the political ecology approach to understanding human interaction with the environment. The political ecology approach emerged in the 1970's as not only a critique of classical economics and traditional resource management, but also as a newer formula for assessing human-environment interaction. Several major themes are addressed under a political ecology framework, however it has no rigid structure of analysis or procedure and has been interpreted in many different ways. Political ecology can *generally* be defined as the study of how people's decisions regarding land use are affected by socio-political institutions, at the local scale of analysis, and how nature is incorporated into the wider economy at the regional and global scales (Blaike, 1985; Blaike and Brookfield, 1987). Scale of analysis is particularly important in political ecology and will be discussed in detail. Themes from two major paradigms, political economy and ecology, are integrated to form the basis of political ecology.



The Contributions of Marxism Classical Marxism maintains that capitalism is inherently volatile and is unsustainable due to crises faced by capital in relation to production. These crises are used to explain many instances of human behavior toward the environment, especially as the environment becomes more commodified. The first contradiction of capitalism is an internal contradiction. As capital seeks to lower costs and increase profit it takes self-destructive steps to achieve its ends. This often takes the form of cutting wages or terminating workers. As the worker has less and less to spend, the market for the product of capital decreases. The second contradiction arises as a direct result of the first. As Martin O'Connor notes "capital defends or restores profits by strategies that degrade or fail to maintain the material conditions of their own production" (O'Connor, p.165, 1994). The reproduction squeeze faced by capital forces it to use any available resources to the maximum level to maintain a constant level of profit. No regard is placed on the fact that the resource may become exhausted in a shorter period of time. Capital accumulation accentuates the scarcity of resources. As resources are devoured by production hungry capital, material limits to growth become ever more apparent; nature is not infinite. This destruction of environment through intensification is the basis of the second contradiction of capitalism. Those with the more rigid Marxian views within political ecology suggest that perhaps even a triple contradiction of capitalism exists. The first of the three, as Jean Paul Deleage (in O'Connor,

1994) notes, is that the exploitation of a collective resource benefits only the elite. Second, the distribution of costs and benefits accrues to the present generations disproportionately so that future generations bear more cost. Finally, the human species enhances its own interests at the expense of other species (paraphrased from O'Connor, 1994, p.49). These contradictions help to explain the destruction of nature and what is termed the 'production of nature' in political economy. The production of nature refers to the commodification and incorporation of nature into the production process. Nature is regarded as a productive resource (such as labor or capital) and treated as such. Little concern is shown for the destruction of nature that results from its incorporation into the production process.

Very little understanding of any human action can be achieved without an understanding of the human interaction with the environment. All human activity stems from a relationship with nature. Humans use soils, forests, minerals, animals, and hosts of other natural resources to survive and thrive, however, production in a capitalist economy has been de-linked from the environment. The environment has been viewed as controllable and easy to manage. But with global environmental change becoming an increasingly important issue, many have been forced to reconsider their long held beliefs regarding nature.

Environmental movements are gaining increased support and recognition in their struggles for ecological protection. The physical processes so long ignored by many are finally being valued for their contribution to the sustenance of life on earth. Many people have become alarmed at the change in the acidity of rainfall

or at the destruction of forests. The relevance of ecology to everyday life has become more appreciated by the average individual as news reports of ecological destruction portray a picture of gloom and doom. Ecology studies may benefit from the heightened attention in the long term, but it will take a concerted effort to change human behavior, especially toward production and the ensuing materialism that results.

Questioning Scale: The Locality Political Ecology focuses heavily on the importance of the locality in studies ranging from farming techniques to political controversies over land. Many researchers within political ecology have a tendency to reify local traditions, customs, epistemologies, and social movements. Peasant farmers possess practical knowledge of the land and soil and have much to contribute to research. Peasants have come under attack in neo-classical and traditional Marxist interpretations of economy and production. They are often characterized as inhibiting progress and change in farming systems. In many cases, they refuse to adopt certain agricultural practices and in fact destroy their own reproductive capacity. Political ecology, however, rejects the notions of the "backward peasant" who inhibits progress and advancement. Quite the contrary, peasants are not backward and obstructionist. They must deal with political pressures and conflict and cope to the best of their ability with changes in their lifestyles, customs, and farming practices. Land alienation, labor shortages due to migration, civil strife and poverty shape the decisions made by what Blaikie and Brookfield refer to as "land managers". These land managers



face constraints on their daily reproduction and must manage wisely what scarce resources they have just to survive.

Questioning Scale: the Region Richard Black incorporates a regional scale of analysis in his article "Regional Political Ecology in Theory and Practice". The major components of a regional political ecology incorporate the integration of human and physical approaches to land degradation. Both social constructs and purely physical constructs are synthesized to form a better understanding of the degradation of the environment. This approach also highlights the interactions between people and their environment, noting that human conceptualization of the environment is constantly changing. For example, in the transition from a pre-capitalist to a primitive capitalist society many long held understandings of the environment are altered. Nature becomes commodified and a new dialectic between humans and the environment emerges. Regional analysis allows for area-wide assessments of environmental degradation to better scope out the extent of ecological problems.

Linkages between Scales Political ecology integrates the different scales -global, regional, local, household- by analyzing the vertical and horizontal linkages between and within each. Horizontal linkages include the social processes and interactions between actors, conflict over resources, and production within the given scale. Blaikie and Brookfield describe vertical linkages

as a “chain of explanation”. It starts with the land managers and their direct relations with the land (crop rotations, fuel wood use, stocking densities, capital investments and so on). The next link concerns their relations with each other, other land users, and groups the wider society who effect them in any way, which in turn determines management. The state and the world economy would constitute “the last links in the chain.” (Blaike and Brookfield, 1987, p 27)² The chain of explanation details the dialectic between how land management decisions made by a regional bureaucrat or global economic change may affect local land managers and how local managers decisions impact the regional and global decision makers.

Cindi Katz gives perhaps some of the best examples of these linkages in her article “ Sow What You Know: The Struggle for Social Reproduction in Rural Sudan” (Katz, 1991). She highlights vertical linkages when describing the impacts of the Suki Development Project on the population of Howa in eastern Sudan. Her work showed how the project shaped images of the environment, especially children’s, and how this environmental knowledge contributed to social reproduction. Examples of horizontal linkages include the effect of labor withdrawal due to the project on the children’s education and their contribution to family labor.

Donald Moore highlights the vertical and horizontal linkages between the scales of analysis in his article "Contesting Terrain in Zimbabwe's Eastern Highlands: Political Ecology, Ethnography, and Peasant Resource Struggles " (1993). He notes the conflict over resources between the residents of Kaerezi and the park officials of the Nyanga National Park in eastern Zimbabwe. Land alienation by the park created discontent in the local communities. The park interfered with local agriculture, hunting rights, and the basic customs of the area. Moore presents vertical relationships in Zimbabwe as in disarray. The government agencies do not work as one between the locality, region, and nation. Many disharmonies existed between what officials in Harare view as good policy and what officials in the park view as good policy, and both are out of sync with what local leaders want. This break down of social consensus allows a local chief to play one element off the other to cause even more discontinuity.

These vertical and horizontal linkages are critical to understand political ecology. Political ecology relies on analysis of the relationships between scale to determine why certain decisions are made. Constraints from above (such as government policy restrictions, donor loan requirements) and below (i.e. unwillingness of peasants to adopt government policy) shape the decisions land managers make on a daily basis. Political ecology stands out from many other theories of resource use because it does address the issue of scale, power, and linkages.

Political Ecology, Traditional Resource Management, and Global Change:

Divergent Views Several major differences exist between political ecology and the traditional resource management or global studies approach. Humans and the environment are more closely related in a political ecology approach, as they are considered part of nature. Under a traditional resource management or global studies approach humans are portrayed as being above nature, able to dominate and control it. Nature becomes an object of management to be used exclusively for human advancement. Overpopulation, poor soils, and climate are deterministic conditions that effect development in a traditional resource management or global change approach. Humans are in a contest or conflict with nature and the rational management techniques of the two traditional schools will help humans prevail. Political ecology on the other hand, deals with socio-political constraints faced by people and how those constraints manifest themselves over space. Global economic conditions, national government policy, and corporations all influence the decision making process of land managers.

Finally, the divergent political outlooks shape the view of the peasantry in each theory. Political ecology tends to portray the peasantry in a more positive light. Peasants are constrained from above. They make decisions faced with those constraints and only act in a way that preserves their own interests. If that may result in resource destruction, then the structure of society is to blame not the peasantry. The traditional approaches however, regard the peasantry as unwilling to change and use Malthusian assumptions to advocate policy which

would adversely effect them. Peasants are often considered backward or ignorant. These visions of the peasantry have a considerable impact upon what actions are suggested taken to solve environmental (and social) problems.

Critique Some questions arise after a thorough study of political ecology. The traditional Marxist approaches assume that ecological destruction occurs only in capitalist economies. Little is mentioned of the destruction of the environment in socialist economies. A political ecology of socialism would provide a counterpart to the present theory that could attempt to explain environmental destruction in the formerly socialist world.

A second oversight in political ecology occurs in the assumption of vertical linkages. Clear examples of impacts on locality from above are illustrated but not the reverse. Few examples in the literature refer to how the locality can impact the region, nation, or global system.

Thirdly, the peasantry becomes romanticized. Political ecology does not address problems caused by peasant behavior. The individual *is* capable of making choices. The bludgeoning of the peasant with structure often blinds political ecologists to more underlying issues such as deviant behavior.

Finally, the term is *political ecology*. But most often the *ecology* is completed hidden by over-emphasis on the *political*. Many ecologists maintain that political ecology is nothing short of basic political science with some regard for environmental issues.



In summation, the theory of political ecology is an integration of politics and economy which uses particularly Marxian methods of analysis to conceptualize the structural constraints which effect the decisions made by land managers on an everyday basis. Assumptions are made regarding linkages of scale, which presume a dialectical relationship between the various scales. The theory provides insights on the relationship between social actors in each scale of analysis. These relationships are critical in understanding why people make certain decisions over land. Despite critical questions regarding ecology and the reification of the peasantry, the political ecology approach is most applicable for analysis of food security issues. The relationships between actors in this arena, and between actors and the environment are critical to the food security process.



Review of the Literature: Food Security in Africa

Several issues permeate the literature on food security. Common themes include definitions of food security, the causes of food shortage, the progression of food insecurity through different stages of intensity, inter- and intra-household differentiation, coping mechanisms, and early warning systems.

Food shortage, food insecurity, hunger, and malnutrition are terms used to define a condition where basic levels of food consumption are not met. Food security will be used in this thesis as it describes most succinctly the processes that lead to a lack of food, the use of coping mechanisms, and contemplation of prevention measures. The most widely used definition of food security comes from a 1986 World Bank report in which food security is characterized as "access by all people at all times to enough food for an active and healthy life" (World Bank, 1986). Several variations on this definition include precise caloric intake standards, distribution ratios, and other variables, however most definitions of food security are similar to the World Bank definition. This definition is the culmination of many years of research and inputs from various disciplines. While not universally accepted, this definition provides a starting point from which to build a greater understanding of food security.

According to Hesselberg (1994), food security research has progressed through three major phases. The first phase of research and policy planning was one where the primary emphasis was focused on "production orientation". Production was seen as the key to ensuring food security. Food availability, or the supply of food, was believed to be vital to ensuring a healthy population. The second phase shifted research and policy planning to a more market oriented arena. Emphasis was placed on "getting the prices right", a definition well suited to the era of structural adjustment. Finally, Hesselberg maintains that the current research is consumption oriented. Food access has taken priority over food supply. The notion of food access encompasses ideas such as the differentiation of households and the effect of this differentiation on food access and gender roles and inequalities. Rukuni and Eicher (1988) also distinguish between the supply and demand phases within food security research. They note, like Hesselberg, that the era of focusing on supply as a key component of the "food security equation" has faded as the focus has shifted to issues of demand, or access.

Buchanan- Smith (1995) observes that "famine is no longer solely- or indeed even primarily- attributed to food availability decline (FAD), but increasingly to food entitlement decline". Lambert (1994) also presents his arguments in a demand-side approach. Both support the shift of paradigm within food security research and expand it through the use of illustrating case studies.

Food Shortage and Coping Mechanisms The progression of food insecurity through different stages of intensity is maintained by Corbett (1988), Dirks (1980), Sperling (1987), and many others. As described by Corbett these stages include an “adaptive” stage in which assets and labor are sold, progressing with increased insecurity to the sale of “key productive assets” and finally with the most intense food shortages, “mass migration” (Corbett, 1988). Watts (1983) makes note of the ten most predominant strategies in his Nigerian case study in the following order:

1. Collect famine foods
2. Borrow grain from kin
3. Sale of labor power
4. Engage in dry season farming
5. Sale of small livestock
6. Borrow grains
7. Sale of domestic assets
8. Pledge farmland
9. Sale of farmland
10. Migrate out

This progression is remarkably similar throughout the literature on food security for all regions of Africa. Cutler (1986) categorizes coping strategies in eastern Sudan into three stages, providing additional support to Corbett and Watts. Initially, adaptive strategies are adopted. These include the sale of livestock, labor migration, and use of credit. Next, key productive assets are sold,



including tools, animals, and in severe cases, land. In the final stage, migration is the only option left to escape hunger and death. Rahmato (1988) indicates that peasants in Ethiopia face food shortage first with "austerity measures" such as eating lower quality and quantities of food. As the situation worsens, temporary migration occurs, followed by sale of assets. The final strategy is mass migration.

Campbell (1990) suggests a similar progression of coping strategies. Quoting Cassanelli, he notes ten distinct stages through which Somali peasants passed during a particularly severe food shortage. Webb and Reardon (1992) document a similar progression of households in Burkina through stages of response to shortage. They note that income diversification is the first adaptation to changing conditions followed by asset disposal and the acquisition of loans and in the final stage consumption is altered (Webb and Reardon, 1992). Webb (1994) reports similar findings from Ethiopia noting a similar progression of coping strategies from asset sales to altered consumption and migration. Lambert points out however, that an undue focus on coping strategies can lead to misinterpretation. He argues that coping strategies are "only one piece of information in an overall mosaic" and further states that "focusing on coping strategies tends to overestimate people's resilience" (Lambert, 1994,p.342) due to the narrow focus often placed on the process of coping to the detriment of other information.

Coping with drought has progressed, in some regions, to coping with daily life (Lambert, 1994). Campbell (1990) notes that coping mechanisms should be viewed in the context of the changes faced by rural dwellers. He maintains that coping mechanisms are dynamic processes and warns of conceptualizing them as static and unchanging. We have the ability to understand insecurity and aid areas in peril; however, a reactive role is not enough. Campbell (1990), Corbett (1988), Vogel (1994), and many others have suggested the development of early warning systems. The ethos for an early warning system (really, a series of systems) is the need to preemptively "strike" at food insecurity and its menacing brother - famine. Early warning systems would help detect the areas in most need and target aid and assistance to those areas. Corbett (1988) warns, however, "the existence of these systems is far from a sufficient condition for the avoidance of famine" (Corbett, 1988, p. 1109). The role of early warning systems in South Africa has been addressed by Vogel (1994) and will be discussed in the following section.

Coping strategies differ from place to place and time to time. The notion that coping mechanisms remain static through time is misleading. Coping strategies that were used in 1900 may or may not be utilized today. Further, Cekan (1992) maintains that coping strategies must be monitored seasonally. She observes that rural Malians have different coping strategies for each season. Lambert strongly challenges the nature of coping strategies when reflecting on rural Mali, "firstly, the term [coping strategies] is not dynamic and fails to

encompass shifts in food strategies taking place in a context of rapid social and economic change in Sahelian environments " (Lambert, 1994, p.336). In areas of chronic drought, coping strategies become more than short-term phenomena, but are a mode of normality (Lambert, 1994). Thus, considering coping strategies as static and unchanging can lead to false conclusions. The *evolution* of coping strategies is important to the understanding of current patterns of behavior.

Southern Africa Food security at the national scale in southern Africa has several complexities not experienced by other regions. First, the relationship between southern African nations and South Africa impacts greatly on the food security situation in that region. Secondly, the relationship between nations in the Southern African Development Conference (SADC) provides an added element to the southern African food situation. However, on the issue of coping strategies, southern Africans follow patterns similar to those of their northern neighbors.

Southern Africa has structures similar to those in other regions of Africa. The legacy of colonialism is a most striking example. South Africa, Zimbabwe, and Namibia have just emerged from years of colonial rule that lasted longer than was the case for any other nation in Africa except Western Sahara. The land alienation policies so familiar to black South Africans were experienced by subjugated populations in countless other African nations in the heyday of colonialism.

The relationship between SADC nations and South Africa changed immediately with South Africa's first free elections in 1994. Apartheid South Africa strove for a host-client relationship with its neighbors in which it could control the most important element of life in southern Africa- food. South Africa's apartheid government used food exports for political leverage and destabilization. Although SADC nations imposed boycotts on South Africa, the latter's influence and economic power meant that SADC nations had few options but to trade with the economic giant. While most nations refused to trade openly with South Africa, clandestine trade in agricultural products nonetheless took place in the early 1980's (Lipton, 1988).

The dependency of the frontline states (those nations closest to South Africa) on South African agricultural exports was greater than that of other SADC states. The apartheid government in Pretoria attempted to maintain food dependency, thus encouraging some degree of political dependency. While thousands were going hungry within South Africa, grain exports kept countries such as Lesotho, Swaziland, and Botswana in line with Pretoria's political agenda.

Within SADC, the need for a counterbalance to South Africa's influence was recognized. Policies to encourage exports were followed by member nations -Zimbabwe most notably. SADC's most successful member in confronting food security problems was Botswana. Diamonds, a stable political climate, and immense international support have led to the development of a series of programmes that help provide a basic level of nutrition during shortages. Botswana's leading role in the development of such a system, coupled with

Zimbabwe's high agricultural output, especially in 1985, aided in counterbalancing South Africa's influence, however, intra-regional trade has been poor at best. (Lipton, 1988; Rikuni et al, 1988; Rikuni and Wyckoff, 1991; Prah, 1987) Trade between SADC nations in agriculture has been one of the key policy initiatives of the regional food security initiative. As noted above, emphasis has shifted away from just such supply side plans, providing SADC with new challenges.

Coping Strategies in Southern Africa Coping strategies at the local scale in southern Africa are not remarkably different from those in other regions of Africa. Zinyama, et al. describes the various economic, social, environmental, and political methods for coping with drought. Coping strategies progress from prevention to modification of conditions, to sharing consequences, and finally to bearing the consequences (Zinyama, et al, 1987). Research in Malawi (Babu and Mthindi, 1995) and Botswana (Hesselberg, 1994; Teklu, 1994; Hay, 1988) suggest coping strategies similar to those reported by Zinyama. Research in Zimbabwe, however, has been almost exclusively supply-side oriented. Mudima, et al. writes "to date there had been little empirical work in Zimbabwe to investigate neither [sic] household coping strategies for dealing with recurring food shortages in low rainfall areas..." (Mudima, et al, 1987).

While differences exist between southern Africa and other regions at the national scale of analysis, similarities are common at the local scale. This is not to say that food security is not context specific, but rather some generalities can be found across regions. The progression of intensity of coping mechanisms is just one example of how southern Africa is similar to other regions. However, the

influence of South Africa is one of the many dissimilarities. A crucial question regards South Africa itself. What is the level food security in South Africa? How do people cope with drought? The next section will outline the food security situation in South Africa.

Famine Prevention - Early Warning Systems and Entitlement Theory

After coping has been identified, the next step is prevention. The prevention, mitigation, and alleviation of famine have been approached from many differing perspectives. The terms entitlement, prevention, and early warning systems refer to distinct approaches in fighting famine. The earliest famine prevention methods date back to the early rule of the British in India when hunger codes regulated food supply in an attempt to forgo the incredible famines so often experienced by that country. The most common approach to combat hunger was work-for-food schemes. Colonial governments such as the Portuguese in Cape Verde and the British throughout Africa and Asia often relied on work-for-food to keep local populations from death (Sen, 1980).

More recently, international relief agencies have been playing a larger part in food relief assistance to troubled areas, especially South Asia and Africa. As African governments become less and less able to handle chronic famine, aid agencies and international governmental and non-governmental organizations have taken a more active role. These new actors in famine relief have brought with them high-profile media coverage. This coverage has caused constituencies at home to wonder whether or not disasters such as the mid-80's Ethiopian famine could have been prevented. NGO's, the U.N., and donor governments

have been actively promoting early warning and prevention of famines, with differing results.

Emphasis on warning systems and famine prevention methods became heightened after the devastating Sahel drought of the early 1970's. Predictive models were proposed to warn of impending droughts and famines using a variety of inputs, from food supply data to socio-economic information. The systems range from highly technical to highly social (see Table 2).

Table 2. Typology of Early Warning Systems

	Conventional Famine Early Warning System (Technically Oriented)	Alternative Food Information System (Socially Oriented)
Scope	Famine- Oriented	Food-security oriented
Determinants of Food Security	Food Production	Access to Food
Level of Operation	Macro, centralized	Micro, decentralized
Unit of Analysis	Geographic, e.g. nation / district	Socio-economic, e.g. vulnerable groups
Approach	Top-down, data-centered	Bottom-Up, People Centered
Response	Food-aid oriented	Sustainable Improvement in Access to Food

Source: Davies, *et al.* 1991

The examples in the above figure represent the extremes of early warning systems, as most systems incorporate some of each extreme. Until recently, early warning systems (EWS) have been overwhelmingly supply side oriented. Components of early warning included monitoring food production, analysis of satellite images, rainfall indexes, and other such indices that are then used to highlight areas vulnerable to famine.

Most Early Warning Systems share some basic features. EWS are designed to provide information, thus the gathering and processing of data is vital to any EWS. Information is then relayed to decision-makers and subsequent action is taken (or not). Most EWS go beyond simply gathering data to analysis

and refinement. In highly technical EWS this could include satellite interpretation and GIS analysis as well as food supply prediction and in highly socially based EWS this could include synthesis and interpretation of data based on an intensive socio-economic study of the area. Some EWS go further and make recommendations for action.

Indicators used by EWS differ greatly. Morgan (1985) distinguishes between input and output indicators in EWS as noted by Campbell:

Input indicators reflect food production potential and include rainfall, soil moisture status, and crop growth. Output indicators, on the other hand, reflect the actual food scarcity situation, the results of shortage. Among the output variables that have been suggested are nutritional indices, behavioral indicators such as rates of migration and economic signals such as crop prices and livestock sales (Campbell, 1990, p.232)

This definition of indicators comes closest to the middle ground between the technically oriented systems and socially oriented ones. Some method of environmental monitoring is included in almost every EWS and many are beginning to include socio-economic indicators.

Campbell further suggests a scaled approach to EWS. He maintains that the regional and national scale are most appropriate for technological (input) variables and that social (output) variables are best monitored at the district and sub-district level (with the caveat that this approach is beyond the capacity of many African governments due to funding limitations). A scaled approach allows for the flexibility needed in African societies where funds are severely limited. Monitoring at the district level can often be assumed by a local structure

responsible to a national authority. A low cost, simple system at the district level coupled with a broader national or regional system supported by outside funds is perhaps more practical than a grand, one-size-fits-all system designed completely by outsiders with no local participation.

Walker (1989) presents the components of the "perfect warning system" as the following:

1. Detecting, evaluating, and predicting a hazard
2. Constructing a forecast or warning message
3. Spreading the warning message
4. Creating effective preparedness and mitigating responses
5. Learning from mistakes

Even with the "perfect warning system" Walker notes some problems. He highlights five common problems of the warning message. First, the language is often too technical. People do not know how to respond, or to what they are responding. Second, different warning systems produce "conflicting messages" and people "ignore the whole package". Potential victims are confused and adopt a wait and see attitude. Third, messages often do not state the problem clearly and confusion follows. Fourth, the potential victims are poorly identified. People in danger are overlooked while those with little potential risk are alerted needlessly. Fifth, people often fail to react (paraphrased from Walker, 1989, p.65-6). He further argues that people can respond in five ways to the warnings. They often ignore warnings, take a wait-and-see approach, try to "investigate... accuracy and credibility", take action not recommended, or take recommended action (Walker,

1989, p.67-8). The conflicting systems and actions of those directly affected are often blamed for the calamitous outcome experienced in the Ethiopian famine of 1984-5, for example. Suspicion about the intent of outsiders run high in normal situations, but during a disaster when mixed messages are sent or poor instructions cause pandemonium, those suspicions can lead to a complete lack of faith.

Buchanan-Smith (1995) reviews the approach of four donor agencies to early warning - the Overseas Development Administration of the British government (ODA), the US Agency for International Development (USAID), the European Union (EU), and the UN World Food Programme (WFP). What is important here is that most donors fund some sort of assessment programme, and USAID is the only donor agency with a formal EWS, the Famine Early Warning System (FEWS). Funding is limited in most aspects of early warning projects and the major information sources for all include NGO's. The role of the media is strong in all except the WFP. Media attention to the Ethiopian crisis was crucial in stirring donors and Western governments to action.

Walker (1989) reviews the FAO's Global Information and Early Warning System (GIEWS) as well as WFP, USAID, UNICEF, OXFAM, and other NGO early warning systems. He recommends that systems must serve six purposes:

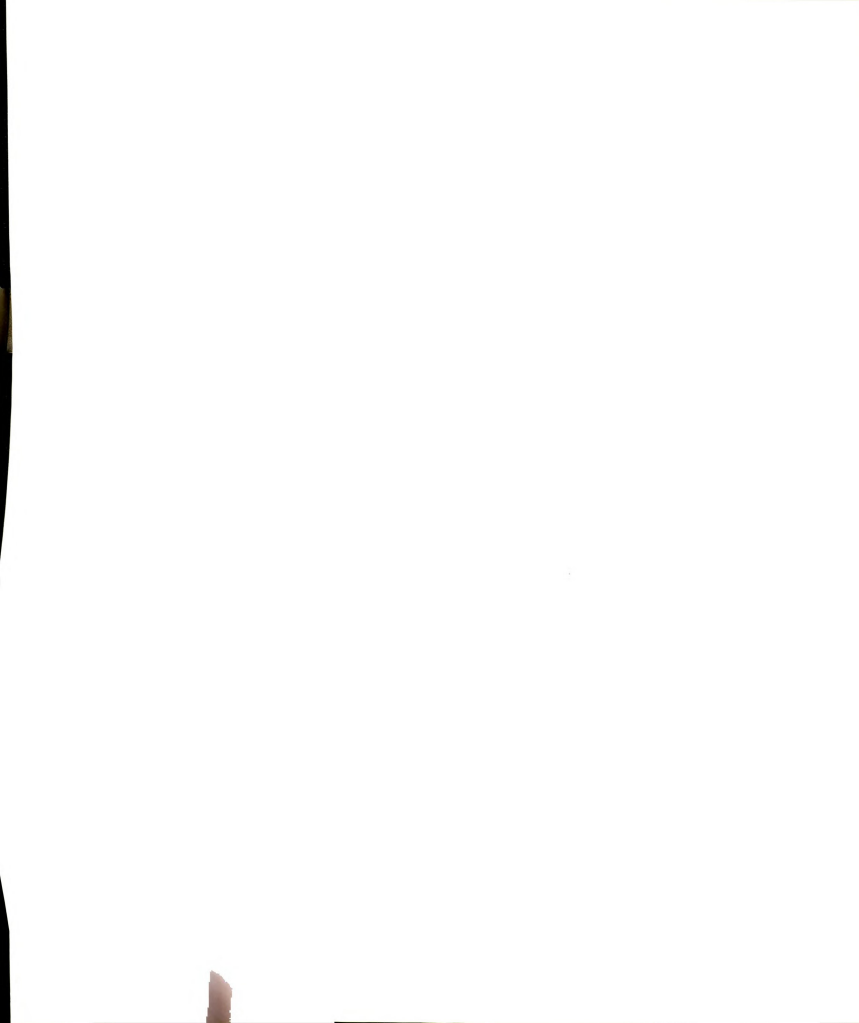
1. Warn of the impending beginning of the famine process
2. Be capable of monitoring the development of that process
3. Be able to recommend sustainable strategies for reversing the process
4. Be able to steer and monitor the application of these strategies

5. Be able to evaluate their effectiveness after they have been applied
6. In the event of the failure of these strategies, it must be able to switch to monitoring those parameters that will predict the likelihood of mass starvation. (Walker, 1989, p.147)

Table 3 (page 50) summarizes the constraints faced by EWS. Perhaps the biggest constraint to using EWS is financial. All actors are consumed by the need to obtain funding for such a project. With hundreds of competing interests, EWS often fall low on the political agenda. Recently, donor fatigue has threatened the most lucrative source of funding for EWS. Many African governments are paralyzed by strict spending constraints laid down by Structural Adjustment Programmes and have little choice but to depend on NGO's and donors for support of even the most rudimentary EWS.

In addition, donors have recently expressed "fatigue" with the development process, noting corruption of project funding as a major source of this "fatigue". Buchanan-Smith classifies this as "avoidance of responsibility" (Buchanan-Smith, p.20). "Passing the buck" also afflicts many donor and non-governmental organizations. Unclear mandates, imprecise goals, and political directives from home governments provide ample room for the avoidance of responsibility.

At all levels the need for more information often overshadows objectives at the ground level. The drive for more information often becomes a goal in itself, crippling any substantive action. Governments and donors often absolve



themselves of action by continually demanding more information, or more precise information, or another report, etc.

Margaret Buchanan-Smith is highly critical of the supply side focus of most EWS,

supply-side indicators continue to predominate over demand-side ones, in spite of doubts about the accuracy of annual harvest assessments...local people's coping strategies are rarely incorporated systematically...many EWS, especially those which are donor funded, are increasingly reliant on high-tech inputs using sophisticated information technology and satellite imagery (Buchanan-Smith, 1995, p.16).

While the literature includes a great deal of critical reviews of the technical EWS, little attention is given to the limitations of the highly social form of EWS. Highly social EWS may overemphasize certain aspects of an affected area. As discussed above, coping strategies are not constant and building an EWS based on specific coping mechanisms may prove to be misleading. The social approach is also limited in the scale of coverage. While intense coverage of one's study region would be very beneficial both to the local inhabitants and the researcher, intense coverage is not possible for the wide range of areas affected by drought, nor does every region affected by drought have the luxury of an outside researcher interested in its survival. If national EWS are faced with severe limitations caused by financial and political considerations, a micro approach would seem to be even less sustainable than a national approach.

Table 3. Constraints to the Use of Early Warning Systems.

Actors	Institutional Constraints	Political Constraints	Logistical Constraints
Government	Lack of human and financial resources. Inappropriate bureaucratic procedures and structures. Avoidance of Responsibility. Lack of Institutional Memory. <i>Ad hoc</i> response arrangements.	Conflicting political objectives. Reluctance to accept aid conditionally. Political incapacity. SAP's.	Lack of financial resources with which to act. Lack of Infrastructure and weak transport sector. Lack of trained local administrators.
Donors	Distance from problem and failure to appreciate lag time in delivery relief. Inadequate co-ordination between field and HQ, or with other donors. Inappropriate bureaucratic procedures and structures. Avoidance of Responsibility. Lack of Institutional Memory.	Home country political agenda. Unwillingness to breach sovereignty. Lack of accountability to local beneficiaries.	Distance over which resources must be mobilized. Lack of infrastructure and weak transport sector in-country.
NGO's	Dependence on Donors. Bureaucratic Overload. Lack of Institutional Memory.	Difficulty in preserving neutrality. Lack of accountability to local beneficiaries. Own political agenda.	Lack of financial resources with which to act. <i>Ad hoc</i> response arrangements.

Source: adapted and modified from Buchanan -Smith (1995)

This is not to argue that the micro-scale is not the most appropriate, and that monitoring local responses is not the most accurate indicator of coming problems. Rather, given the present financial and political situation in most drought prone nations, a micro-scale approach is simply less feasible and impacts potentially far fewer people than a national approach to EWS.

Entitlement Theory Rarely until the early 1980's did the early warning literature focus on the people directly affected by famine and food insecurity. The approach to warning systems, as noted above, had been supply oriented, i.e. food supplies, food availability, and soil conditions. Amartya Sen, writing in 1980, challenged the status quo of famine early warning, notably that as food availability declines (FAD) started, a famine was sure to happen. He also challenged the notion that famines were caused by a FAD, also prominent in the literature.

Defining the entitlement approach, Sen writes:

The entitlement approach to starvation and famines concentrates on the ability of people to command food through the legal means available in society, including the use of production possibilities, trade opportunities, entitlements *vis-à-vis* the state, and other methods of acquiring food. A person starves either because he does not have the ability to command enough food, or because he does not use this ability to avoid starvation. The entitlement approach concentrates on the former, ignoring the latter (Sen, 1980, p.45)

The entitlement approach developed as a response to FAD theory of famine. Sen remarked about FAD at length in his manuscript ***Poverty and Famines: An Essay on Entitlement and Deprivation***. Sen showed, using many famine experiences, that famine and hunger can occur without a substantial FAD. This argument had been used to explain the 1943-4 Bengal famine and the 1973 Ethiopian famine, however, Sen highlights faults with this assumption. Political maneuvering and lack of entitlement to food rather than a dramatic FAD caused the Bengal famine. The same was said for Ethiopia.

Sen countered FAD theory by maintaining that access to food and the entitlements of individuals was more at issue when examining famines than was FAD. Two kinds of entitlement failures can cause a lack of food:

[maximum food entitlement] can fall either because one has produced less food for own consumption, or because one can obtain less food through trade by exchanging one's commodity for food. The former will be called a direct entitlement failure and the latter a trade entitlement failure. The former can arise for food producing groups, while the latter can occur for others (i.e. for those who sell their commodities to buy food) (Sen, 1980, p.51).

The failure of entitlement is the true cause of famines, Sen maintains. On the issue of food exports during famines, he states that the balance of entitlements can cause problems. People with weak entitlements can not acquire food even if it is available. The mechanisms they employ to secure food have collapsed either as a result of direct entitlement failure (i.e. crops fail, herds die) or because of a trade entitlement failure (i.e. the services provided are no longer affordable). Those with strong entitlements, therefore, are able to access food. They have the means to acquire food at any cost. In the Ethiopian famine of 1973, food was actually being exported from the worst hit region- Wollo. The food entitlement in Wollo as a whole was weak, while strong outside the region, therefore allowing export of food. The same situation prevailed in Bengal in 1943, another region where food was being exported while thousands were starving.

The entitlement theory of famine has led many other authors to call for more social approaches to food issues. Buchanan-Smith (1995), Davies *et al* (1991), and Downing (1990), among others, have contended that a more people-

oriented warning system would most accurately predict the onset of famines. Campbell (1990), Walker (1989), and Buchanan-Smith (1995) suggest incorporating analysis of coping strategies as one possible indicator for an EWS. Torry(1984) has urged the use of more socio-economic indicators to assist in identifying the onset of famine. These approaches, often referred to as demand side, are similar to, if not derived from the entitlement approach. More recently, the literature has focused on the maintenance of livelihoods. Protecting livelihoods during famines will enable people to better withstand future events. Families will not find themselves in a weakened entitlement position at the onset of the next major famine, and will therefore be more able to survive.

Gender and Food Security One of the pivotal issues in food security research is the role of women in agriculture. Research into women's role in the household production cycle generally focuses on the gender division of labor. Women's roles vary greatly throughout Africa. Just as dryland production differs from pastoralism women's roles in each system differ, however, commonalities do exist.

Women are an integral part of the household production system. Often women's labor provides the bulk of both farm and off-farm income, not to mention the hours of unpaid domestic work performed almost exclusively by women. The FAO best sums up the role of women in agriculture:

Women are generally responsible for providing certain foods for the household that complement the foods and other goods for which men are responsible. Women provide these foods either by producing them in separate fields, gardens, or livestock concerns, or by selling or exchanging some of their produce to obtain foods they need...Furthermore, men's incomes are not often used to make up a shortfall in women's production. Thus, in much of Africa, thinking in terms of a total household production or total household income is inaccurate. Two sets of activities, men's work and women's work generate the household's wealth and meet different obligations to the household... (FAO, 1987, in Gittinger.)

Campbell and Trechter (1983) observe differences between men and women's income and coping strategies in their study in northern Cameroon. They noted that women tend to stay near the home to cope, while men tend to migrate. Huffman confirms much of Campbell and Trechter's work, finding that women tend to be more involved with subsistence crops, while men tend to be involved with cash crop production (Huffman, 1987, p.375). She further notes that in two villages in Cameroon "women provided 57 percent of family cash income" (ibid.). Women's role in the sustenance of the household should not be overlooked, but unfortunately it has been. Staudt writes "macrostatistics detailing women's involvement in agriculture are far from adequate" (Staudt, 1987, p.37). She further writes of the role of women's labor in the household and the relationship between men and women in regard to the exchange of labor. Women influence greatly the subsistence of the household. Chidzonga confirms much of Staudt's observations regarding women's work remarking that "women...have a central function and vital stake in the agricultural sector and its development" (Chidzonga, 1993,p.181). Attention has been drawn to the role of women, but empirical studies of women's work are few. The role of women in the provision of food is commanding and must be investigated further, especially in South Africa

where the government has placed an interest in the empowerment of women.

This coupled with their role as food providers and preparers places women in the center of food security issues.

Review of the Literature: Food Security in South Africa

Food security in the rural areas of South Africa has been a systematically understudied topic. The apartheid legacy in the rural areas manifests itself as a lack of information on the daily rigors, trails, and tribulations of the local populations. A comprehensive body to monitor rural health and local environment has materialized only as recently as 1993 (Vogel, 1993). The degree of ignorance about rural food security and health issues in the rural areas is highlighted by the fact that out of over 1,000 entries in a recent publication devoted to food security in Southern Africa, less than 50 made specific reference to South Africa's rural food security situation (Geldenhuys, 1994). Furthermore, voices in the rural development field in South Africa decry the sad state of knowledge. Vogel writes:

while much is known of such [coping] strategies in the rest of Africa, including the areas to the north of South Africa, little local detailed knowledge is available. Communities in rural areas, even where well intentioned drought relief has been devised appear to lack any ability to actively mobilize themselves around droughts (Vogel, 1994).

Vogel further argues that responses to drought in rural South Africa are different from the general pattern described above for the rest of Africa. She writes of a case study:

The notion of a linear, organized series of coping options in the face of harsh droughts as mentioned in some of the literature for the rest of Africa, does not occur in this case. Rather strategies are locally/regionally specific. The choice of coping mechanism is influenced by variables peculiar to these areas while the role of violence as a deterrent in migration options cannot be underestimated (Vogel, 1994, p.2)

Adams (1994) also calls for a wider understanding of the issues facing rural dwellers. She recounts the effects of drought on the rural areas in KwaZulu-Natal and proposes several “strategies for drought relief” (Adams, 1994,p.1). Her first concern regards the distribution of drought relief funds. She maintains that these funds benefited primarily white farmers with large land holdings and that rural areas received little in terms of support during the 1992 drought, one of the worst in decades. The distribution of drought relief was “dispersed through a plethora of bureaucracies created as a result of the homelands system” (Adams, 1994,p.3). She maintains that this system was an inefficient agent of relief. Lastly she addresses the issues of the allotment of water supply. She argues that there exists no “strategy for ensuring rural water supply” (Adams, 1994,p.3). To counter these problems she suggests the development of a “National Early Warning System for Food Security” be established. This system would be responsible for alerting authorities of impending famine before it become too late. She further advocates similar systems of monitoring for water supply and nutrition. Adams echoes Vogel's calls for more information gathering: “the rural voice needs to be strengthened in order to continue to lobby for more appropriate and effective relief and development programmes” (Adams, 1994,p.6)

Some common themes throughout the Review of Literature will be addressed in this study. First, the history of shortages will be identified. The cycle of drought is as important as the effects of drought. Second, the coping mechanisms and sources of food during shortage will be identified. Thirdly,

prevention/mitigation and expectations of future famines will be investigated as a component of possible early warning systems for the area/region. An analysis of the use of GIS at the local scale will also be presented in the context of EWS. The need for such a study is clearly presented by Vogel. These most basic questions will be addressed in this study.

Chapter Four

Results

To accommodate the wide range of data collected and the various methods of interpretation used, this chapter is divided into four sections. The first section presents summary statistics from the questionnaire schedule. The second section details the results of statistical tests to determine relationships in the data. Analysis of the qualitative data is presented in section three, and section four explores the efficacy of using GIS in the analysis of the data from the interview schedule. A brief review and synthesis of the hypotheses follows.

Both the summary statistics and tests were designed to investigate themes discussed in the Review of Literature including the history of shortages, coping strategies and preparations for future shortages. Several hypotheses were drawn from the literature and tested through the use of both the summary and test statistics. The results of the statistical operations are presented in this chapter. The relevance of the tests to the thesis will be presented in the Discussion section.

The qualitative section allows for more probing of issues that only came to light during the course of quantitative interviewing, such as the apparent inconsistency between the overwhelming response that the government has not assisted the area, while power lines hung overhead and windmills pumped water.

Finally, concepts, ideas, and nuances lost in the translation from English to Zulu are discussed to assist in future study designs.

Summary Statistics Summary statistics are essential to this thesis as it was designed to be a tool for primary data collection. The scope of the study limits the amount of statistical procedures that can be used to analyze the data. The data is nominal in nature, which violates the assumptions of both correlation and regression tests, and therefore, bars their use. Summary statistics provide groundwork for understanding phenomena at the most basic level. In areas where research has not previously been conducted, such as the study site described herein, often the most useful information is that which describes the setting, or context or the area. The summary statistics have been grouped and are presented by theme.

In order to characterize respondents to the survey, several demographic variables were collected on each respondent, including the gender, age, and number of people in the family. Overwhelmingly, respondents were female. Females represented 90.3 percent of the survey. Men were often not at home or inaccessible. The issue of female bias was addressed to some degree in the qualitative data, where men were more willing to participate (see footnote, p.21). The average age of respondents was 41.4 years. The youngest respondent was 16 (1 respondent) and the oldest was 87 (also 1 respondent). The age data was grouped into cohorts for ease of analysis (see Table 4).

Table 4. Age Cohorts for the Sample at Zidonini

	Frequency	Percent
0-19 years old	1	0.7
20-29 years old	20	13.9
30-39 years old	44	31.2
40-49 years old	25	17.4
50-59 years old	34	23.6
60 + years old	17	11.8

Southern African societies are comprised of younger populations, and this study concurs finding the highest number of respondents to be in the 30-39 year old age cohort. While population per cohort in Southern Africa is highest in the under 20 category, this study has largely excluded this cohort. The design of the study did not actively seek to exclude the youngest cohort (or the eldest, either). Rather, when asked for interview, persons often deferred to the “head wife”. This is also reflected in the gender composition of the survey. After asked for an interview, most men deferred questions to their wife, or wives.

The mean number of people in a household was 10.7. This does not reflect the number of people per dwelling, rather the number of relatives or dependents living in the same homestead, therefore, the number of people who could call on the interviewee at any time for assistance. Because of inter-familial ties, and lack of precision over the definition of a “household”, “homestead”, “dependent”, or “relative”, this statistic may reflect a disproportionately high number of “people living in your household”.

The final socio-economic factor relevant to the study was the number of years an interviewee had lived in the given study area. This indicator was extremely important as new arrivals could not comment on even the most recent shortages and lifelong residents had extensive personal recollections of shortages. The mean residency in the study area was 26 years. The mode was 20 years, confirming both the in- migration in the 1950's and 60's and the large component of younger respondents. Several key informants corroborate the finding that large population increases occurred in the 1960's.

The bulk of the interview schedule was designed to illuminate the history and causes of shortages, how people cope (or coped) with shortages, whether or not they were preparing for future famines, and what expectations people had regarding future assistance, particularly from the new South African administration.

Several factors of production had to be established before reasonable analysis could begin, such as the number of fields and gardens, and the type of tools used. Wide variation could be anticipated if large numbers of people had no access to the key components of production while a few had access to the entire component of production.

The average number of fields was just over one, while the average number of gardens was between zero and one. The majority of respondents (n=102) had under two fields. Hoes and oxen were the primary tools used by respondents in the study, as mechanized farm implements were available to very

few. Hoes were used by 131 people, oxen by 96, tractors by 23, and other implements such as rakes and scythes, by 15.

Central to this thesis is the recent history of shortage, coping mechanisms, and expectations of assistance. Respondents were asked to list the years in which they experienced a severe drought. Only three respondents reported never having a food shortage. Twenty-four percent of the respondents reported experiencing a food shortage in 1983, and eleven percent noted that they experience a shortage in 1982. In fact, the years 1980-83 were mentioned by thirty-eight percent of the respondents as shortage years.

The early 1990's were more often observed as shortage years. Twenty-five percent of respondents indicated 1992 as a shortage year and eleven percent indicated 1993. In total the years 1990 through 1993 were reported as shortage years by forty-nine percent of respondents. However, when controlled for length of time in residency, more respondents who had lived in the area since 1980 reported experiencing the 1982-4 drought than the 1992-3 drought.

The shortage data was compressed by case to evaluate the number of times a respondent reported experiencing a shortage. This allows for some rudimentary analysis to be performed on highly vulnerable groups (if any exist). Twenty-eight percent reported experiencing only one shortage, while forty-four percent noted two. Twelve and a half percent experienced three periods of shortage and just fewer than ten percent of the sample experienced four or more periods of shortage.

When asked about severe shortages, the situation changes somewhat. The year reported most often for severe shortage was 1983 (33.1%), followed by 1992 (17.2%), 1982 (12.6%), and 1993 (11.3%). Far fewer people had experienced more than one severe shortage (16.7%), unlike the same statistic for (general) shortage.

Table 5. Occurrence of Food Shortages and Severe Food Shortages⁵

	Shortage Frequency - (Percentage)	SEVERE Shortage Frequency- (Percentage)
No shortages	4 (2.8%)	3 (2.1%)
One period of shortage	30 (20.8%)	97 (67.4%)
Two periods	64 (44.4%)	14 (9.7%)
Three periods	18 (12.5%)	6 (4.2%)
Four periods	12 (8.3%)	0
5 or more periods	2 (1.4%)	0
Missing / NR	14 (9.7%)	24 (16.7%)

The second major subject of inquiry was coping strategies/mechanisms. Coping mechanisms, as noted in the Review of Literature, usually vary with increasing intensity of shortage. The easiest coping options are exhausted first, and thereafter, more severe measures are generally implemented. When asked their first response to drought, forty-five percent of the respondents remarked that they made and sold baskets. Asking neighbors for assistance and buying food in shops were both reported as the first response by eleven percent of the sample. Attempting to cultivate was the first response for six percent of the sample⁶.

⁵ This is NOT controlled for length of residency.

⁶ Men do not make baskets as their first coping mechanism. Most men said that if the crops failed they tried to plant again. The first coping mechanism of men was to try to plant again. They then noted that they would go to shops to buy food, similar to women.

When asked about the second coping mechanism thirty-eight percent responded “none”. Twelve and a half percent made and/or sold baskets and eleven percent relied on store bought foods. Nine percent of the sample used stored foods. Overwhelmingly (94.4%), coping ends after the second option is exhausted. The lack of a third coping mechanism will be highlighted in the discussion section.

The most significant source of food during shortages is the purchase of food in shops (35% of responses), followed by other sources such as selling wood, fruit, goats, etc.(15%) and only then does basket making/selling appear as a source of food (12.5%), followed closely by the use of stored foods (11.7%) and dependence on neighbors/relatives (10.8%).

The difference between the coping mechanism and sources of food question is interesting when examined in light of the basket trade. Forty-five percent of respondents said that they made and sold baskets as their first coping mechanism, however, only 12.5% report it as a source of food during food shortages. This may indicate how many baskets were *actually* sold. This research is insufficient to draw such conclusions firmly, but indicates such a phenomenon may exist.

Because of the proximity of the Hluhluwe-Umfolozi Game Reserve a question was incorporated which would attempt to access the state of hunting in the study area. Wild game is often used in other parts of Africa as a source of food, but has a long history of “protection” in the apartheid period in South Africa.

The majority of respondents (67.8%) reported that they do not hunt while 28.5% reported that they do hunt. The policies on hunting in the homelands were similar to those in apartheid South Africa, however enforcement was drastically different. Both in homeland and “white” South Africa, special costly permits were needed to hunt game. This actively discouraged illegal hunting in “white” South Africa, but enforcement in the homelands was scant at best. The situation changed when the Hluhluwe and Umfolozi Parks were consolidated. Stricter enforcement in the KwaZulu homeland areas around the park curtailed hunting once more.

In order to follow up on the progression of coping mechanisms, a question was included which asked about the level of assistance from the community in general, as community assistance often represents an indirect form of a coping mechanism. However, in this case, seventy-five percent of respondents reported that no one in the community assisted them, while twenty-one percent noted the opposite. A fuller explanation of problems related to the outcome of this question can be found in the discussion section. A second question was asked to find the influence of remittances and labor migration. The majority of respondents did not work elsewhere or have family members working elsewhere (88.2%). Of those that did work outside the study area, the most notable locations were Johannesburg, Hlabisa, Empangeni, Durban, Richard’s Bay, and Nongoma.

The final question that dealt with coping related topics queried respondents on assistance from the Zulu homeland government. Governmental assistance was recognized by just fewer than thirty-two percent of respondents.

Infrastructure in the area was noticeable and the apparent conflict will be addressed in the Discussion section.

When asked why the last shortage occurred, two environmental factors overwhelmingly dominated – heat/sun and drought/rain (47.2% and 36.1% respectively). Only eleven percent reported that they “did not know” what caused the last drought.

The final emphasis of the study revolved around expectations. Questions included topics that probed for any preparations for future famines and perceived needs of the community. Basket trade dominated the question on preparations with fifty-nine percent of the respondents reporting that they were actively making and/or selling baskets to safeguard against the next shortage. Storing food was the second most important preparation being undertaken to prevent future shortages (25.4%).

Community input was gathered on the perceived needs of the community – what *they* thought they needed. Just over nineteen percent of the respondents maintained that water was needed, just fewer than seventeen percent said schools/pre-schools were needed, fourteen percent said clinics, and eleven percent said jobs were needed. (Note, the question did NOT ask for a ranking of what was needed, rather just for a list of things that people thought were important).

In addition to the questions presented above, a composite variable was created which helped to emphasize the most vulnerable component of the

population (see Methods for a more detailed description). The Vulnerability Index proved to be a useful indicator of the number of highly vulnerable people in the study area and will also be used in the next section dealing with statistical tests. In this variable, the numbers six through four (six being the most vulnerable) represented the highest level of vulnerability. These individuals met over half of the requirements to be classified as “vulnerable”. The numbers three through one represented those people with moderate to no vulnerability. No individual met all six requirements to be classified as the “most vulnerable group”, however, 40.3% of the population fell into the “highly vulnerable” grouping. Just fewer than 60% of the population was moderately to slightly vulnerable. The percentage of the population in the higher categories is significant and will be examined in the Discussion section.

The summary statistics have provided the framework from which the statistical tests in the next section are drawn. Many of the hypotheses formulated from the Review of Literature section have been tested in the above section and will be further reviewed in the Discussion section.

Table 6. Vulnerability among Sample Population

	Frequency	Percent	Classification
1.00	9	6.3%	Slightly vulnerable, met only one characteristic of a "vulnerable individual"
2.00	27	18.8%	Somewhat Vulnerable, met two characteristics of a vulnerable individual
3.00	50	34.7%	Moderately Vulnerable, met three characteristics of a vulnerable individual
4.00	43	29.9%	Highly Vulnerable, met four characteristics of a vulnerable individual
5.00	15	10.4%	Highly Vulnerable, met five of the six characteristics of a vulnerable individual

Analysis of Statistical Tests In this section the results of statistical tests to determine the existence of relationships in the data are presented. These tests originated from themes in the literature and were incorporated into the interview schedule. The variables were then summarized and analyzed in the last section to determine the efficacy of their use in this section. Many of the variables presented in the last section were used to uncover relationships in the data. This section explores those relationships using the chi-square test. This test was chosen because the nominal nature of the data prevented the use of correlation or regression tests. The confidence limits were set at 90 percent for all tests. The Statistical Program for the Social Sciences (SPSS) was used for the chi-square testing.

Results of Testing In order to highlight the major themes in this thesis, several tests were conducted to support or question hypotheses regarding the

state and nature of food security as it pertained to rural Zululand in early 1997. These themes, introduced at the end of the Review of Literature section, include understanding coping mechanisms, past history, and the expectations of the residents. Statistical tests to uncover relationships were utilized to further build upon these themes and begin to better understand the meaning of the data collected.

Determining the causal factors of shortages included the testing of several variables against the number of shortages. The shortage question is open-ended and only requires the dates of shortages be listed. While helpful in understanding the cyclical nature of drought in southern Africa, this did not prove useable until a variable was created that compressed the open-ended dates into a simple numerical counting of the number of shortages per respondent.

The first test was a cross tabulation- chi square test to determine whether or not a relationship existed between the number of shortages and the distance from the Nduna. As the center of power for the study area, the Nduna controlled the distribution of food in times of stress, when it was available from the KwaZulu government. Respondents were coded according to their distance from the Nduna, i.e. 1-kilometer. From this test a chi-square value of 9.209 was attained with four degrees of freedom. The critical chi value for the ninety- percent probability range is 77.79, thus the null hypothesis is rejected. There is a relationship between distance from the Nduna and the number of shortages.

Table 7. Chi-Square Results for Proximity to Nduna Test

	One Shortage	Two Shortages	Three or More Shortages
Nearest to the Nduna (1Km)	9	33	18
Second Nearest to the Nduna (2 Km)	15	14	9
Furthest from the Nduna	10	17	5

Test	Chi-Square	df
Pearson	9.209	4
Likelihood Ratio	9.571	4

The second relationship explored with the chi-square test was between the number of fields and the number of shortages. Often those farmers with more fields, or more access to fields, fare better during times of shortage. In fact as evidenced from the Review of Literature, a political ecology approach would support the proposition that groups of individuals or households with more access to fields are better off than those with less access. A political ecology perspective would maintain that it is the differentiation of farmers that promotes food insecurity. However, this research shows that in this particular situation the number of fields has no relationship with the number of shortages. A chi-square statistic of 5.420 was attained with six degrees of freedom. The critical chi value at the ninety- percent level is 10.645 – again, the null hypothesis must be accepted. Statistically, no relationship exists.

Political factors were next tested to determine any influence outside assistance had on the intensity and prevalence of shortages. One of the more important questions considered the degree of help received from the KwaZulu government, both during and after apartheid and the homeland system of governance. With a chi-square of 0.638 and two degrees of freedom, this test also failed to reject the null hypothesis.

One of the final factors of food insecurity reported by key informants in the qualitative section and queried in the qualitative section was the impact of the loss of hunting rights due to the encroachment of the Hluhluwe-Umfolozi park officials into the lives of residents. Quantitative testing shows that indeed a relationship exists between hunting and shortages of food. The chi-square for this test (10.386, $df=4$) exceeded the critical chi-square leading to the rejection of the null hypothesis.

Finally, the vulnerability index created to investigate the idea that chronic shortages are caused by a "package" of vulnerabilities rather than disconnected chance relationships, was tested for the ability to provide useful insight into relationships in the data. The main function of the index was to further investigate any relationship between vulnerability and distance from the Nduna. However, the chi-square test showed that the two variables are independent, suggesting more investigation of the Vulnerability Index.

This section presented the results of the statistical tests used to highlight relationships in the data. The tests helped to prove or disprove assumptions

made at the end of the Review of Literature. The findings and shortcomings of the statistical tests will be reviewed in the Discussion section.

Qualitative Analysis The qualitative analysis of key respondent data provides much needed insight to issues of particular interest that arose in the course of interviewing. This section focuses on the provision of basic infrastructure, the role of the Nduna, history of shortage in the earlier part of this century, and the role of the basket trade.

When a respondent to the quantitative section felt the need to elaborate before, during, or after the interview, the statements were recorded. Often, people who had not been randomly selected felt the need to express their views and in these instances their information was recorded in a qualitative format⁷. More men agreed to participate in the informal interviews. Thirty percent of the qualitative interviews were with men, providing a mechanism for comparing men and women's responses.

One of the most often discussed topics throughout the fieldwork was the basket trade. Often while conducting interviews or waiting to be interviewed, women would be sitting and weaving baskets or engaged in exchange of baskets for other goods. The older key informants maintained that only recently had baskets become a medium of cash exchange. In the past baskets were primarily for use in the household itself for carrying water, storing beans, and other purposes. Exchange with whites in earlier times was very limited. The only means

⁷ In fact, many of the refusals to the quantitative portion would answer informal questions.

of sale was for migrant workers to transport them to interested employers. With the “opening up” of the rural areas during the establishment of the homelands, and especially in the late 1980’s, women began to be able to sell baskets to tourists. Major relaxation of apartheid laws in the early 1990’s further facilitated the basket for cash trade. As the study area is rather far inland, one option for sale of baskets was for the women to set up stands along the N-2 road, which runs from Durban to the northwest into current day Mpumalanga. However, the over 75 km trek to the freeway, coupled with the high cost of transportation resulted in few trips to sell baskets. Women were needed more in the home. The only other method for the sale of baskets was for the women to rely on visitors traveling through Hlabisa to Nongoma. The returns from the market at Hlabisa were not as profitable as those from the N-2 road. At the time of my arrival in late February, 1997, the women at the Zidonini site reported having not sold any baskets since the previous July. The women at Sangoyana, Ximbakazi, Madlinjini, and Zagomfe reported similarly dismal sales. Waiting by the main north-south road through the area proved to be the only means of selling baskets. Children were often sent to the road to waive down passers-by in an attempt to sell baskets. Women outside the study area closer to Hlabisa City reported generally better sales along the road to Nongoma and during the three month observation period were often engaged in the sale of baskets, although of lower quality than those produced in the Zidonini-Ximbakazi area. This supports the suggestion made in the summary statistics section that the difference between

the use of baskets as a coping mechanism and their use as a source of money for food represents the number that were actually sold.

The role of baskets was only one of many topics that needed further investigation. In the quantitative section of the field research sixty percent of respondents noted that the government had never helped them, yet power lines hung overhead and water pumps were nearby. After speaking with several key informants, including a lengthy conversation with the Nduna, the situation became clearer. The KwaZulu homeland government had erected power lines through about half of the study area and had plans to erect more in the near future, according to the local administrator⁸. The homeland government administered a project to drill boreholes throughout the more arid and drought-prone regions of the homeland. Several pump systems could be found throughout the study area.

The apparent discrepancy between the actual government assistance and response to the question was uncovered in follow-up interviews after quantitative questioning was completed. When asked, "Did the Zulu or national government ever help?" most respondents replied that it hadn't helped them *personally*. Although they knew that the government provided the infrastructure, they considered this a form of "community improvement" and not a direct benefit

⁸ The KwaZulu homeland government ceased to exist in 1994 with the election of the ANC and end of apartheid laws. The homeland government had jurisdiction over a disjointed territory that is now entirely part of the KwaZulu-Natal province. Administrative control is still exercised from Ulundi, about 100 km to the southeast of the study area.

to them, particularly in times of drought.⁹ This incongruity in the interview was never resolved. Semantics were adjusted after the pilot study to no avail.

The history of drought was a fertile topic for discussion and older informants were rather helpful in this respect. Droughts occurred in the late 1930's, 1945-48, 1969, 1974, 1983, and 1992. The late 1930's drought was remembered as being particularly severe as was the 1969 drought. Several of the oldest respondents referred to the use of famine foods such as figs and sour milk, which incidentally are no longer identified as coping mechanisms. Settlement of the Zidonini area had occurred at the turn of the century as a result of a drought and famine in the Nongoma area.

Numerous informants reported filling out forms from the government for food assistance in both the 1992-3 and 1982-4 droughts but to no avail. This was an exceptionally contentious issue with the local population. Many people were still upset that the government had promised them food and had not delivered, which may help explain the fact that many respondents reported that the government had not helped them. The severity of the 1982 hunger was worsened by the fact that people were waiting for food from the government rather than making other preparations.

The impact of the Hluhluwe-Umfolozi Game Reserve was a lively topic of conversation among key informants. Several key informants were relocated because of the merging of the two parks in 1989 and had faced food insecurity as

⁹ It must be noted here that some of these same respondents had electrical appliances running in their homes

a result. The two game parks, Hluhluwe and Umfolozi, had been separated by a strip of land known as the Corridor (see Figure 5, p.17). In 1989, the Natal Parks Board joined the two parks and evicted the residents from the land. The only road from the east to the Hlabisa area ran through that strip of land. Eventually, the Parks Board consented to allow public access on the road, thus keeping Hlabisa from being isolated from the east. The consolidation of the Parks is a very sore issue in the minds of the people near the Park. Hunting restrictions outside the Park and the loss of access to game within it were sited as major causes of food insecurity. Informants noted that they were allowed, under certain conditions, to hunt game that escaped from the Park, but were often harassed by Park officials. Cattle kraals¹⁰ within the Park were one of the concessions made for the loss of access to game.

GIS Analysis This section explores the use of GIS as a tool for understanding the spatial relationships of socio-economic data from a rural southern African setting. Included in this section are the particular challenges, obstacles, and design issues required for the effective use of a GIS in such a setting. The data from the previous sections in this chapter will be used to illustrate the major topics mentioned above.

To help avoid some of the problems noted by critics of GIS (particularly Pickles, 1995), the relationship between variables used in overlay procedures were proven through the use of the Chi-square test. This helped to prevent the

as they were saying this.

¹⁰ Fenced areas in which cattle are kept for the night.

impression of relationships in the data that did not exist. Any two or more variables can be used in the overlay process, related or not.

Before using variables in the overlay process, some basic spatial patterns were identified. The percentage of respondents with one or fewer fields was mapped (see Figure 6). Madlwaleni and Sovane had the highest percentages of people (upper end at 90%) in this category while The Ridge, Madlinjini, and Ximbakazi had the fewest (lower end at 33%). At the opposite end of the variable, the Ridge, Madlinjini and Ximbakazi had the highest percentage of respondents with three or more fields (see Figure 7). Both of these sites are furthest away from both the Game Park and the Nduna in hilly terrain.

The areas with the greatest percentage of respondents reporting no assistance from the KwaZulu government were rather randomly distributed (see Figure 8). The highest proportion was at the Ridge and Sovane, followed by the Tree, Ximbakazi, and Sangoyana. Surprisingly, one of the most inaccessible and remote locations, Madlinjini, had the lowest proportion of respondents who had not received assistance.

The spatial distribution of sites with high proportions of respondents reporting no hunting was not surprising given the history of game wardens patrolling the areas near the game reserve. The four sites closest to Hluhluwe-Umfolozi Park, Khalweni, The Ridge, The Tree, and Zagomfe, had the fewest hunters, while the most distant sites, Sangoyana and Ximbakazi had the most.

Next, the number of shortages was plotted (Figure 9). While the overwhelming response in the survey was two shortages, Madlwaleni and Madlinjini sites had the highest proportion of respondents reporting one or fewer shortages. Twenty to forty percent of respondents at Khalweni, the Nduna, the Ridge and the Tree reported having experienced three or more shortages. Of these sites, all except the Nduna border the Game Park.

Some very basic overlay operations were conducted in the GIS to help show *spatially* the relationships uncovered in the previous sections of this chapter. These overlay operations included the presentation of only statistically significant relationships between variables.

One of the more important findings of this chapter is that a relationship exists between hunting and the number of shortages. While the Chi-square test cannot indicate causality, a hypothesis was made that as hunting declines, the number of shortages rises. When queried for the sites with greater than twenty-five percent of respondents reporting three or more shortages and greater than seventy-five percent of respondents reporting no hunting, Khalweni, The Ridge, and The Tree were shown to have met the criteria (Figure 10, represented as triangles). These three sites are the closest to the game reserve.

Another theme in this thesis is that distance from the Nduna is related to the number of shortages. Proven significant at the ninety- percent level, this makes for an interesting map (Figure 11). The hypothesis made for this variable was that those furthest from the Nduna would have more shortages due to lack of

political contact with him. However, the spatial picture does not support this. Sites with more than twenty-five percent of respondents having experienced three or more shortages were actually closest to the Nduna. Respondents at the more inaccessible and distant sites such as Ximbakazi, Sangoyana, and Madlinjini actually fared better.

Finally, the junction of respondents reporting both no hunting activity and no assistance from the KwaZulu government in times of shortage was mapped (Figure 12). A significant level of vulnerability in the population is expressed in these two variables. Upon examination, the four sites closest to Hluhluwe-Umfolozi have greater than half the sample population that neither hunts nor has received assistance. Closely related is the vulnerability index map (Figure 13). The four sites near the park have some of the highest levels of vulnerability. Sovane and Madlwaleni also rank high.

GIS and Food Security At the local scale of analysis, GIS can both enhance and detract from a food security project. This section is a summary of the challenges of incorporating GIS into the field research component and the potential benefits of its use in early warning systems.

The most acute problem in this study was the lack of positional accuracy in the location of households. Lacking a GPS¹¹, accuracy on the precise location of households was low and, therefore, households were rejected as the unit of

¹¹ Global Positioning System – A system utilizing a series of satellites to locate precise points on the earth's surface. Location of a particular phenomenon is accomplished through the use of a hand held positioning unit.

analysis for the mapping component of the study. To compensate, a centroid was located for each study area using an orthophoto and landmarks. Data from each site was then aggregated to the centroid. This process admittedly lowered the resolution of the data, but the accuracy was not as severely compromised as it could have been if an attempt had been made to plot each individual household.

Secondly, a common problem with research in lesser-developed areas became apparent rather early in the GIS portion of the study. The most recent orthophotos of the study area dated from 1982. A number of important landmarks were missing and new landmarks had not been captured. The number of households had increased since 1982, roads had changed or been constructed, power lines erected, and water reservoirs built. Corrections to the orthophotos took a considerable amount of time because they were used to identify pockets of people for inclusion in the random sampling procedure and for basic navigation.

The primary benefit of using the GIS technology was the efficiency with which the data could be queried and spatial patterns identified. Immediately upon examination of the map showing the relationship between hunting and the number of shortages, one gets a clear impression that the game reserve has a large impact on life in the communities near it.

GIS use for early warning systems at the local scale of analysis, thus, must be investigated further. The findings help to stress some of the benefits of the technology, such as the display of spatial patterns, and some of the challenges, such as positional accuracy. Through effective use at the local scale,

GIS can help present a spatial picture at regional / national scales of analysis. Geographic data from local studies can be merged using GIS technologies and analyzed at the regional scale. Cross comparison becomes easier and local variation stands out. However, more research is needed on the use of this technology at this scale of analysis for it to be widely beneficial to food security studies.

The Hypotheses and Findings A brief review of the hypotheses is shown in Table Eight.

Table 8 : The Hypotheses and Findings

<i>Hypotheses</i>	<i>Findings</i>
What is the history of drought and famine in the Zidonini study area?	Droughts and Food Shortages occurred in 1982-1984 and 1992-1993 as many other parts of South Africa.
Is drought or entitlement failure more responsible for food shortages in Zidonini?	In this case, drought is more to blame for food shortages.
How do the local and provincial political institutions influence the level of food security?	Provincial political institutions have little effect, while the local traditional authority has a negative effect on food security.
What are the coping mechanisms to entitlement failure?	Basket Making (45%), Purchase in Shops (11%), Moral Economy (11%). However, asking about the sources of food during shortage provided better data on the origination of food supplies during shortages.
What is the role of labor migration in the food security equation in Zidonini?, Does it hold to the convention wisdom on homeland areas (the homelands were primarily labor reserves)	Very few respondents rely on the migration economy during food shortages (12%). This challenges the conventional wisdom on the role of the (former) homelands.
What are the people expecting from the government regarding food?	Food distribution in times of stress (98%)
What do the people believe will help them secure food?	Clinics, shops, places to sell baskets, schools.

The results of data analysis have been presented in this chapter from both quantitative and qualitative sources. The data was presented in a concise format with little discussion included in the reporting of the statistics or key informant responses. The next chapter will present a discussion of the findings in the context of the local area, the Review of the Literature, and themes of the thesis.

Figure 6 : Percentage of Respondents with One or Fewer Fields

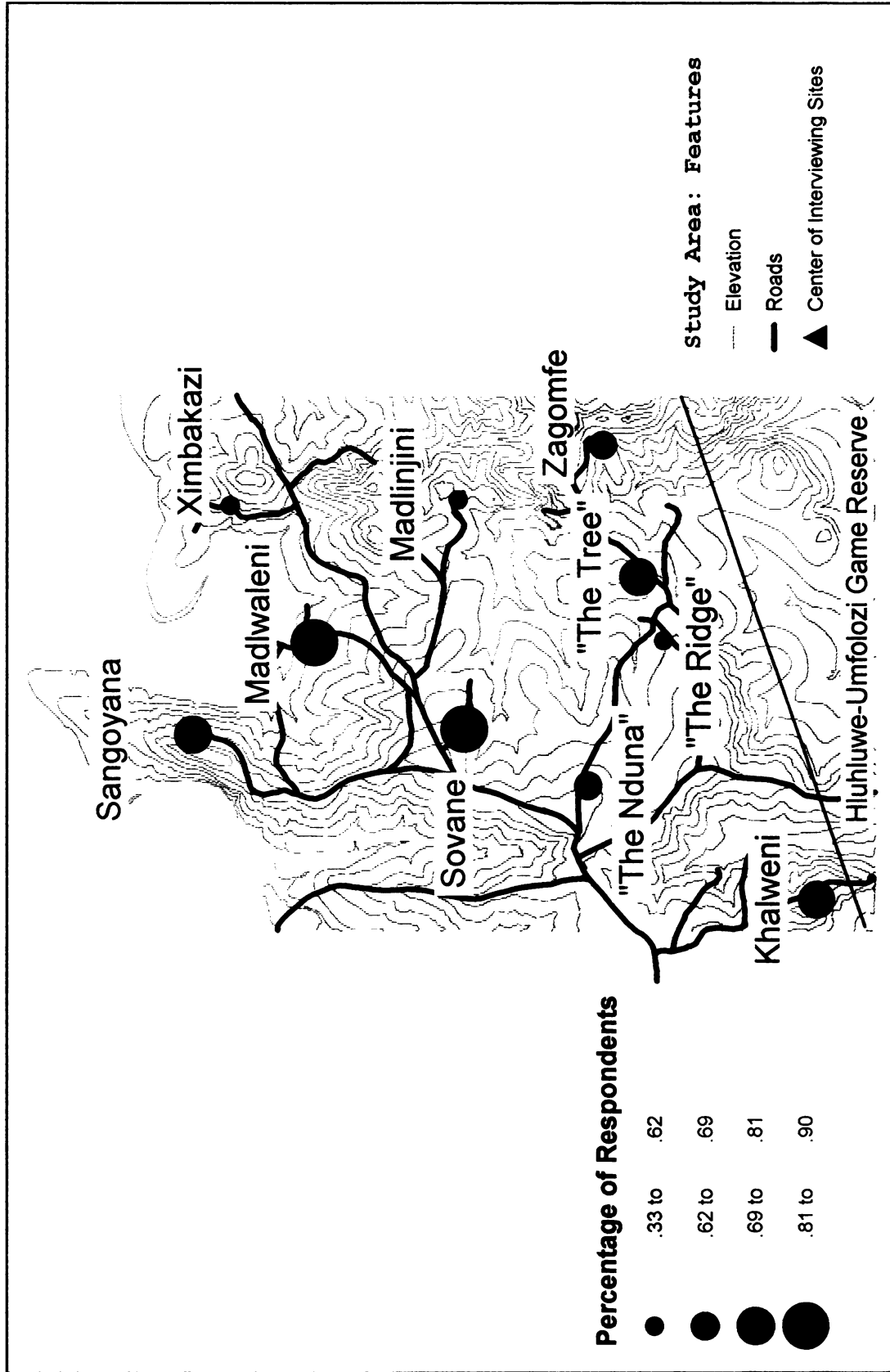


Figure 7 : Percentage of Respondents with More than Three Fields

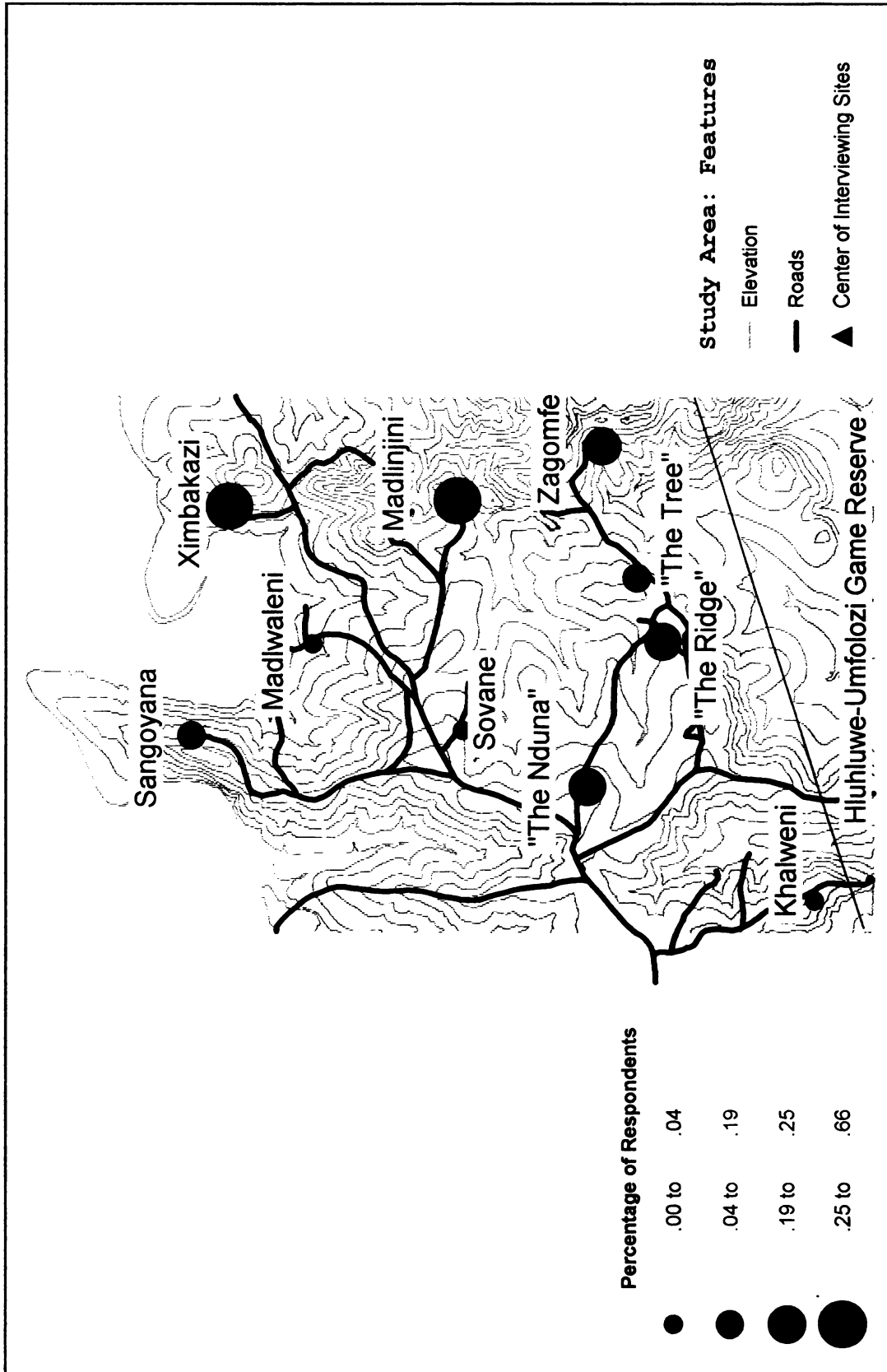


Figure 8 : Respondents Reporting No Assistance from the Zulu Government

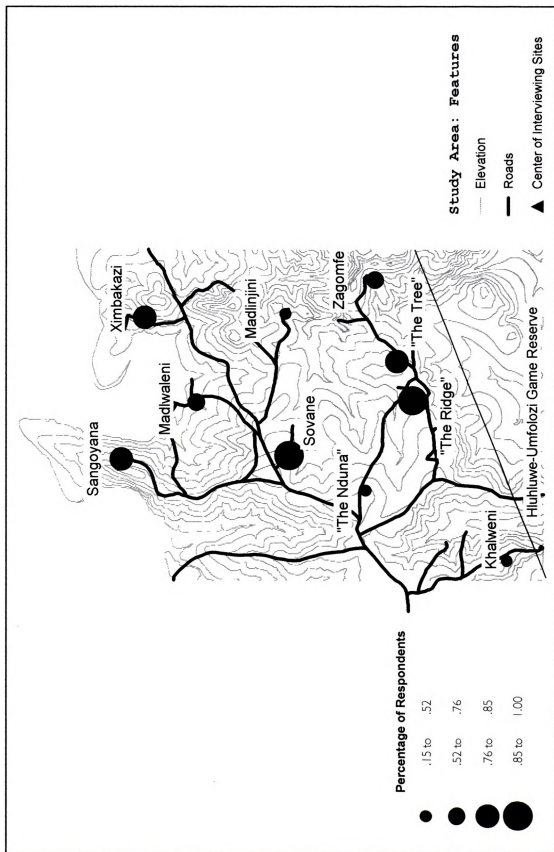


Figure 9 : Number of Shortages in the Past Ten Years

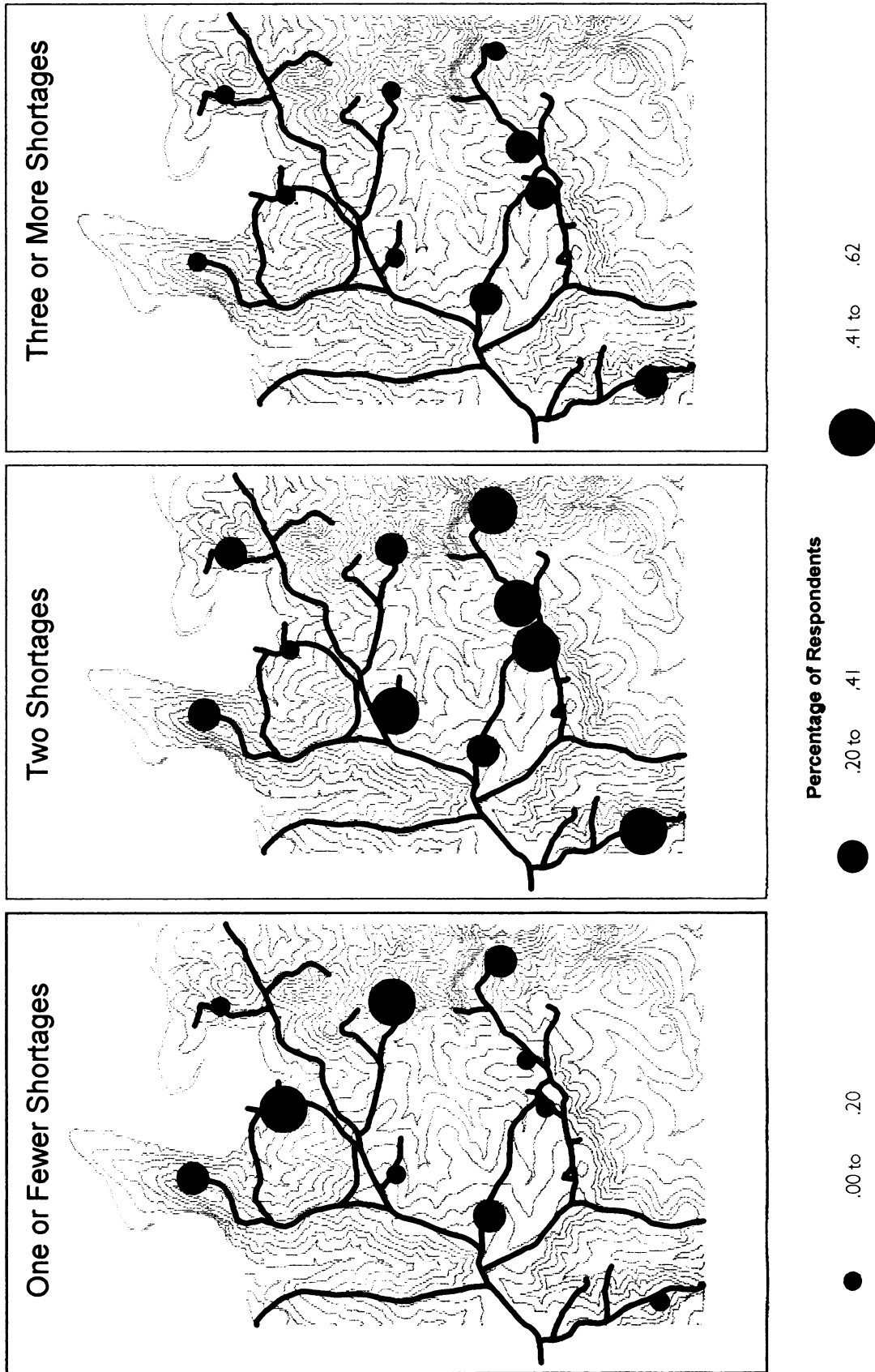


Figure 10 :The Impact of Hunting on the Number of Food Shortages

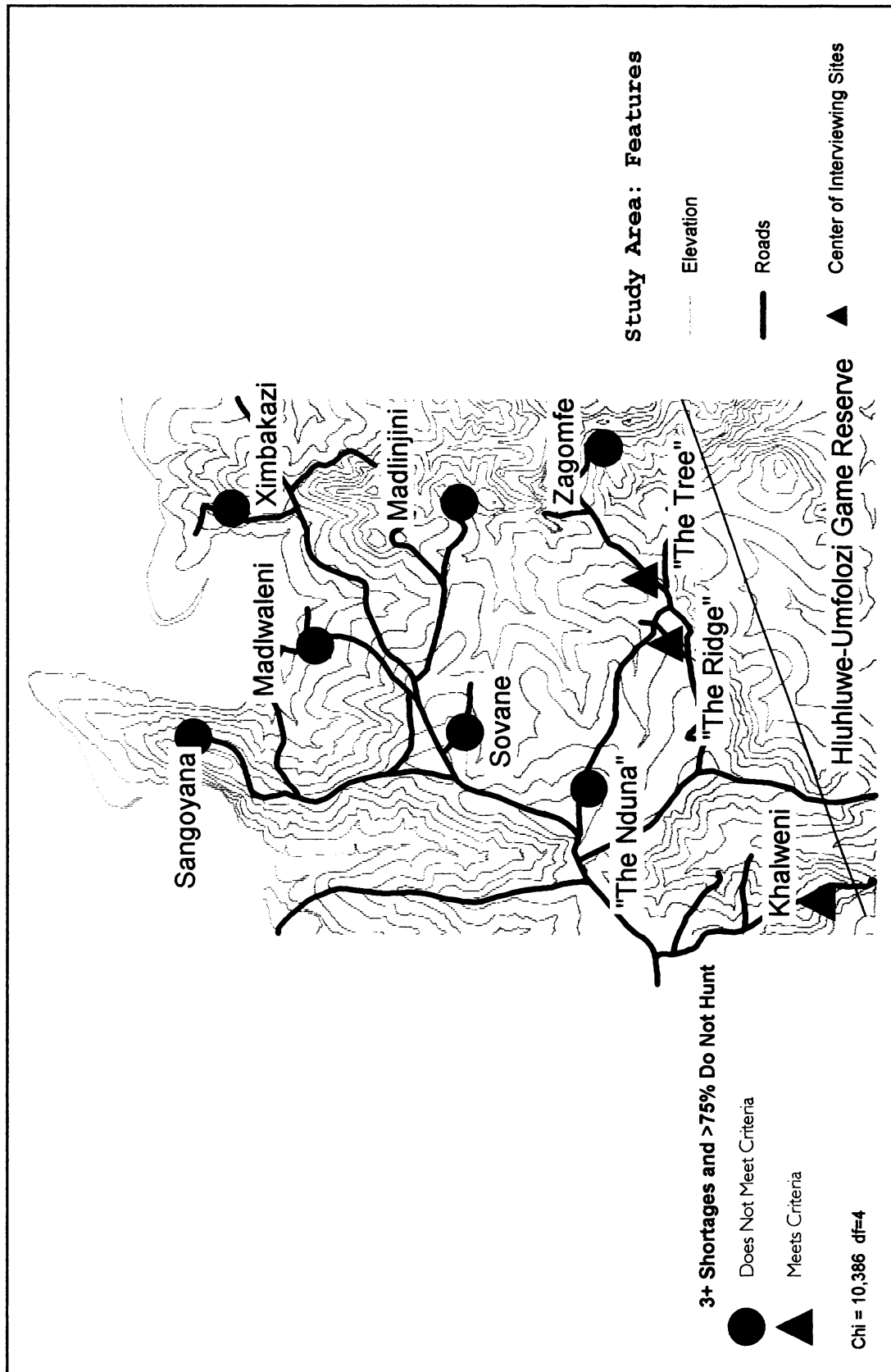


Figure 11: Respondents with Three or More Shortages and Distance from the Nduna

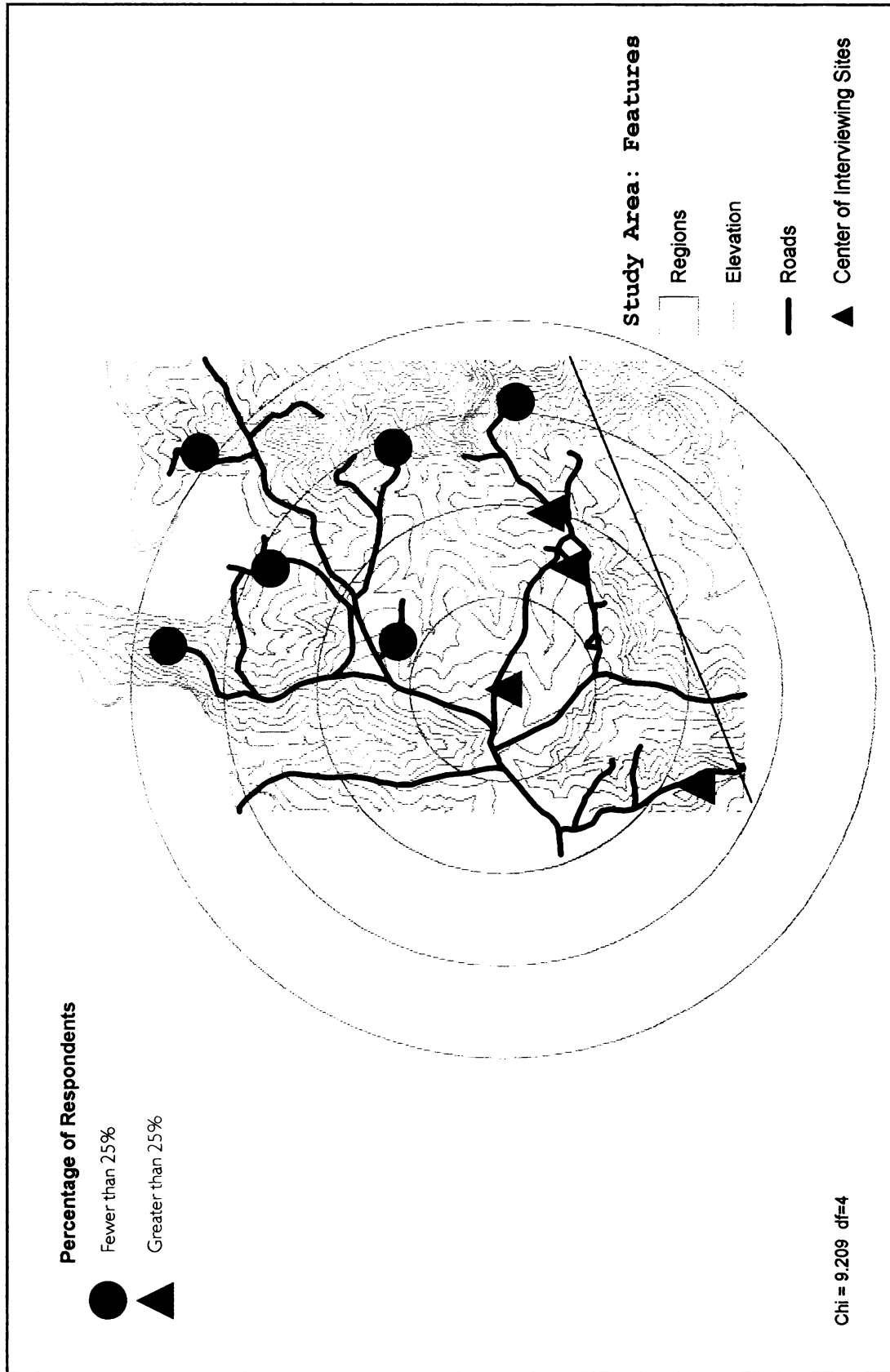


Figure 12: Respondents Reporting No Hunting Activity and No Help from the Gov't

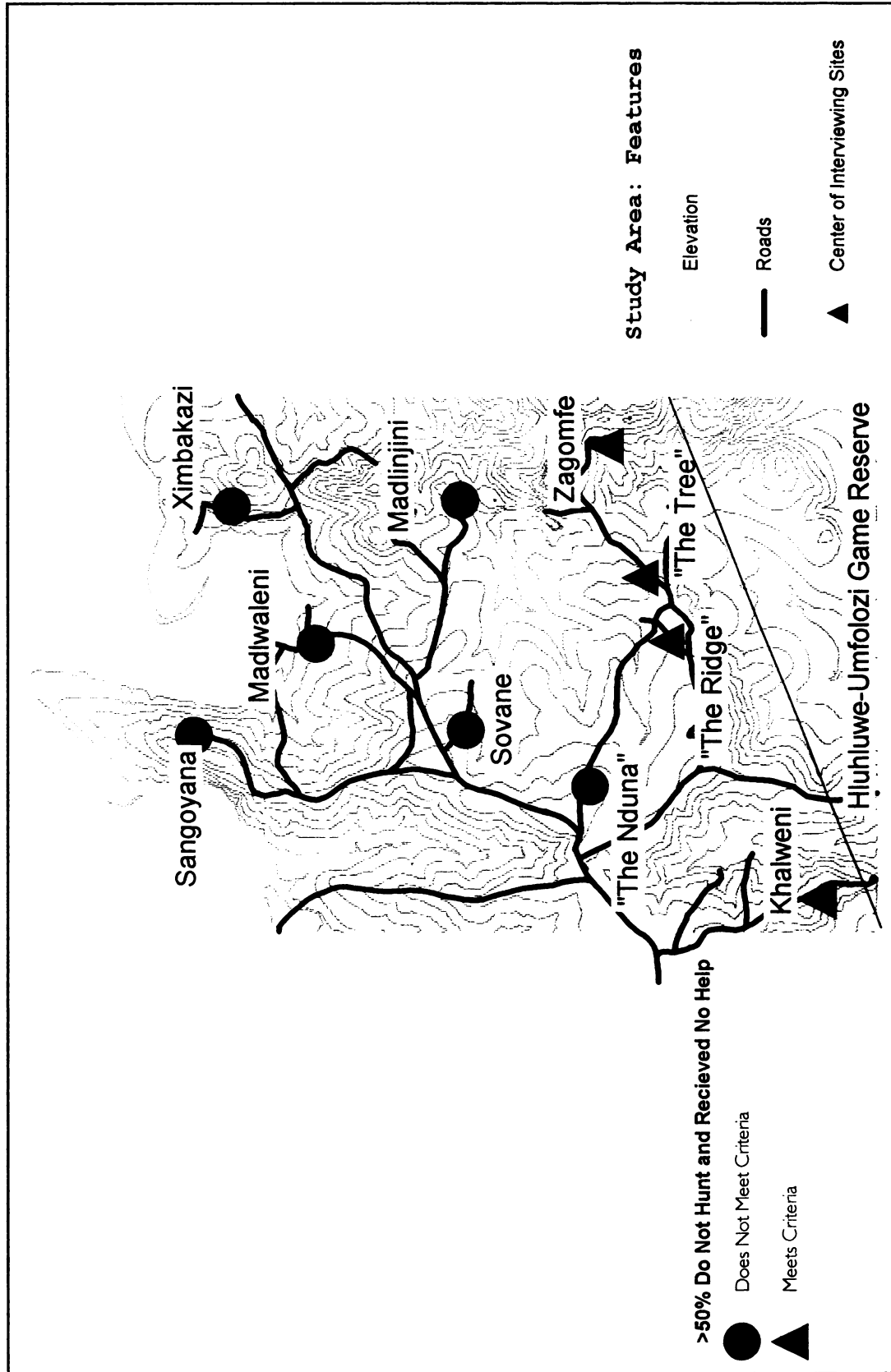


Figure 13: Sites with the Highest Levels of Vulnerability

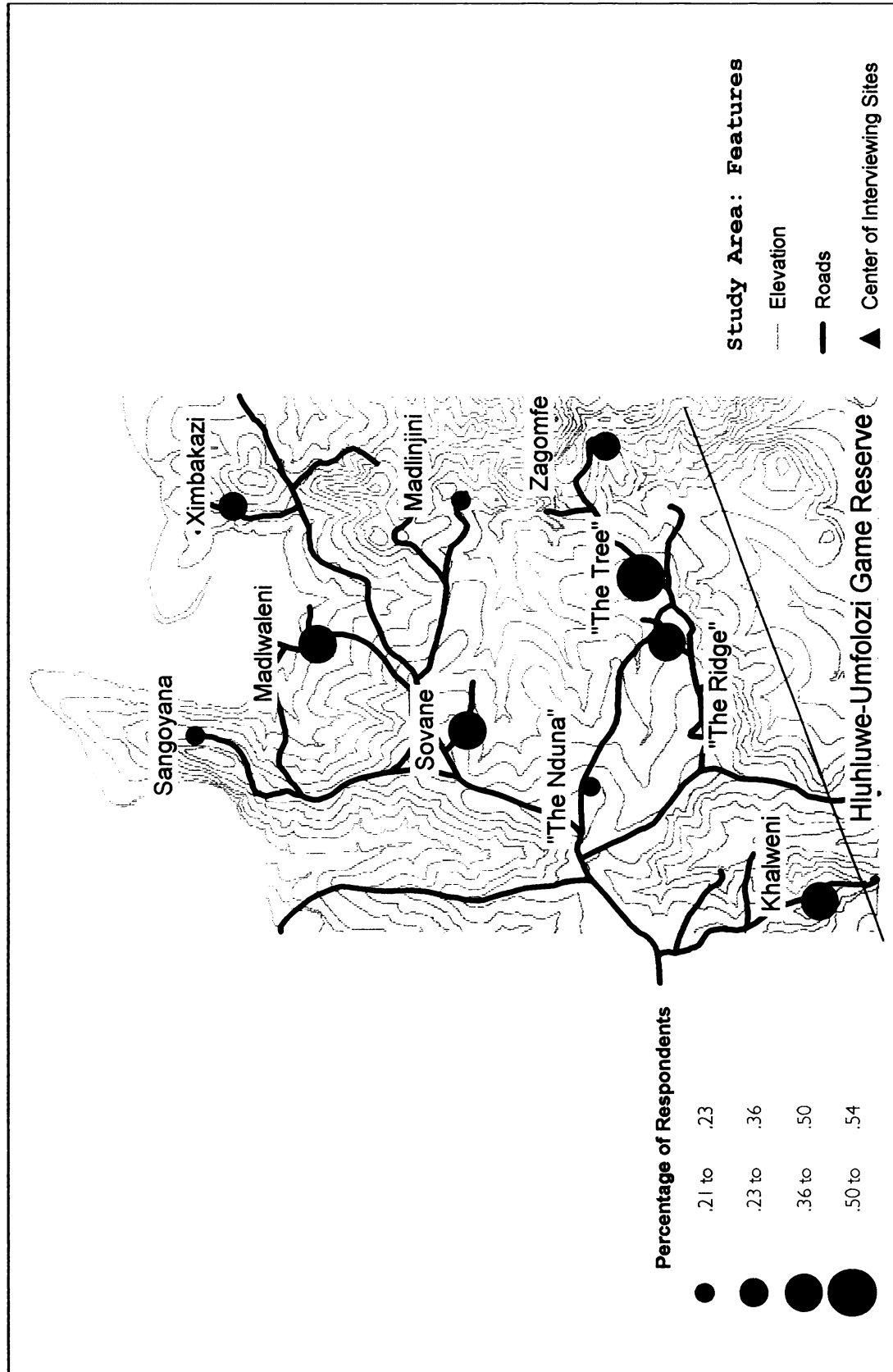
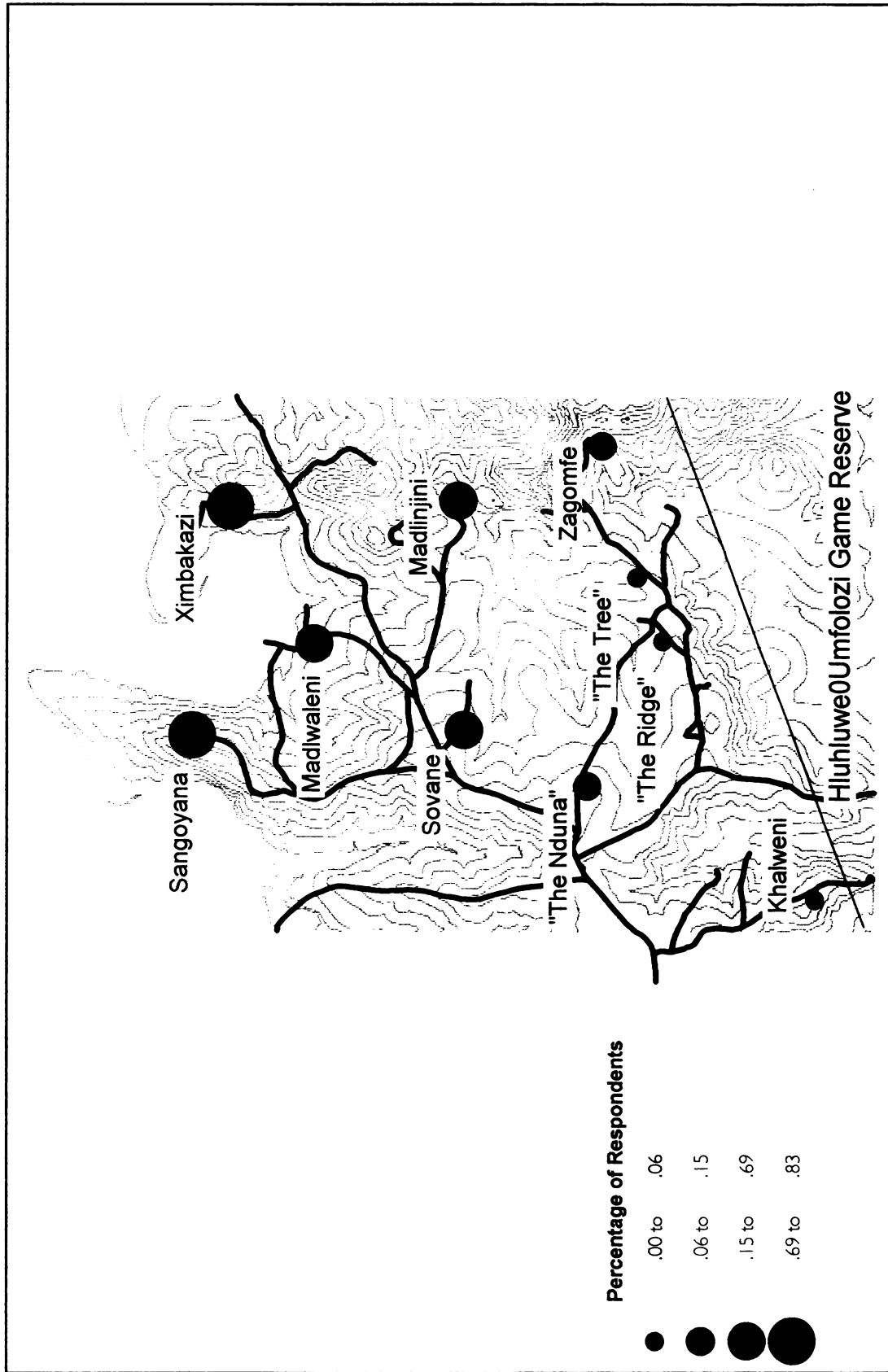


Figure 14 : Percentage of Respondents Who Hunt



Chapter Five

Discussion

This thesis is based on the integration of the elements of food security / shortage issues in the particular case study area. Political ecology urges an integrative approach, rejecting the notion of singular causal factors. Rather, the culmination of a series of variables leads to a more accurate understanding of phenomena. The intent of this thesis is not to point out a particular cause to the shortage history and response in the Zidonini area, but to understand the complexities that underlie the "package" of variables relating to food security.

This chapter will emphasize the processes underlying food security. Explanation of the findings presented in the Data Analysis chapter will be included in two sections. The first section will detail issues related to the design of the study- what went wrong (and right) and the meaning of the statistical tests and interpret the results in the context of the study area. The second section will address larger issues of relevancy to theory and the interaction between the study findings and theory.

Findings and the Study Area Generally the history of drought in Zidonini is similar to that found elsewhere in South Africa (Tyson, 1986; Vogel, 1994). More respondents identified 1992/3 as drought years, although 1982/3 was a more devastating drought. Influx of newer residents coupled with the fact that the

1992/3 drought is in recent memory, explains the apparent contradiction of the finding that the 1982/3 drought was far worse than the 1992/3 drought. The two most recent drought periods are about equal in the terms of loss of food acquisition mechanisms. However, upon closer examination, the 1992/3 period of shortage may be envisaged as more severe because of the loss of previous rights of hunting. Indeed, one of the major coping mechanisms to shortage suffered a severe constriction in 1989 when the Hluhluwe and Umfolozi Game Parks were joined and hunting was curtailed.

The Sangoyana and Madiwaleni sites provide an excellent example of some of the processes underway in the past decade. The number of respondents in both Sangoyana and Madiwaleni with fewer than ten years of residency is in the upper quartile at twenty-one and thirty-eight percent, respectively. Qualitative research confirms the presence of relatively high numbers of newer residents. However, Sangoyana does not rank in the upper quartile of vulnerability while Madiwaleni does rank in the second to highest quartile, thus ruling out length of residency as a cause. The question poses an interesting challenge. Both groups of settlers originated from the "Corridor"¹², but one is more vulnerable. Even more puzzling is the fact that the Sangoyana site has steep slopes, while Madiwaleni is in a relatively flat river valley. Two factors can help to clear up the puzzle in this instance. First, Sangoyana is less densely populated than Madiwaleni. Because Madiwaleni is a fertile area, more people want to farm and live there, thus reducing the available cropland. Examination of

Figures 6 and 7 helps to clarify the situation. The percentage of respondents with one or fewer fields in Madlwaleni is greater than that of Sangoyana. Figure 7 shows the reverse of this- Sangoyana has a higher percentage of respondents with three or more fields.

Second, when asked about hunting more respondents reported hunting activity in Sangoyana (Figure 14). In fact, Sangoyana, being one of the furthest sites from the Park, has the best hunting opportunities. The combination of more land, even though at lower quality, and more hunting indicates the better position of Sangoyana on the vulnerability index. In this context, residency has less to do with vulnerability than previously assumed in this study. Although Madlwaleni is slightly less well off in these terms than Sangoyana, it ranks with the four sites closest to the Park in most of the indicators of vulnerability. The sites closest to the Park, however, are not handicapped in terms of land, as all except Khalweni have high percentages of respondents with access to three or more fields. This leaves the role of hunting as a strong suspect in the understanding of the factors of vulnerability to shortage. The research here, however, is simply inadequate to draw a firm conclusion on the role of hunting¹³. While strongly suggestive, this research does not satisfactorily delineate the loss of hunting rights and game as a sole causal factor of shortages in this area.

¹² The "Corridor" is the strip of land between the two Parks from which people were forced in the years leading up to the merging of the two units in 1989.

¹³ For more information, see S. Brooks forthcoming dissertation on the role of hunting in areas surrounding Hluhluwe-Umfolozi Game Reserve.

The coping mechanisms identified were not extraordinary or unusual. However, the heavy dependence on basket making is intriguing. Two notions are particularly interesting here. First, the sale of baskets as a coping mechanism is overwhelming, yet access to markets is very limited. Many respondents at the Nduna's site, "The Tree", Zagomfe, Madlinjini, and Ximbakazi reported that a long period of time had elapsed since they had last sold handicrafts. The most severe case was at "The Tree", where some residents noted not having sold baskets in over nine months. At the same time, residents of Sovane reported that they were able to sell far more baskets along the main north-south road. In fact, basket trade near Hlabisa was far more brisk than anywhere in the study area. Lack of access to markets is the key factor preventing widespread trade. The women are not able to leave to sell baskets because of their responsibilities on the farm. Often, women complained that the market was too far and to unpredictable for them to leave. However, basket making continued.

The heavy reliance on the basket trade as a coping mechanism seems contradictory. However, *women* control the basket trade, a task exclusively for women. Many women maintained that even though they are not always selling baskets they are at least ready to seize the opportunity to enhance their incomes. This makes them less dependent on their husband in times of stress. Men may always be at the Nkosi's or have to "go to town" to look for employment or may spend all of the extra cash in good times on beer. The basket trade is a very personal form of food security. Women can ensure their family's well being and have control over the income in many cases. Selling baskets is the first response



to dwindling food stocks. Women are less dependent on others at first, which extends the range and options of coping strategies.

Not only is the basket trade a form of coping with food shortage, but also a form of family security. The sale of baskets went not only to the purchase of food, but helped pay schools fees, purchase raw materials for dressmakers, and a variety of other uses. In the long run, this is a diversification of assets designed to widen the number of ways in which insecurity (not just in food stocks) can be minimized. For example, some women who the profits of the basket trade to make dresses, giving them an alternative source of income during periods of stress. This supports the notion that coping mechanisms are intensifications of practices that are used in non-stress periods as income diversification techniques (Campbell and Trechter, 1982). Coping mechanisms are not practices only used during food shortages.

The second finding relating to the basket trade as a coping mechanism is a little unsettling. When asked for second or third coping mechanisms many respondents said "nothing" or "don't know". The first coping mechanism to shortage is largely the basket trade, however, after that, the large proportion of respondents reporting "nothing" was disturbing. Pursued further in the qualitative follow up, many respondents reported that they often only tried to sell baskets. They reported no other source of income and no other options. Thirty-eight percent of respondents reported "don't know" as a second coping mechanism and ninety-four percent reported it as a third coping mechanism. The other common response in the qualitative follow up to this phenomenon was that in the last

shortage of 1992/93 people actively sold baskets in Hlabisa and other areas. The stored foods helped to mitigate shortage and the basket trade was successful enough to prevent resorting to other strategies to obtain food.

Examining the question regarding the sources of food during shortages provides some clarification. This question was designed precisely to clear up any inconsistencies in the coping question. During the pilot study, a strong suspicion that the role of the basket trade *might* fog the memory of what was done to cope during shortages was confirmed. The high degree of importance people place on the basket trade could have obscured the role of other coping strategies. In the first response to the query "What were your sources of food during shortages?", basket making/selling was noted by thirty-six percent of respondents, a higher rate than for any other response. However, this question was more successful at identifying second, third and fourth responses than the coping question. When the sources of food were tallied for first through fifth responses, buying food in shops became the most widespread source of food (35%) followed distantly by "other" (15%) and then basket making/selling (12.5%). While basket making is important, other factors, contribute substantially to obtaining food in times of shortage.

The divergence between women and men is illustrated best through the analysis of the basket trade. Women are more obligated to the farm and therefore, when off farm strategies of income diversification are sought men are the seekers. The traditional role of men in this respect is no different in the Zidonini area. The men worked on farms in the area or went to the Nkosi or

Nduna to seek assistance. The women, however, utilized the local resource base to make baskets. Many female respondents remarked with a great deal of amusement that when first diversifying *they* tried to hunt. After complete failure, they turned to basket making for sale outside the area. This intensification is a response particular to women. Obligated to the maintenance of the family unit requires women to invent new ways of using the available resources. Nowhere was this more evident than in the basket trade. Men simply do not make or trade baskets. This supports Campbell and Trechter's finding that coping mechanisms are every day income diversification techniques that are intensified during times of stress.

The findings that distance from the Nduna and the number of shortages are related, from a political ecology point of view, is not extraordinary. However, when mapped the relationship is the opposite of hypotheses made in this document. Those sites nearer the Nduna are, in fact, the ones with *more* shortages (Figure 11). While the Chi-square test does not indicate directionality, mapping the data clearly shows the relationship. This suggests that the Nduna has less control over food issues than previously assumed. This source of the erosion of the traditional authority of the Nduna is unclear. However, a cursory explanation draws upon South Africa's past. The apartheid government of South Africa tried to discredit traditional leaders and cause division in the homelands. People filled out forms for food, but the Nduna never received food promised to him. In addition, during the last food shortage South Africa was a net food exporter. Serious questions are raised about the role of the apartheid state during

food shortages in the homelands. However, more research is needed on the structure of local governance and relations with apartheid South Africa before any clear explanation can be provided.

The distance decay of vulnerability from the Game Park is remarkably steep, as the effects of the park are lessened drastically within five to six kilometers. To understand this phenomenon, a closer examination of the Park is needed¹⁴. Game wardens often patrol outside the border of the park through Khalweni, The Ridge, The Tree and Zagomfe sites. Tales of harassment were not uncommon. However, at Sangoyana, Ximbakazi, and Madlinjini, the park was less impressive on daily life. Respondents replied that rarely had game wardens bothered them at their homes, although isolated incidents had occurred. Fear of the wardens is extensive and pervasive in the four sites nearest the park¹⁵. Hunting is widespread only in the sites furthest from the park. Respondents often took to complaining about the poor quality of hunting in the area compared with the past. The influence of the park is great, but mitigated by distance, poor roads, and a hilly terrain.

Remittances were significant neither as a coping mechanism nor as a source of off farm income. In general, South African homelands have served as sources of significant labor and subsequent out-migration. This study suggests that not *all* areas of the old homelands have played that role in the national

¹⁴ This data was provided exclusively through qualitative methods. Nearly sixty people in close and distant residence to the Park were asked to describe its effects on their life.

¹⁵ In fact, until the conclusion of the pilot study the author was often suspected of being a spy for the Parks Board.

economy. The area studied is relatively near Durban, yet migration and remittances are minor aspects of the economy. While not entirely surprising, the low level of migrations/remittances was unexpected. More research on this topic is needed to clarify and validate this finding.

Finally, the number of respondents in the “highly vulnerable” category of the vulnerability index is disturbingly high (40%). When coupled with evidence that preparations for future famines are lacking, the potential of a future food shortage becomes a pressing issue. The vulnerability index indicates from the data the respondents who have experienced the most shortages, have the fewest fields, have been residents the least amount of time, do not hunt, and have received no assistance from the KwaZulu government. It is interesting that the four sites near the Park are among the most vulnerable according to the above categories (Figure 13).

This study found that people in this area are somewhat able to mobilize themselves around drought. Vogel’s (1994) statement that communities appear to lack any ability to actively mobilize themselves around drought is not entirely incorrect, however, since the context of this study is so vastly different (See Review of Literature). More research is needed for a strong conclusion on this hypothesis.

Broader Questions and Issues The results of this study, presented in the context of the local area only, would indeed provide some insight into food security processes. However, when related to larger theoretical issues, the study

gains a broader relevance, helping to strengthen or weaken a variety of theoretical expectations. Arguing that one case study will drastically alter theory would be shortsighted, however, the study can provide a platform for testing theory. This case study has been set in just such a context. Several hypotheses from the literature have been used in the Zidonini case study, with mixed results. Detailed in this section is the relationship between the findings in this case study and the larger body of theory on food issues. Questions posited include: Is political ecology an appropriate approach to use in this situation?, and How does this case study fit into theory?

An Appropriate Approach? The ecology in political ecology is often marginalized in social science work. No claim was made here that biophysical issues such as soil structure, precipitation levels, or wildlife management issues would be covered. However, the junction of humans and environment and the dependence of the former on the latter are paramount. This study has the same flaw as many other political ecology studies. The use of local natural resources is a key coping mechanism manifested through basket making (the use of local grasses) and hunting, not to mention the most basic dependence of people on the soil and weather. Basket making and hunting are local responses to environmental conditions, mitigated by political, economic, and geographic forces (i.e. game wardens' restriction of hunting even outside the park and lack of markets due to isolation and political indifference). In a broader context, debate over environmental policies has also affected local conditions. The conservationist approach to the environment adopted by apartheid South Africa

was compounded by a paternalistic attitude toward local people. The resentment many residents feel toward the game park stems from the paternalistic policies enforced by the apartheid regime. In discussing the Park, local residents acknowledge the need to protect game, but question why they are the ones absorbing the brunt of the negative effects. *Their* land was seized, *their* cattle lost foraging land¹⁶, and *they* are constantly pressured by game wardens. What have the people who enjoy the Park for aesthetic reasons suffered? Why aren't the Northern Suburbs being preserved? The Park is part of the environmental "package" with which the residents have to grapple. Basket making is a response to pressures put on the population to cope with the loss of resources dedicated to the park. Hunting is no longer a viable coping mechanism to drought, thus in some part, inducing basket making. Basket making has become the most common coping mechanism to drought. Further research could provide confirmation or challenges to this statement. Research in other areas near the park that confirm this finding could indicate a Boserupian situation where pressure on agriculture induces innovation. A lack of evidence on this matter has precluded such analysis on this front, but evokes provocative questions.

Food security is influenced to a small degree by the moral economy. Almost eleven percent of the 120 valid responses to the question about sources of food during shortage were "relatives" or "neighbors". Ranked fourth in terms of importance, the moral economy follows buying food in shops, basket making, and

¹⁶ The Natal Parks Board has recently conceded this point. Cattle are now allowed in the Park in confined areas to graze.

the use of stored foods. When phrased in terms of coping mechanisms, the degree of reliance on the moral economy is more pronounced. When asked about the *first* coping mechanism, relying on relatives and neighbors is second only to basket making. The divergence between the two statistics is rather meaningful. As a coping mechanism, the moral economy is indeed important, but as a source of food less so. People may attempt to get food from neighbors and relatives, but with a lesser degree of success than through food purchase, basket making, or using stored foods. This divergence between expected and actual assistance may indicate a weakening of the moral economy, an explicit goal of the apartheid regime.

Environmental Security Food security is one part of a larger environmental security that includes soil, wildlife, plant, and political security. Food issues are a very large part of the equation and as such need to be considered not only in their own right but also in combination with the other components of security. Food security alone cannot provide total security. The multiplicity of factors involved in the food security process attest to the inter-relatedness of food security with other forms environmental security. Typical queries in a food security study include topics relating to the weather and climate, quality and/or quantity of land, the role of local authorities, etc. The role of food security in environmental security is large, but for an accurate assessment of the level of food security other forms of environmental security must be carefully analyzed, especially in light of the fact that Africans were moved to the most marginal land during the rule of Apartheid.

Scale Issues How does this study relate to the region and nation? The question of integration of scale was brought up early in the Review of Literature. This study addresses issues of migration, drought, food security, coping mechanisms, and preparations at the local scale, but with broad implications for the region and the nation. If one study area was found that calls into question the role of migration, are there others? What does this say about models that base assumptions on a migration economy?

The generally held belief that smallholder agriculture in South Africa is largely unviable and that rural people are dependent on urban processes is seriously questioned. Rural people in this setting are able to mobilize themselves around food shortages. The coping mechanisms, however, do rely heavily on industrial agriculture to produce surplus as evidence by the dependence on "buying food in shops". These dynamics between the local (the study), the regional (migration), and the national (reliance on agricultural surpluses) provide fertile ground for research.

The El Nino Southern Oscillation (ENSO) raises many questions for the southern African region, as ENSO leads to warmer, drier conditions with substantial implications for agriculture. The degree of success in predicting ENSO events has increased in the past decade. At the local scale, coping mechanisms can become proactive rather than reactive. Nationally, governments can prepare for shortages (as the South African government began to do in the summer of

1996) while regionally organizations such as SADC can prepare plans for cooperation and assistance across national boundaries. The questions in this study that addressed preparation for the next shortage was an exploratory exercise in anticipation of the development of a mechanism which allows researchers to ask questions such as "If you knew that there was going to be a drought in X months from now, would you begin coping now and what would you do". This, perhaps, is one of the most fertile areas for future research.

Related to this thesis, research should focus on what farmers in areas such as Zidonini should or could do to prepare for a forecast food shortage. How would people adapt and cope? What about false predictions of an ENSO effect? Will this cause more disruption than preparedness? At the national scale, how will governments react to such information? Will governments prepare far enough in advance as South Africa has begun to do? How will nations cooperate regionally to lessen the effects of a predicted ENSO event? These questions are beyond the scope of this research, but answers are needed urgently.

Problems and Opportunities There were a number of problems in the development and implementation of this study. Translation problems became apparent in the pilot study. Despite being translated and back-translated several times, question design problems became apparent early in the project after two difficulties arose. The first regarded assistance from the outside. The idea behind the question regarding community assistance failed dismally. The prime culprit was translation. During the pilot study the wording of the question was changed several times but to no avail. The goal was to gain an understanding of

assistance from the community as a whole. The question was meant to ask “Did people receive help from members of the community outside of their homestead/family?” but the term “community” and “family” were imprecise at best. Many respondents assumed that this meant people outside the immediate family while others included relatives separated by generations. Others thought “community” referred to the Hlabisa-Zidonini area, while others did not include people next door. The difficulty with the question excluded it from analysis.

The second problem in study design pertained to the question on government assistance. The question was intended to probe for forms of government assistance in the past. However, respondents did not include obvious government assistance programs in the consideration of their responses. Individuals would respond that government had not helped them while at the same time sending children to draw water from a well sunk by the government or using an electrical appliance. Subsequent interviews uncovered the source of the inconsistency. Respondents assumed the question was asking about assistance in the time of shortage, as that was the theme of the questionnaire. Respondents also noted that the electrification and water projects were not intended for one individual only, and therefore, the project was for everyone – one person could not claim that the government had *directly* helped them. A question regarding government assistance to the community at any time could have helped to clear up the inconsistency, if a definition / term for “community” could be identified. The question, however, was exceedingly useful as the focus of government



assistance was narrowed to times of shortage, and therefore, able to be used to highlight differences between respondents and the relationship to vulnerability.

Overall, the design of the study satisfactorily accomplished the goals of this thesis. Other than the two items noted above, the questionnaire schedule was rather successful in isolating issues and conveying ideas. Improvement of the interview schedule would entail probing to uncover the more complex issues, such as the exact role of hunting, and expansion of the core of the schedule to include more biophysical variables and relationships.

The use of a pilot study, follow up questions, and the qualitative method is highly recommended. The qualitative portion provided valuable information both about the quantitative schedule and information not included in the schedule. Discrepancies noted above were identified and corrected through the use of qualitative methods after the pilot study. The short quantitative interview did not always allow the necessary flexibility to pursue topics of interest. The pilot study elicited participant reaction to the actual structure of the questions. Unclear or unanswerable questions were re-translated after meanings intelligible to the participants were identified. The process of clarification in the pilot study, though initially time consuming, allowed for a much smoother interview process afterward.

Chapter Six

Conclusion

Food security results from a dynamic process and understanding it requires careful examination of the history of drought and shortages, coping mechanisms, expectations of future shortages, and prevention, both by local peoples and through the use of Early Warning Systems. Food issues affect a variety of people, from the rural smallholder struggling to provide enough food for her or his family to the government decision-maker trying to implement development programs.

The method for examination of food security issues is drawn from the vast literature, particularly Sen (1980), Watts (1983), Corbett (1988), Lambert (1994), Hesselberg (1994), Campbell (1990), Buchanan-Smith (1995), and Vogel (1995). Central to the analysis was the political ecology framework from which most of the authors examined food security issues. The contestation between coping mechanisms as linear and progressive and coping mechanisms as context specific provided further insight.

This study focused on the level of food security in one area of rural South Africa.

The food shortages and coping mechanisms were identified. The study

X/ confirmed the hypothesis that drought and shortages occurred in 1981-84 and 1992-94. These droughts and shortages set off a series of coping mechanisms

including basket making, buying food in shops, and the use of stored food. The causes of food shortages in the study area were presented as a package. No single cause was cited as the most important, or having the most explanatory power.

The study confirmed other research that has shown coping mechanisms in rural South Africa to be context specific, while following general patterns of coping common to the rest of Africa. The study further confirmed that there is some degree of mobilization around droughts and shortages in Zidonini. Coping mechanisms were poorly developed and obscured by the role of the handicraft trade, but clarified by determining the sources of food.

The study evoked questions about the role of the Hluhluwe-Umfolozi Game Reserve in the lives of people near its borders. The study found that the role of hunting is significant when addressing the level of food security. The inability to hunt affected the population nearest the park border dramatically. The tests indicate that the loss of hunting led to a higher percentage of shortages and a higher level of vulnerability in the study sites near the reserve. However, the lack of hunting was not conclusively determined to be the primary cause of food insecurity.

The study confirmed the hypothesis that shortages are related to distance from political authority. Proximity to local authority was found to have a *positive* effect on shortages, that is, as proximity to the local authority increases, so does the number of shortages, which indicates political incapability.

The use of Geographic Information Systems was found extremely useful. Positional accuracy was the largest challenge, while the display and manipulation of spatial data was the primary benefit. This research may provide some insight into the development of Early Warning Systems for South Africa.

Further research on the political ecology of the area is recommended. Several issues are intriguing and need exploration. First, the role of the game reserve needs further investigation. The role of game wardens, loss of land and hunting rights, and the spatial relationships between the number of shortages and proximity to Hluhluwe-Umfolozi are just a few of the topics that need further investigation. Secondly, the basket trade needs to be examined to determine the precise impact on coping mechanisms and the local economy and ecology, and the methods of incorporating the trade into the larger economy. Third, further research into the role of the political authorities is needed. The study addressed none of these issues in great detail. Fourth, the geographic area was limited by poor infrastructure among other factors and could be widened to include not only more sites but also physically larger sites as well. Fifth, the bio-physical elements relative to food security need to be investigated. Particularly, exact measurements of soil quality and field size are needed in place of the surrogate that was used (number of fields). Drought needs to be more clearly understood. How long after the onset of drought does coping begin? What are the effects of recurrent drought on the basket trade? Is drought more significant than entitlement failure? This study focuses heavily on drought as a causal factor of food insecurity. Are there other areas of KwaZulu-Natal and South Africa where

this is not the case? Finally, more research is needed in the analysis of how these local processes affect the regional and national scales and how regional and national processes affect the local, especially in the case of the ENSO phenomenon.

This study focused on the exploration of themes often ignored in South Africa. While the local context is meaningful, the findings of this study are broadly indicative of the food security situation in rural South Africa. The political economy of the area is not unique to South Africa and this study has provided illustrations that can be used as a context for research in other areas of rural South Africa.

Appendix A

1. How has the weather been?
2. How many people live in your house/ household?
3. How long have you lived here?
4. How much land do you *typically* farm for yourself?
5. How much land do you farm for someone outside your family?
6. What tools do you use to farm?
7. Did any h/h members receive wages from off farm labor?
If yes, who & how much
8. Did the h/h receive remittances?
If yes, how much?
9. Have you experienced a food shortage in the last 10 years?
In the last 5 years?
Please give dates if possible
10. Have you experienced a SEVERE food shortage?
If yes when?
11. What was the first thing you did when food was scarce? Next? and Next?
12. What were the household's major sources of food during the shortage?
13. What do you think caused the last shortage?
14. Did you receive assistance from others in the community?
15. Did you receive assistance from a political party?
16. Did you go to town to work during the shortage?
17. Are you doing anything to prepare for the next shortage?

18. Do you expect the new government will help you in the next shortage?

18a. Do you want them to?

19. Did the Old government help?

19a. Did the KwaZulu government help?

20. What do you need / how can we (the outside) help?

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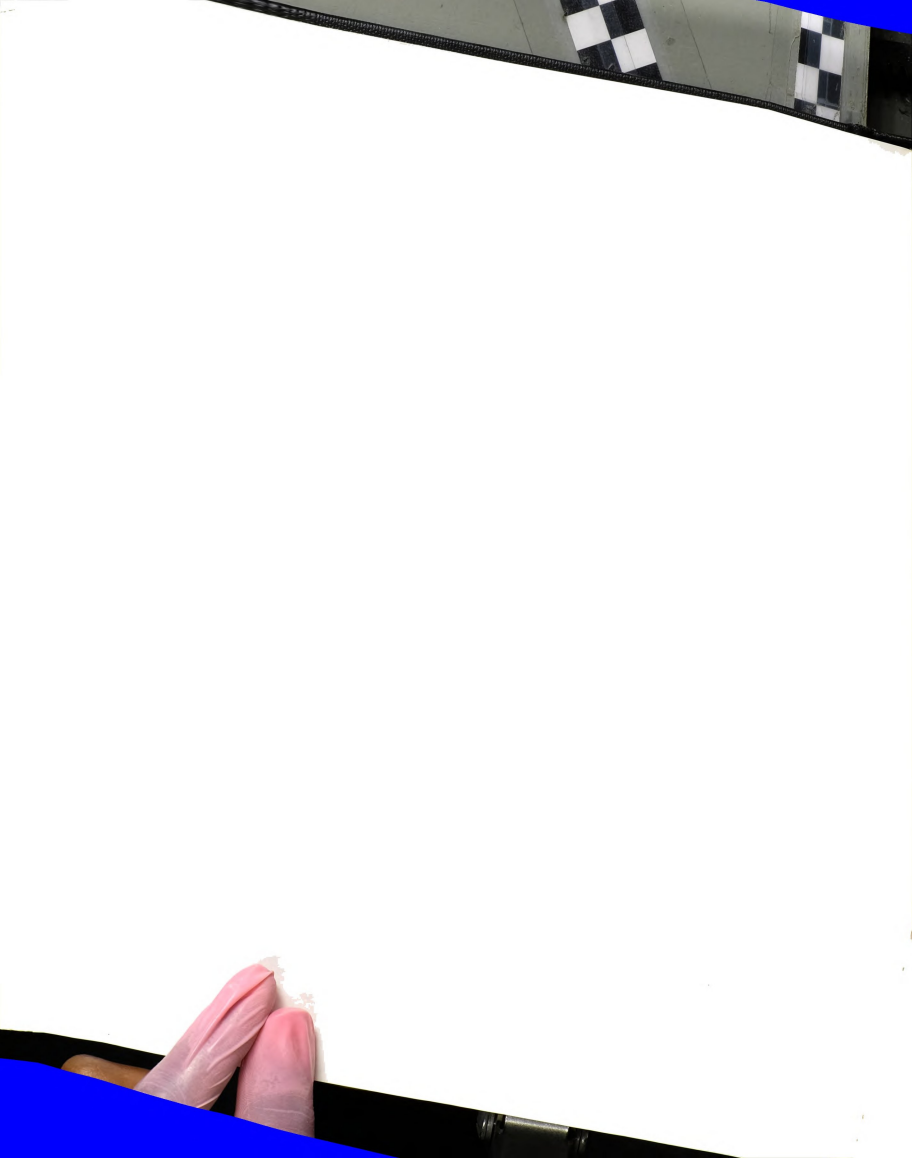
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