

STOP THE BLEEDING, HEAL THE WOUND: THE ROLE OF
FERTILIZER SUBSIDIES IN FOOD SECURITY,
ZOMBA DISTRICT, MALAWI

by

MARIE S. JAVDANI

A THESIS

Presented to the Department of Geography
and the Graduate School of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Master of Arts

September 2009

“Stop the Bleeding, Heal the Wound: The Role of Fertilizer Subsidies in Food Security, Zomba District, Malawi,” a thesis prepared by Marie S. Javdani in partial fulfillment of the requirements for the Master of Arts degree in the Department of Geography. This thesis has been approved and accepted by:

Peter A. Walker, Chair of the Examining Committee

8|25|09
Date

Committee in Charge: Peter A. Walker, Chair
Derrick L. Hindery

Accepted by:

Dean of the Graduate School

© 2009 Marie S. Javdani

An Abstract of the Thesis of

Marie S. Javdani for the degree of Master of Arts
in the Department of Geography to be taken September 2009

Title: STOP THE BLEEDING, HEAL THE WOUND: THE ROLE OF FERTILIZER
SUBSIDIES IN FOOD SECURITY, ZOMBA DISTRICT, MALAWI

Approved: _____

Peter A. Walker

The government of Malawi is being lauded internationally for having ostensibly eliminated hunger within its borders through a subsidy that makes available chemical fertilizers to smallholder farmers. Development scholarship and policy have recently turned toward promoting a “new” Green Revolution in Africa for the establishment of food security and the advancement of economic development. Many view the increased use of chemical fertilizer in Malawian agriculture and the resultant rise in maize yields—described by such publications as the *New York Times* as the “Malawi Miracle”—as evidence that the prescribed NGR is indeed a recipe for success. This thesis places the subsidy in its historical and theoretical framework and discusses the extent to which production-end strategies accomplish the goals of food security. Also discussed are non-production measures that are essential to creating a reliable and accessible food system.

CURRICULUM VITAE

NAME OF AUTHOR: Marie S. Javdani

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene, Oregon

DEGREES AWARDED:

Master of Arts, Geography, September 2009, University of Oregon

Bachelor of Arts, Geography, June 2004, University of Oregon

AREAS OF SPECIAL INTEREST:

Political Ecology
Hunger and Food Security
African Geography

PROFESSIONAL EXPERIENCE:

Graduate Teaching Fellow, University of Oregon, September 2007 to August 2009

Assistant Research Supervisor, Harvard Institute for International Development, Malawi Agricultural Research Project/Center for Social Research, University of Malawi, Zomba, June 2008 to September 2008

Data and Research Technician, Harvard University Center for International Development, February 2007 to October 2007

GRANTS, AWARDS AND HONORS:

Summer Research Award, Fertilizer Subsidies as Solutions to Hunger, University of Oregon Department of Geography, 2008

PUBLICATIONS:

Tallant, M. S. (2006). Plata o plomo: Life choices in rural Colombia. In X. Kennedy, D. Kennedy & J. Aaron (Eds.), *The Bedford Reader* (9th ed., 448-454). Boston and New York: Bedford/St. Martin's.

ACKNOWLEDGMENTS

I wish to sincerely thank Professor Peter A. Walker, for his support in the ongoing development of my work in the Zomba Project, and the countless hours he has dedicated to my training and education. I also thank Professor Derrick L. Hindery for his help in the preparation of this manuscript, and Professor Alexander B. Murphy for his support throughout my academic career. Special thanks are due to Dr. Pauline E. Peters, of the Harvard Center for International Development, for her inclusion of me in the Zomba Project and for her help in better understanding the lives and customs of the people of Malawi. Thanks go to Dr. Daimon Kambewa, as well as Noel Mbuluma and Dorothy Chirwa, without whom my fieldwork would not have been possible. Funding for this study came from the University of Oregon Department of Geography and from the Regional Network on AIDS, Livelihoods and Food Security (RENEWAL), coordinated by the International Food Policy Research Institute (IFPRI) awarded to Dr. Pauline Peters at Harvard University. Thanks are of course due to my husband Cameron, who more than a few times saved me with words of support and the occasional chocolate bar. Finally, I thank the residents of the sample villages for their patience and hospitality as I conducted my research.

For Kendra, my gold standard.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION: FROM BEGGING BOWL TO BREAD BASKET	1
1.1 Research Question and Significance.....	3
1.2 Overview of Subsidy.....	4
1.3 The Dual Roles of Food: Market Meets Subsistence.....	5
1.4 Map of Thesis	7
II. BACKGROUND AND METHODS	10
2.1 Site Description and History of the Zomba Project.....	10
2.2 Methods.....	13
2.3 Literature Review	15
2.3.1 Prominent Authors, Themes and Policy Recommendations	16
2.3.2 Missing Pieces	25
III. THEORETICAL FRAMEWORK.....	28
3.1 The Food Availability Decline Theory	28
3.2 Population as the Cause of Hunger and/or Famine	29
3.3 The Concept of Entitlement	29

Chapter	Page
3.4 The Capability Approach	32
3.5 Primary Goods.....	33
3.6 Modes of Production.....	35
3.7 Metabolism.....	37
3.8 Conclusion.....	39
 IV. A HISTORY OF FOOD SECURITY AND AGRICULTURAL POLICY IN MALAWI.....	
4.1 Pre-European Agricultural Practices.....	40
4.2 European Contact.....	44
4.3 Early Colonialism	47
4.4 Late Colonialism.....	51
4.5 Independence and Policy under Life President Banda	56
4.6 Debt, Donor Agencies and Structural Adjustment	59
4.7 The Era of Democratization	60
4.8 Food Crises of the 2000s.....	61
4.9 Bingu wa Mutharika	62
 V. OBSERVATIONS AND INTERPRETATIONS.....	
5.1 Coupon Distribution.....	65
5.1.1 Quantitative Assessment	65
5.1.2 Respondent Assessment	68
5.1.3 Central Distributional Challenges.....	72

Chapter	Page
5.2 Maize Production.....	77
5.2.1 Quantitative Assessment	78
5.2.2 Other Cultivation Challenges.....	82
5.2.2.1 Soil Quality	82
5.2.2.2 Land	83
5.2.2.3 Labor.....	85
5.2.2.4 Weather	86
5.3 Food Security.....	86
5.3.1 National Self-Sufficiency	87
5.3.2 Household Food Security	88
5.3.2.1 Quantitative Assessment.....	89
5.3.2.2 “Feeling” Hungry	94
5.4 Conclusion.....	97
VI. BROADER SIGNIFICANCE.....	98
6.1 Economic and Social Opposition.....	98
6.2 Ecological Considerations.....	100
6.2.1 Intercropping.....	102
6.2.2 Animal Manure	104
6.2.3 Compost Manure.....	106
6.3 Alternatives to the Current Subsidy	108

Chapter	Page
VII. CONCLUSION: STOP THE BLEEDING, HEAL THE WOUND	111
7.1 Lessons from the Subsidy	111
7.1.1 Execution and Design.....	112
7.1.2 Provision.....	112
7.1.3 When Market Meets Subsistence.....	112
7.2 Looking Forward: Time for a New Green Revolution?.....	115
7.3 Conclusion.....	116
REFERENCES.....	118

LIST OF FIGURES

Figure	Page
1. Zomba District Research Area	11
2. Households Receiving Coupons, by Cluster	66
3. Households Receiving Coupons, by Expenditure Quartile.....	66
4. Households Receiving Coupons, by Asset Quartile.....	67
5. Households Receiving Coupons, by Land Holdings	67
6. Household Maize Harvest, by Expenditure Quartile.....	81
7. Household Maize Harvest, by Asset Quartile	81
8. Household Maize Harvest, by Land Holdings	83
9. Months of Maize in Storage, by Cluster, 2007	90
10. Months of Maize in Storage, by Cluster, 2008	90
11. Months of Maize in Storage, by Expenditures, 2007	91
12. Months of Maize in Storage, by Expenditures, 2008	91
13. Months of Maize in Storage, by Assets, 2007	92
14. Months of Maize in Storage, by Assets, 2008	92
15. Months of Maize in Storage, by Land Holdings, 2007.....	93
16. Months of Maize in Storage, by Land Holdings, 2008.....	93

LIST OF TABLES

Table	Page
1. Estimated Annual Maize Crop, in millions of tons	78
2. Yields by Type of Maize and Treatment in metric tons per hectare	84

CHAPTER I
INTRODUCTION: FROM BEGGING BOWL
TO BREAD BASKET

Malawi, long a popular media pariah for hunger and famine, once again made international headlines for its conditions of food security in 2007. This time, however, the news was good, as it seemed Malawi was finally on its way to becoming food secure while at the same time setting an example for the rest of the developing world in need of better hunger policy. After spending the better part of 25 years obeying the dictates of lending agencies such as the World Bank and International Monetary Fund, Malawi decided to, as aptly described by Celia Dugger of the New York Times (2007), “follow what the West practiced, not what it preached.” In other words, rather than continuing to adhere to the dogma of free-market and counter-protectionist policy, Malawi has decided to help itself.

The policy receiving such acclaim is a subsidy that provides chemical fertilizers and hybrid seeds to a selected group of smallholder farmers, whose productive potential is perceived to have been hampered in the past by inadequate soil fertility. With the inception of the policy in 2005 came promises from the government that Malawi’s need to go begging for food was over. Indeed, the following two cropping seasons yielded

record harvests. Having filled the “food gap”—that is, achieved national yields equal to estimated aggregate caloric needs—the subsidy was regarded internationally as an agricultural miracle. However, the declaration that Malawi’s having exported maize for two consecutive years meant the “end of hunger” (Dugger, p. 6) may have been premature, as evidence has emerged that household-level food security, while improved, was far from universal (Dorward & Chirwa, 2008; Peters, Walker, & Kambewa, 2008). Further, the 2007/2008 cropping season was characterized by heavy rainfall and flooding in some areas, causing a setback in the gains of the previous years. These issues call into question the tendency to equate national food self-sufficiency and exportation with food security.

However, one can hardly ignore the benefits brought about by the subsidy. Higher yields can have the effect of lowering food prices and providing opportunities to pursue alternative activities to farming. Though many Malawians have some complaints about the program—mostly relating to distributional issues—very few would argue against the continuation of the subsidy. In short, the resultant increased yields from the subsidy have almost certainly boosted livelihoods and saved lives across the country.

In light of the successes and shortcomings of the subsidy program, food policy must continue to evolve if it is to make further gains toward food security. Among the many considerations are: improved targeting of the benefits of the subsidy; an account of the ecological consequences of increasing yields and the use of agricultural chemicals; the need to balance national food security measures with concerns of household food security; and the need to provide additional support to those households that remain un-

served or underserved by the program. In short, it is necessary to assess the subsidy within the broader Malawian political economy in order to understand its role in food security, and what needs remain.

1.1 Research Question and Significance

The research that informs this thesis questions the place of the subsidy within the political economy of Malawi and its national and local food systems. Particular attention is paid to the extent to which the subsidy has served to ease chronic hunger and to prevent acute food crises, the ways in which the subsidy fits within current policy and social structure, and the ways in which the benefits of the subsidy are differentially experienced. A central question is the extent to which the higher maize yields recorded since the beginning of the subsidy translate into food security.

The timing of this study is such that it occurs as the development community (whether in the academy, activist groups, or policy-making institutions) is increasingly turning the discussion of food security and development to the concept of a “new” Green Revolution for Africa (NGR) (“Alliance for a Green Revolution in Africa,” 2008; Dugger; Sachs, 2005; World Bank, 2007). Scholars, non-governmental organizations, popular media, charitable foundations (such as the Bill and Melinda Gates Foundation and the Rockefeller Foundation), international agencies (such as the World Bank) as well as national governments perceive increased agricultural production to be a solution to worldwide hunger. In the face of volatile global food prices, this study is particularly important in that it demonstrates that the proposed NGR may serve as a stop-gap

measure, but the unconditional high praise it has received distracts the development community from addressing hunger at its root. Considering the attention currently being paid to Malawi's "success", this research could not be more timely nor more relevant.

1.2 Overview of Subsidy

The current subsidy began in the 2005/2006 cropping year, on the back of a terrible harvest in 2005. Malawian President Bingu wa Mutharika (hereafter Mutharika) was elected in 2004 on a platform of improved food security through agricultural policy. The famine of 2005, in which nearly five million people required some form of food aid, was an embarrassment for Mutharika. The introduction of the subsidy in 2005 was accompanied by a declaration from Mutharika that "...as long as I am the president, I don't want to be going to other capitals begging for food" (Dugger).

Thus, the objective of the subsidy, according to Ministry of Agriculture and Food Security documents, is to "increase agricultural productivity and hence improve food security at the national and household level," by "improv[ing] accessibility and affordability of agricultural inputs among the most vulnerable in the country" (Ministry of Agriculture and Food Security, 2007). This was to be done by providing access to two 50-kilogram bags of fertilizer and 10 kilograms of hybrid seeds at discounted prices to a target group of smallholder farmers. Targeted households were described as the "middle 60 percent" of producers: those who were wealthy enough to own land, purchase the subsidized inputs, and use them to increase their maize production, but not so wealthy that they can afford to buy the inputs on their own. The bottom twenty percent are

considered to need more assistance than the subsidy provides, and thus would be unable to put the subsidized inputs to full use, while the top twenty percent are seen as not needing the subsidy to remain productive.¹ Selected recipients received a series of coupons, which they redeemed at designated locations for the inputs listed on the coupon.

The structure of the subsidy has remained more or less constant over the four years it has been in place. Some changes include the subsidized price of the fertilizer (from 950 Malawi kwacha in 2005/2006 to 800 kwacha in 2008/2009 for maize fertilizer; from 1450 kwacha to 800 kwacha for tobacco fertilizer), reassignment of the role of coupon distribution, and inclusion of private firms in fertilizer procurement.

1.3 The Dual Roles of Food: Market Meets Subsistence

Many have attempted to explain chronic food insecurity as the result of two incompatible production and distribution systems (Mandala, 1990; Karl Marx & Friedrich Engels, 1990; Scott, 1976; Watts, 1983). It is theorized that the survival structures of a society living on the margin—that is, constantly at risk of a crisis—is one of risk-aversion. James Scott refers to this as the “Safety-First” principle (1976, p. 6). The goal is to maintain a minimum requirement for subsistence. Meanwhile, the aim of the capitalized market system is to maximize the average return on production by leveraging risk over profitability. This is more viable where a surplus exists with which the producers may gamble.

¹ A full description of the intended recipients of the subsidy can be found in section 4.1.3 of this document.

Thus, a duality exists within food and agricultural systems worldwide. This duality has come about as a consequence of the creation of the “food economy,” and the commercialization of agriculture. As is detailed in sections 4.1 and 4.2, the process of monetization in Malawi created a second life for food. Beyond the role of social and biological sustenance, food became a commodity. Today, although the right to eat a healthy and fulfilling diet has been officially acknowledged by the United Nations and most national governments as basic and fundamental (Food and Agriculture Organization, 1996), fulfillment of this right has largely been left to the individual, who must assert his or her power within an increasingly unregulated market. Though the stated goals of many development programs are to increase food security, they are often self-defeating because they neglect the social nature of food. That is, development programs often rely exclusively on economic sources of food, without accounting for social, cultural, political or ecological inequality within the idealized “free” market—see section 6.1. One of the main themes occurring throughout this thesis, Amartya Sen’s concept of entitlement—see section 3.3, attempts to invoke all limitations to access to food, rather than simply economic ones. It is vital to acknowledge the social context of food as well as its role as a market commodity in order to understand ways in which the food system will respond to the inputs provided by the subsidy.

I argue in this thesis that the challenge facing Malawian smallholders is that of needing to maintain the minimum requirement needed for survival, while balancing the needs of the capitalist market of which they are now a part. Therefore, I examine the role of policy in helping smallholders balance those needs.

1.4 Map of Thesis

The objective of this study is to identify a context in which the input subsidy can be analyzed. Production-based food security policy has been over-emphasized in the development community. Here I analyze the social, political and ecological circumstances leading to the patterns of food security seen in Malawi. In order to do this, this thesis places the subsidy within its theoretical and historical context, explaining along the way the types of changes that have taken place to lead to the current Malawian political economy.

Chapter II details the research featured in this thesis. Beginning with a description of the research site and previous studies, this chapter provides the basic economic, demographic and sociological information needed to understand the study. A methods section then explains my research strategies and circumstances under which the research took place. Finally, a literature review contextualizes this study in relation to other research on food security and agricultural policy in Malawi, with some suggestions made for future directions for research.

Chapter III creates a theoretical framework for understanding the processes at work in Malawi's political economy. Marx's modes of production analysis is used to understand the changing relationships between the local means (that is, resources) of production and the relationships of production (that is, how the resources are used). Another important concept introduced in this chapter is Sen's entitlement theory, wherein analysis of food security, or the lack thereof, integrates all aspects of an individual's access to food, avoiding the common mistake of concentrating only on economic

entitlement. Finally, metabolic rift is used to describe the ecological process of soil degradation in the context of increasingly commercialized agriculture.

In Chapter IV, I detail the history of agricultural and economic policy change in Malawi over the last 150 years. Beginning with a description of agricultural and social relations in the region prior to European contact, the chapter follows the changes that take place with each new form of political government, and the effects of those changes on local practices. The chapter ends with a description of present-day Malawian politics and agricultural and food security policy.

Chapter V contains detailed analysis of the data collected during the 2008 study. Observations are made on coupon distribution, the contribution of the subsidy to agricultural production, and the subsidy's effect on food security at both a national and household level. Here, the importance of scale in analysis and interpretation of these data is stressed.

Chapter VI relates the findings of Chapter V to the theoretical and historical contexts built in previous chapters. By offering a discussion of the economic and ecological critiques and counter-critiques of input subsidies, I illustrate some factors in the design process of establishing such a policy. Particular attention is paid to the ecological effects of chemical fertilizers and their traditional counterparts. Some alternatives to input subsidies are also discussed.

The work of the preceding chapters leads to the concluding chapter (VII), wherein I make the argument that temporarily mitigating the problems of a broken food system is only the beginning of the process of healing it. Here I summarize the findings of the

study and illustrate ways in which the analysis used here should be applied to agricultural development decision-making in general. Finally, I attempt to discuss input subsidies in the context in which they are often found in popular development literature: as one element in the introduction of a “new Green Revolution” for Africa and other developing areas

With these themes in mind, it is hoped that the end product of this thesis is a nuanced look at the place of input subsidies and other production-based strategies as only the beginning of the struggle to achieve food security in Malawi.

CHAPTER II

BACKGROUND AND METHODS

This chapter is an introduction to the ongoing research in the Zomba District. Following a description of research methodology, the chapter closes with a brief review of literature relating to Malawian food security and agricultural policy.

2.1 Site Description and History of the Zomba Project

Research took place in six clusters of villages in the Zomba District of southern Malawi—see Figure 1. The area is highly densely populated, impoverished, and heavily reliant on agriculture for sustenance. The subject pool was originally selected in 1986 at the beginning of a longitudinal study conducted in this area by Pauline Peters, of Harvard University. Those involved believe the longevity of this study to be unique to research in Malawi. Peters' original intent was to study the effects on food security of cash crops and agricultural liberalization. Data was collected in 10-12 monthly rounds in 1986/1987², 1990/1991³, 1997⁴ and 2006⁵. Analysis during the 2006 round was focused

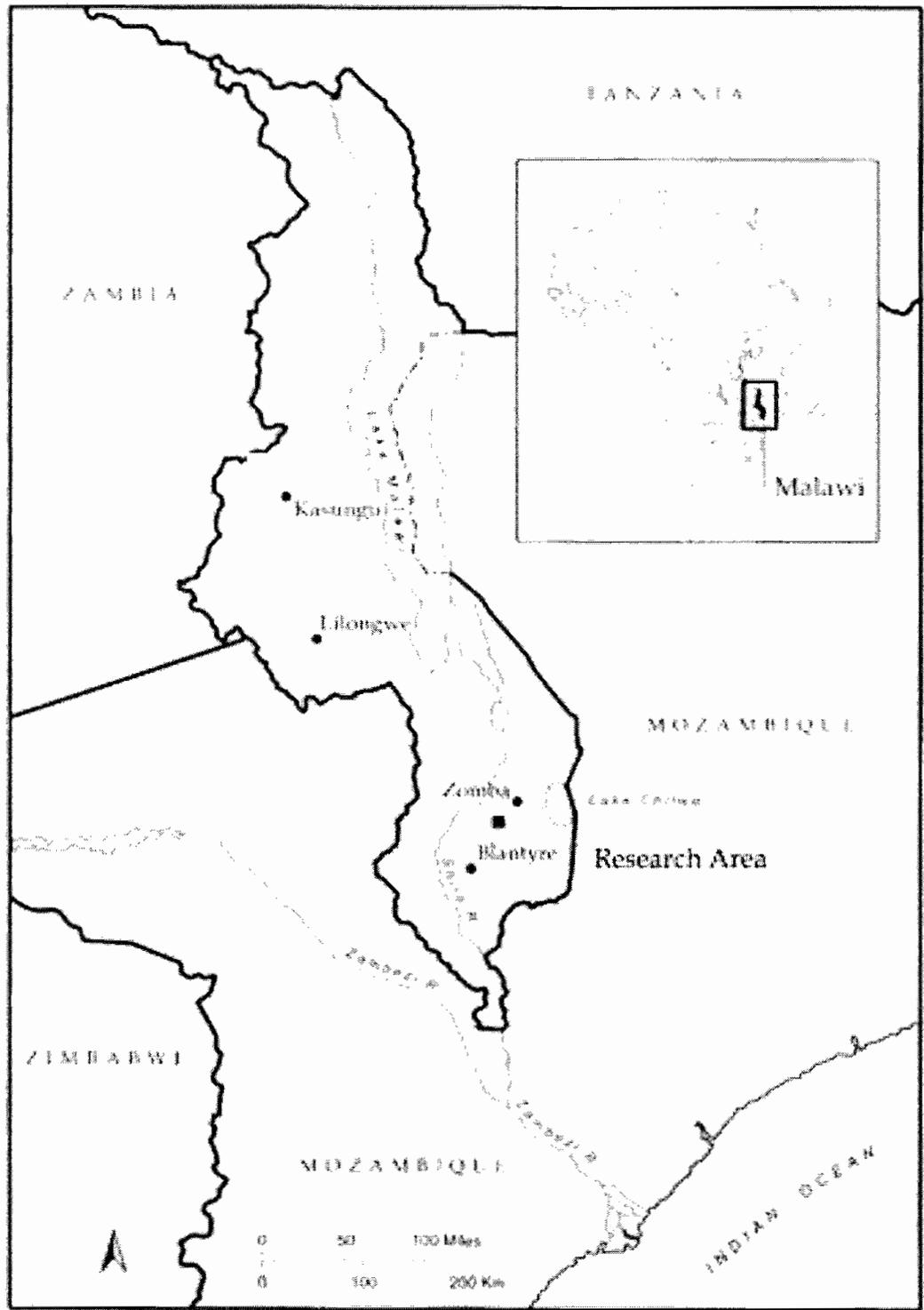
² See Peters 1989.

³ See Peters 1992, 1994 and 1996.

⁴ See Peters 1999.

⁵ See Peters, Walker and Kambewa 2008.

Figure 1: Zomba District Research Area



on understanding the social, cultural and economic impacts of HIV/AIDS on respondent households and their communities. It should be noted that due to the original use to which the dataset was to be put, sample selection was partially biased toward those households with the capacity for cash crops. Thus, the sample is somewhat skewed toward households having more land—each household in the sample owns at least some land—and generally more resources than the population of Malawi as a whole. Though the sample population contains households that could be considered extremely poor, the sample should not be taken as representative of Malawi as a whole.⁶ Additionally, the sample fluctuates somewhat from one round of collection to the next. Some households are lost through migration, while daughter and sister households continue to be added to the study. All comparisons across years of study are thus made of only the original, “core” households.

The subject population consists of approximately 230 households with a mean occupancy of 5.5 persons. The population ranges in age from 0 to 85+ years. The mean dependency ratio is 0.79 (dependents/adults) (Peters & Walker, 2006). The population age structure reflects the high HIV prevalence—listed as 18% for Zomba district (Malawi National Statistical Office, 2004)—in that the population between ages 25-45 has dropped severely in the 20 years since the study began (Peters et al., 2008). Demographic changes due to HIV/AIDS have had negative consequences for the overall food security of the area because the primary working and producing age group is that which is most affected. HIV/AIDS has been shown to be the cause of other sources of food insecurity in the form of lost labor to illness and caring for the sick, lost wages and

⁶ See Peters 1989 for a full description of original sample selection.

expenditure transfer from food needs to medical care (Barnett & Blaikie, 1992; Peters et al., 2008).

Land is inherited through a matrilineal system, making women the primary landholders. Likewise, the majority of households are headed by women or by a married couple. Almost no households are headed by a single male. Income indicators place female-headed households below those headed by a male and female.

The single most important crop in the study area is maize, grown mainly for subsistence but increasingly for sale as well. In 2006, the average reported number of crops mixed on a single field was 6.3 (range was 2 to 12). Of those crops and aside from maize, which was grown by every household, the most commonly mentioned crops were pigeon peas (188 of 236 households), cowpeas (88 of 236 households) and groundnuts (77 of 236 households). Other intercrops include cassava, pumpkins, sorghum, tomatoes and sweet potatoes. The main cash crop is burley tobacco, which is grown for sale on the international market.

2.2 Methods

Data gathered were both quantitative and qualitative. Data was collected via questionnaire-based interviews of heads of households. The questionnaires consisted of household demographic updates of the entire population, household economic assessment through analysis of assets, review of agricultural practices and annual maize yields, respondent evaluation of the fertilizer subsidy program, and assessment of food security through methods detailed below.

Qualitative interviews were also conducted with two expert informants. Formerly the chief consultant on agricultural development in sub-Saharan Africa for the World Bank, Stephen Carr has lived and worked in Malawi for 20 years. He has long advocated for input subsidies in Malawi and was one of the architects of the current subsidy. Ephraim Chirwa is an associate professor of Agricultural Economics at the University of Malawi, Chancellor College, and the founder/director of Wadonda Consult, which offers consultancies in socio-economic and market surveys, as well as project appraisal and evaluation. He was one of the co-authors of an appraisal of the 2006/7 input subsidy commissioned by the Malawi Ministry of Agriculture and Food Security (MoAFS) and the United Kingdom's Department for International Development (DFID).⁷

Both groups—heads of households and key informant scholars—were asked their opinions of the effectiveness of the fertilizer subsidy program. They were requested to evaluate the distribution of the coupons, estimate effects on food security in general, and to suggest strategies for its improvement. Qualitative interviews with Carr and Chirwa included discussions of the uses to which food and food security are put in politics. Respondents from the Zomba group also discussed specific food security strategies undertaken within their household.

The 2008 study drew from data gathered in previous rounds of study (1986 through 2006). The pre-existing dataset consisted of the following:

- *Household demographics*: membership, headship, dependency ratio, age, education, occupations, morbidity and mortality, young child anthropometry;

⁷ See section 2.3 for a discussion of each author's work.

- *Household economic status*: expenditures and assets; land holdings; sources of cash income;
- *Agricultural practices*: crops grown, tobacco yield when applicable (using sales as a proxy), maize yield, use and source of inputs with particular attention to fertilizer subsidy coupons and purchase;
- *Food security*: meals (by 24-hour recall), bimonthly quantity of grain in storage; food expenditure ratios;

Due to the short duration of the 2008 study, data from 2006 serve as a baseline for the 2008 assessment. The purpose of the quantitative data analysis is to examine coupon distribution within the respondent population. Special attention is paid to the type and amount of fertilizer received by each household in comparison to demographic, economic and food security indicators. Key demographic indicators are headship, dependency ratio, and relative age of the key woman. Economic indicators used are expenditure, assets and landholdings. Finally, food security is assessed using maize harvests and grain storage, gathered in 2008. Always a difficult characteristic to quantify, many other factors must be considered in the assessment of food security. For instance, ownership of a *dimba* (dry season) garden makes enormous difference in the level of food security experienced by a household. This and other non-yield factors (to be discussed in chapter IV) are taken into consideration whenever possible.

2.3 Literature Review

This section outlines the prominent authors and central themes of Malawian food security literature. After a discussion of the main policy recommendations found in the

literature, the section concludes by suggesting the need for inclusion of several missing elements in the discussion of food security. It is an unfortunate effect of limited space that not all contributors to the food security literature of Malawi can be examined here. I attempt to integrate authors who have made significant contributions to the central themes found in the literature today.

The work of Pauline Peters forms the basis of this study. In addition to historical and social background information for the sample population itself, Peters' mode of analysis is employed at many points within this thesis. Specifically, Peters integrates her observations of economic trends and processes into a broader cultural and social context based on her extensive ethnographic work. Peters is able to explain in detail, for instance, how the liberalization of burley tobacco in Malawi both benefited and undermined the food security of different segments of the population (Peters, 1989; Peters, 1996). Further, Peters' understanding of the unique cultural traits of the population guided the data analysis of this thesis to move beyond the usual assumptions found within Western development literature.

2.3.1 Prominent Authors, Themes and Policy Recommendations

In Malawi, agriculture and food security tend to go hand-in-hand. It follows that agriculture would be prominently featured in the literature regarding food security and development. Most commonly discussed are production-based and market-based food security strategies. These typically take the form of programs to promote the use of

agricultural inputs such as chemical fertilizers and hybrid seeds, as well as cash cropping and other income-producing schemes.

One of the main proponents of the advancement of agricultural technology in Malawian production is Melinda Smale. She, along with her frequent co-author, Paul Heisey, has often written on merits of high-yielding hybrid maize and chemical fertilizers in raising agricultural production. Smale's work analyzes the benefits and obstacles to the adoption of hybrid seed varieties. Her tendency is to emphasize the commercial use of maize and the importance of adaptation to growing land constraints and the need to supplement Malawian diets with items other than maize (M. Smale & Jayne, 2003). She concludes that Malawians have historically made the risk-averse choice of selecting local seed varieties, which they consider to be more dependable and suitable for local consumption (Melinda Smale, 1995). She argues that policy should shift from self-sufficiency strategies to evoking comparative advantage on national and international markets (Melinda Smale, Heisey, & Leathers, 1995).

In many ways, Anne Conroy's assessments of the food security problems in Malawi are similar to those of Smale. Conroy was an advisor in the Malawi government under its second president, Bakili Muluzi, during which time she was behind many agricultural policies of that administration. She co-authored *Poverty, AIDS and Hunger: Breaking the Poverty Trap in Malawi* (2006) with Malcolm Blackie—a Zimbabwean whose expertise is in agricultural technology and natural resource issues, Alan Whiteside—a South African AIDS researcher, Justin Malewezi—former Vice President of Malawi and Conroy's boss while she worked for the government, and Jeffrey Sachs—

a controversial American economist. This edited volume is her main contribution to the literature. Conroy judges the causes of food insecurity in Malawi to be production constraints, specifically lack of soil fertility, labor stresses and problems of land tenure. She also cites economic causes stemming from structural adjustment, low gross domestic product and debt. Her recommended solutions are ones that can be found throughout development literature. She emphasizes the need for external inputs (seeds and fertilizer) to increase production, and international aid in order to maintain or improve government services. The chapter co-authored with Sachs contains a list of “quick wins,” which Sachs has promoted elsewhere (Sachs, 2005) as strategies for rural development.

A small digression regarding Sachs’ “quick wins” is necessary here. Sachs’ to-do list is a set of humanitarian and development goals that would be the envy of every impoverished and struggling nation in the world. Unfortunately, however, to refer to Sachs’ list as “quick wins” borders on absurdity, as many of the items listed are neither quickly-achieved nor automatic wins. While few would argue that, for instance, “Eliminating school fees to ensure that all children are in school” (Conroy, Blackie, Whiteside, Malewezi, & Sachs, 2006, p. 224), is not a praiseworthy goal, this is much more easily said than done. In Malawi, the elimination of school fees would have to be followed by increased government funding in order to pay teachers and administrators. New schools would have to be constructed throughout the country to accommodate the additional pupils. Families would need a way to replace the labor provided by their children in agricultural production. Children would still require school uniforms, books and supplies—a prohibitive cost for most smallholder families. Finally, higher-paying

jobs would be needed for a more educated population to make the time spent in school worthwhile. It is not the intention here to indicate that any of these goals cannot be accomplished or that they should not be attempted, but it is important to acknowledge that the simple step of eliminating school fees must be accompanied by many not-so-easy developments in order to be helpful. As we shall see later in this work, another entry on Sachs' list, "Providing impoverished farmers...with affordable replenishment of soil nitrogen and other nutrients" (Conroy et al., 2006, p. 224), is no easy achievement, and certainly cannot be reached simply by creating wish-lists and making pleas for more international aid.

One of the most influential economists in the literature is Andrew Dorward, of the School of Oriental and African Studies at the University of London. Dorward cites risk and lack of market access as the most common causes of food insecurity. When describing the food crisis of 2002, Dorward refers to natural shocks, price variation and opportunistic behavior on the part of the powerful as having contributed to the risks of the food system (Dorward & Kydd, 2004b). In reference to the market, Dorward sees liberalization as having been too drastic in the case of Malawi. Rather, he recommends a short-term and long-term strategy, beginning with support provided by government where markets are absent or underdeveloped, then a gradual shift away from government intervention as markets develop (Dorward & Kydd, 2004a). He also supports government intervention in social protection, providing services like welfare for relief and recovery, risk insurance to encourage growth, and resilience-building in the macro-economy (Dorward et al., 2006). His view on input subsidies is that they are useful short-term,

pro-poor strategies, but must be implemented correctly or else risk social dependence (Dorward & Kydd, 2004a).

Alistair Orr has studied the role of what he refers to as a “technology package” of burley tobacco, hybrid maize and chemical fertilizer in Malawian smallholder agriculture. He has found that smallholders who adopt the cultivation of burley tobacco are more able to use the income to pay for hybrid seeds and fertilizer, and are therefore more food secure than those who do not (Orr, 1998). He also found that adoption of these mutually-reinforcing elements is neither simultaneous nor evenly distributed geographically. Because not all smallholder farmers have enough land to support the rotation cycle of burley tobacco, Orr observed an increase in the disparity between the poorest and somewhat better-off classes of smallholders, though the poorest did derive some benefit from the increased availability of wage labor (Orr, 2000). For that reason, he advised that liberalization be accompanied by alternative forms of welfare and assistance to the very poorest of households (Orr, 2000).

Sarah Levy, of Calibre Consultants, published an edited volume in 2004 about an agricultural input program started in Malawi in 1997. Contributors included Levy, Dorward and Kydd, Smale, Conroy and others. The program, referred to as “Starter Packs” (described in detail in section 4.7), distributed small amounts of chemical fertilizers, hybrid maize seeds and seeds for legumes to smallholder farmers. Levy, along with several of the others mentioned above—most notably Anne Conroy—was on the committee responsible for designing and implementing the program. Levy’s view was that the cause of Malawi’s food security problem was chronic under-production, and the

biggest constraint to that was lack of agricultural inputs. Levy's argument in favor of Starter Packs was that the adoption of so-called "best-bet technology" enabled smallholders to sell more of the maize in order to be able to buy more inputs the following year (Levy, 2004). She blamed the instability of output markets and World Bank pressure to reduce government expenditure for the failure of the program to produce lasting results. Like others, Levy stresses the importance of long-term strategies such as cash cropping, off-farm employment and market and infrastructure development for food security and economic development (Levy, 2004).

Orr's and Levy's assessment that the role of the public sector is to help generate effective demand for agricultural inputs is seconded by Uma Lele, whose work for the World Bank, the United Nations Food and Agriculture Organization (FAO) and the Consultative Group for International Agricultural Research has included assessments of public policy toward and farmer adaptation of fertilizer in African countries (Lele & Ekoir, 2004). Lele's assessment of the Malawian situation is that agricultural returns for labor are limited by lack of inputs, and that they are unable to keep up with growing population pressure (Lele, Christiansen, & Kidiresan, 1989). Her solutions are "learning by doing" fertilizer adoption, extension, and credit targeting of the poor (Lele, 1975; Lele, Christiansen, & Kidiresan, 1989).

Finally, Stephen Carr (introduced in section 2.2) has also contributed to the literature by assessing the causes and results of smallholder adoption of hybrid maize and chemical fertilizer, which he argues to be vital for achieving food security. Carr writes of a "frustrated Green Revolution," the progress of which was stopped in Malawi because of

a series of “necessary” World Bank structural adjustment reforms, such as the cutting of input subsidies and currency devaluation (Carr, 1997). Carr’s priority in food security is national food self-sufficiency, which, according to him, results in increased household food security through trickle-down effects such as lower food prices and increased wage labor opportunities. The central challenge, then, is to encourage smallholder use of agricultural inputs with minimum and temporary market distortion (Carr, 2001). As one of the main architects and proponents of the current subsidy program, Carr appears to be getting his wish.

Hence, production policy is often favored over concerns for distribution. When attention is paid to distribution, the advice consists mainly of price and market incentive policies. The most common theme up to this point has been the suggestion that if smallholders are provided with even small amounts of free inputs in the beginning, their effective demand will grow, thus bringing the market to them. Once this cycle has been set in motion, according to the literature, it will be self-sustaining. Then the only role of the public sector will be to continue targeting the poor for inclusion in the market. The main difference among authors so far has been on the question of national self-sufficiency (Carr, Harrigan) versus full globalization of the food market with exports paying for imports (Smale, Heisey, Orr, Lele).

Stephen Devereux offers a somewhat different view. While acknowledging that production and market inequalities are a serious problem, Devereux also highlights social issues such as gender inequality, and degenerating informal social support systems as obstacles to food security (Devereux, 2007). Devereux’s treatment of the food system as

a series of social connections—rather than as a self-regulating machine—allows him to transcend market analyses to make recommendations upon differing types of need within and between different demographics (Devereux, 2007). He suggests a variety of programs, including cash transfers, public works programs, and input subsidies for food and agricultural policy (Devereux, 2002a, 2002b; Devereux, Baulch, Phiri, & Sabates-Wheeler, 2006).

Jan Kees van Donge stands out in this review as an author who specifically addresses the cultural value of food and food production in Malawian society. According to van Donge, maize has a higher value in the minds of Malawians than does money. In fact, the social impetus is on producing one's own food in order to prevent having to enter the "unreliable" cash market (Van Donge, 2005). Since access to inputs is the main constraint to household production, according to van Donge, households engage in cash cropping in order to buy inputs (Van Donge, 2002).

Jane Harrigan's work relies extensively on historical development for understanding of current patterns in policy. Her 2001 book, *From Dictatorship to Democracy*, follows changes in economic policy throughout Malawi's postcolonial history (Harrigan, 2001). Harrigan supports self-sufficiency policy strategies, but also stresses the importance of what she refers to as "insurance policies." That is, she explains that there is a need for institutions such as strategic grain or cash reserves, as well as other social safety nets and livelihood strategies for the poor (Harrigan, 2005). Harrigan's work on relations between the World Bank and the Malawi Government

throughout structural adjustment is particularly informative for understanding the political process of policy-making (Harrigan, 2003).

Another historically-oriented scholar writing about food security in Malawi is Elias Mandala. Mandala's emphasis is on a long-term account of how food systems have changed in the years since first European contact. Mandala's work is particularly important, as it stands out from others—with the notable exceptions of Peters and van Donge—in highlighting the importance of cultural and social relations of food within Malawian society. His description of the social roles of cultivation, harvest, preparation and consumption, and particularly the ways those roles have changed in response to policy (Mandala, 2005) lays the foundation for the discussion of food relations in this thesis. Mandala's most important contribution to this work is the importance he places on food's duality—that its roles as a basic need and as a market commodity—and the conflicts that arise when policy fails to recognize its multiple roles.

Finally, historians David Hirschmann and Megan Vaughan analyze the role of gender in economic and household relations, particularly in relation to food security. They argue that although women were somewhat socially subordinate to men before the arrival of European colonists and capitalism, the changes brought by the new systems, particularly the diversion of male labor from food production, further marginalized women while increasing their burden of household provision (Hirschmann & Vaughan, 1984). Aside from Peters, few contributors pay such close attention to gender roles and the matrilineal system as does Vaughan. Some other missing or underrepresented elements are outlined in the following section.

2.3.2 Missing Pieces

In this body of literature, largely dominated by agricultural and development economics, little attention is paid to theories of food security beyond concerns of production and marketing. The analyses used by many of the authors listed above would be well-served by the integration of some broader concepts of food security. The exceptions here are Mandala and Vaughan, who discuss such theorists as Amartya Sen and Michael Watts. The need for integrating concepts external to productive and market forces will be outlined in the following chapter.

As mentioned in section 1.3, another often-neglected approach in the study of food security is the acknowledgement of the different roles of food within a society. The policy suggestions made within most of the present literature treat food almost exclusively as a commodity. There is a tendency to downplay the importance of informal safety nets, thus no policy space is made for them. As a result, policy is potentially counter-productive. This thesis ties together the strands of food's duality in order to more fully understand the ways in which its different roles are shaped by social, economic and political relations.

Production also tends to take a deceptively linear character in most accounts of food insecurity. Production is often spoken of as the result of a combination of factors—land, labor and inputs—which can be formulated to predict their outcome. While it is important to recognize the constraints with which smallholder farmers struggle, the reductionist tendency to focus solely on inputs obscures many of the problems in food security. Section 3.5 outlines a need to consider not only the material elements of

production, but also the circumstances under which production takes place, as well as the relationships between producers, consumers, and policy-makers.

Additionally, two distinctly geographical modes of analysis are largely missing from the literature. First, the concept of uneven development lends insight into problems of policy formation and implementation. Uneven development refers not only to development in the economic sense, but also to social development. Proponents of uneven development theory argue that within capitalism, growth occurs for some at the expense of others. Thus the processes of development and underdevelopment are closely tied (Johnston, Gregory, Pratt, & Watts, 2000). Also, the concept of uneven development applies not only between, but also within geographical areas. Peters (1997) and Hirschman and Vaughan (1983) recognize that social and economic differentiation occurs both between men and women, and amongst women themselves. Uneven development is a concept that examines all types of social groupings—as opposed to only economic class—in order to understand the relationships of development and how they change from one place to another.

Finally, the most striking element missing from the body of work regarding Malawian food security and agricultural policy is a political ecological analysis. The exception is the work of Peter Walker, whose studies have examined the roles of culture and policy in shaping natural resource use within the Zomba sample population of this study. Walker found that policies pertaining to private property rights and individual resource use introduced during the colonial period led to ecological degradation because they conflicted with the previous social structures for resource management. He argued

that the mismatch between male-oriented policy and female land ownership should be solved not by “correcting” the social structure of matriliney and uxoriolocality, but by changing policy prescriptions to match cultural traditions (Walker & Peters, 2001). The otherwise absence of political ecology from Malawian literature is a serious disadvantage to understanding both production and food security. It is also particularly ironic, considering that the central concern of agricultural policy has been soil conservation, while the famous early work in political ecology pertains specifically to the causes of soil degradation and its effects on food security in developing areas.⁸ This body of work, particularly Piers Blaikie’s (1985) analysis, provides an alternative to the colonial model of soil erosion, which largely blamed population and misuse for the African agricultural crises of the 1900s. Using a political ecological framework, this thesis argues, as Walker has observed, that perhaps problems of productivity do not originate from some innate failure to manage resources properly, but rather from the conflict created when external policy does not fit well within traditional cultural structures.

⁸ See, for example, the early works of Piers Blaikie, Harold Brookfield, Michael Watts, Susanna Hecht and Karl Zimmerer.

CHAPTER III

THEORETICAL FRAMEWORK

The purpose of the analysis in this thesis is to discuss input subsidies as one possibility within a broad spectrum of food security strategies. In order to strategize for food security, one must first attempt to explain the failure of food security from one place to another. Thus, this section discusses different explanations of food security and lays a theoretical framework for analyzing the food system of Malawi.

3.1 The Food Availability Decline Theory

At first glance, explaining hunger seems fairly simple. The intuitive explanation is that there simply is not enough food. This is consistent with the Food Availability Decline (FAD) model of hunger and famine. According to FAD, lack of food is the result of underproduction relative to need. In this way, hunger and famine are attributable to production-end shocks such as unfavorable weather or natural disaster. This model has been largely disproven, as it has been shown historically that hunger can occur in the midst of plentiful food supply, and that even in famine conditions some parts of society remain unaffected by hunger (Moore-Lappé & Collins, 1998).

3.2 Population as the Cause of Hunger and/or Famine

Another explanation is that presented by Thomas Malthus in his *Essay on the Principle of Population* (Malthus & Layton, 1914). Malthus postulated that the worldwide human population grows at a rate much faster than the rate at which food production grows. Under his hypothesis, population would eventually outgrow “carrying capacity,” resulting in famine as a “natural check” on the section of the population growing most rapidly. Though this theory is broadly discounted within development scholarship, it commonly finds acceptance within mainstream debate. Paul Ehrlich’s 1960s description of the “Population Bomb,” for instance, has contributed to the continued popularity of this theory within the public consciousness. Moore-Lappé and Collins disprove this notion by attempting to geographically correlate population density with occurrences of hunger and famine. They found little evidence of a causative relationship (Moore-Lappé & Collins, 1998). Rather, they attest that hunger and rapid population growth share a common cause in underdevelopment.

3.3 The Concept of Entitlement

A more nuanced approach comes from economist Amartya Sen, whose thesis states that hunger and famine are due to a person’s lack of access to to access food. That is, a lack of what he refers to as “entitlement” is what leads to deprivation. As described by Dréze and Sen, “in each social structure, given the prevailing legal, political, and economic arrangements, a person can establish command over some alternative commodity bundles...referred to as [a] person’s entitlement” (Dréze & Sen, 1989, p. 17).

In Sen's entitlement theory, a person's endowments (resources over which a person has control) can be exchanged for food. Entitlement serves as one element of the theoretical basis for examining the current Malawian input subsidy and its contribution to food security. It is most useful because, as described by Stephen Devereux, it "shifts the analytical focus away from a fixation on food supplies...and on to the ability of groups of people to acquire food" (Devereux, 2001, p. 246).

An examination of some of the major critiques of Sen's entitlement further illuminates the concept. Devereux depicts one point of contention over entitlements as attributable to Sen's presentation of the concept. In his essay, *Poverty and Famine* (1981), Sen sets entitlement in opposition to the FAD normative theory. This has led to the criticism that entitlement offers no normative explanation of its own. Devereux points out that although Sen specifically states that entitlement is meant as an analytical framework, rather than a normative theory, his juxtaposition of it to FAD implies an intention to use the concept of entitlement as a causative explanation (Devereux, 2001). Furthermore, entitlement theory does not disallow FAD as a proximate cause of hunger or famine. Rather, Sen describes FAD as one potential *direct* entitlement failure. This illuminates the importance of entitlement theory's use in the analysis in this thesis: it is meant as a nuanced description of the ways in which food systems fail to meet needs. The important concept here is that these failures go well beyond mere supply problems. Attempts at a causative explanation are described below.

Another critique bears discussion. Gasper (1993) and Leach *et al* (1997) describe a limitation of Sen's entitlement as being too reliant upon the concepts of private property

and legal rights to explain access to food. Their argument is that Sen fails to acknowledge extra-legal and informal systems, and that “endowments” and “exchange” are too exclusively economic to adequately describe a food system (Devereux, 2001; Gasper, 1993; Leach, Mearns, & Scoones, 1997). In this case it seems that the definitions of these terms used by critics is perhaps too narrow to encompass Sen’s overall meaning. If one thinks of an endowment in the broadest terms as a resource, options outside of private property and formal markets become available. It is also important to note that Sen uses the term “command,” rather than “ownership” when describing both entitlements and endowments. Similarly, one needs to think of exchange in ways outside of the traditional economic term. Marx provides a framework for consideration. In his model, production (of say, food crops) consists of an exchange between man and nature. In the case of food production, a person has command over certain agricultural inputs (manure, seeds, etc.), over land, and over his own labor, which he provides in exchange for crops produced by the earth (Foster, 2000; Karl Marx & Friedrich Engels, 1990). Of note here is that economic exchange is not necessarily required for the farmer to command these resources. Thus, endowments should not always be thought of in entirely economic terms.

The assertion that Sen discusses entitlements in terms that are too exclusively economic should be considered in another way. Here I return to the discussion of entitlements as an explanation of causality. The extent to which entitlements should be used to explain causation is merely that of proximate causes. The reason entitlements are seen as overly economic is that in many ways the possible types of entitlements have

become increasingly economic. Thus, the possible proximate causes are more economic in nature. For example, one proximate economic cause for the inability to access food is an increase in market prices for food. But to end the explanation there is to stop short of understanding the fundamental reasons for this incidence of hunger. It is important to explain *why* the market price for food has risen. For example, perhaps new taxes have been levied on the markets—this is a political/economic explanation. Perhaps crop yields were low because of poor weather conditions. Perhaps higher prices are simply an effect of increased cultural preference for certain foods. Thus, although the critique of entitlement as overly economic is a misrepresentation, the use of entitlement as a way of examining only proximate causes of hunger renders a means of explanation for the more fundamental causes necessary.

3.4 The Capability Approach

The concept of endowments as part of the entitlement framework places higher vulnerability to hunger within the realm of poverty as defined by a lack of resources. Indeed, poverty can be more broadly thought of as a deprivation of wellbeing. In that sense, it becomes necessary to describe the sources of deprivation in order to explain poverty and its consequences, such as hunger.

Nussbaum and Sen use the capability approach as a framework for discussing wellbeing. If entitlement theory is concerned with a person's command over goods or resources—that is, what a person *has*—capability's focus is the set of options from which a person can choose to obtain that command—that is, what a person *can* have. When Sen

first articulated this concept in 1979, his intention was “to explore a particular approach to well-being and advantage in terms of a person’s ability to do valuable acts or reach valuable states of being” (Sen, 1993, p. 33). These “valuable acts” and “valuable states of being” consist of a range of livelihood components, such as being well-nourished and in good health, or having self-respect and being socially integrated. This approach is meant to help evaluate the terms of a person’s actual ability to achieve various parts of living. Thus, entitlement is just one component of a person’s capability.

Capability attempts to describe a range of options from which a person can choose. The concept is important in terms of food security for two reasons: 1) it helps explain how a person gains his or her entitlements come, and 2) it illuminates the barriers preventing a person from achieving entitlements. In this way, entitlement theory can be used to understand the extent of food insecurity, and capability can be used to explain failures of entitlement, as well as to formulate policy responses to them.

3.5 Primary Goods

One weakness of capability theory bears discussion. There is no function within capability theory that determines when a person’s needs have been met. Nussbaum (2000) has articulated a number of essential contributing factors to a person’s well-being, such as health, control over one’s body, education and freedom of thought, emotional space, and control over one’s environment. It is not difficult to identify cases of limits to these factors, such as a woman losing control over her body to domestic abuse. More difficult is to articulate the form and extent these factors should take.

One response has been a utilitarian attempt to delimit needs by a person's welfare and quality of life. An important aspect of quality of life is considered to be a person's satisfaction. Rawls (1971) discusses the drawbacks of utilitarian welfare in his work, *A Theory of Justice*. He criticizes the concepts of welfare and satisfaction on the basis that "satisfaction" may take different forms to different people. He specifically cites instances of "offensive taste," that is, a preference that oppresses other people's ability to be satisfied, and of "expensive taste," which results in dissatisfaction with a good that would be otherwise satisfactory to the average taste. Rawls proposes instead a set of "primary goods," determined to be the goods a person would rationally select before other items that he or she wants (Cohen, 1993). For example, rational choice states that a Malawian would choose to obtain their staple food, maize, over a luxury good, such as a television.

Criticisms of rational choice abound. To begin with, the assumption of the rational actor is considered to be entirely unrealistic. The characteristics of a rational actor would be "perfect knowledge, egoism, independent preferences, ability and desire to maximize utility, and pursuit of a single goal" (Johnston et al., 2000). The possibilities for these attributes vary from one person to another, in addition to varying from one time in a person's life to another. More importantly, one person's rational choice is another's over-consumption—take, for example, the dietary needs of an HIV patient taking anti-retroviral drugs, which would outweigh that person's need under circumstances of unaltered health. Because of the sometimes vague, sometimes inconsistent articulations

of what exactly is a “primary” good (Cohen, 1993), the concept loses its usefulness for policy-making.

Sen’s compensation within the capability model for the lack of a defined set of needs is to approach capability as a set of freedoms to fulfill one’s needs (Sen, 1999). Sen’s objective, then, is to reduce the presence of “unfreedoms,” which impede a person’s ability to meet their own needs. A fine line must be observed. The usefulness of the concept of primary goods is to avoid taking for granted that one person’s freedom to meet what they perceive to be his or her needs does not interfere with another’s.

3.6 Modes of Production

One response to cases of capability deprivation in formerly colonized regions has been to blame the introduction of capitalism. Vaughan (1987) cites, by way of example, Raynault’s (1977) conclusion that famine in the Sahel during the 1970s was a direct result of monetization (Raynault, 1977; Vaughan, 1987). Certainly, there are elements of capitalism that have had negative net results for food security, but to dismiss its usefulness and suggest complete withdrawal from the market system is to miss the point. A more practical approach is to understand where and why reliance on the market has failed and to suggest adjustment to those areas, rather than do away with the system altogether.

A useful approach is to think of food security in terms of modes of production. This concept was taken from the Marxist tradition and applied as a counter-argument to anti-capitalism. According to Klein (1985), the mode of production approaches analyzes

the distribution of the benefits of production in terms of the relationship between the forces or means of production (that is, technology, raw materials, labor) and the relations of production. Marx used the means of production to describe, as components of a production system, who labors and who benefits (Johnston et al., 2000). Articulation of modes of production has been used to “examine the interrelationships between an externally dominated capitalism and an indigenous pre-capitalist base” (Klein, 1985; Vaughan, 1987).

It is important to think of modes of production as a historical analytical framework, as Marx intended it, rather than some revealed truth or normative theory. Additionally, although the modes of production theory has been used to categorize societies into decisive categories (primitive communism, slavery, feudalism, capitalism, socialism and communism), Marx’s original use of this analysis was to understand the dynamics of change in systems of production, rather than to simply develop a typology (Johnston et al., 2000). Vaughan (1990) and Watts (1983) use modes of production to understand changes in African food systems. Using the means of production as a base, and relations of production as a superstructure, Vaughan postulates the possibility of understanding disjuncture in food systems as the result a capitalist superstructure combined with a pre-capitalist base (Vaughan, 1987). This is consistent with Marx’s articulation theory, which states that tensions in capitalism result from 1) the continued exploitation of old modes of production while selectively changing certain aspects and 2) a mismatch between the means and relations of production (Johnston et al., 2000).

While the mode of production analysis is useful for tracking historical changes in the functioning of food systems, its usefulness breaks down in the context of explaining current phenomena. The concept of base and superstructure of human relations has the potential to over-emphasize structure as a driving force of human behavior, while understating the role of human agency. This often emerges in hunger and development studies as a “blame the colonist” framework. To use colonization as the explanation for current flaws in African food systems risks placing too much emphasis on history as the determining factor for modern-day relations. For that reason, the mode of production analysis is used here only to form a historical understanding of changes in production relations, and to lay the context for input subsidies in the current food system.

3.7 Metabolism

The modes of production analysis lends itself directly to agricultural theory. Modes of production examines the link between relationships of production and the means of production. In agriculture, one essential means of production is land. A central theme of agricultural theory has been an attempt to understand the causes and effects of soil fertility decline as it pertains to human use of the land. Metabolism is a concept established by Justus von Leibig to describe the material exchange of agriculture as both an ecological and social process (Foster, 2000). The modes of production analysis helps describe the nature in which the labor process that was the basis of metabolism evolved. Humans’ relationship with their environment is the foundation of studies in political ecology, and one of the seminal works of political ecology is directly concerned with the

soil degradation that results from human use (Blaikie, 1985; Blaikie & Brookfield, 1987; Johnston et al., 2000).

Marx developed the concept of metabolic rift to explain soil fertility loss as the result of an extractive relationship based on unchanging means of production (labor, soil nutrients) and a rapidly changing relationship of production, where agricultural produce is removed from the land on which it was produced. He referred to the resulting loss of nutrients as “metabolic rift” (Foster, 2000; Karl Marx & Friedrich Engels, 1990).

Marx explains metabolic rift as the degradation of land (namely, soil fertility) by the distancing of man from land-based production (Karl Marx & Friedrich Engels, 1990). In this theory, Marx postulates that the metabolism of agriculture is a cycle of production, consumption and restitution. The production phase of the cycle consists of nutrients being drawn from the soil through crop cultivation. This is followed by consumption, which before the rift occurs, takes place within close proximity to production. Finally, restitution is the process by which the cycle is completed as the nutrients that have been consumed are returned to the soil through the waste of the consumers (animals and humans). The rift occurred, according to Marx, as the result of a transition in agriculture from local subsistence production to an industrialized capitalist venture. Agricultural historians observe this transition as occurring in three phases of revolution (Foster, 1999). The three phases are described as follows: 1) technique evolution, disenfranchisement, and commercialization; 2) input commercialization and increased capital requirement; 3) mechanization and labor displacement.⁹ The hypothesis

⁹ Adapted from Foster, 1999. Pages 373-374.

is that with each technological innovation, less labor is required for production. When their labor is no longer needed, people move (or are removed) from the farm to urban areas where they can sell their labor for cash. Thus, food is now shipped to the cities for consumption, causing a rift in the nutrient cycle. Nutrients leave the soil via produce, but are never returned, as “natural manure” is wasted within the sewage systems of urban areas.¹⁰

The immediate application of metabolic rift in the context of this study is to consider the input subsidy (particularly chemical fertilizers) as a substitute for the restitution phase of agricultural metabolism. In this way, policy concerned with increasing production and yields can be reunited with concerns for other aspects of the food system, and the livelihood systems within Malawi in general.

3.8 Conclusion

The common theme amongst the theories discussed above ties back to the modes of production analysis and its relation to political ecology. To understand the changes wrought by policy within the Malawian food system requires an understanding of the ways in which those policies are misaligned the underlying social structure. The remainder of this thesis illustrates the ways in which that misalignment is reflected in the articulation and implementation of the input subsidy in question.

¹⁰ Taken from Lenin’s 1901 publication, *The Agrarian Question and the Critics of Marx*. Quoted in Foster 2000, p. 51.

CHAPTER IV

A HISTORY OF FOOD SECURITY AND AGRICULTURAL POLICY IN MALAWI

In order to understand the practical implications of the current input subsidy, it is important to place it within its historical context. This chapter provides an overview of agricultural history in Malawi, with emphasis on changes in agricultural policy of the last 150 years. As discussed below, much of agricultural development policy in Malawi has been based on flawed assumptions and attempts to change relationships of production, labor and resource use. This, coupled with a lack of an accompanying development of agricultural means, has led to the degradation of local social and natural resource bases.

4.1 Pre-European Agricultural Practices

The pre-colonial agricultural system in the Shire Highlands was characterized primarily by shifting cultivation and communal land ownership (Mandala, 1990). In this system, the village head was considered to be the custodian of the land, whose authority included the apportionment of land amongst households. The area is still characterized by matrilineal inheritance, meaning that possession of land is passed along female lines of kinship (Peters, 1997). According to Mandala (1990), control of land was not

conceived of as ownership. In fact, the concept of ownership only applied to items that were unproductive (a grass mat, for instance) or perishable. Due to the centrality of female labor and custodianship of land, women were thought of as the “real owners and chief cultivators of the soil” (Mandala, 1990).

Agriculture was organized around a single, rain-fed principal growing season, accompanied by dry-season riverside cropping. New land was historically brought under cultivation through the clearing of wooded areas and the burning of the residual plant material. According to Mandala, this was only practiced in the creation of a new household with its own land needs. Others used a series of crop alternations, along with fallowing and grassland burning on already-active land (Mandala, 1990). Under the demographic and socio-economic conditions of the time, this process was sufficient to maintain the fertility of agricultural soil. Before maize became the main staple of people’s diets in the region, the most central crops were sorghum and two different types of millet. These were typically rotated and intercropped with groundnuts, pumpkins, pigeon peas and a variety of vegetables (Mandala, 1990).

The most common input constraint to agriculture was labor. Weeding was a monumental task, which occupied most of the women’s time during the rainy season. Another demand on labor was *dindiro*, an activity oriented toward preventing crop loss by wildlife. *Dindiro* consisted of activities ranging from children chasing birds, to an intricate system of grass lines strung across the fields, which could be shaken to scare off intruding pests. Adult men were involved in *dindiro* through hunting beasts such as

elephants and hippopotami, preventing them from trampling the riverside *dimba* (dry-season) gardens (Mandala, 1990).¹¹

Mandala describes in detail the social relations of food in pre-capitalist southern Malawi. According to Mandala, food underwent a transformation, from being the private property of the grower, to becoming a community good once it had been prepared and cooked (Mandala, 2005). Mandala refers to *chidyerano*, a community meal in which the sharing of food was central. This mirrors Watts' description of pre-capitalist peasant economies in Nigeria, where the primary concern was the aversion of risk, rather than maximization and accumulation. Watts describes a system of reciprocity, where a household shared its surplus in the knowledge that its future deficits would be covered by the community (Watts, 1983). This system was referred to by James C. Scott (1976) as the moral economy of the peasant.

Lest these systems be seen as utopian, Scott, Mandala and Watts qualify their analyses with descriptions of the internal inequalities of this type of food sharing. First, *chidyerano* was characterized by a system of taboos and restrictions, allowing some members of the family and community preferential access to the more highly valued--and typically more nutritious—elements of the meal. In the matrilineal and uxorilocal system of the Shire Highlands, older married men tended to have access to the more desirable portions, while younger sons-in-law, having recently relocated to the village and who often shouldered the greatest burden of labor, were the most neglected (Mandala, 1990). Beyond enjoyment of the meal, there were nutritional implications of this sort of

¹¹ *Dimba* or *dambo* in Chichewa/Chinyanja means “near,” or “close by.” A *dimba* garden implies that the garden is close to the river, or source of water.

segregation. Scott explains that reciprocity was less often pure altruism than forced generosity and social necessity in a community that could hardly be considered egalitarian (Scott, 1976).

Though pre-colonial subsistence agriculture tended to be risk-averse, it would be misleading to represent as it crisis-proof. There is evidence that crop failure was frequent, if less wide-ranging and less severe than has been seen in the 1900s and early 2000s (Mandala, 1990; Warman, 2003; Watts, 1983; White, 1985). The food sharing system described by Mandala was most effective during times of *njala*, or cyclical food shortage between harvests, but was susceptible to breakdown during *chaola*, or famine, when there was little or none to be shared. Also, famine coping behaviors, gathering “bush” foods, for example, were most easily accessed by the least affected segments of society. In times of duress, those individuals would choose to feed themselves and their households before extending to those too weak to gather for themselves (Mandala, 1990, 2005). White’s description of the 1862-1863 famine in the Shire Highlands reflects a similar situation (White, 1985).

The above description is not intended to portray a perfectly functioning food system. Rather, its importance is to establish a baseline for comparison of the immense and rapid changes that would take place beginning around the arrival of David Livingstone in the 1850s. It should also be noted that this description is not meant to imply a static set of social and agricultural arrangements.

4.2 European Contact

Before the arrival of David Livingstone and a series of missionaries and traders, the main European influence came from the East African slave trade (Vail, 1983). Slave traders, who were influenced by the Portuguese, brought with them a number of changes to agriculture in the Shire Highlands. First, maize was introduced from the New World. At first a supplementary garden crop, maize would quickly become the main staple crop of the region. Additionally, although small-scale trade in agricultural produce was always a part of the agricultural system, the concept of crops grown exclusively for trade was introduced through the trading systems of the slave trade. Tobacco and cotton were among the most important of these. Previously, tobacco and hemp had been grown merely for recreation (Mandala, 2005).

In 1879, a small Scottish mission was established in an area of the Shire Highlands which would come to be known as Magomero (White, 1985). Little time passed before the expansion of the Portuguese from the eastern coast of southern Africa was perceived by the missionaries and the few accompanying settlers as a threat. At the behest of the missionaries, the United Kingdom established the Nyasaland Protectorate in 1891, which would go on to become the Republic of Malawi.

As discussed above, intervention in African agriculture was a common theme amongst missionaries during the nineteenth and twentieth centuries. Peters (1997) and White (1987) describe one of the first of these interventions as an attempt to undermine the matrilineal system of land tenure of the predominant culture group of the Shire Highlands, the Mang'anja. The Bishop of the mission at Magomero began sanctioning

Christian marriages, bestowing land to the husband of each newly married couple, and simultaneously undermining the authority of women, the village head, and traditional norms. Attempts to undermine the matrilineal and uxori-local systems of the Mang'anja continued throughout Malawi's colonial history, culminating in the 1940s with widespread government attempts to reform agricultural practices in an attempt to prevent a looming agricultural crisis. At this time, it was asserted that matriliney and uxori-locality allowed a woman to maintain her gardens less thoroughly than would if she had to please her husband's family, rather than being able to rely on her own mother in the case of shortfall (Peters, 1997). More important, if somewhat less seditious, was the argument that female control of land and production were incongruent with the goal of mimicking England's agricultural revolution (ibid). Peters also points out that the matrilineal and uxori-local traditions seem to have survived this and many other proceeding interventions. However, like many other attempts to change social and agricultural customs, they did serve to create tensions in the traditions that remained.

Environmentally, the 1890s were a disastrous decade for the region. Drought was accompanied by infestations of rinderpest, sand jiggers, and red locusts (Vail, 1983), and by outbreaks of smallpox and sleeping sickness (McCracken, 1987). This served partly as a justification for the first set of policy interventions by the British Protectorate government. Regarding the Nyasaland system of shifting cultivation, first commissioner of the protectorate Sir Harry H. Johnston remarked that it was a "heedless system, ruinous to the future interests of the country" (Vail, 1983). According to Peters, colonial agricultural officials saw their charge as one of enacting agricultural changes that would

parallel those of the agricultural revolution in England. The implications of this attempted transplantation are discussed below.

Counter-examples to the British model of African agriculture abound.

Intercropping was one of the most widely criticized agricultural practices by the colonizers. Far from its characterization by Europeans as random, careless spreading of seeds, intercropping and crop sequencing were (and still are) carefully managed and based on generations of observation and experimentation. Intercropping provides many advantages: it allows farmers to make use of limited space (Peters, 2002); intercropped plants provide nutrients to each other, as well as helping to control weeds, pests, and disease (Innis, 1997); it helps maintain (or create) healthy soil structure and nutrient content (Altieri, 1995); and it reduces nitrate leaching (Whitmore, 2007). It also helps to diversify local diets and contributes to household income generation with the cultivation of surplus, high-value produce (DeWalt, 1994; Innis, 1997).

Shifting cultivation, also known as slash-and-burn or swidden agriculture, is another much-maligned indigenous practice. David Livingstone, cited by Mandala (1990: 52-53), described the practice of field preparation he encountered among the Mang'anja as the creation of mounds by "collecting all the weeds and grass into heaps, covering them with soil and then setting fire to them. They burn slowly, and all the ashes and much of the smoke is retained in the overlying soil." Though this practice has come under heavy criticism as "barbaric" and "destructive," Stephen Carr argues for its benefits. Simply burying residuals, rather than burning them, creates the need for decomposition in order for the nutrients in those residuals to be made available for plant

use. The decomposition process uses soil nitrogen (N), diverting its use from crops (Stringfield, 1955). Carr explains that burning grasses and residuals not only solves the problem of competition for N, it also increases the availability of carbon, and makes the release of nutrients easier for farmers to control. Thus, colonial attempts to stop the practice of burning resulted in the disruption of a useful crop nutrient system.

4.3 Early Colonialism

Once the Nyasaland Protectorate government was established in 1891, the British brought about three important changes in land tenure and crop use, as well as creating a formal, monetized economy. Colonial agriculture in Nyasaland was characterized by the establishment of plantation production. The protectorate government set up a system of estates and tenant farming. These estates were made up of huge tracts of land annexed from its customary holders. This had the effect of displacing huge segments of the population to marginal, less productive areas, and of creating a large class of laborers. Some natives were permitted to remain on estate land in exchange for growing crops demanded by the estate owners and remitting a portion of their harvest to their landlords as rent (Mandala, 1990; Vail, 1983; White, 1985).

The objective of the estate system was the production of cash crops for export. Coffee started as the main export crop, but fluctuations in world market prices caused plantation owners to favor cotton, tea and tobacco at different times. It was at this time that the mass exportation of soil nutrients from the Protectorate began. Agriculturalists

would soon find themselves in need of a way to replace those nutrients in order to maintain productivity.

The key to the Nyasaland plantation economy was the readily available cheap labor (Vail, 1983). The colonial government instituted a hut tax on the natives of Nyasaland, compelling them to enter the cash economy in order to pay the tax. For those who had been reassigned to the remaining areas of customary land and were able to produce crops of their own, this meant the adoption of some cash crops for sale. However, many were obliged to cultivate on estate land and pay “rent” and “tax” to the European owners in the form of labor for the owners’ crops—a system known as *thangata* (Mandala, 1990).

Other than a small number of administrative positions, few economic alternatives were available. Throughout the history of Nyasaland as a protectorate, as well as in post-independence Malawi, labor policy shifted to allow or disallow laborers to migrate for work in the mines of South Africa and the Rhodesias (Vail, 1983). Migrant labor brought cash to the Protectorate through remittances directly to the government and to the families of the laborers. However, labor shortfall was a frequent problem for the plantations, and depending on the needs of the estate owners, colonial policy would chose to disallow migration outside of the Protectorate.

The tax requirement of the Protectorate and diversion of labor to a monetized economy placed further strain on a heavily labor-dependent indigenous agricultural system. Because the colonial system focused on male labor, it also changed the gender relations of household labor. Further burden was placed on the women of the household

to produce enough food for consumption, now without the full help of their husbands and grown sons (Peters, 1997). Also, because a man was needed by each household to pay the hut tax, female-headed households were at a great disadvantage. A woman would be required to work for wages—even lower than a man's—in order to pay the tax, as well as maintain food production for the household.

Their land expropriated by the estates, much of the native population of Nyasaland found itself crowded onto smaller and more marginal lands. Part of the impetus for containing the African population was to facilitate tax collection and labor recruitment (Warman, 2003). This was accompanied by increased population density due to higher child survival rates as a result of improved medical facilities and sanitation, as well as an influx of Lomwe refugees fleeing the oppressive colonial government of Portuguese Mozambique (*ibid*). The higher food requirements caused by these demographic stresses, combined with the conversion away from the fallow-dependent shifting cultivation techniques and the emphasis placed on peasant cash crops caused such intensification of production that agricultural soil in the Shire Highlands quickly began to lose its fertility. This process culminated in the establishment of the colonial Department of Agriculture in 1909, charged with fostering African commodity production. This department was directly responsible for policy interventions involving seeds, cultivation techniques, and market development (Beinart, 1984).

This completed a very important transformation in Malawian agriculture. Colonial policy mirrored that of the English agricultural revolution, as had been the plan of Commissioner Johnston and others. The results of these policy shifts played out in

many ways similar to those in England centuries before, but also differed in many important ways. In Britain, according to Foster, “[t]he agricultural revolution was a *gradual process occurring over several centuries*, associated with the enclosures and the growing centrality of market relations” (*emphasis added*) (Foster, 1999). In Malawi these changes took place of a shorter period of time, leaving little time for local customs and practices to adapt. Many of the new policies were adapted only in name, while traditional modes of production continued to be practiced in secret (Peters, 1997, 2002). The result was a mismatch between the relations of production, as sanctioned by the colonial government, and the means of production remaining under the control of the African producers.

Another key difference is that the revolution in agricultural production in Britain was accompanied by a revolution in industrial production. Thus, the displaced rural population was able to turn to cities to sell their labor. In Malawi, however, there was (and is) a distinct lack of this outlet for labor. The population of Malawi became, as Marx would put it, an industrial reserve army with no industry. To the colonists, farming was not a source of livelihood in the sense of food. Rather, it was a source of income in order to purchase food and other life necessities. This shift represents a broader change to capitalist modes of production. Estate owners were then free to exploit their laborers, who had no other option for earning income.

The estate owners may have seen the produce of the land as a commodity, but to the native population it was still the most important source of household food. This dichotomy created a schism between food as a good for consumption, and food as a

commodity for trade. Under a system of communal land tenure and resource sharing, food was obtained through community and household collaboration. With the introduction of a formal monetized food system, cash, an individually owned good, was to become the route to sustenance—if not by the direct purchase of food, then by the purchase of agricultural inputs (Mandala, 1990). Importantly, the woman's role in the household was diminished, as most cash that entered the household was under the direct control of the husband, while providing for the family's needs remained the responsibility of the wife. As the struggle for survival became more individualized, the social fabric of the community began to wear thin.

4.4 Late Colonialism

The early years of colonial policy in Nyasaland were formative years in terms of the economic structure for the next 60 years. The result of colonial land tenure policy was the formation of three distinct economic sectors (Vail, 1983). Primacy was given to the estate sector, where white plantation owners produced export crops. This sector was dependent upon the class of migrant labor produced by the displacement of people from their land. Particularly in the northern and central districts, lack of economic opportunity led to mass migration of laborers to the plantations. The remaining sector was that of the peasant economy, living on what were known at the time as “Crown Lands.” Here the previous traditions of land tenure remained, while the colonial government continued to encourage cash crop production.

The later years of colonial Nyasaland were characterized by agricultural intervention in the form of conservation ordinances. Beinart writes that officials across colonial British southern Africa had become obsessed with the processes of soil erosion and natural resource use (Beinart, 1984). Not incorrectly, the British saw the major cause of the rapid soil fertility decline as peasant agriculture. What they failed to acknowledge, however, was that this problem was largely brought about by the contradictions between the ecological needs of the land and the economic use to which it was being put.

Mandala asserts,

...over the years, Africans have indeed abused their natural environment...but [it has been shown] that the reasons for this are not to be found in some natural or biological givens, but rather in economic and socio-political processes...[P]easants undermined the ecological base of all production as they tried to accommodate cash crops without the benefit of new agricultural technologies (Mandala, 2005).

This is seconded by Vail's contention that the Africans lived in such abject poverty that there was little opportunity for the agricultural strategies necessitated by the intensified land use of the colonial era. For example, the purchase of tools, fertilizers or seeds was out of the question because of limited cash income (Vail, 1983). In addition to economic constraints, households had come under severe pressure for labor because of migrancy and the impetus for cash crop cultivation. So while land was being more intensively used, there were fewer laborers available to carry out the labor requirements, and less available land on which to do it.

If the major causes of severe soil degradation were constraints imposed by lack of land, labor and cash, colonial conservation policy did little to mitigate this

problem—in some ways it caused further shortfalls of these necessities. Settlers and colonial officials often used soil degradation as justification for interference with peasant agriculture. Further, conservation was often used justification for the imposition of private property and exclusionist policies (Beinart, 1984).

The practice of contour ridging serves as an illustration. Amid concerns about hillside erosion, the British began to introduce contour ridging in southern Africa after World War I in order to counter the erosional effects of rain events, as well as to mitigate water loss in times of scarcity. Contour ridging is the process of building elongated mounds on agricultural land running exactly perpendicular to the slope. These 12-18 inch ridges, spaced roughly two feet apart prevent loose soil from being directly washed from the slope in the event of heavy rainfall. They also help retain rainwater, allowing more time for absorption by crops. The ridging inarguably accomplished these goals in some places, but was widely unaccepted by traditional farmers in Nyasaland (Vail, 1983).

Like many cases of British colonial policy intervention, Africans' hesitation to adopt contour ridging was seen as the backwards and stubborn refusal to accept new improvements. In reality, it was more a sign of tension between the demands of new policy and the ability of the peasantry to meet those demands. For example, in areas where land constraints were already a major issue, contour ridges further constrict the cropping area on the field, as some crops planted in the lower area between the ridges are likely to become waterlogged and fail (Beinart, 1984). Another complaint was that building contour ridges loosened the soil more than shallow hoeing. This invited crop-destructive pests such as white ants (Beinart, 1984).

Despite these complaints, and because the ridges proved so effective in droughts, ridges were made compulsory on the Crown Lands—that is, land farmed by smallholders---in the 1940s (Beinart, 1984; Vail, 1983). The rift between policy and ability grew deeper. The construction and maintenance of the miles of ridges required by the colonial government was a further burden upon an already exhausted labor force. By the 1940s, labor migrancy had nearly emptied the villages of the adult male population. According to Vail, “In 1946 it was estimated that fully 40 percent of the able-bodied males were absent from the country, with the figure as high as 65 or 70 percent in some areas” (Vail, 1983). That is, what the colonial government perceived as laziness on the part of the Africans, was in reality a direct result of flawed colonial labor and tax policy.

Agricultural crisis grew as yields suffered at the hands of a labor force spread far too thin, and as local ecology suffered extensive extraction at rates irreplaceable by natural forces. Social crises abounded as well, as community and family relations changed drastically as more migrant laborers chose to remain permanently abroad, leaving their households bereft of labor or income (Vail, 1983).

The problems listed above came to the fore during instances of food scarcity, particularly in the famines of 1922 and 1949. British attempts to mitigate famines often failed in light of the mismatch between policy and social relations. For example, when, during the 1922 famine, the colonial government managed to import a small amount of food for relief, the food failed to reach many of the most affected households. Female-headed households, suffering because of the missing labor and income provided by adult males, were often denied relief on the basis that it was meant for families, and would

therefore only be distributed to heads of households, who were wrongly assumed to be male (Mandala, 2005). This assumption of the nuclear family would once again play a part in the years preceding the agricultural crisis in the 1940s, when the provision of extension and other services failed to reach those households headed by a female (Peters, 1997; Vaughan, 1987).

Policy response to the agrarian crisis was disastrous. The colonial government, attempting to increase smallholder production of food crops, decided to once again restrict the profitable cash crops allowed to smallholders, depriving them of the income from those activities. Because food had become so scarce, prices were high, prompting the intensification of maize cultivation. The impetus to grow maize for sale resulted in the further commodification of the food system, where farmers began to monocrop maize with the intention of purchasing other foodstuffs with the profit from the sale of their maize. Seeing this practice as destructive to the soil, the government again intervened to reduce the producer price of maize, dampening the market in order to reduce the acreage dedicated to monocrops (Vail, 1983). Finally, the government attempted to create a middle class of farmers, providing land and free inputs of seed and fertilizer to a selected group of “productive” farmers. The yields achieved through this strategy paled in comparison to the resentment it caused, providing popular support to the burgeoning nationalist movements of the time (ibid). The political crisis of the 1950s and 1960s ended colonial development schemes. However, Peters (1997) writes, “...it is also clear that the blueprint of the yeoman [modern, middle-class] farmer on *his* farm, practicing rotation of single-cropped fields, was so far removed from local practices that the

schemes would have failed even without the political emergency” (*author’s emphasis*). Further, policy makers had overestimated the speed at which the new techniques would begin to produce higher yields. This, along with the intensive labor needs, and required fallow periods on small plots of land, resulted in decreased yields and food availability for these households (McLoughlin, 1967; Peters, 1997).

Malawi’s colonial history does not reveal the beginning of social inequality and agricultural challenges, but rather their magnification. Mandala (1990) describes a preexisting social system of differentiation by age, gender, household and status, as well as conflict within these groups. As he explains, “[t]he subsequent incorporation of this system...in[to] the capitalist world economy tended to magnify preexisting contradictions between work and control...” (Mandala, 1990). The occurrence and severity of both chronic hunger and famine increased over these years. Though agricultural shortfalls were not unknown before European contact, they became crises under the new rules of production and consumption. Warman states, “[b]ad harvests and insect infestations predated colonial times. Only rarely had widespread famine loomed, however. Colonial rule dislocated native productive systems and destroyed the historical responses of Africans in the face of agricultural catastrophes” (2003).

4.5 Independence and Policy under Life President Banda

By independence, the Malawian agricultural economy was firmly divided into an estate sector, a smallholder sector, and a class of migrant laborers. The general effect of colonial policy was that smallholders produced most of the food crops for the nation,

while estates were the central producers of cash crops. During the 1950s and early 1960s nationalism throughout the country had manifested itself in several forms, one of which was the near complete abandonment of many agricultural techniques imposed by the colonial government. While the means of production had been a mismatch with colonial relations of production, the schism widened with this disruption. Relations of production would continue on the trajectory set by the British, while Malawian social relationships bore the strain of the contradictions between economic policy and reality.

The first Prime Minister (later to become self-appointed Life President) of independent Malawi, Hastings Kamuzu Banda's campaign ran on a platform of raising smallholder production, encouraging estate commodity exports, increasing the nation's commerce and industry, and maintaining the goodwill of international donors (Vail, 1983).

The central goal of Banda's economic policy was to establish an agriculturally-based, export-oriented economy. Though his stated emphasis was on smallholder production, his policies strongly favored the estate sector by extracting from the smallholder sector the three important means of agricultural production: land, labor and capital.

At independence, vast tracts of estate land were annexed from European settlers. This was done through the 1967 Land Reform Act. However, rather than reverting to smallholder ownership, most of this land was divided amongst Banda's political supporters. The Land Reform Act also allowed for further annexation of land from the smallholder sector, as traditionally-held land was "vested in perpetuity in the President,"

(Chinsinga, 2002) increasing the problem of population concentration on marginal lands. In this way, Banda extracted both land and labor from the smallholder sector. According to Kishindo, the Act also had the effect of increasing the popularity of thinking of land tenure in terms of ownership rather than in terms of access rights, reducing allocatory power of the village head, increasing male occupation of the land, and increasing the informal sale of land where the price was not determined according to the value, but rather to the desperation of the seller (2006).

Another policy that continued after colonialism was the restriction on the cultivation and sale of lucrative cash crops to the estate sector. The smallholder sector was not permitted to grow burley tobacco (though small amounts of flue-cured tobacco were allowed), sugar cane for sale, cotton or tea (Chinsinga, 2002; Harrigan, 2001). This had the effect of directing almost all foreign exchange to the estates.

In addition, Banda's government changed the name and directive of the maize marketing board. In 1974, the Agricultural Development and Marketing Corporation (ADMARC), was given monopsony control (that is, it was the sole legal buyer) over smallholder maize (Chinsinga, 2002). ADMARC paid smallholders producer prices well below market value. Produce was then sold for much higher prices. The capital produced in this way was then funneled to estate sector in the form of subsidies and credit (Kydd & Chirstiansen, 1982). In addition to providing more capital to the estates, the low producer prices also represented an implicit tax on smallholder producers and induced further need for poorer Malawians to seek out wage labor in order to keep up

with the monetized economy. This sent even more laborers to the estates looking for work.

Popular protest was nearly non-existent. Banda's was a strongman government, complete with secret police and brutal scare tactics (Mapanje, 2002). The Life-President's political supporters had license to pillage Malawi's land (and other) resources, leveraging the soil's fertility for the opportunity to amass vast fortunes. Malawian smallholders' only choice was to continue intensifying their production patterns, abandoning fallows and rotations. Banda was meanwhile able to claim that he was encouraging aiding development in view of the country's increasing GDP and export market. Thus, the blundering policy mismatches of the colonial government became blatant exploitation in the first decades of Malawi's independence.

4.6 Debt, Donor Agencies and Structural Adjustment

The economic crisis of the late 1970s led the Malawian Government to seek international assistance with its heavy debt burden. World Bank Structural Adjustment Programs (SAPs) began in Malawi in 1981. Among the usual prescribed reforms, such as reduced government expenditures, currency devaluation and trade liberalization, were two important modifications: ADMARC reform and the liberalization of cash crop production—both of which were aimed at correcting the policy bias favoring the estate sector (McCracken, 1987).

During Banda's early years, ADMARC had essentially functioned as an implicit taxation system upon smallholder farmers (Harrigan, 2001). Under structural adjustment,

this role changed to focus on the provision of agricultural input supplies to (Lele, Christiansen, & Kidiresan, 1989) smallholder farmers. This was done through credit and market extension. The Smallholder Farmers' Fertilizer Revolving Fund of Malawi (SFFRFM) was established through the Bank of Malawi to help smallholder farmers gain credit for the purchase of fertilizer.

Under Banda and the colonial system, smallholders had been nearly excluded from the production and sale of Malawi's most important cash crop: burley tobacco. A SAP initiative in 1989 made it legal for smallholder farmers to enter the burley market in Malawi. Though results have been mixed—generally more favorable for the wealthier smallholder farmers—this was an important factor in the formation of the current agricultural economy of Malawi (Peters, 1996).

4.7 The Era of Democratization

International pressure and age finally forced Banda to relinquish the presidency in 1994. The first multi-party election resulted in the presidency of Bakili Muluzi, whose administration would decide Malawian policy for the next 10 years.

The beginning of democracy in Malawi represented a major change. No longer threatened by the specter of secret police, some people began to test the limits of their newfound freedom. In the agricultural credit sector, many farmers defaulted on their loans, which they had previously paid back at all costs. As a result, the agricultural credit system collapsed in the mid-1990s and the Smallholder Agricultural Credit Association (SACA) and the SFFRFM had to be rebuilt (Carr, 1997).

Throughout the period of SAPs, many attempts were made to eliminate agricultural input subsidies in favor of increased credit and extension. There was much resistance to this, as many farmers were heavily reliant upon subsidies in order to maintain production. In 1998, Muluzi's government reached a compromise by introducing Starter Packs. The Starter Packs program distributed small amounts of free fertilizer, hybrid maize seeds and legume seeds to all smallholder farmers. SAPs and donor cutbacks required the program to be downscaled in 2001 to a targeted social supplement, which later ended in 2005 (Levy & Barahona, 2002).

4.8 Food Crises of the 2000s

The scaling-back of Starter Packs in 2001 coincided with a poor production year, mainly the result of too much rainfall and poor soils (Kydd, Dorward, & Vaughn, 2002). A drop in the prices of Malawi's main export crops and the availability of off-farm employment contributed to the impending food crisis of 2001 and 2002 (Conroy, 2005), when more than three million Malawians were in need of food aid (Chinsinga, 2007). This was exacerbated by the controversial sale of Malawi's strategic grain reserve in 2000 (Bradshaw, 2003). Conroy writes that the World Bank had insisted on the privatization of the National Food Reserve Agency, which after a bumper crop in 2000 was pressured to sell the grain reserve in order to repay donor loans (Conroy, 2005). In retrospect, this is widely seen as an unwise move (Conroy, 2005; Devereux, Stevens, & Kennan, 2002; Dorward & Kydd, 2004b; Kydd et al., 2002), particularly in light of the fact that the proceeds from the sales still cannot be accounted for (Bradshaw, 2003).

Kydd and others also highlight the importance of non-supply factors in the 2002 crisis. They point out that although severe drought in 1991 had reduced maize yields much more drastically than the poor harvest of 2001, the 2001/2002 famine was far worse (Kydd et al., 2002). They attribute this to the delayed recognition of and response to the poor yields of the 2001 harvest on the part of the government and donor agencies. Government services were known to have grown increasingly inefficient and corrupt since multi-party democracy reached Malawi. A combination of political pandering, patronage and incompetence meant that the problem was not recognized until food shortage had become a major crisis (Kydd et al., 2002). The importation of food was expensive and slow. Further, domestic distributive mechanisms were not sufficiently developed to mount an effective relief effort.

The food crisis of 2005/2006 followed another severe drought and resulted in the need for food aid by more than 5 million Malawians. Many similar processes contributed to this famine, but these were exacerbated by the increased prevalence of HIV/AIDS (Corcoran).

4.9 Bingu wa Mutharika

Bingu wa Mutharika was elected on a platform of improving food security. In addition to the agricultural input subsidy described in this thesis, Mutharika has made plans for other agricultural policies in the hopes of not only increasing yield, but enabling an extra cropping season each year. His Green Belt initiative is a proposal for irrigation in the areas surrounding Lake Malawi that would reduce Malawi's dependence on rain-

fed agriculture (Morgan, 2009). Also, during the food crisis of 2008, Mutharika attempted to mitigate soaring food prices by giving ADMARC complete control over all buying and selling of maize. This initiative was later rephrased to dictate that no private sellers could buy or sell at prices which undercut or overshot those of ADMARC (Bwandala, 2009).

Fertilizer subsidies have been in place in Malawi for decades. The earliest subsidies were in the colonial period, when fertilizer was provided to estates for the increased production of cash crops (Vail, 1983). The Banda regime provided subsidized loans for the purchase of farming inputs to the estate sector using ADMARC proceeds (Kydd & Chirstiansen, 1982). From 1980 to 1992, despite loan agreements to scale back fertilizer subsidies, the government subsidized smallholder fertilizer prices at approximately 25 percent, reducing assistance to 11 percent (partly because of donor withdrawal in protest to the Banda regime) in 1993 (Heisey & Mwangi, 1996; Lele, Christiansen, & Kadiresan, 1989). Starter Packs later replaced the subsidy, only to be reduced and later cut (Levy, 2005). The current subsidy is unique in its implementation and the international acclaim it has won. The next chapter discusses observations from the 2008 Zomba study as to the functioning and effects of the subsidy in the study area.

CHAPTER V

OBSERVATIONS AND INTERPRETATIONS

This chapter reports the findings of the 2008 study. It focuses on three aspects of the effectiveness of the Input Subsidy Program (ISP). I begin with quantitative and qualitative assessments of the coupon distribution process, followed by an analysis of the benefits to production provided by the subsidized fertilizer. The chapter ends with a discussion of the factors that contribute to household food security, and the role of the subsidy within those factors. The general findings of the research were that, as hypothesized, distribution of the coupons between households was highly uneven and problematic, while many of those who did receive subsidized fertilizer received the wrong amount or type, or received it at the wrong time. Excessive rainfall was a major factor in the 2007/2008 cropping year in addition to other common limitations on cultivation. Finally, the benefits of increased yields did not necessarily ensure food security.

5.1 Coupon Distribution

Problems with distribution are symptomatic of underlying problems of the food system itself. It was apparent that nearly everyone in the subject population was desperate for the subsidy, but only those who are otherwise advantaged in the local political economy have the power to *guarantee* their own access to it.

5.1.1 Quantitative Assessment

From the 2006/2007 cropping season to that of 2007/2008, 23 more sample households received some amount of subsidized fertilizer—an increase of 10 percent. A total of 278 coupons were distributed to sample households¹² in 2007/2008, an increase of 70.5 over 2006/2007. However, distribution was generally diluted, with each household receiving less fertilizer on average. In fact, the number of households that received the recommended combination of fertilizer for hybrid maize according to the subsidy—that is, one bag of NPK and one of Urea—increased from one year to the next by only 10, from 29 in 2006/2007 to 39 in 2007/2008.

Figures 2, 3, 4 and 5 show coupon distribution by cluster, expenditure quartile, asset quartile and landholding category, respectively from 2006/2007 to 2007/2008. Clusters 1, 2 and 3 consistently received better coverage than clusters 5 and 6. Cluster 4 showed the strongest improvement from one year to the next, increasing from 57.2 percent coverage to 96.4 percent. Coverage by expenditure quartile both increased and evened out between the two years, with the lowest quartile receiving the fewest coupons

¹² Note that the sample does not include all members of the villages in which the study was conducted.

Figure 2: Households Receiving Coupons, by Cluster (N = 218)

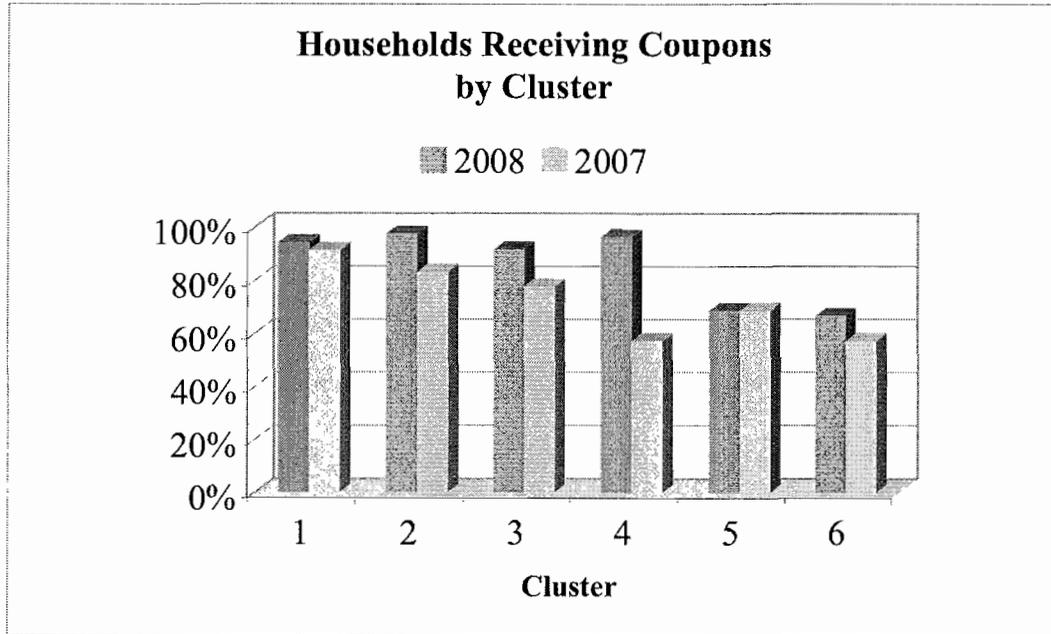


Figure 3: Households Receiving Coupons, by Expenditure Quartile (N =218);
Quartile 1 = lowest, Quartile 4 = highest

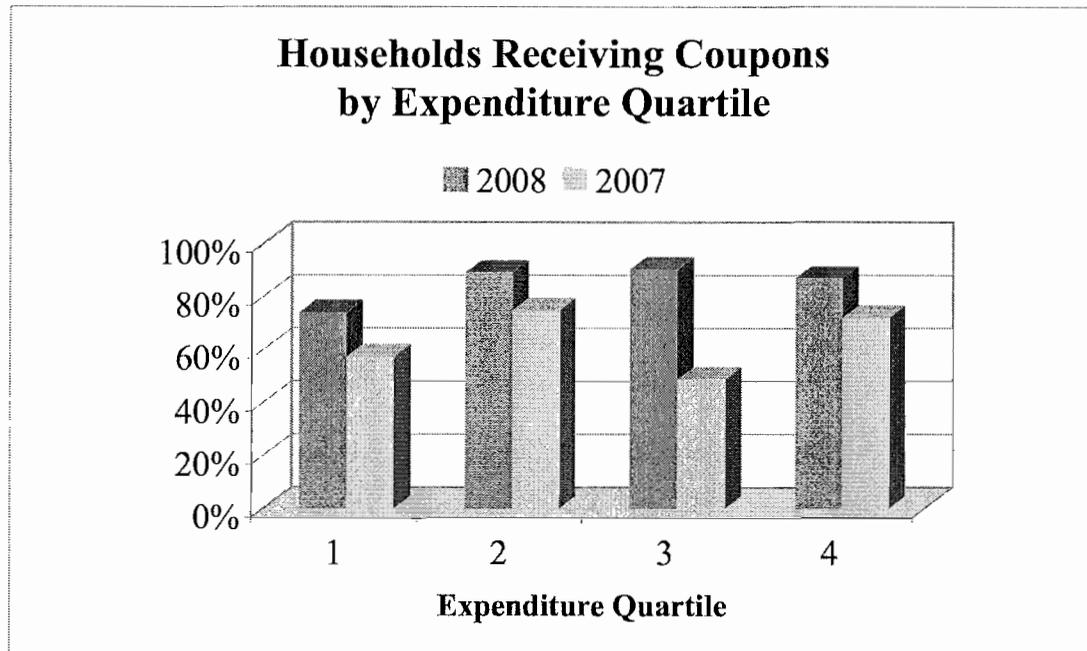


Figure 4: Households Receiving Coupons, by Asset Quartile (N =218); Quartile 1 = lowest, Quartile 4 = highest

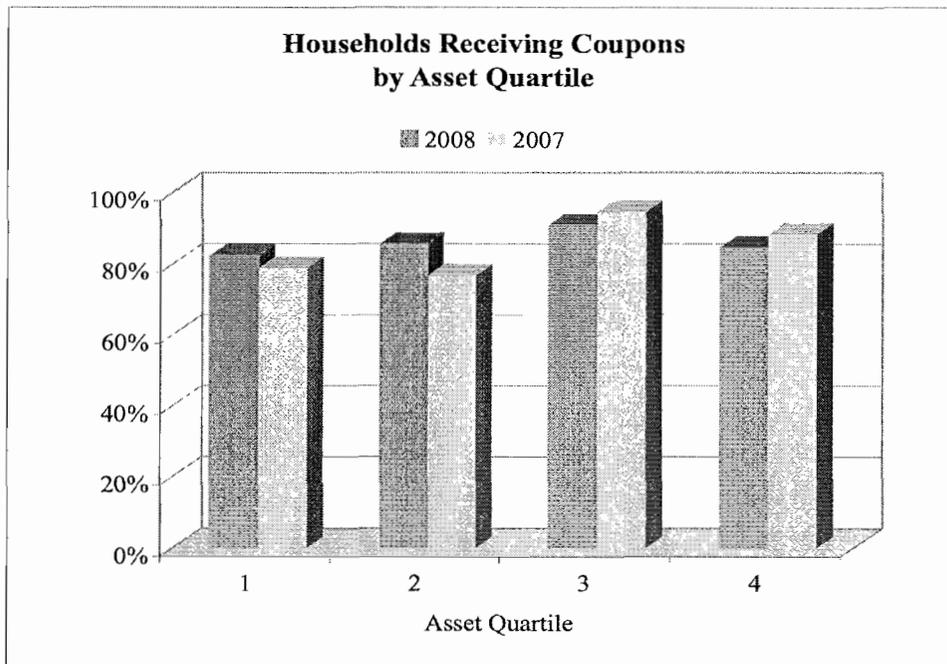
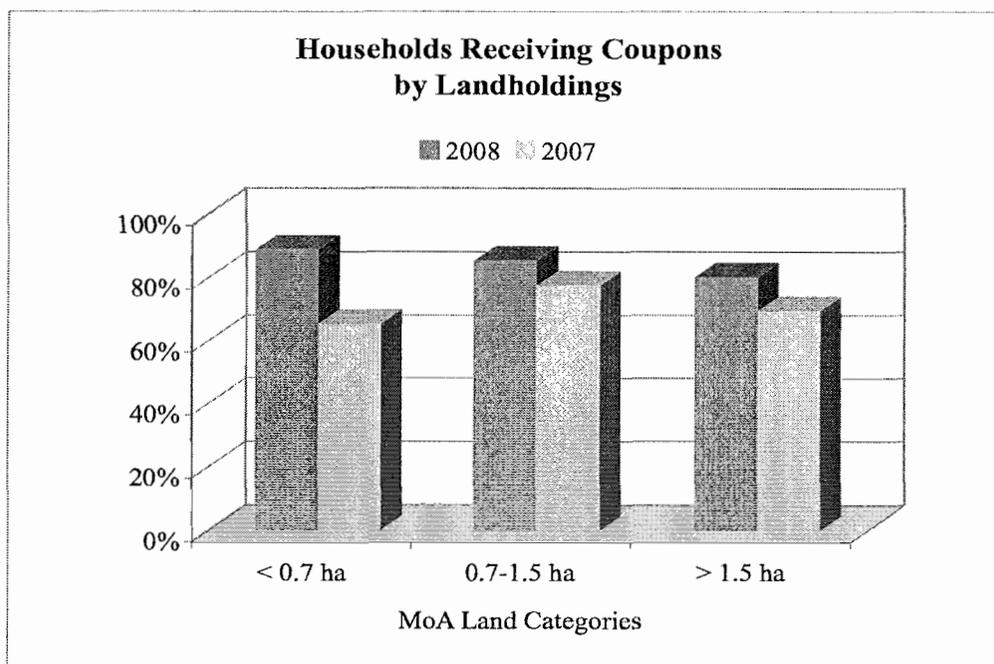


Figure 5: Households Receiving Coupons, by Land Holdings (N =218)



in 2007/2008. Coverage decreased slightly in the top two asset quartiles and increased slightly in the bottom two from one year to the next. Households that held the most farmland received the least number of coupons in 2007/2008, though the difference was marginal.

These observations show a general broadening of coverage from 2006/2007 to 2007/2008. The next two sections discuss some of the nuances of and explanations for the distribution patterns noted here.

5.1.2 Respondent Assessment

Almost without exception, respondents stressed the importance of the subsidy to their livelihoods. There is no question that easier access to fertilizer has increased overall yields in the study area. Coverage in clusters three and four has reached nearly 100% amongst the sample population. Others have increased substantially since the program's inception. This section discusses the central complaints voiced by our respondents in the context of their interpretation of the intended coverage of the subsidy. The four most common complaints regarding distribution were: there were not enough coupons; there was corruption, theft and favoritism on the part of the distributors; recipients were provided with coupons for the wrong types and quantities of fertilizer; and the coupons were distributed late, reducing the effectiveness of the fertilizer.

The complaint that there were not enough coupons, by far the most frequent amongst respondents, can be analyzed in a number of ways. As shown in the previous section, relatively few respondents (N=39) received the prescribed combination of NPK

and Urea fertilizer. Still fewer (N=21) did so without buying extra coupons. It was common for households to receive only one coupon, or to be told to share a coupon with another household. In that sense, people who received less than two coupons were, according to the dictates of the subsidy, correct to complain that there were not enough coupons. However, in light of the fact that overall respondent coverage of the subsidy was well more than the “middle 60%” suggested by Stephen Carr, the question is raised as to whether respondent’s perceptions that there were not enough coupons was due to the government having failed to provide the proper number of coupons or to the fact that the program was diluted to include more recipients. The problem becomes difficult to identify because of the lack of clarity in distribution criteria, the lack of transparency in the process, and because the number of households that meet the recipient criteria set in the ISP document exceeds the 60% target described by Carr.

A related complaint was that the subsidy did not provide enough fertilizer to properly cover the respondents’ fields. This comment was common amongst all recipient households, including those that received the prescribed two coupons. The result of this issue was that many farmers found themselves choosing between applying small amounts of fertilizer to their entire cropping area, or applying the appropriate amount to a limited area.

Corruption and theft were also common allegations. Comments about corruption on the part of village heads tended to vary geographically from one village to another. Theft seemed to be a common theme throughout the study area. Instances of corruption and theft were reported at all scales of authority. The number of officials involved in

coupon distribution has increased since the inception of the subsidy. Rather than reducing instances of corruption and theft, this seems to have increased the problem. Participants in distribution now include Members of Parliament, District Agricultural Officers, Traditional Authorities, Group Village Heads, individual Village Heads, Agricultural Advisors and Extension Officers, Village Chairpersons and local police. The points of entry for corruption have increased substantially, multiplying the opportunities for abuse. Meanwhile, in cases where maldistribution was apparent, each administrator interviewed denied any involvement in the final choice of recipients. In three villages in particular, respondents often reported that the Village Head had favored his or her own relatives and friends in choosing who would receive coupons. Most Village Heads recommended that police and agricultural extension officers be excluded from the distribution process, as police were most frequently accused of stealing or hiding coupons, and extension officers were cited as not knowing the villagers well enough to make decisions. One Group Village Head interviewed gave a detailed description of envelopes containing the proper coupons for each recipient from the area Traditional Authority as having arrived empty or open. The Group Village Head reported dutifully seeing to it that each envelope went to the person whose name was written on it. However, respondents and Village Heads interviewed denied the inclusion of envelopes in any part of the distributional process. Other accounts of corruption included the acceptance of bribes, favoritism and even violence on the part of the distributors. As one respondent pointedly commented, "There is no motivation for [authorities] to deal with us evenly, because they can easily blame someone else." Another said, "Everyone is

desperate for [the subsidized inputs], so many people are able to profit from stealing and selling coupons.” Indeed, each attempt by policymakers to provide additional monitoring to the process seems only to result in further fraud.

The next most commonly reported problem was that beneficiaries received the wrong type of fertilizer, thus limiting its effectiveness. Many respondents demonstrated knowledge of the use and timing of each type of fertilizer, and many cited the lack of one or more appropriate type as a reason for poor yields. In most cases respondents received either NPK or Urea, but not both. Some respondents, however, reported having received D Compound, a fertilizer meant exclusively for tobacco, although they did not grow tobacco and had no history of it. This again, is symptomatic of attempts to spread out the benefits of the subsidy past its original intentions.

Another issue cited by respondents also had major implications for the effectiveness of the subsidized fertilizer. Many sample smallholders reported the late arrival of the subsidy coupons, such that they were forced to alter its use. Most frequently, respondents mentioned finally accessing fertilizer long after planting—in some cases when their maize was nearly mature. Some smallholders planted their maize at the first rain (toward the end of October or early November), despite not yet having received the NPK basal dressing. One method used to cope with this situation was to mix the different types of fertilizer and apply all at once late in the cropping cycle. Others waited to plant for the arrival of the coupons, sometimes as late as December, which, in addition to the early end of the rainy season in 2008, did not allow enough time for the crop to mature.

Each of the problems listed above has the potential to reduce the effectiveness of the input subsidy program. Combined with unusual rain patterns, the result for the majority of respondents in the sample was what they spoke of as a poor or inadequate harvest. The next section discusses the problems cited by smallholders along with my observations as the investigator as to the biggest challenges to the proper distribution of the subsidy.

5.1.3 Central Distributional Challenges

As indicated above, many of the problems referenced by sample smallholders can be attributed to macro-level factors in the design of the subsidy. First and foremost, the main problem of the program is the lack of clarity in identifying target beneficiaries. The obvious question is how one is to select the “middle 60%” of producers referenced by Carr. This can be interpreted to mean perhaps households between the 20th and 80th percentiles of income, landholding, assets or current production. Any of these criteria would be extremely difficult to measure accurately for the entire nation. The ISP document itself gives the following description of qualified recipients:

- A household that owns a piece of land
- Vulnerable household, with purchasing power
- Guardian looking after physically challenged persons who are unable to farm
- Hard-working household
- Adopter of new technologies
- Resident of the village
- Farmers with low income levels but can afford to buy the farm inputs
- Only one beneficiary per household will registered [sic]
- The vulnerable group—child-headed household, female-headed household, elderly but hard-working household

A number of problems can be identified here. First, the above list is rife with vagueness. For example, most households would likely identify as “hard-working.” With the exception of a few households—one made up of two boys who choose to attend school rather than cultivate their fields, and one or two others in which the principle cultivators would likely be identified as “alcoholics” (as described by their neighbors)—it would be difficult to argue that any of the households in the study population could be thought of as anything less than “hard-working.” “Vulnerable household” is another heavily weighted term. The ISP document provides no criteria for identifying whether a household qualifies as either “hard-working” or “vulnerable.” Also, for a household to be an “adopter of new technologies,” it would first be necessary for that household to have access to those technologies, which are unlikely to be within the reach of a “vulnerable” or low-income household. Also unclear is whether recipient households should be identified by one, all, or some of the above characteristics.

This difficulty in interpretation lends itself to abuse of the system by distributors. Without a systematic method for the selection of recipients, this will be done at the discretion of those in power. Also, without more transparency in the allocation process, failure to provide coupons can easily be blamed on others involved in the system. This allows for many of the phenomena reported by respondents, such as favoritism, coupon theft and hoarding. Further, with relatively little recourse available for many smallholders, these activities are nearly risk-free.

Another critique of the distribution criteria is that the number of households that qualify according to the conditions above easily outnumber the amount of beneficiaries

allowed for by the budget of the subsidy or by the “60%” goal. This mismatch is not easy to resolve, as the subsidy’s budget is likely to remain below what is necessary to reach full coverage of all qualified beneficiaries, especially considering the high potential for creative interpretation of recipient guidelines.

Coupon sales also serve to illustrate a number of underlying problems. Though it is illegal to sell a coupon, whether as its intended recipient or having received it by some other means, several respondents reported having sold their coupon because they could not afford the fertilizer even at the subsidized price. Others sold them because they had urgent income needs such as medical expenses, and thus had to leverage their future food security against immediate cash availability. The number of respondents reporting selling their coupons, however, was quite limited. More common was the admission by wealthier respondents of having purchased coupons from others. In both instances, there seemed to be no ethical question as to the direct purchase coupons from one smallholder to another. Indeed, the sale or use of the coupons were widely regarded as the prerogative of the recipient. Questionable, however, was the morality of purchasing coupons from shops, vendors or non-locals. This is likely due to the fact that coupons for sale on a large scale were much more likely to have been stolen or hoarded. No respondents who purchased coupons were willing to identify specifically from whom they bought them—likely due to the illegal nature of buying coupons. Many, however, were willing to discuss their rationale behind the purchase. One respondent, who acknowledged that the 14 extra coupons she had purchased that year were very helpful to her, also reflected that she felt pity for those who did not have enough cash to buy the

fertilizer themselves and that she was at least giving them something for their “useless” coupon. When questioned about the topic, however, agricultural economist Ephraim Chirwa discussed the process in terms of a “welfare loss” on the part of the poorer households.¹³ By this he meant that the prices paid for the coupons were far below the actual value of the coupon. That is, the price of fertilizer at the subsidized rate was 900 kwacha per 50 kilogram bag. Most coupon purchases were reported between 1000 and 2000 kwacha per coupon. Depending on type, the average reported unsubsidized cost of a 50 kilogram bag of fertilizer was between 5000 and 6000 kwacha. Thus, the actual value of a coupon was approximately 4000 to 5000 kwacha, the price received for it was 50% of the value, at most. In that way, the benefits of the program, in Chirwa’s words, are “leaked” to the more advantaged households. This is reflective of the food system in which poorer households find themselves needing to sell their produce at lower than average prices, later having to purchase maize after prices have increased, while wealthier households are more able to take advantage of market price fluctuations.

Also reflective of broader issues within the local food system are instances of bribery and the assignment of “fees.” Many respondents reported having to pay additional “handling” and “assurance” fees at the fertilizer distribution points. In some cases, a smallholder waiting in line would be told that the fertilizer was running out (this was often this case) and if they paid an additional fee, ranging from 50 to 500 kwacha, a bag would be set aside exclusively for them. Other times a bribe would allow someone to skip the queue or purchase more than the amount of fertilizer allotted by their coupons.

¹³ Personal communication, September 3, 2008.

Those unable to pay the fees were often required to wait longer or were outright turned away. As the fertilizer distribution points were widely spread and transportation was also difficult and expensive, smallholders often had little opportunity to exchange their coupons elsewhere, and were forced to pay the bribes and fees.

The above descriptions provide a basis for the conclusion that most of the major problems of coupon distribution in the subsidy are both symptomatic of and resultant from inherent disadvantages within the food system itself. The most marginalized smallholders are the least likely to be able to control their access to and ability to use the coupons. Further, the better-off households have more methods at their disposal for obtaining the subsidized fertilizer. These add up to the effect that the benefits of the subsidy itself are channeled from the poorer segments of the study population to the richer, as shown by the quantitative analysis above.

Though many of the processes listed above tend to favor the more privileged segments of the population at the expense of the marginalized, it is not the intention of this account to imply any kind of innate propensity for trouble-making. Rather, these accounts should be taken as evidence that nearly all segments are desperate for the benefits of the subsidy. Instances of apparent greed, when carefully examined, serve as proof that severe need is the motivating factor behind most individuals' behavior with regard to the coupons. Evidence of this is that even those who receive the prescribed amounts and type of fertilizers still often fail to produce yields sufficient to feed the household until the next cropping season. Thus, problems of distribution are clearly symptomatic of disparities within the political economy of the local food system.

Although nearly everyone is desperate for the benefits of fertilizer use, many people are unable to command the resources needed to access those benefits through the subsidy.

It should also be noted that there are different ways to interpret claims of corruption or favoritism on the part of the distributors. Stephen Carr observes that within local villages there is “an intense belief that any benefit arriving in a village must be shared between all members.”¹⁴ This specifically cultural characteristic often results in the dilution of benefits in order that everyone should receive some assistance.

This analysis is not, however, meant to excuse inappropriate behavior on the part of those stealing or manipulating the benefits of the program. Rather, I wish to recognize that many of the problems in coupon distribution can also be associated with distributional failures within the food system and Malawi’s political economy themselves. This leads to two conclusions: first, that these problems must be acknowledged and consciously averted for the program to reach full effectiveness; and second, that the subsidy itself does not solve the more fundamental issue—namely, the desperation with which many respondents cling to sources of food security and livelihood—and will not do so without additional food security strategies.

5.2 Maize Production

The central goal of the input subsidy program is to increase maize production both nationally and at the household level. The results have been striking. This section assesses maize production since the beginning of the subsidy. While it is clear that some

¹⁴ Personal communication, May 22, 2009.

of the increased production is a direct result of the subsidy, it remains to be seen what other factors have also influenced yields.

5.2.1 Quantitative Assessment

Nationally, maize yields have increased from year to year since 2005, with the exception of the year this study was conducted, 2008. In fact, official estimates assess that the 2009 harvest is more than three times larger than the disastrous harvest of 2005. Table 1 lists official maize crop estimates from the Ministry of Agriculture and Food Security. However, it is possible that these estimates may be exaggerated by as much as 25%.¹⁵ That possibility aside, it is still clear that national yields have risen above pre-subsidy levels (Dorward & Chirwa, 2008). This section presents the quantitative findings of household production from the 2008 study.

Table 1: Estimated Annual Maize Crop, in millions of metric tons (M mT) (data from Ministry of Agriculture and Food Security, Government of Malawi)

Year	MoA Crop Estimate
2005	1.2 M mT
2006	2.7 M mT
2007	3.4 M mT
2008	2.9 M mT
2009	3.9 M mT

According to the Statistics Division of the United Nations Food and Agriculture Organization (2008), the average Malawian needs 1740 calories per day. This translates to roughly 180 kilograms of maize per year (Freeling & Walbot, 1994). Overall, average

¹⁵ See Jayne and others (Jayne, Chapoto, Minde, & Donovan, 2008).

household maize production per person dropped dramatically from 2006 to 2008, from 209.4 kilograms to 93.3 kilograms. The most likely explanations for this decrease are the lateness of coupon arrival and the wider, more diluted distribution of the fertilizer benefits, in addition to the significantly worse weather conditions of the 2007/2008 cropping seasons.

Clusters 1 and 4 had the highest productivity rates at averages of 720.9 and 749.5, respectively. These clusters also have the highest concentration of households in the uppermost expenditure quartile. Production rose consistently with expenditure quartile, beginning with an average of 273.0 kilograms in the lowest and 792.5 kilograms in the highest. Assets and expenditures are used as fairly reliable indicators of household welfare, so those households with more income or items to sell for cash generally have more access to productive resources.

The use of chemical fertilizer had a clear effect on overall yields. Those households that used no chemical fertilizer harvested an average of 162.7 kilograms of maize, while those using fertilizer harvested an average of 501.9 kilograms. Households that purchased some fertilizer at the unsubsidized price, either in addition to or in place of subsidized fertilizer, harvested an average of 701.2 kilograms of maize, and those households relying on subsidized fertilizer harvested an average of 521.3 kilograms. Clearly, purchasing power, with or without the subsidy, is an important consideration in productivity. Finally, the households that used the recommended types of fertilizer (that is, NPK basal dressing and Urea top dressing), whether obtain through the subsidy or purchased, along with hybrid seeds harvested an average of 903.4 kilograms of maize.

Thus, yields are maximized under the ideal conditions named by the designers of the subsidy. Unfortunately, for reasons discussed in the previous section, it is unrealistic to expect full realization of those conditions across beneficiaries.

Figures 5 and 6 illustrate levels of production across expenditure quartiles and asset quartiles, respectively. From figure 6 and 7, it is clear that production levels increase alongside wealth indicators. With the exception of the third expenditure quartile¹⁶, this is true regardless of whether the household received a fertilizer coupon. However, it is also true that those households receiving a coupon consistently produced more maize than those that did not. In both expenditure and asset quartiles, the largest difference between producers who received subsidized fertilizer and those who did not was in the lowest quartile, while the smallest difference was in the highest quartile. This is mainly because many of the households in the upper expenditure and asset quartile could afford to purchase fertilizer without a coupon, while those in the lowest quartile could not.

This quantitative analysis mostly addressed household resources available for the procurement of agricultural inputs. The next section discusses the influence on production of factors other than input availability.

¹⁶ All but five households in expenditure quartile three received fertilizer coupons, so this result should not be considered statistically significant.

Figure 6: Household Maize Harvest, by Expenditure Quartile (N = 218);
Quartile 1 = lowest, Quartile 4 = highest

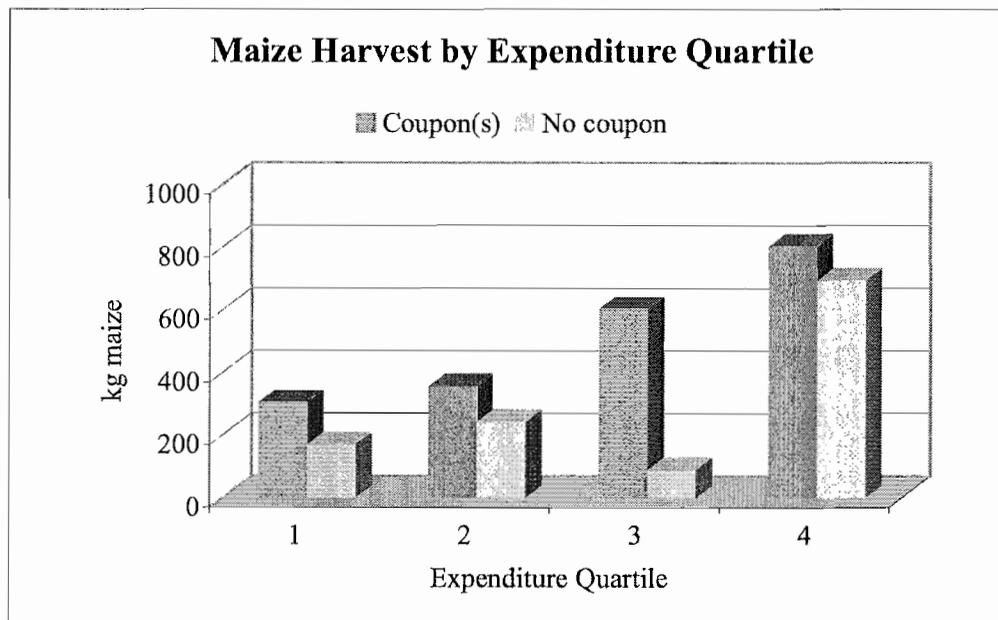
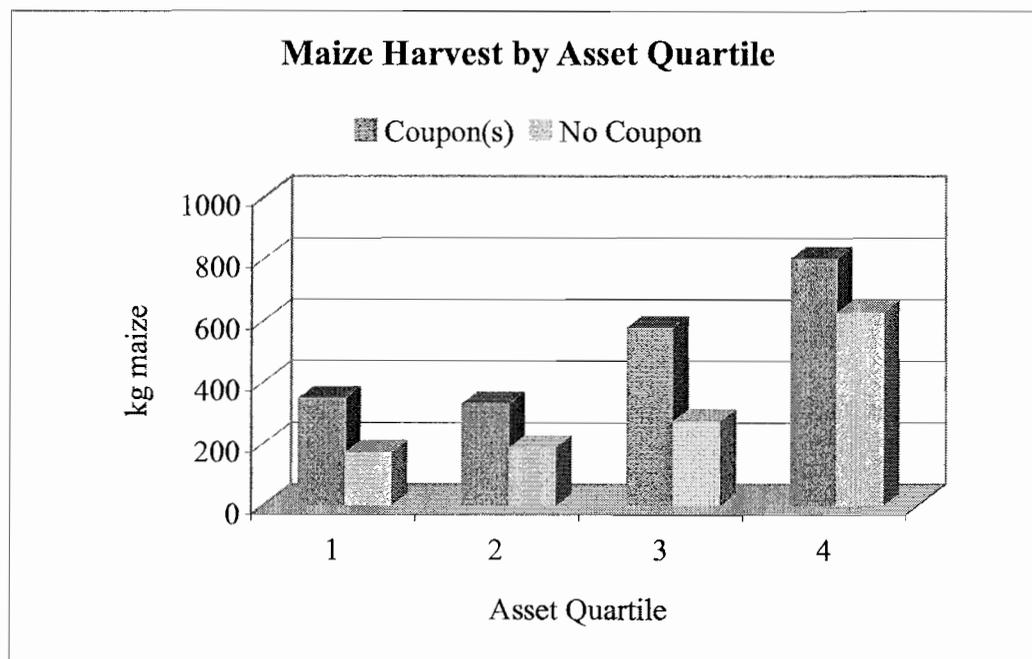


Figure 7: Household Maize Harvest, by Asset Quartile (N = 218);
Quartile 1 = lowest, Quartile 4 = highest



5.2.2 Other Cultivation Challenges

The positive effect the subsidy has had on agricultural yields is apparent. However, the question remains as to whether these benefits are sustainable in the long term, or even from one year to the next. Multiple other factors, such as soil quality (that is, not only fertility), labor and land availability, and weather conditions affect production in ways independent from chemical fertilizers.

5.2.2.1 Soil Quality

Soil fertility is important to the overall production ability of land, but to imply that supplementing soil nutrient content is enough to ensure productivity would be perpetuate what is known as the “NPK myth.” First, it is false to assume that simply increasing nitrogen, phosphorus and potassium will produce nutrient-balanced soils. Some of the consequences of focusing solely on these three macronutrients are discussed in section 6.1.2. Further, there are many factors that determine the overall quality of soils. According to Mason, ideal agricultural soil, in addition to having a well-balanced nutrient supply, must be well drained, have a deep root zone, is easily penetrated by air, water and roots, has good water-holding capacity, and is erosion resistant (Mason, 2003). Some of these characteristics are encouraged through the practice of contour ridging, as discussed in section 4.4, but at a huge labor cost to the household—see section 5.2.2.3.

5.2.2.2 Land

Figure 8 shows that across land categories, maize yields improved with area for those households that used subsidized fertilizer. However, yields remained roughly the same for households not receiving a coupon, despite area of land. Though landholdings can be loosely associated with wealth, the more land a household owns, the more fertilizer it must procure. In general, however, lack of land is a serious constraint on smallholder agriculture. Excluding households whose landholdings exceed three hectares, the average household in the 2008 sample has 1.1 hectare of land and 5.2 members (N = 204). In order to fill the caloric needs of all members, estimated at 180 kilograms per person per year (Food and Agriculture Organization, 2008), the average sample household would need to produce 1200 kilograms (1.2 metric tons) per hectare of land. This need varies greatly between households, from a minimum need of 16 kilograms per hectare (a household of two members with 2.1 hectares of land), to an impossible maximum need of 6,840 kilograms per hectare (8 members, 0.2 hectares).

Figure 8: Household Maize Harvest, by Land Holdings (N = 218)

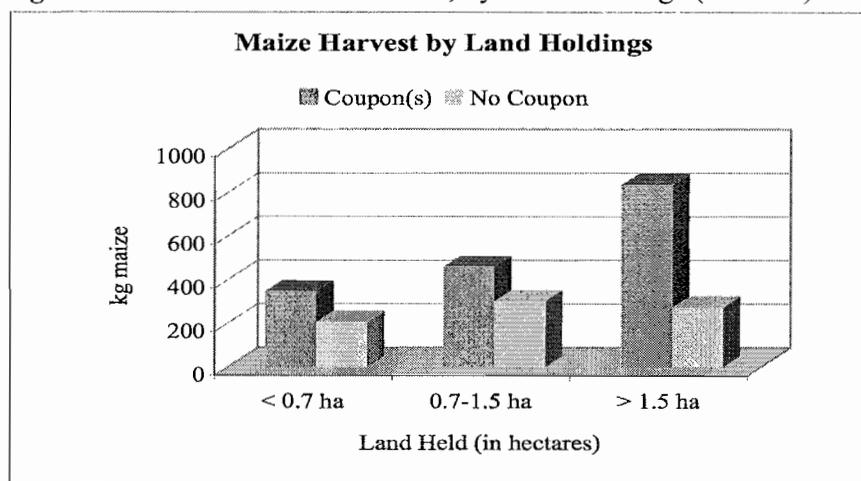


Table 2 lists expected maize yield per hectare according to type of maize and whether it has been fertilized sufficiently (Heisey & Mwangi, 1996) alongside actual yields from the 2008 study. Expected yields, according to Heisey and Mwangi, vastly outweigh those achieved in 2008 within the sample population. Even amongst households that received the prescribed fertilizer combination and used hybrid seeds, yield per hectare averaged only 780 kilograms per hectare, well short of the expected 4,000 kilograms per hectare. At that rate of production, the average household in the sample would need 1.2 hectares of land. While the average sample household would only need 0.16 hectare more land, that need ranges from 0 (or less than zero, for those who have more land than is needed according to these calculations) to 1.95 hectares. Of households that need more land, which is 60.1 percent of the sample, the average need is for 0.62 hectares. Of the total sample (including outlier households) 29.3 percent would need at least 0.5 more hectares of land in order to fill the dietary requirements of their members under the most favorable conditions of production found in the 2008 study.

Table 2: Yields by Type of Maize and Treatment in metric tons per hectare (expected yield data from Heisey and Mwangi, 1996, page 14)

Maize Type	Treatment	Expected Yield	Sample Yield
Local	No fertilizer	0.9 mT/ha	0.25 mT/ha
Local	Fertilizer	1.3 mT/ha	0.46 mT/ha
Hybrid	No fertilizer	1.6 mT/ha	N/A
Hybrid	Fertilizer	4.0 mT/ha	0.73 mT/ha

Households in the sample area, however, cannot rely upon increasing their landholdings. Though it can be said that the intensification effects of population growth have been somewhat slowed by the HIV/AIDS pandemic (Peters et al., 2008), the number

of daughter households inheriting land vastly outweighs the number of parent households. Outmigration to less densely populated areas of Malawi is one attempt to mitigate this problem, but overall, land is becoming further subdivided in the study area.

5.2.2.3 Labor

Labor has always been a major constraint to Malawian agriculture. Weeding alone represents a monumental task. If the field is not cleared of weeds, the crop plants will have to compete for nutrients and water—a battle they are likely to lose. Illness has always been a major constraint on labor availability. Malaria, tuberculosis and diarrheal diseases are most likely to occur during the rainy season, which is also the period of highest agricultural labor requirement. HIV/AIDS has added to the pressure on household labor availability. The age group most heavily affected is young working adults, those otherwise most capable of performing labor-intensive tasks. In addition to the added morbidity and mortality among laborers, much time is spent caring for the ill and attending funerals—an all-day affair requiring the attendance of all able villagers (Peters et al., 2008). Also, as discussed in chapter IV, the demands of a monetized economy has led to increased need for off-farm income, which usually results in the loss of male labor through labor migration to the estates. Finally, child and elderly care, school attendance, childbirth, and household chores such as cooking and fetching water also place demands on household labor availability.

5.2.2.4 Weather

The yield benefits of chemical fertilizers notwithstanding, crop production is always vulnerable to some extent to changes in weather patterns. As is shown in section 5.3, the favorable weather conditions of the 2005/2006 and 2006/2007 cropping seasons gave way to flooding and excess rainfall in 2007/2008. This resulted in crop loss throughout the study area. Weather conditions can only be expected to deteriorate as global climate change becomes more severe. While some seed varieties help reduce crop vulnerability to unfavorable rainfall and weather conditions, the risk remains.

It is because of these types of production vulnerabilities that food security strategies outside of production-oriented schemes are critically important. Few will dispute that higher crop yields will have a generally positive affect on affordability and availability of food, particularly for a population which is so heavily reliant on agriculture for its means of survival. However, those yields cannot be guaranteed to be sustained, nor will the benefits be distributed appropriately without increased entitlements. The next section discusses what food security benefits from the subsidy were observed in the Zomba study.

5.3 Food Security

This section emphasizes the importance of scale in the assessment of food security. Household food security is the chief concern of this discussion because the benefits of the subsidy on aggregate national production have already been shown (Dorward & Chirwa, 2008). Also, the exclusive use of national figures is widely seen as

shortsighted and misleading (Dréze, Sen, & Hussain, 1995; Moore-Lappé & Collins, 1998; Mukherjee, 2004; Sen, 1995). Finally, use of the entitlement framework requires examination of food security at multiple scales, particularly the individual and household levels (Dréze & Sen, 1989; Sen, 1981).

5.3.1 National Self-Sufficiency

The opinions of scholars and policy makers as to the best national food security strategy vary. The stated goal of the current subsidy is to achieve national self-sufficiency so that no imported food is required. However, the presence of food does not mean it will be distributed properly. One major problem is that the Malawian government has chosen to export the surplus grain. Since in capitalism resources are not distributed evenly, if the government plans to retain only enough grain according to estimates based on population then some will be in want, because others will have plenty. Another problem is the difficulty of estimating the national grain requirement. First, though the amount of grain needed per person can be estimated, there is significant room for error. For example, HIV/AIDS and its treatment with antiretroviral drugs causes increased nutritional needs in patients (Bukusuba, Kikafunda, & Whitehead, 2007; Ngwira, Bota, & Loevinsohn, 2001). Also, national population figures are fraught with difficulties, and should only be relied upon as rough estimates.¹⁷

¹⁷ It happened that while I was conducting the research for this study, the Government of Malawi was conducting its 10-year population census. Most respondents we spoke to complained of miscounts and households being excluded completely. Indeed, one village head went to the district statistical office to request that census officers return to account for missed households.

In addition to a person's estimated nutritional requirement, there are many social demands for food in the villages. Funerals, weddings, rites of passage and other rituals require the provision of food for visitors. Many respondents who had expected their harvests to last well into the hungry season were found to have used their stores within the next month or two because of one or more of the above reasons. These uses are culturally essential, but do not fall strictly within the parameters of what would be considered *grain requirement*.

One metric used throughout the popular media as evidence of Malawi's apparent newfound food security is its having become a net exporter of grain, in contrast to most previous years of grain importation. Exportation of food, however, is an economic choice, not a measure of production.¹⁸ Other considerations suggest that grain shortage is hardly a thing of the past. For example, coincident with the reported bumper crops of 2005/2006 and 2006/2007, market grain prices continued to rise dramatically. Proponents argue that high prices were the result of speculation and opportunistic behavior, and give the counter-hypothetical argument that had it not been for the increased yields, food prices would have been even higher. Be that as it may, monetary access to food remains restricted in ways that the subsidy can only partially mitigate.

5.3.2 Household Food Security

Most important in assessing food security is to understand the vulnerability of a household to external shocks, production or otherwise. Food security from the 2007

¹⁸ In the case of the Irish potato famine, for instance, potatoes were being (forcibly) exported to England, while the farmers themselves starved.

harvest to the 2008 harvest is illustrative. The 2007/2008 production season was affected by late fertilizer application and excessive rainfall and flooding. The true test of the country's newfound food security is whether it can be maintained in the face of non-ideal conditions.

5.3.2.1 Quantitative Assessment

The short duration of the study limited the ways in which food security could be measured among the respondent population. Grain storage was selected as the most effective measure of food security under the conditions of the study. In Malawian culture, a household is considered to be wealthy and food secure if it is able to grow enough food to last until the following harvest season. Thus, respondents were asked when their stored maize ran out during the previous season (after the 2007 harvest) and how long they expected the harvest from 2008 to last. The results are listed in figures 9 through 16.

In general, the 2007 harvest lasted until approximately January or February 2008, which is a significant improvement over previous years. Respondents expected their 2008 maize harvest to last until November or December of the same year, which translates to a very long "hungry" season, lasting until the next harvest in April and May 2009. Household food storage declined from 2007 to 2008 across clusters, expenditure quartiles and asset quartiles, regardless of whether the household received a coupon. It remains, however, that households that received coupons generally maintained their maize supply for more months than those that did not.

Figure 9: Months of Maize in Storage, by Cluster, 2007 (N = 178—data not available for Cluster 1)

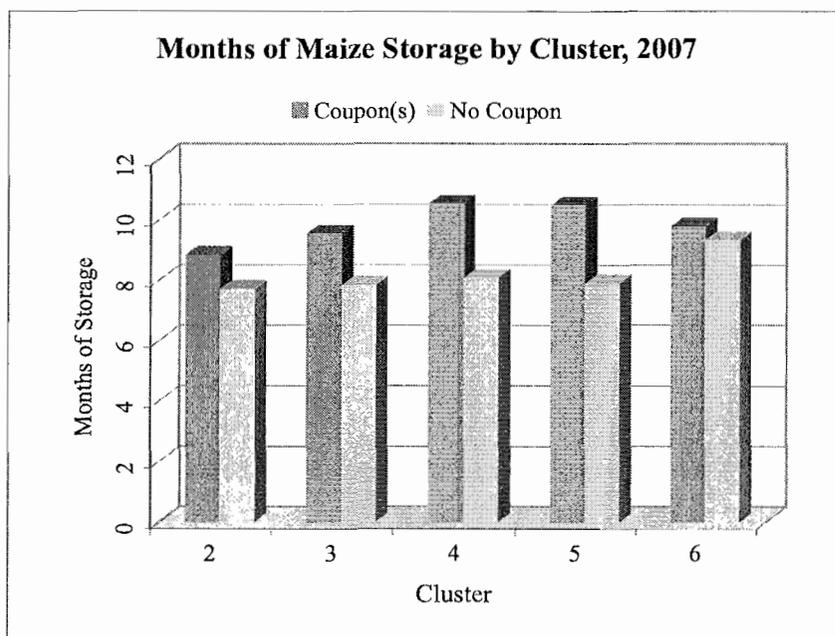


Figure 10: Months of Maize in Storage, by Cluster, 2008 (N = 178—data not available for Cluster 1)

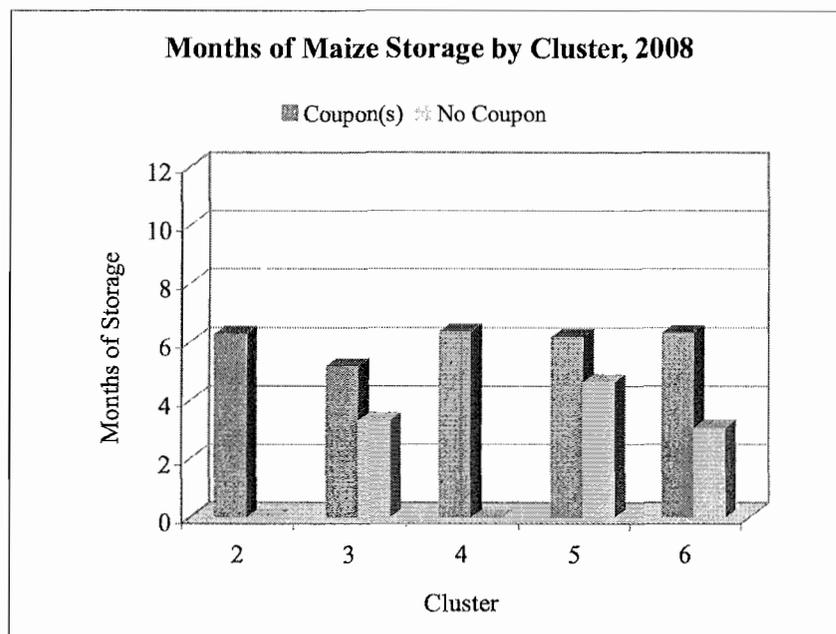


Figure 11: Months of Maize in Storage, by Expenditures, 2007 (N = 178)

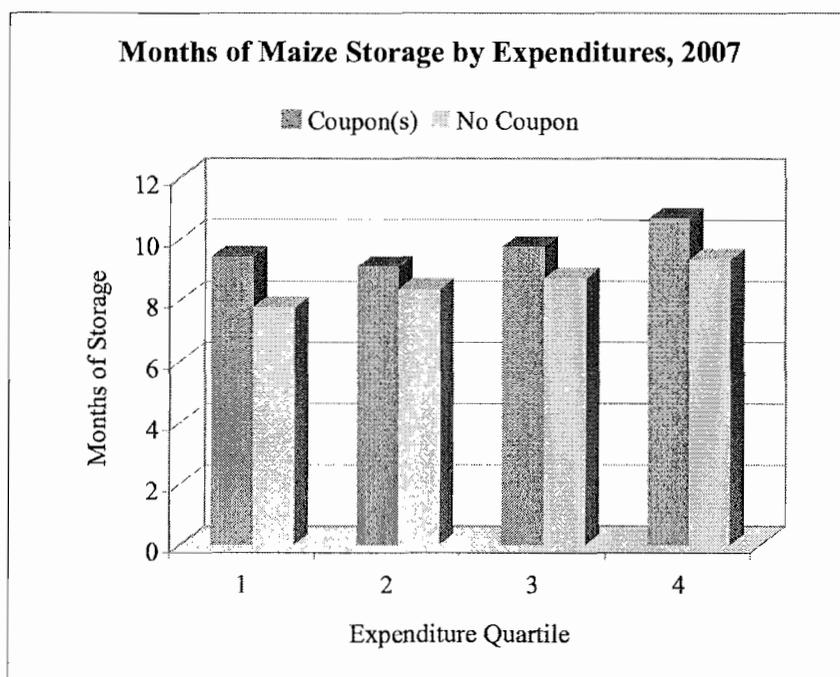


Figure 12: Months of Maize in Storage, by Expenditures, 2008 (N = 178)

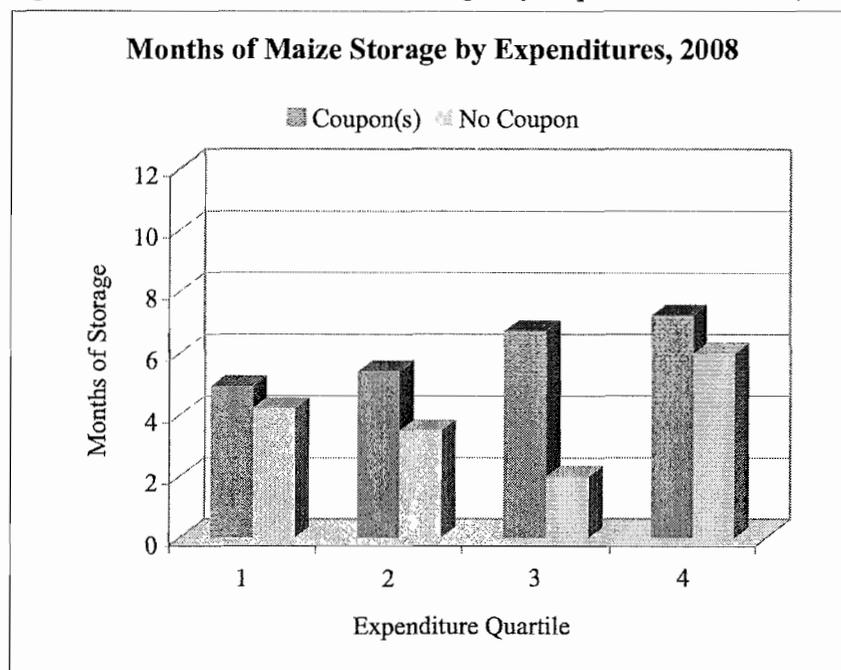


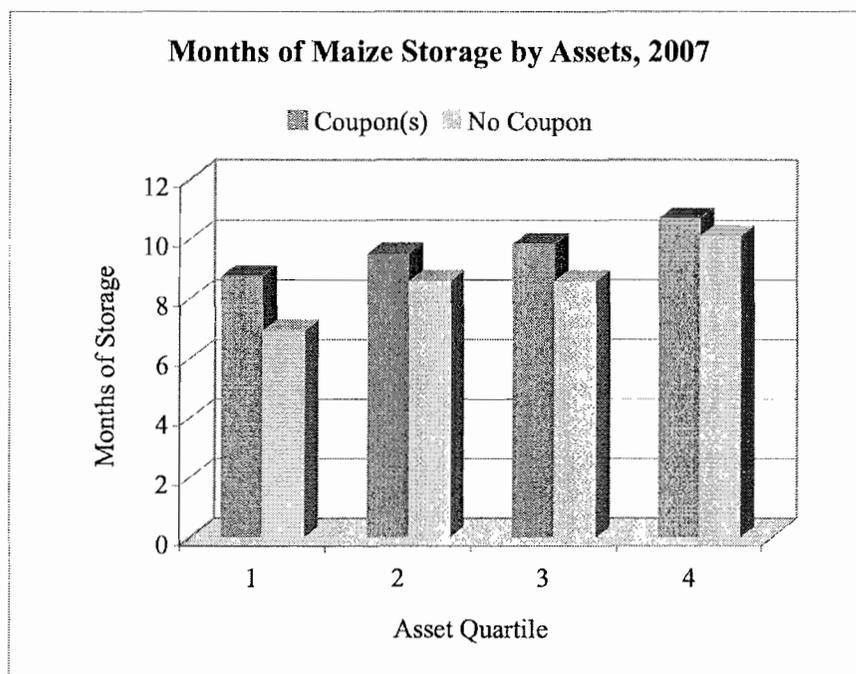
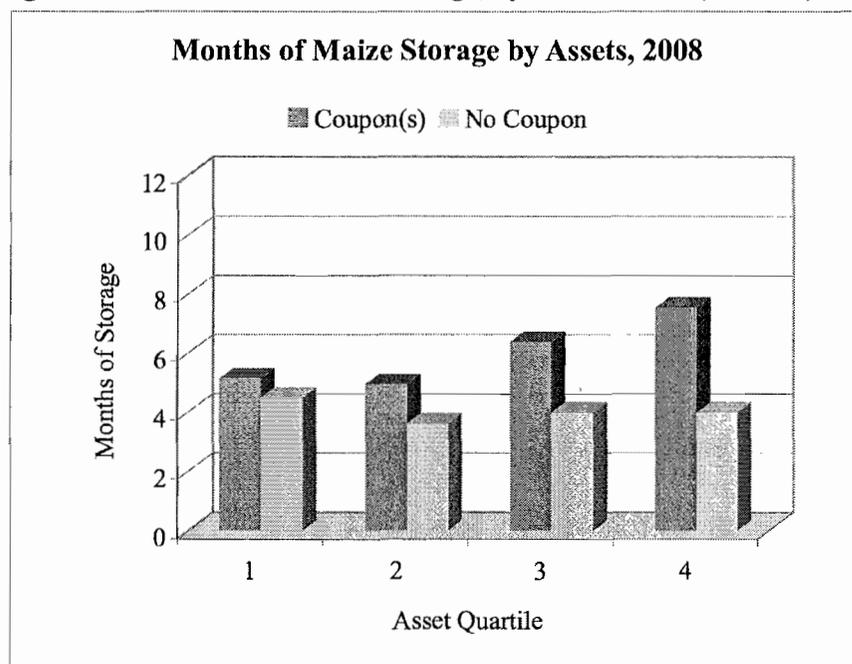
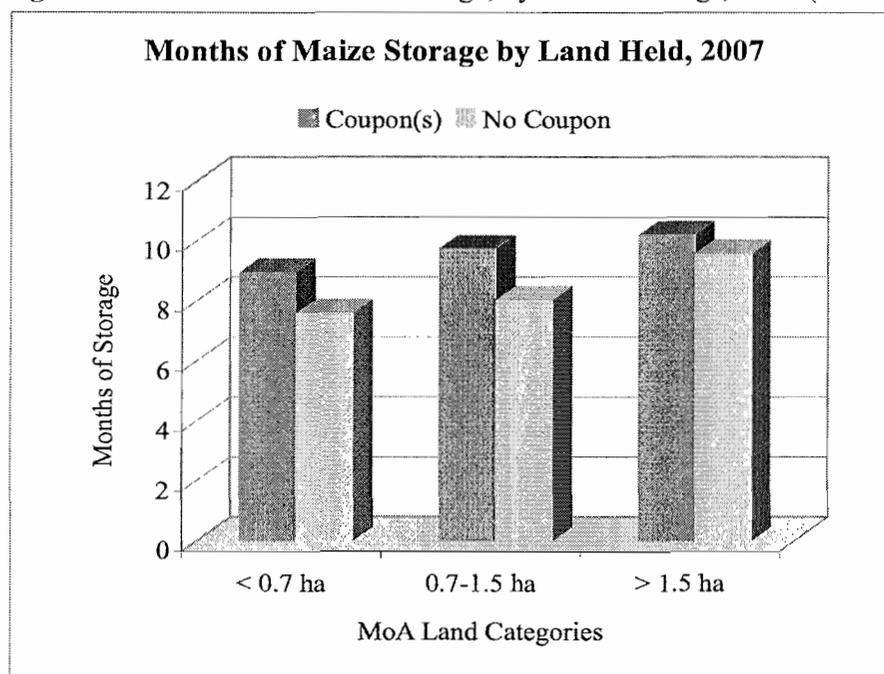
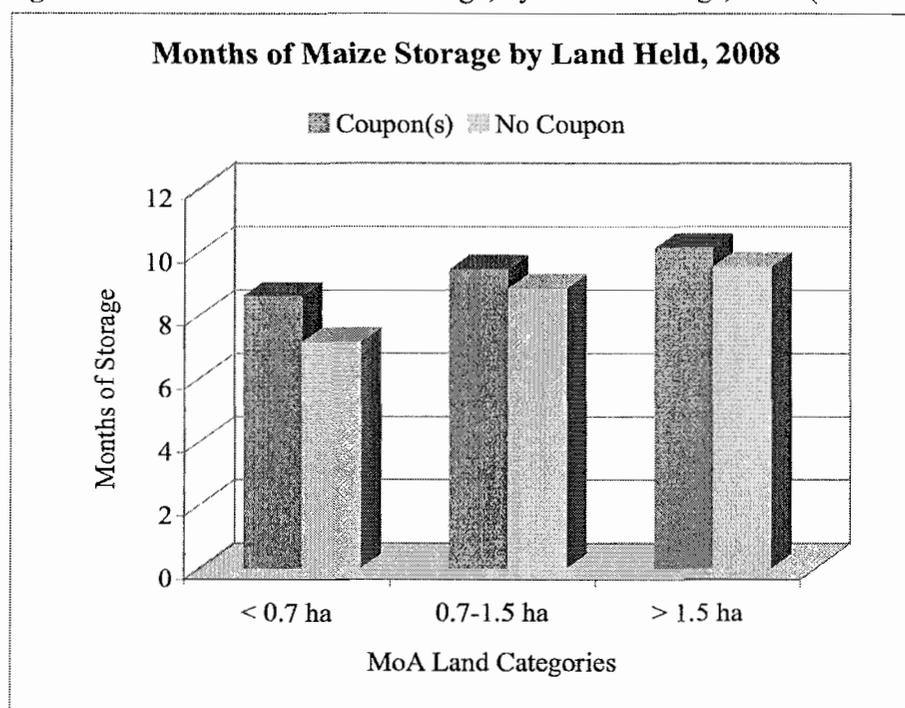
Figure 13: Months of Maize in Storage, by Assets, 2007 (N = 178)**Figure 14: Months of Maize in Storage, by Assets, 2008 (N = 178)**

Figure 15: Months of Maize in Storage, by Land Holdings, 2007 (N = 178)**Figure 16:** Months of Maize in Storage, by Land Holdings, 2008 (N = 178)

The 2007 harvest lasted an average of 9.8 months for households that used subsidized fertilizer, and 8.5 months for those that did not. This dropped drastically in 2008, to 6 months for coupon holders and 4.1 months for those without a coupon.¹⁹ A similar pattern exists across expenditure and asset quartiles. Notably, the largest drop in storage time from 2007 to 2008 occurred in the lowest quartile in both expenditures and assets. This is likely the result of those households' reduced capacity to purchase supplementary maize for future use. The ability to purchase supplemental maize is one of several alternative food security strategies discussed in the following section.

5.3.2.2 "Feeling" Hungry

While this quantitative assessment is a good indicator of the general food security situation of the study area, follow-up interviews revealed that some respondents considered their households to be food secure despite the lengthened hungry season. In many cases, these were households that had alternative resources for acquiring food. These sources included the sale of cash crops, remittances and gifts from relatives, jobs and other sources of off-farm income, and possession of a dry-season garden (*dimba*).

Peters has written extensively on the benefits brought to households able to grow and sell substantial amounts of burley tobacco and other cash crops (Peters, 1989). Not only are they able to purchase supplemental food, less labor time is spent earning wages outside of the household. Peters also found that because of the expense of inputs, land needed, extra labor required, difficulty moving products to markets and volatile producer

¹⁹ Data was not available for cluster 1. In clusters 2 and 4 in 2008, N = 1 for non-coupon holders, so these results were omitted as not statistically significant.

prices, it was generally the more advantaged households that were able to sustain profitable production of cash crops.

Several respondents answered during follow-up interviews that although they expected their maize stores to be consumed within the next several months, they were not worried about food security because they had a relative (usually an adult son or daughter) who sent regular remittances and gifts. These came in the form of cash, grain or occasionally fertilizer. In some cases remittances were the only source of sustenance—this was usually an elderly woman living alone or with an ill spouse or orphaned grandchildren—while other households used remittances in combination with other food sources.

The most common source of income was *ganyu* labor (casual, day labor), performed by household members for neighbors, relatives or other nearby farmers. It is traditional to pay *ganyu* workers in grain, but in the increasingly monetized economy cash has become more common. Several wealthier households reported buying several bags (usually 50 kilograms) of maize early in the season while prices were still low, which they would save and use later to pay *ganyu* workers. For some, *ganyu* labor is undertaken only in times of severe need, but it is more common for *ganyu* to be a regular part of a household's food strategy. Proponents of production-based food security schemes argue that *ganyu* is made more widely available when crop yields are higher.

Other sources of income included regular jobs, with occupations ranging from caretaker to teacher to cook, and the sale of items in the local market. Many respondents reported growing vegetables, most commonly peas and tomatoes, to sell locally. Those

able to set aside a fair amount of capital purchased bales of second-hand clothing, which they laundered and then sold at the local market. Others perform services such as bike repair or operate bicycle taxis. Many households count on these sources of income for regular sustenance, which become problematic when consumer food prices fluctuate from year to year.

Dimba gardens are also an important way for Malawians to supplement their regular season harvest. These gardens, located along the banks of rivers, allow for the cultivation of crops during the dry season, thus providing a supplemental source of food or income (Chinsinga, 2007; Peters, 1996). *Dimbas* are often used to grow vegetables for meals or for sale, or as a nursery for tobacco seedlings. Respondents in the 2008 study often commented that they had chosen to plant their *dimbas* with more maize than usual that year, in order to supplement the poor maize harvest. However, *dimbas* are another example of a resource more accessible to the wealthier households, as 35 percent of *dimba* owners are ranked in the top expenditure quartile, while only 14 percent are in the bottom quartile. Thus, another potential source of food is dominated by the wealthy.

While there are many ways in which a household can compensate for poor harvests, most of them vary with the household's general wellbeing. Households that are most likely to suffer from crop loss are least likely to be able to take advantage of the above strategies. Increased crop production offers some relief from chronic underproduction, but does not significantly reduce household risk against shocks, to which the least advantaged households are the most vulnerable.

5.4 Conclusion

There is little question that the use of fertilizer increases agricultural yields in most cases. Further, it can be said that the input subsidy has resulted in increased use of fertilizer in Malawi. It would be false, however, to conclude that because yields have risen nationwide, food security can be assumed to have done the same. This section has demonstrated three important caveats in the assessment of the subsidy's success: distribution according to the program's specifications is difficult, and tends to sideline the needs of the less powerful; while production is aided by the use of inputs, it is still quite vulnerable to shocks, such as the flooding that took place in the rainy season of 2008; and finally, national crop estimates seem to tell us little about household food security levels, as it has been shown in this study that very few households have reported maintaining their staple food stocks for the entirety of the growing season. While there is much to praise about the subsidy, it is important to recognize these drawbacks, particularly as other African countries have begun to consult with Malawi concerning the design and implementation of their own subsidy programs.

The discussion featured in chapter VI focuses on some of the major critiques of input subsidies in general. It also examines some alternative or supplemental strategies to production-oriented development schemes.

CHAPTER VI

BROADER SIGNIFICANCE

Analysis of the Malawian subsidy illuminates the reasoning behind many critiques of subsidies within the literature. It also provides a basis for discussing various alternative or supplemental strategies. The critics of input subsidies can be divided into two major camps: one group opposes input subsidies on the basis of economic and social arguments; another is concerned over the ecological effects of increased input use.

6.1 Economic and Social Opposition

The classic position of economists and groups such as the World Bank and International Monetary Fund is that input subsidies distort prices and sideline private sector participation (Morris, Kelly, Kopicki, & Byerlee, 2007; World Bank, 2007). This argument postulates that competition, the central feature of the market, is what drives innovation. Companies will compete to provide their product at the lowest possible price in order to maintain their clientele. In this way they strive for the most efficient way to maximize profit in their industry. According to free-market capitalism, price subsidies undermine private companies' ability to compete. They also argue that subsidies serve as national protectionist policies, reducing the competitive advantage of importers. In

addition to thinking of the free market as the best way to ensure the distribution of productions, neoclassical economists are known for their assertion that the best way to provide for the needs of a population is to reduce regulations and allow businesses to compete freely.

This argument takes several important factors for granted. First, it assumes equality of access both for consumers and for competing firms. It can be seen, however, that the more resource-rich will be able to take advantage of said efficiencies in production. For example, many maize farmers are found to be acting “irrationally” by selling their maize when producer prices are low, rather than waiting for prices to rise, as they inevitably will during the cultivation season when maize is more scarce. It is often the case, however, that in the absence of other forms of cash income, the smallholder will have no other option than to sell the maize early in order to cover other expenses, such as the purchase of fertilizer and seeds for the coming season. A farmer with readily available cash income, however, is able to wait and take advantage of higher prices later in the season. Furthermore, it may be tempting for those with the wherewithal to intentionally monopolize the market by buying the local supply of maize while prices are low and reselling it when prices go up. In an ostensibly free market, the consumer has little recourse for such a situation. In this way, it is quite possible for the market to reduce people’s ability to provide for their needs.

It also takes for granted that supply, demand and price are always direct functions of each other. However, as has been the case in Malawi since it was introduced, the price of fertilizer remains well out of the range of effective demand. When the ability of

consumers to pay for a product is less than a seller needs to make a profit, neither will last. That is, if the seller is unable to sell his or her fertilizer for more than cost, the market will fail.

The main grounds upon which organizations such as the World Bank object to fertilizer subsidies is that of fiscal responsibility. Morris and others (2007) write that the benefits of fertilizer subsidies come at too high an opportunity cost in terms of agricultural expenditure. They use the example of Zambia, the cost of whose fertilizer distribution program totals more than 40% of the Ministry of Agriculture and Cooperatives' annual budget. It is argued that this money would be better spent on infrastructure and market development (Morris et al., 2007, p. 117). Another argument is that input subsidies are not fiscally responsible or sustainable because they do not necessarily lead to market growth (Morris et al., 2007). However, in contrast to the alternative of importing emergency food aid in the face of underproduction, subsidies seem to be a wise investment as a national strategy. The Malawian government spent 13 billion Malawi kwacha on emergency food aid during the 2005/2006 food crisis, but spent only 4.7 billion in the first year of the subsidy (Government of Malawi, 2007). In addition to spending far less out of national coffers for the subsidy, the eliminated social cost of widespread famine in lives lost, disease and social discontent is immeasurable.

6.2 Ecological Considerations

Another group voices its concern not so much at subsidies as a mode of distribution, but rather the general promotion of inorganic agricultural inputs. The two

chief concerns in this study are high-yielding hybrid maize varieties and chemical fertilizers. This discussion focuses on chemical fertilizer.

Chemical fertilizers are widely criticized for the ecological degradation they allegedly cause. The most frequently cited problems attributed to chemical fertilizer are groundwater contamination, loss of soil microbiology, stripping of soil nutrients, and aquatic eutrophication (Motsi, Mangwayana, & Giller, 2002). Vanlauwe and Giller reject these claims, blaming misuse (or overuse) of fertilizer compounds for these effects (Vanlauwe & Giller, 2006). They claim that increasing yields has beneficial side effects, such as increased organic matter and organic carbon presence due to the rise in root and crop residuals (Vanlauwe & Giller, 2006).

The idea that the use of chemical fertilizer strips soil of further nutrients is notable. Innis maintains that the intensification of production—enabled by the addition of NPK and other fertilizers—has “made it possible to flush out from the soil all the other elements plants need” (Innis, 1997). That is, while the finite amounts of N, P and K in the soil previously prevented the overuse of the other, then abundant, essential nutrients, the addition of NPK fertilizers allowed use of these other nutrients to the extent that they became the limiting factors. It is in this way that reports that the benefits of chemical fertilizers decline over time can be explained.

Other ecological considerations abound. Chemical fertilizers can cause changes in soil pH balance, which must be corrected through the use of lime (Vanlauwe & Giller, 2006). The use of chemical fertilizers also encourages monocropping, or single-stand cultivation. This practice loses the benefits provided by intercropping methods—see

section 4.2. Finally, the manufacture and transport of chemical fertilizers require the use of fossil fuels and the release of greenhouse gasses, two central issues in the discussion of global resource use and climate change.

Finding alternatives to the use of chemical fertilizer in Malawian production is difficult. Many non-industrial options exist, but in most cases the quantities of local inputs needed to sustain the current population are not available in the study area. Three examples are given here. This description is not meant to be taken as a dismissal of these methods, but rather an acknowledgment of their limitations within the framework of resource instability.

6.2.1 Intercropping

Intercropping provides many distinct advantages: it allows farmers to make use of limited space (Peters, 2002); intercropped plants provide nutrients to each other, as well as helping to control weeds, pests, and disease (Innis, 1997); it helps maintain (or create) healthy soil structure and nutrient content (Altieri, 1995); and reduces nitrate leaching (Whitmore, 2007). It also helps to diversify local diets and contributes to household income generation with the cultivation of surplus, high-value produce (DeWalt, 1994; Innis, 1997).

Legumes, well known for the nitrogen-fixing bacteria, *rhizobia* (United Nations Food and Agriculture Organization, 1983), which live in their roots, are the most widely promoted form of intercrop within development literature. In the context of much of sub-Saharan Africa, soil N is often the limiting factor among the essential soil macronutrients.

This is because of the nutrient-use patterns of maize, one of the most widely cultivated crops. Maize, which demands large quantities of N for its development, is one of the worst perpetrators of metabolic rift. As the maize plant matures, it moves nutrients from the soil from one part of the plant to the next. Above all other portions of the plant, N accrues most heavily in the last part of it to develop: the cob (Stringfield, 1955). This part of the plant is harvested and consumed, and although the stalks are typically left as residuals to be plowed back into the soil, most of the N is lost. Legumes contribute to soil health by restoring some of the lost N by way of taking it from the surrounding air (United Nations Food and Agriculture Organization, 1983).

The benefits of legumes can be restricted by external factors, however. First, N is “fixed” into the soil in the form of protein, when must undergo ammonification and nitrification before it can be used by most crops. Soil pH must be slightly basic in order for this to occur. If soil pH is not properly balanced, any N brought to the soil by *rhysobia* will but unusable (Harpstead, Sauer, & Bennett, 2001). Also, in soils with high clay content, the uptake of fixed nitrates can be blocked by the clay (United Nations Food and Agriculture Organization, 1983). Finally, in order to improve soil N availability, the legumes must themselves be able to grow. In soils short of other nutrients—such as P or K, which tend to be nutrients needed at high rates by legumes—the plant will be unable to grow, thus limiting its capacity to fix N (Vanlauwe & Giller, 2006).

However, traditional farmer knowledge has intervened with many of these constraints in Malawi. In Peters’ description of Malawian intercropping patterns, the most frequent combinations all involve one or more legume. Peters explains that the

most common traditional intercroops with maize are pigeon peas, beans, pumpkins, cowpeas and groundnuts—four of which are legumes (Peters, 2002). Of those, pigeon peas, cowpeas and groundnuts are the type of legume which are particularly effective at N fixing (Harpstead et al., 2001), and which also leave behind residuals rich in N, which can later be returned to the soil (Vanlauwe & Giller, 2006).²⁰

Other commonly intercropped species include sorghum, millet, sunflower, sweet potatoes, “Irish” potatoes, cassava, mustard, rape, cabbage, Chinese cabbage, tomatoes, okra, peppers and various herbs and spices. In 2006, the average reported number of crops mixed on a single field was 6.3 (range was 2 to 12). Of those crops and aside from maize (which was grown by every household), the most commonly mentioned crops were pigeon peas (188 of 236 households), cowpeas (88 of 236 households) and groundnuts (77 of 236 households).

6.2.2 Animal Manure

Animal manure is one of the more widely prescribed “organic” soil inputs. The advantages are many. Animal manure content returns to the soil much of the nutrients which were used during cultivation, somewhat mitigating the effects of Marx’s metabolic rift—described in section 3.7. Also, the benefits from the addition of organic matter to soils are difficult to overstate. Organic matter helps stabilize the texture of soil, increases water storage capacity, releases important nutrients (particularly Nitrogen), maintains the

²⁰ See below for discussion of some problems associated with the use of crop residuals for soil fertility.

soil pH balance, stimulates root growth, and invites beneficial soil organisms (Altieri, 1995).

Unfortunately, the availability of animal manure is often a significant drawback. Acquiring and maintaining livestock is resource-intensive, and somewhat inappropriate in circumstances where resources are already in short supply. Though livestock have a number of profitable outputs (for example, one respondent is a hugely successful dairy farmer, whose maize yields benefit significantly from the use of the manure from the cattle), the input requirements are considerable. It is questionable whether the increased yields made possible by manure use can accommodate the consumption of grain required to keep the animals. This could potentially have a negative net effect on household food security. If livestock are not grain-fed, they must be allowed to graze. In the Zomba study area, there is little land available to dedicate to that purpose. In a densely-farmed area, free-roaming livestock are likely to eat and destroy crops as they develop. In short, the maintenance of livestock requires a level of resources unavailable to most respondents in the study.

Nevertheless, it is not uncommon for the Zomba respondents to own a small number of chickens or goats. Of the six respondents who referred to using animal manure during the 2008 survey, three did so with great success, while three continued to experience poor harvests.²¹ Of the three successful farmers, all perennially produce high

²¹ These numbers should not be thought of as statistically representative, as respondents were not specifically asked whether they had used animal manure. Rather, these descriptions should be taken as examples.

crop yields, and are ranked highly in the main household economic welfare categories.²² They all also owned five or more chickens, goats or cows. Conversely, two of the three farmers with unsuccessful harvests were ranked in the bottom welfare categories, and did not have their own animals—though one had previously owned several chickens, they had died the year before of chicken pox. The exception was a divorced woman, in whose household three deaths had occurred during the cultivation season, one of which, that of her son, was likely caused by AIDS. She is typically one of the more successful farmers in the sample. She attributed her relatively poor yields in 2008 to time lost caring for the sick and the diversion of household resources to medical treatment, which normally would have been used to purchase additional chemical fertilizer.

6.2.3 Compost Manure

Finally, the use of compost manure is becoming more frequently cited within the literature (Blackie et al., 1998; Gyasi, 2004; Mortimore & Harris, 2005; Snapp, Rohrbach, Simtowe, & Freeman, 2002). Similar to animal manure, this can help return nutrients to the soil (mitigating the effects of metabolic rift) as well as increase soil organic matter. As an example of the popularity of this method as a prescription, Traditional Authority Likoswe of Chradzulu District (in central Malawi) declared that for the 2008-2009 growing season, the use of compost manure is a precondition for receiving a voucher for subsidized fertilizer (Siyame). However, for the reasons listed below, this may be a moot point, and not worth the backlash caused by the reception of this news.

²² These categories include size of landholdings, expenditures per capita, assets, and maize and tobacco yields.

The following argument is not meant to discount the use of compost manure in general, but the barriers to its use must be accounted for in the case of the Zomba study area.

First, the amounts of nutrients added through the use of compost manure are limited. The main source of compost in the area is maize stalks. As discussed earlier, most of the N used by the maize plant is taken away in the cob, with little remaining in the stalks (Stringfield, 1955). According to Vanlauwe, it is common (indeed, logical) that crop residues do not contain the amount and proportions of nutrients needed to produce the next generation of crops (Vanlauwe & Giller, 2006). Many of the intercropped legumes found in the study area leave residuals that are quite rich in N. However, the most common of these is pigeon peas, of which the wood plant is usually gathered and saved for cooking fuel during the rainy season (Peters, 2002). Research conducted by Ganunga and others in Malawi has shown that maize yields are particularly responsive to compost made from sunflower residuals. However, even the high return of N from sunflower required 5 tons of sunflower material to match 60 kilograms of the most commonly used chemical fertilizer, an 83:1 ratio (Ganunga, Yerokun, & Kumwenda, 1998). In the 2006 survey, only two respondents reported growing sunflower—and as no respondents managed to grow even 5 tons of maize, it is unlikely for that amount of sunflower to be supported by a single household.

The decomposition process of compost manure is another consideration. According to Sprague, although even N-poor residuals such as grasses and maize stalks can provide up to 9 kilograms of N per 1 ton of residual, fully 18 kilograms of N is made temporarily unavailable during the decomposition process—and if the additional N is

unavailable, decomposition will be incomplete (Stringfield, 1955). If timed incorrectly, then, compost manure can actually compete with maize for soil resources, rather than act as a supplement. A common practice for mitigating this effect is the burning of residuals. This practice, often referred to as slash-and-burn, or swidden agriculture, has come under heavy criticism as “barbaric” and “destructive.” However, according to Stephen Carr, this not only solves the problem of competition for N, it also increases the release of carbon, and makes the release of nutrients easier for farmers to control. One problem associated with this practice, though, is that once the residuals are burned, there remains little organic matter to add to the soil.

6.3 Alternatives to the Current Subsidy

This section explores several alternatives to the current input subsidy that have been attempted in Malawi or elsewhere. Those alternatives are universal subsidies, public works programs (PWPs), and producer price floors and consumer price ceilings. Universal subsidies, where benefits are available in unlimited amounts to anyone would be one way to ensure access to benefits to those who need it most. Unfortunately, these programs are prohibitively expensive and subject to leakage through smuggling. That is, to provide a universal subsidy to Malawi would in reality be to subsidize most of southern Africa (Carr, personal communication August 30 2008; Chirwa, personal communication, September 3, 2008).

PWPs are referred to as self-targeting subsidies. That is, if one wishes to deliver inputs to able-bodied and productive, but impoverished, smallholders, a public works

program can be effective. These programs usually involve construction of some form of public infrastructure—a road, bridge or dam—or the provision of some public service—childcare, for instance—where payment of laborers is in kind. This overcomes the market barriers to access, such as distant markets and limited transportation. It is considered self-targeting because it is assumed that only those truly in need of the inputs would be willing to put forth the labor—those who can afford to purchase their inputs would opt out (Devereux, 2002a). A PWP was executed effectively in cluster 4 during the year this study was completed. As payment for labor in constructing a small dam, villagers were given two 50-kilogram bags of fertilizer and ten kilograms of hybrid maize seed. Beneficiaries amongst the study population consistently had higher yields and better food security than local non-recipients. A few drawbacks are apparent, however. A PWP requires resources not only to provide inputs, but also to build infrastructure and administer the program. Also, PWPs are geographically limited, and can be difficult to execute in the more remote areas of the country—though the remote areas are where they are most needed (Devereux, 2002a). Finally, Stephen Carr explains that as the price of food or inputs rise in comparison to wages, laborers would be required to work longer and longer in order to obtain the same benefits. Stephen Carr spoke of a fertilizer-for-work program that had to be shut down because laborers would have had to neglect their own fields in order to complete the program (personal communication, August 30, 2008).

Price floors and ceilings are an attempt to mitigate the variability of cash markets. The idea is that if producer prices are kept high and consumer prices are kept low, then more people will be able to afford to buy food. Unfortunately, price floors and ceilings

are difficult to enforce, and may be completely ignored in times of severe scarcity or when the potential for high profits exist (Carr, personal communication August 30, 2008; Chirwa, personal communication September 3 2008). The maintenance of such price policies requires a distributive mechanism, such as Malawi's ADMARC to ensure enforcement—such an attempt, and its potential pitfalls, is described in section 4.9.

Another strategy, one favored by Peters for the research area in question (1992, 1994, 1999), is farmers' clubs. These are organizations that enable smallholder farmers to combine resources in order to better compete with estates and large companies. The members of burley (tobacco) clubs, for example, sell their tobacco harvest to the club, which then sells it to international buyers at the major trading warehouses in Blantyre. Because the clubs are run by the farmers themselves, benefits are maximized by the exclusion of profit-seeking middlemen. The clubs also provide protection from risk in the form of redistributive loans and credit access for input purchase. In the view of the subsistence ethic, these clubs are more culturally appropriate than private companies and lending agencies. They tend to be more resilient in the event of disasters such as drought, but are liable to collapse if too many members were to experience failure.

The final chapter of this thesis summarizes the findings of this study, explores the importance of the methods and theory used here, and questions the wisdom of yet another proposed technological fix to the fundamentally social problem of food security.

CHAPTER VII

CONCLUSION: STOP THE BLEEDING, HEAL THE WOUND

The central theme of this study has been to illustrate the multi-dimensional nature of food security. Using Sen's Entitlement Framework, the discussion here has demonstrated the need to shift the focus from food supply to food access. I conclude by summarizing the findings of this study, and by offering some thoughts for moving forward in the struggle to eradicate hunger.

7.1 Lessons from the Subsidy

Beyond illuminating the successes of and room for improvement in the Malawian input subsidy itself, a number of lessons can be gleaned from the methods of analysis and theory used in this study. Though no two situations are identical, the historical materialist analysis of food system processes used here can help illuminate the decisions of agricultural policy makers outside of Malawi. Most important to this method is to understand the changes across time in production and producer-consumer relations. A brief review of the findings of this study helps begin a discussion of the ways in which policy can be sensitized to the needs of those it is intended to help.

7.1.1 Execution and Design

The subsidy is not well-executed from a distributional standpoint, as irregularities in distribution coincide with many failures of both the local and national food system and political economy. Sen theorized (and subsequently proved) that the wealthy and well-connected in a community are more able to ensure they are served by the food system. In the same way that the more-advantaged segments of the population have more control over their food entitlements, they are more able to act on their own accord to provide agricultural inputs, including manipulation of the subsidy program.

What is needed to ensure the sustainability of the program is transparency and accountability in the distribution process, clear messages as to the goals of the program (from intended recipients to the quest to fill the food gap), and options for recourse on the part of smallholders in the event of irregularities. Smallholders would be further empowered to fully reap the benefits of the program if input depots were more accessible and they were able to choose between locations to redeem their coupons, avoiding additional “handling” charges and supply shortages. Most important is for smallholders, rather than being at the mercy of the more powerful, to be capable of obtaining that to which they are entitled by the program.

7.1.2 Provision

The subsidy, even under circumstances of perfect execution, would be only one component of a set of strategies needed to ensure household food security. The subsidy’s stated goal of national food self-sufficiency is not enough to achieve this. I have

presented evidence showing that although Malawi became a net exporter of food in recent years, hunger remains a serious concern. While it is true that higher yields increase the potential for food security, they by no means assure access to sufficient food. Thus, the strategy of simply filling the “food gap,” while potentially helpful, is insufficient for food security.

Smallholder household food security is not dependent solely upon food availability. Therefore, strategies to encourage food security should be based upon the goals of increasing the entitlements of and decreasing the risks to smallholder producers. Encouraging entitlements takes the form not only of raising production power, as is the goal of the input subsidy, but also of increasing purchasing power, off-farm livelihood opportunities, and ensuring access to social programs that provide for community and household needs such as healthcare or clean water. Only the empowerment of smallholders with the ability to voice their objections and hold authorities accountable will enable them to take control of their livelihoods. This is the difference between welfare handouts and capability—between stopping the bleeding and healing the wound.

7.1.3 When Market Meets Subsistence

Three fundamental conflicts arise when free-market enterprise and production for subsistence meet. For example, production for subsistence and for the market have differing goals. Subsistence producers tend to prefer risk-averse activities, while production for the market depends on the maximization of average production. The input subsidy is thus an appropriate response to risk-averse smallholder preferences. Without

the reduced prices provided by the subsidy, smallholders must offer their forthcoming harvest as credit for obtaining inputs. In the event of failure or underproduction, not only will the farmer be unable to feed his or her family, but will also be unable to repay loans and procure inputs for the following year. Further, the smaller capital investment requirement allows the smallholder to choose between producing for consumption and producing for the market. Which option the smallholder chooses is less important than his or her ability to make that choice. Rather than dictating the ways smallholders should gain their livelihood, policy makes itself most useful when it provides the support smallholders need to make their own choice.

Another mismatch between market and subsistence systems occurs between the types of social contracts associated with the benefits of production. Section 4.1 discussed the subsistence ethic, as described by Scott and others, in which producers are required to share their product in order to compensate for the shortfalls of others, under the assumption that the same will be done for them in the event of failure. In a free-market economy, however, profit maximization is assumed to “trickle-down” through the rest of the community in the form of increased demand for labor, services and goods. The analysis in this thesis has shown that there is nothing inevitable about these supposed trickle-down effects, and that social contracts can be destroyed when production begins to focus on individual profit. Here, it is clear that the most important role of policy is to provide the type of support that struggling smallholders need and to contribute to community well-being. As discussed in section 6.2, this strategy is superior to waiting

for a flawed market to come to the rescue. That is, policy should promote the reciprocity and social support known under the subsistence ethic.

Finally, it has been shown here that when market values meet the subsistence ethic, the role of food itself is transformed. The ideal condition, then, seems to be when smallholders can, through their own production, provide for both the subsistence role of food as well as its role as a commodity. This appears to be the ultimate goal of the subsidy. From this study, though, it is clear that the resources required for this level of production go well beyond the simple provision of fertilizer and improved seeds. Again, the market is most effective for maximizing profit, not ensuring the distribution of human necessities. Since free-market doctrine does not distinguish between these goals, policy must.

7.2 Looking Forward: Time for a New Green Revolution?

The conclusion of this study—that increased yields do not automatically translate into food security—calls into question the enthusiasm with which agricultural inputs, as part of the “new” Green Revolution, are being promoted. It is not the intention of this analysis to suggest that agricultural production is not an important element of development. Indeed, a central concern is the need to encourage livelihoods that can rely on the productive elements of agricultural resources without incurring long-term the ecological, economic and social consequences of irresponsible agriculture.

However, the Green Revolution is another “quick win,” based on technology packages and free-market beliefs. Agricultural inputs have indeed raised yields over the

years, but at the cost of farmer debt, environmental degradation and deepened economic disparity. Still more, people continue to go without food despite these advances. Increased yields are useless if food continues to fail to reach the mouths of the hungry.

Yet the same solution is proposed today. The perceived need to produce more food remains the major misdiagnosis of the world food problem. For example, in 2009 Kenya became the fourth African country to allow genetically-modified maize varieties to be grown within the country. This was a response to the food crisis of 2008, which was worsened for Kenya because political strife early in 2008—the result of long-standing conflicts over political power and land tenure—had disrupted much of agricultural production in western Kenya (Blaustein, 2009). Despite the trade restrictions of many countries concerning genetically-modified organisms (GMOs), the Kenyan government seems to have placed higher priority on increasing yields. In the long run, this may have important geopolitical consequences. If Kenya is no longer able to trade with traditional partners such as the European Union because of its anti-GMO policies, Kenya will turn to new partners, such as China.

7.3 Conclusion

There is indeed a food crisis. People face chronic hunger in Malawi and worldwide. Malawi's input subsidy provides an excellent example of bucking the free-market dogma that has failed to work for the last 30 years. The clearest lesson from the subsidy is that technology packages, such as those featured in the Green Revolution,

address only the supply side of food security, distracting from the more fundamental problems of unequal access and vulnerability to external shocks.

On the other hand, it is also clear that the need for some kind of strategy is urgent and ongoing. It is not the purpose of this thesis to imply that symptoms no longer be treated. Rather, what is needed is a change in attitude toward the short-term strategies discussed here. There is little doubt that the fertilizer subsidy has saved lives, and to discontinue it on the basis that it is not a long-term final answer would not only be inhuman, it would be to miss the point. What is proposed here is that effective programs, such as Malawi's fertilizer subsidy, continue to be improved upon to reach their full potential. Most essential to the short-term goal of alleviating hunger is to focus on those who are hungry—that is, the poorest—rather than to wait for the market to sort them out. Subsidies targeted to the poor and public works programs have proven to be effective for local, short-term alleviation.

However, simply because these strategies show fast progress in the short run is not reason to rely on their replication at a larger scale to solve the overall problem. Most important is to see their role for what it is: short-term. What is needed is not a bigger band-aid in the form of another Green Revolution. Production strategies buy time to look for solutions. If we become too caught up in quick fixes, however, we may miss opportunities for real change, and possibly cause irreversible damage in the process.

REFERENCES

- Alliance for a Green Revolution in Africa. (2008). Retrieved 12 December 2008, from www.agra-alliance.net
- Altieri, M. A. (1995). *Agroecology: The science of sustainable agriculture* (2nd ed.). Boulder, CO: Westview Press.
- Barnett, T., & Blaikie, P. M. (1992). *AIDS in Africa: Its present and future impact*. New York: Guilford Press.
- Beinart, W. (1984). Soil erosion, conservationism and ideas about development: A southern African exploration, 1900-1960. *Journal of Southern African Studies*, 11(1), 52-83.
- Blackie, M., Benson, T., Conroy, A., Gilbert, R., Kanyama-Phiri, G., Kumwenda, J., et al. (1998). *Malawi: Soil Fertility Issues and Options - a discussion paper*. Lilongwe, Malawi: MPTF/Ministry of Agriculture and Irrigation, Malawi.
- Blaikie, P. M. (1985). *The political economy of soil erosion in developing countries*. London; New York: Longman.
- Blaikie, P. M., & Brookfield, H. C. (1987). *Land degradation and society*. London; New York: Methuen.
- Blaustein, R. J. (2009). The Green Revolution arrives in Africa. *Bioscience*, 58, 8-14.
- Bradshaw, S. (2003). The perfect famine. On *Life III Series*. Reading, PA: Bullfrog Films.
- Bukusuba, J. J., Kikafunda, J. K., & Whitehead, R. G. (2007). Food security status in households of people living with HIV/AIDS (PLWHA) in a Ugandan urban setting. *The British journal of nutrition*, 98(1), 211-217.
- Bwandala, J. 15 April 2009. *We urge caution on new firm to manage maize*. Lilongwe, Malawi: The Daily Times.

- Carr, S. J. (1997). A green revolution frustrated: Lessons from the Malawi experience. *African Crop Science Journal*, 5(1), 93-98.
- Carr, S. J. (2001). Changes in African smallholder agriculture in the twentieth century and challenges of the twenty-first. *African Crop Science Journal*, 9(1), 331-338.
- Chinsinga, B. (2002). The politics of poverty alleviation in Malawi: A critical review. In H. Englund (Ed.), *A democracy of chameleons: Politics and culture in the new Malawi* (pp. 25-42). Blantyre, Malawi: Christian Literature Association in Malawi.
- Chinsinga, B. (2007). *Hedging food security through winter cultivation: The agronomy of dimba cultivation in Malawi*. Paper presented at the Education Development Conference.
- Cohen, G. A. (1993). Equality of what? On welfare, goods, and capabilities. In M. C. Nussbaum & A. Sen (Eds.), *The Quality of Life* (pp. 9-29). Oxford: Clarendon Press.
- Conroy, A. C. (2005). Poverty, AIDS and the food crisis. In S. Levy (Ed.), *Starter packs: A strategy to fight hunger in developing countries? Lessons from the Malawi experience 1998-2003* (pp. 219-227). Cambridge, MA: CABI Publishing.
- Conroy, A. C., Blackie, M., Whiteside, A., Malewezi, J., & Sachs, J. (Eds.). (2006). *Poverty, AIDS, and hunger: Breaking the poverty trap in Malawi*. New York: Palgrave Macmillan.
- Corcoran, B. (2 October 2005). Five million face death as famine grips Malawi. *The Observer*, London.
- Devereux, S. (2001). Sen's entitlement approach: Critiques and counter-critiques. *Oxford Development Studies*, 29(3), 245-263.
- Devereux, S. (2002a). *From workfare to fair work: The contribution of public works and other labour-based infrastructure programmes to poverty alleviation*. Geneva: International Labour Office.
- Devereux, S. (2002b). *Social protection for the poor: Lessons from recent international experience*. Brighton, England: Institute of Development Studies.
- Devereux, S. (2007). *Vulnerability and social protection in Malawi*. Brighton, England: Institute of Development Studies, University of Sussex.
- Devereux, S., Baulch, B., Phiri, A., & Sabates-Wheeler, R. (2006). Vulnerability to chronic poverty and malnutrition in Malawi. Zomba, Malawi: DFID Malawi.

- Devereux, S., Stevens, C., & Kennan, J. (2002). *The Malawi famine of 2002: More questions than answers*. Brighton, England: Institute of Development Studies.
- DeWalt, B. R. (1994). Using indigenous knowledge to improve agriculture and natural resource management. *Human Organization*, 53(2), 123-131.
- Dorward, A., & Chirwa, E. (2008). Evaluation of the 2006/7 agricultural input subsidy programme, Malawi. Zomba, Malawi: Wadonda Consult.
- Dorward, A., & Kydd, J. (2004a). Starter pack in rural development strategies. In S. Levy (Ed.), *Starter packs: A strategy to fight hunger in developing countries? Lessons from the Malawi experience 1998-2003*. Cambridge, MA: CABI.
- Dorward, A., & Kydd, J. (2004b). The Malawi 2002 food crisis: The rural development challenge. *The Journal of Modern African Studies*, 42(03), 343-361.
- Dorward, A., Wheeler, R. S., MacAuslan, I., Buckley, C. P., Kydd, J., & Chirwa, E. (2006). Promoting agriculture for social protection or social protection for agriculture: Strategic policy and research issues discussion paper.
- Dréze, J., & Sen, A. K. (1989). *Hunger and public action*. Oxford Clarendon Press.
- Dréze, J., Sen, A. K., & Hussain, A. (Eds.). (1995). *The political economy of hunger: Selected essays*. Oxford: Clarendon Press.
- Dugger, C. (2 December, 2007). Ending hunger, simply by ignoring the experts. *The New York Times*, New York.
- Food and Agriculture Organization. (1996). *Food: A fundamental human right*. United Nations Food and Agriculture Organization, Rome.
- Food and Agriculture Organization. (2008). *Minimum dietary energy requirement*. United Nations Food and Agriculture Organization, Rome, Italy.
- Foster, J. B. (1999). Marx's theory of metabolic rift: Classical foundations for environmental sociology. *The American Journal of Sociology*, 105(2), 366-405.
- Foster, J. B. (2000). *Marx's ecology: Materialism and nature*. New York, NY: Monthly Review Press.
- Freeling, M., & Walbot, V. (1994). *The Maize handbook*. New York: Springer-Verlag.

- Ganunga, R., Yerokun, O., & Kumwenda, J. (1998). *Nitrogen and phosphorus uptake from tithonia diversifolia (Hemsley) A. gray and inorganic fertiliser and their effect on maize yield (Zea Mays) (L.) in Malawi*. Paper presented at the Maize Production Technology for the Future: Challenges and Opportunites, Proceedings of the Sixth Eastern and Southern Africa Regional Maize Conference.
- Gasper, D. (1993). Entitlements analysis: Relating concepts and contexts. *Development and Change*, 24, 679-718.
- Gyasi, E. A. (2004). *Managing Agrodiversity the traditional way : Lessons from West Africa in sustainable use of biodiversity and related natural resources*. Tokyo: United Nations University Press.
- Harpstead, M. I., Sauer, T. J., & Bennett, W. F. (2001). *Soil science simplified*. Ames, IA: Blackwell Publishing Company.
- Harrigan, J. (2001). *From dictatorship to democracy: Economic policy in Malawi 1964-2000*. Burlington, VT: Ashgate Publishing Company.
- Harrigan, J. (2003). U-turns and full circles: Two decades of agricultural reform in Malawi 1981-2000. *World Development*, 31(5), 847-863.
- Harrigan, J. (2005). Food security policies and Starter Pack: A challenge for donors. In S. Levy (Ed.), *Starter packs: A strategy to fight hunger in developing countries? Lessons from the Malawi experience 1998-2003* (pp. 229-246). Cambridge, MA: CABI Publishing.
- Heisey, P. W., & Mwangi, W. M. (1996). *Fertilizer use and maize production in Sub-Saharan Africa*. Mexico, D.F.: CIMMYT.
- Hirschmann, D., & Vaughan, M. (1984). *Women farmers of Malawi: Food production in the Zomba District*. Berkeley, CA: Institute of International Studies, University of California, Berkeley.
- Innis, D. Q. (1997). *Intercropping and the scientific basis of traditional agriculture*. London: Intermediate Technology Publications.
- Jayne, T., Chapoto, A., Minde, I., & Donovan, C. (2008). The 2008/09 food price and food security situation in eastern and southern Africa: Implications for immediate and longer run responses, *Draft report*. East Lansing: Michigan State University.
- Johnston, R. J., Gregory, D., Pratt, G., & Watts, M. (2000). *The Dictionary of human geography* (Fourth ed.). Cambridge, Mass: Blackwell Reference.

- Klein, M. A. (1985). The use of mode of production in historical analysis. *Canadian Journal of African Studies*, 19(1), 9-12.
- Kydd, J., & Christiansen, R. (1982). Structural change in Malawi since independence: Consequences of a development strategy based on large-scale agriculture. *World Development*, 10, 355-375.
- Kydd, J., Dorward, A., & Vaughn, M. (2002). The humanitarian crisis in southern Africa: Malawi: International Development Committee.
- Leach, M., Mearns, R., & Scoones, I. (1997). Environmental entitlements: A framework for understanding the institutional dynamics of environmental change, *Discussion Paper 359*. Brighton, England: Institute of Development Studies.
- Lele, U. J. (1975). *The design of rural development: Lessons from Africa*. Baltimore, MD: Published for the World Bank by Johns Hopkins University Press.
- Lele, U. J., Christiansen, R. E., & Kidiresan, K. (1989). Fertilizer policy in Africa: Lessons from development programs and adjustment lending, 1970-87, *MADIA Discussion Papers* (pp. 80). Washington, D.C.: World Bank.
- Lele, U. J., & Ekoir, J. (2004). Technology generation, adaptation, adoption and impact: Towards a framework for understanding and increasing research impact (pp. 23). Washington, D.C.: World Bank.
- Levy, S. (2004). Production, prices and food security: How starter pack works. In S. Levy (Ed.), *Starter packs : A strategy to fight hunger in developing countries? Lessons from the Malawi experience 1998-2003* (pp. 103-116). Cambridge, MA: CABI Publishing.
- Levy, S. (Ed.). (2005). *Starter packs : A strategy to fight hunger in developing countries? Lessons from the Malawi experience 1998-2003*. Cambridge, MA: CABI Publishing.
- Levy, S., & Barahona, C. (2002). *2001-01 Targeted inputs programme (TIP): Main report of the evaluation programme*. Ministry for Agriculture and Irrigation (Malawi).
- Malawi National Statistical Office. (2004). *HIV/AIDS prevalence factsheet*. Zomba, Malawi.
- Malthus, T. R., & Layton, W. (1914). *An essay on population*. London; New York: J.M. Dent ; E.P. Dutton.

- Mandala, E. C. (1990). *Work and control in a peasant economy: A history of the lower Tchiri Valley in Malawi, 1859-1960*. Madison, WI: University of Wisconsin Press.
- Mandala, E. C. (2005). *The end of Chidyerano: A history of food and everyday life in Malawi, 1860-2004*. Portsmouth, NH: Heinemann.
- Mapanje, J. (2002). The orality of dictatorship: In defense of my country. In H. Englund (Ed.), *A democracy of chameleons: Politics and culture in the new Malawi* (pp. 178-187). Blantyre, Malawi: Christian Literature Association in Malawi.
- Marx, K., & Engels, F. (1990). *Capital: A critique of political economy* (E. Mandel, B. Fowkes & D. Fernbach, Trans. Vol. 1). London: Penguin Classics.
- Marx, K., & Engels, F. (1990). *Capital: A critique of political economy* (E. Mandel, B. Fowkes & D. Fernbach, Trans. Vol. 3). London: Penguin Classics.
- Mason, J. (2003). *Sustainable agriculture*. Collingwood, ON: Landlinks Press.
- McCracken, J. (1987). Colonialism, capitalism and the ecological crisis in Malawi: A reassessment. In D. Anderson & R. Grove (Eds.), *Conservation in Africa: People, policies and practices* (pp. 63-77). Cambridge, UK: Cambridge University Press.
- McLoughlin, P. F. M. (1967). Some aspects of land reorganization in Malawi (Nyasaland), 1950-60. *Ekistics*, 24(141), 193-195.
- Ministry of Agriculture and Food Security. (2007). *The 2007/2008 agricultural input subsidy programme document*. Ministry of Agriculture and Food Security, Government of Malawi, Lilongwe, Malawi.
- Moore-Lappé, F., & Collins, J. (1998). *World hunger: Twelve myths*. New York, NY: Grove Press.
- Morgan, J. 16 February 2009. *Seeking Africa's green revolution*. London: BBC News.
- Morris, M. L., Kelly, V. A., Kopicki, R. J., & Byerlee, D. (2007). *Fertilizer use in African agriculture: Lessons learned and good practice guidelines*. Washington, DC: World Bank.
- Mortimore, M., & Harris, F. (2005). Do small farmers' achievements contradict the nutrient depletion scenarios for Africa? *Land Use Policy*, 22(1), 43-56.

- Motsi, K., Mangwayana, E., & Giller, K. E. (2002). Conflicts and problems with water quality in the upper catchment of the Manyame River, Zimbabwe. In P. M. Haygarth & S. C. Jarvis (Eds.), *Agriculture, hydrology and water Quality*. Wallingford: CAB International.
- Mukherjee, A. (2004). *Hunger : Theory, perspectives, and reality - Assessment through participatory methods*. Aldershot, England: Ashgate.
- Ngwira, N., Bota, S., & Loevinsohn, M. (2001). HIV/AIDS, Agriculture and Food Security in Malawi. *Lilongwe and The Hague, Regional Network on HIV/AIDS Rural Livelihoods and Food Insecurity (RENEWAL) Working Paper, 1*.
- Orr, A. (1998). Unwrapping a technology package: Burley, fertilizer, and hybrid maize in Malawi. *Development Southern Africa, 15*(1), 85-101.
- Orr, A. (2000). 'Green Gold'?: Burley tobacco, smallholder agriculture, and poverty alleviation in Malawi. *World Development, 28*(2), 347-363.
- Peters, P. E. (1989). *Cash cropping, food security and nutrition: The effects of agricultural commercialization among smallholders in Malawi*. Cambridge, MA: Harvard Institute for International Development.
- Peters, P. E. (1992). *Monitoring the effects of grain market liberalization on the income, food security and nutrition of rural households in Zomba South, Malawi*. Cambridge, Massachusetts: Harvard Institute for International Development.
- Peters, P. E. (1994). *Deciphering the effects of agricultural marketing reforms on the rural poor: a case from Malawi*. Cambridge, Massachusetts: Harvard Institute for International Development.
- Peters, P. E. (1996). *Failed magic or social context? Market liberalization and the rural poor in Malawi*. Cambridge, MA: Harvard Institute for International Development.
- Peters, P. E. (1997). Against the odds: Matriliney, land and gender in the Shire Highlands of Malawi. *Critique of Anthropology, 17*(2), 189-210.
- Peters, P. E. (1999). *Agricultural commercialization, rural economy and household livelihoods [in Malawi], 1990-1997*. Cambridge, MA: Harvard Institute for International Development.
- Peters, P. E. (2002). The limits of knowledge: Securing rural livelihoods in a situation of resource scarcity. In C. B. Barrett, F. Place & A. A. Aboud (Eds.), *Natural resources management in African agriculture: Understanding and improving current practices* (pp. 35-50). New York, NY: CABI Publishing.

- Peters, P. E., & Walker, P. A. (2006). Unpublished data.
- Peters, P. E., Walker, P. A., & Kambewa, D. (2008). The Effects of Increasing Rates of HIV/AIDS-related Illness and Deaths on Rural Families in the Zomba District, Malawi: a Longitudinal Study: RENEWAL Program.
- Raynault, C. (1977). Lessons of a crisis. In D. Dalby (Ed.), *Drought in Africa* (pp. 17-29). London.
- Sachs, J. (2005). *The end of poverty: Economic possibilities for our time*. New York: Penguin Press.
- Scott, J. C. (1976). *The moral economy of the peasant: Rebellion and subsistence in Southeast Asia*. New Haven: Yale University Press.
- Sen, A. K. (1981). *Poverty and famines: An essay on entitlement and deprivation*. Oxford: Clarendon Press.
- Sen, A. K. (1993). Capability and well-being. In M. C. Nussbaum & A. Sen (Eds.), *The Quality of life* (pp. 30-53). Oxford: Clarendon Press.
- Sen, A. K. (1995). Food, economics and entitlements. In J. Dreze, A. K. Sen & A. Hussain (Eds.), *The political economy of hunger: Selected essays* (pp. 50-68). Oxford: Clarendon Press.
- Sen, A. K. (1999). *Development as freedom*. New York, NY: Knopf.
- Siyame, G. 24 August 2008. Village head sets condition for coupon access. *Malawi Sunday Times*, Lilongwe.
- Smale, M. (1995). "Maize is life": Malawi's delayed Green Revolution. *World Development*, 23(5), 819-831.
- Smale, M., Heisey, P. W., & Leathers, H. D. (1995). Maize of the ancestors and modern varieties: The microeconomics of high-yielding variety adoption in Malawi. *Economic Development and Cultural Change*, 43(2), 351-368.
- Smale, M., & Jayne, T. (2003). Maize in eastern and southern Africa: "Seeds of success" in retrospect, *EPTD Discussion paper 97*. Washington, D.C.: International Food Policy Research Institute.
- Snapp, S. S., Rohrbach, D. D., Simtowe, F., & Freeman, H. A. (2002). Sustainable soil management options for Malawi: Can smallholder farmers grow more legumes? *Agriculture, Ecosystems & Environment*, 91(1-3), 159-174.

- Stringfield, G. H. (1955). Corn culture. In G. F. Sprague (Ed.), *Corn and corn improvement* (pp. 343-378). New York, NY: Academic Press Inc.
- United Nations Food and Agriculture Organization. (1983). *Technical handbook on symbiotic nitrogen fixation*. United Nations Food and Agriculture Organization, Rome.
- Vail, L. (1983). The State and the creation of colonial Malawi's agricultural economy. In R. I. Rotberg (Ed.), *Imperialism, colonialism, and hunger: East and Central Africa* (pp. 39-88). Lexington: D.C. Heath and Company.
- Van Donge, J. K. (2002). Disordering the market: the liberalisation of burley tobacco in Malawi in the 1990s. *Journal of Southern African Studies*, 28(1), 89-115.
- Van Donge, J. K. (2005). The farmer's perspective - Values, incentives and constraints. In S. Levy (Ed.), *Starter packs: A strategy to fight hunger in developing countries?* (pp. 117-128). Cambridge, MA: CABI Publishing.
- Vanlauwe, B., & Giller, K. E. (2006). Popular myths around soil fertility management in sub-Saharan Africa. *Agriculture, Ecosystems & Environment*, 116(1-2), 34-46.
- Vaughan, M. (1987). *The story of an African famine: Gender and famine in twentieth-century Malawi*. Cambridge: Cambridge Univ. Press.
- Walker, P. A., & Peters, P. E. (2001). Maps, metaphors, and meanings: Boundary struggles and village forest use on private and state land in Malawi. *Society & Natural Resources*, 14(5), 411-424.
- Warman, A. (2003). *Corn & capitalism: How a botanical bastard grew to global dominance*. Chapel Hill: University of North Carolina Press.
- Watts, M. (1983). *Silent violence: Food, famine, & peasantry in northern Nigeria*. Berkeley, CA: University of California Press.
- White, L. (1985). *Magomero: Portrait of an African village*. Cambridge, MA: Cambridge University Press.
- Whitmore, A. P. (2007). Intercropping reduces nitrate leaching from under field crops without loss of yield: A modeling study. *European Journal of Agronomy*, 21(1), 81-88.
- World Bank. (2007). *World development report 2008: Agriculture for development*. Washington, D.C.: World Bank.