

**THE IMPACT OF A UNIVERSAL SUBSIDY PROGRAM ON
SUSTAINED FOOD SECURITY: A CASE OF MWANDAMA**

MASTER OF ARTS (ECONOMICS) THESIS

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UNIVERSITY OF MALAWI

CHANCELLOR COLLEGE

APRIL, 2011

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Master of Arts (Economics) Thesis

By

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a degree of Master of Arts in Economics

UNIVERSITY OF MALAWI

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APRIL, 2011

DECLARATION

I, the undersigned, hereby declare that this thesis is my original work and has not been submitted to any other institution for similar purposes. Where other people's work has been used, acknowledgments have been made.

Alick Galimoto Stephens Mtika

Signature

Date:

Certificate of Approval

The undersigned certify that this thesis represents the student's own work and effort and has been submitted with my approval.

Signature: _____ Date: _____

Ben Kaluwa, PhD (Professor)

Supervisor

Dedication

To my late Dad and Mentor, Stephen and, Violet, my ever inspiring mum

ACKNOWLEDGEMENTS

I am eternally grateful to the Almighty God for without Him there is nothing that is made and with Him all things are possible. He has brought me thus.

I am also greatly indebted to my supervisor, Professor Ben Kaluwa, for his mammoth professional guidance, pieces of advice and support in the process of writing this thesis.

I would also like to extend my thanks and appreciation to all lecturers and staff in the Department of Economics, my classmates and all friends for their guidance, support, understanding and encouragement over my two year period of study.

To Faithrosé Mawaya, for the relentless encouragement and support you provided throughout my study period; the translation you made of the Focus Group Discussions' questions was so thorough and clear not to be singled it out here. I do not take all that for granted. I say thank you dear. I am also grateful to my entire research team: Dr Jonathan Mkumbira, Dr Blessings Chinsinga, Dr Alister Munthali, Dr Peter Mvula, Henry Msatilomo, Phelire Nkhoma, Elvis Bande, Joseph Chibwe, Dzaone Focus Group and Mwandama Focus Group for tirelessly assisting me in carrying out my field research. I wonder what the field research would have been without you, guys. God bless you all.

And of course, to my wife, Esnath, my daughters, Tijuana and Tiza Nadi, for the patience and endurance you put up with during my absence. *Yewo chomene*. I love you! To my brothers: Chatonda, Chimwemwe, Suzgo and Chitumbiko and, my sisters: Knight, Temwa, Tapiwa and Mwawi. I know you have always been there for me. I deeply acknowledge your moral support, encouragement and prayers.

ABSTRACT

This study investigated the impact of the universal subsidy program on households in Mwandama millennium villages in the Zomba district of Malawi. This was done by comparing yield before the agriculture intervention and after the intervention. There is a clear yield difference between the before the intervention period and the after the intervention period. Additionally, there is a rising trend in yield from 2005/06 to 2009/10. These results show that the universal subsidy program has had a significant impact on sustaining the food security status in study area.

It also sought to establish whether the interventions that the Millennium Villages Project (MVP) had been providing to the project site have had an effect on the food security status in the area .The difference between the means was used to statistically determine whether there was a difference between the mean yield in the treatment and control groups. Dzaone, a non-intervention area, was used as a control group while Mwandama research village (MV1) was the treatment group. MVP yield data was analyzed using STATA version 10.1 and the treatment size was tested using a t-test statistical model. It has been empirically revealed that the computed t-value was much higher than the observed t-value, signifying statistical significance.

This means that the interventions that the MVP had a significant effect on the food security status in the area. This implies that in a country where land and labor are major constraints, it is important for the government to approach food security in an integrated way by providing all determinants of food security in a single package

including modern inputs, investment in infrastructure (road, market and irrigation), agricultural extension activities, social safety net programs and investment in skills training and education for farmers.

One of the major limitations to this study was the nature of the data which made it impossible to use regression analysis, an alternative method to independent t-test for significance levels. The data that was available for use was mean yield per village as opposed to yield per household which would have allowed for any econometric analysis.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADMARC	Agricultural Development and Marketing Corporation
AIDS	Acquired Immunodeficiency Syndrome
AISP	Agricultural Input Subsidy Programme
ASWAp	Agriculture Sector Wide Approach
CFSVA	Comprehensive Food Security and Vulnerability Analysis
COMESA	Common Market for Eastern and Southern Africa
CRS	Catholic Relief Services
CSR	Centre for Social Research
DADO	District Agricultural Development Officer
DHO	District Health Officer
DPD	Director of Planning and Development
DEVPOL	Development Policy
DFID	Department for International Development
DPP	Democratic Progressive Party
EU	European Union
ERP	Education for Rural People
FEWS	Famine and Early Warning Systems
FG	Focus Group
FGDs	Focus Group Discussions
GDP	Gross Domestic Product
GNP	Gross National Product
HIV	Human Immunodeficiency Virus

IMF	International Monetary Fund
MaSSP	Malawi Strategy Support Program
MDGs	Millennium Development Goals
MGDS	Malawi Growth and Development Strategy
MK	Malawi Kwacha
MKm	Million Malawi Kwacha
MVP	Millennium Villages Project
MV	Millennium Villages
NFRA	National Food Reserve Agency
NSO	National Statistical Office
OECD	Organization for Economic Cooperation and Development
OIBM	Opportunity International Bank of Malawi
OPC	Office of the President and Cabinet
PRs	Poverty Reduction Strategies
PRSP	Poverty Reduction Strategy Programme
SGR	Strategic Grain Reserve
SP	Starter Pack
TIP	Targeted Input Programme
UDF	United Democratic Party
UN	United Nations
UNDP	United Nations Development Programme
USAID	United States Aid for International Development
VAC	Village Agriculture Committee

VDC	Village Development Committee
VEC	Village Education Committee
VGC	Village Grainbank Committee
VHC	Village Health Committee
VIC	Village Irrigation Committee
VWC	Village Water Committee
WFP	World Food Programme
WHO	World Health Organization
WB	World Bank

CHAPTER ONE

INTRODUCTION

1.1 Background

Malawi is a landlocked country with a population of about 13 million, 51% of which are female and 49% are male (NSO, 2008). Its economy is heavily agrarian given the fact that the country has very few mineral deposits which can be viably and economically exploited. The country's key resource endowments are agricultural land and the abundant labor (Chirwa, 2006) signifying that the country has its comparative advantage in agriculture. Thus, the agricultural sector plays an important role in the economy of Malawi. It accounts for 35% of real gross domestic product (GDP) and, contributes more than 90% to the country's foreign exchange earnings. At least 80% of the population of Malawi find solace in the agriculture sector employment basin, both paid and self-employed. This percentage is even bigger in females than males. In fact, the majority of persons employed in the rural areas are engaged in agriculture (NSO, 2005). Thus, Malawi is heavily dependent on agriculture so much that in the Malawi Growth and Development Strategy (MGDS) agriculture productivity and food security is one of the top priorities of the government of Malawi. This means that agriculture decides the pace and direction of overall economic growth for Malawi. As Figure 1 shows, where growth in agriculture slumped, as it did in 1991, 1993, 1995 and 2005 for example, following periods of exceptional drought, growth in the overall GDP was also markedly

reduced (Tchale, 2009). This clearly means that there is a close correlation between agricultural sector performance and overall economic performance.

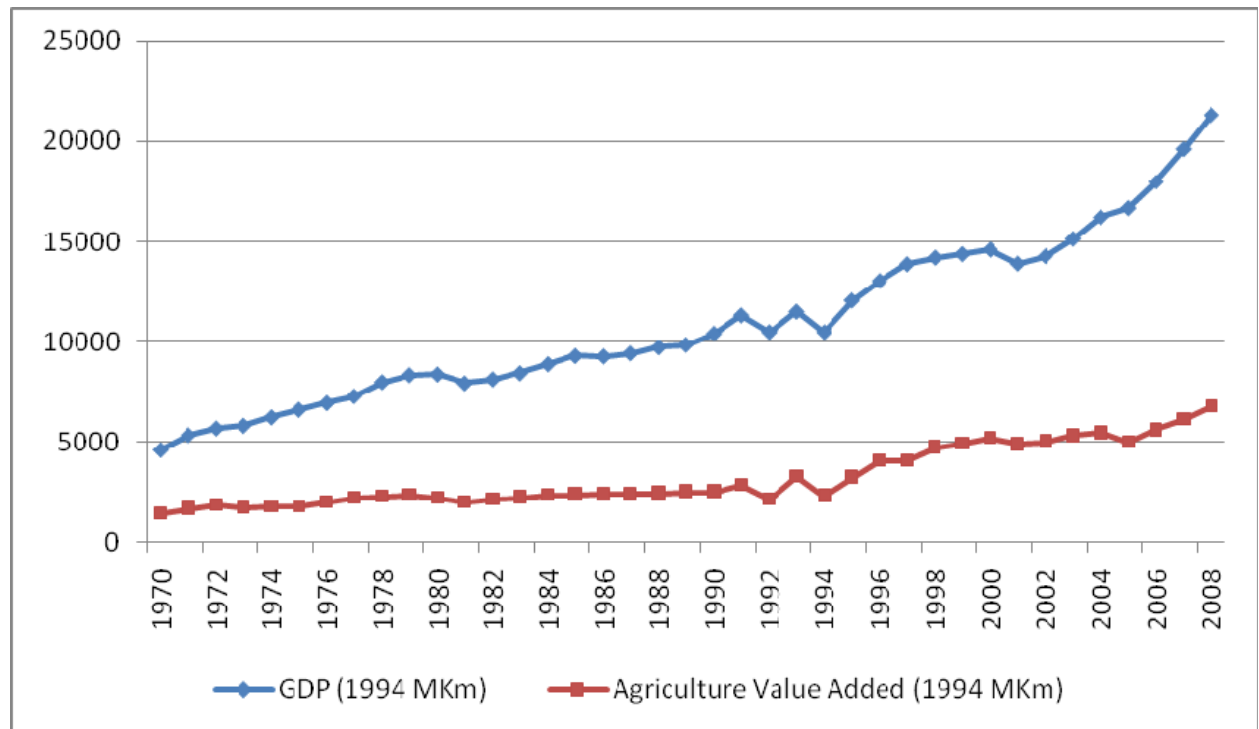


Figure 1: Malawi's agricultural value-added and total GDP, 1980-2008 (MK million)

Source: Adapted from Tchale (2009)

1.2 Food Security and Food Insecurity

Food security is one of the debated subjects in the world, especially in the sub Sahara African region. Various factors have been cited as attributing to the food insecurity in the sub-Sahara Africa. Wars, draught, diseases and famine have been among the key factors contributing to the food insecurity situation in Africa. The follow on section, therefore, briefly discusses the definition of food security and its causes.

1.2.1 Definition of Food Security

There is a wide variety of definitions of food security by a wide variety of schools of thoughts and institutions. The generally accepted definition of food security is that when all people at all times have access to sufficient food to meet their dietary needs for a productive and healthy life (USAID Bureau for Africa, 1986). This definition has three distinct variables that are central to the attainment of food security: *availability*, *access*, and *utilization*. Importantly, the definition also specifically touches on how access can be gained to the needed food: the physical and economic vehicles. This distinction is important and needs to be clearly understood. It is important also to note that the above variables (*availability*, *access* and *utilization*) do not work in isolation but are rather interrelated as follows:

- i. **Food availability** is achieved when sufficient quantities of food are consistently available to all individuals within a country. Such food can be supplied through household production, other domestic output, commercial imports or food assistance.
- ii. **Food access** on the other hand is ensured when households and all individuals within them have adequate resources to obtain appropriate foods for a nutritious diet. Access depends upon income available to the household, on the distribution of income within the household and on the price of food.
- iii. **Food utilization** is the proper biological use of food, requiring a diet providing sufficient energy and essential nutrients, potable water, and adequate sanitation. This means that the provision of water and sanitation are central to food security in a country. Similarly effective food utilization depends in large measure on

knowledge within the household of food storage and processing techniques, basic principles of nutrition and proper child care. Various interventions like health and nutrition, education, water and sanitation, and infrastructure (like markets¹, irrigation, roads, energy) have been injected by the MVP in the Mwandama Millennium villages based on the above understanding of the definition of food security. Summarily, therefore, the food must be made available, accessed and utilized in order for a household to be food secure. Schematically, this interrelationship can be presented in Figure 2.

¹ One such market infrastructure is the grain bank which has been constructed at Mwandama Research Village in the Millennium Villages Project. Lunzu and Limbe in Blantyre are other market points that the Project has linked the village to.

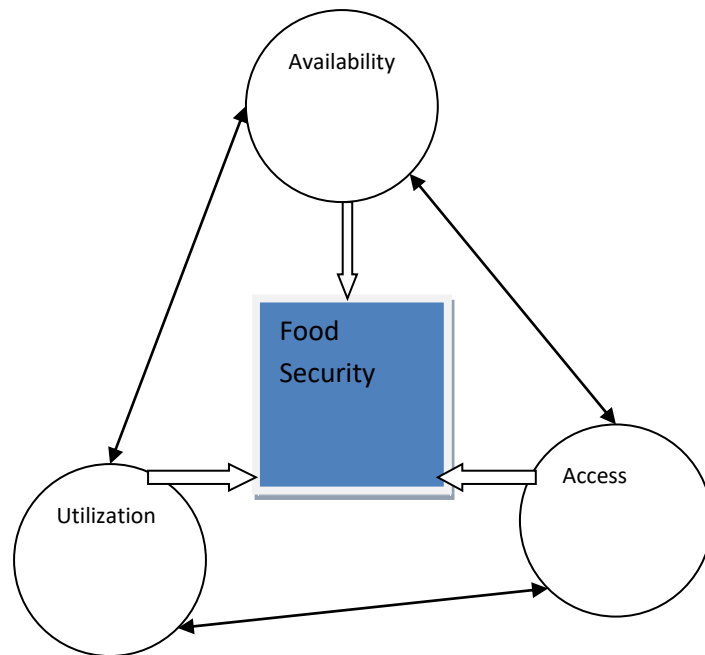


Figure 2: Schematic definition of food security

Source: Author's own understanding

The World Bank also came up with its own definition of food security. As quoted by Stevens et al (2000), food security is defined as, 'secure access by all people at all times for a health and active life'. Again this definition includes all the three elements, central to understanding food security which, are the guarantee (availability) of having access (accessibility) to enough food (utilization) at any given time.

1.2.2 Definition of Food Insecurity

Food insecurity on the other hand is defined as a condition that exists when people do not have physical and economic access to sufficient, safe, nutritious, and culturally acceptable food to meet their dietary needs to lead an active and healthy life (Sanchez et al, 2005). Following Sanchez et al (2005) access to food is closely related to poverty and lack of economic growth. This means that people who are economically poor do not have adequate means to gain access to food in the required levels.

In conclusion, therefore and, on the basis on the above discussion, food security can be defined as all groups of people having the physical and economic means to access at all times food quantitatively and qualitatively in sufficient amounts for their nutritional needs. This description means that as the food becomes available, people have the means to obtain it for their benefit (Madziakapita, 2008).

1.2.3 Causes and Levels of Food Insecurity

The rural populous continue facing various categories of food insecurity, both short-term which is known as transitory or seasonal and long-term also called chronic. An estimated 30% of the rural population live below the ‘calorie needs line’, while over 40% are unable to acquire a ‘basic needs’ basket of essential goods and services.

1.3 The Ancestral paradigm of the Input Subsidy Program

Immediately² the government recognized that agriculture can play a pivotal role in generating the overall economic development, much attention has been given to identifying ways of accelerating its growth. For instance, in the early 1960s, central planning strategies aimed at promoting sustained economic growth and transforming the nation from a poor country to a relatively middle-income, industrialized, nation guided the government's policy. Raising agricultural productivity as the vehicle for industrialization became the government's top priority (Dorward et al., 2010). The following discussion, therefore, looks at the birth and evolution of the input subsidy program in Malawi.

In order to understand the input subsidy program, it is critical to look at its ancestral and theoretical paradigm. Dorward et al., 2010) present a clear review of the Malawi subsidy program from which the author draws some lessons. According to Dorward et al., 2010), large scale (also called universal) agricultural input subsidies were a common and major feature of agricultural development policies in poor rural economies from the 1960s to the 1980s. They were subsequently criticized as a major element in fiscally and economically unsustainable policies that were inefficient, ineffective and expensive in Africa (World Bank, 1981). Similarly, Dorward et al., 2010) argue that these policies distorted market incentives, blunted competitiveness and farmer incentives, and undermined the growth of private sector services. While admitting that the universal input subsidy was beneficial in the sense that it brought higher yields in some countries at

² This dates back to Nyasaland's colonial era under the British protectorate from 1891 until the independent Malawi in 1964. The colonial administrators took control of the population, heavily promoted agriculture albeit they took some of the best land to themselves and turned them into estates

some times, the return on investment of the subsidy program was very low. This is because the theoretical difficulties with subsidy benefits³ were compounded by diversion and inefficiency such that actual benefits to farmers were often very limited (Dorward et al., 2010). Studies in Asia have also supported these findings: Evaluations of the rate of return to alternative public investments in Asia tend to rank input subsidies as fourth or fifth on the list after investments in road infrastructure, agricultural research and development, education, and often other types of public investments (Fan et al., 2007; Economist Intelligence Unit, 2008).

Until late 1980s, Malawi enjoyed food surpluses as evidenced by agricultural stocks in rural Agricultural Development and Marketing Corporation (ADMARC) granaries. The coming of the 1990s, however, saw the existence of acute poverty and hunger, exacerbated by unstable and sometimes very high food and fertilizer prices. Thus, over the period, as Chinsinga (2006) notes, the problem became chronic, with most contributors to the debate attributing it to the decline of smallholder farmer credit clubs and the liberalization of the agricultural markets. According to Chinsinga (2006), the collapse of the smallholder farmer credit system, combined with the removal of fertilizer and hybrid maize seed subsidies, against the backdrop of a sharply devalued local currency, made farm inputs virtually unaffordable to the majority of the chronically impoverished smallholder farmers. These events, coupled with persistent adverse climatic patterns over the last decade, have had tremendous negative consequences on the food

³ Conventional arguments for subsidies in agricultural development have focused on the promotion of increased agricultural productivity through the adoption of new technologies (Ellis, 1992). Reduced costs of subsidized inputs increase their profitability and reduce risks perceived by farmers in adopting them. This combined with credit and extension services, input subsidies were supposed to help farmers implement, benefit from and then, with the withdrawal of the subsidy, themselves fully fund efficient input purchases and use (Dorward et al., 2010)

security status of most households in the country. The upward spiral in food insecurity eventually culminated in the hunger crisis, which has had a devastating impact on the already fragile livelihoods of the vast majority of Malawians, especially those living in rural areas. The government of Malawi responded to this through the Starter Pack (SP) programme introduced in the 1998/9 growing season targeting 2.8 million households and repeated it in the 1999/2000 growing season. As a sustainable weaning strategy, the government scaled it down to Targeted Input Programme (TIP) at 50% of the households. Ironically, however, Malawi experienced hunger crisis in 2001/2 which evidently meant that the SP/TIP interventions failed to achieve the desired results.

In 2004/5 Malawi was yet again suffered a severe hunger crisis. This signaled that the hunger crisis has now become chronic rather than transitory. This problem required urgent response. And being a Presidential and Parliamentary election year which saw President Bingu Wa Mutharika win the race under the United Democratic Front ticket, the Malawi government introduced the Input subsidy program against strong donor resistance. Notice that Malawi is still heavily dependent on donors. With 39% of the gross domestic product (GDP) coming from agriculture and 80% of the development budget overhauled by donor inflows, it is known fact that donors provide nearly the entire development budget, and official development assistance comprises about 27% of GDP (Rubey, 2004). This means that without donor support the magnitude of government's deficit would be quite overwhelming. It is against this backdrop that we say that the government took a very bold stand to implement the input subsidy policy.

That said it was envisaged that the fertilizer subsidy program would potentially raise food production in the rural smallholder sector and thus reduce hunger in the short

run. Income gains transferred to farmers through the subsidy are expected to result in greater savings and investment in productive assets, contributing to longer-run growth. So too are income transfers to farmers which ought to address the social and political objectives of poverty alleviation and improved equity. However, achieving these benefits depends greatly on how the programs are implemented. In Malawi, for example, the design and implementation of the Agricultural Input Support Programme (AISP) has changed somewhat each year since 2005/06. A detailed analysis of Malawi's subsidy program, often heralded as a major success story, shows benefit-cost ratios that fluctuate greatly from year to year, reaching an average high of 1.54 in 2007/08 to an average low of 0.94 in 2008/09 (Dorward and Chirwa, 2009).

1.4 The Donor Support to the Input Subsidy Program

In an attempt to complement government efforts and demonstrate to the world that the Millennium Development Goals (MDGs)⁴ are achievable through low investment, the United Nations Development Program (UNDP) through the Millennium Promise and Earth Institute implemented a universal subsidy program in Mwandama millennium villages. The subsequent section presents a brief background to the Mwandama village, its geographical landscape and the major plantations in the area. It also briefly highlights the climatic conditions facing the project site before winding up with the implementation of the universal subsidy policy in the area.

⁴ The MDGs in order of hierarchy include the following: Eradicate extreme poverty and hunger, Achieve universal primary education, Promote gender equality and empower women, Reduce child mortality, Improve maternal health, Combat HIV/AIDS, malaria, and other diseases, Ensure environmental sustainability and Develop a global partnership for development

1.5 Historical Background to Mwandama Millennium Villages

1.5.1 The Geographical Landscape

The Mwandama cluster with a population of 35000 in 7 villages is located in the southern region of Malawi's Zomba district (Appendix 6). The region is characterized by native vegetation of the Miombo woodlands. The area is intensively cultivated both by smallholders growing maize, pigeon peas, cassava and groundnuts, and by the commercial estate owners growing tobacco and maize. The main cropping season is between November and April and most of the crops are harvested around May. Livestock management is practiced at a small scale and the common livestock are chickens and goats. In fact in 2005, there were only 3 cows in the entire Mwandama village.

1.5.2 The Tobacco Plantations

Large privately-owned tobacco plantations, which surround the seven villages, provide day labor for many people at wages of \$0.50 per day, but they also impose significant repercussions on the development of surrounding communities. Plantation owners restrict the usage of roads to the villages, and the availability of work gives families an excuse to keep their children out of school. As a result, school attendance rates are extremely low.

1.5.3 The Mwandama Climate

The Mwandama cluster is in the world's only region that has seen both a rise in temperature and a drop in rainfall in recent years. These changes have led to common recurrent famines. Nearly 90% of people in the Mwandama Millennium Village cluster

live in extreme poverty. This is a much higher proportion compared to the 53% that live below the poverty line in the entire country. The average maize yield without fertilizer is 0.5 tons per hectare. Frequent droughts which have occurred over the years due to El Niño effects compounded the problems of crop production in the area. Prior to the subsidy program, most of the households produced food that lasted only through August of that harvest year. This means families run for a period of six months without food. During this period of food shortage, most people are forced to sell labor in the surrounding estates at a meager salary in order to buy food.

1.5.4 The Subsidy Program in Mwandama

The Millennium Villages Project (MVP), in partnership with the Malawi national fertilizer subsidy program, was able to provide maize seed and fertilizers at a subsidized rate. Rather than purchasing inputs on credit, farmers in Mwandama receive fully subsidized inputs at the start of the season, and pay back an approximate cost in maize to the school meals program at the end of the season. In 2007, the Malawi cluster had a successful harvest, producing crop yields averaging 5.5 tons of maize per hectare. Given these high yields, it is indisputable that the MVP has achieved undefined food security over the past 5 years. Through their architect, Professor Jeffrey Sachs, a Special Advisor to the UN General Secretary, the MVP has been implementing a 100%⁵ agricultural input subsidy program along with various development interventions in Mwandama as one way of ending abject poverty in the area. The \$110 integrated rural development concept as Sachs calls it entails that \$70 is contributed by the donor while the host government

⁵ The author differentiates the MVP subsidy from the government's subsidy program. The government subsidy is targeted unlike the projects subsidy which is given to all households.

contributes \$30 and the community \$10. The project therefore tries to demonstrate the MDGs can be achieved through low investment. This at least for now seems to be practically the case.

1.6 Statement of the problem

As the global economic crisis deepens, hunger and malnutrition are likely to increase. Reduced incomes and higher unemployment mean the purchasing power of the poor diminishes. Already, more and more people are finding food is out of reach. Malawi's economic development cannot be defined without mentioning food security since the country's economy is highly agrarian. Achieving food security has been on the government's development agenda for years. Notably, Malawi's Growth and Development Strategy (MDGS) which is in line with the Millennium Development Goals recognizes that the achievement of food security is a prerequisite to sustained economic growth and poverty reduction (Makombe et al, 2010).

That said, with maize contributing 90% of farm households and 60% of calorie consumption, the achievement of sustained food security would really bring about a healthy and productive economic society (Lewin and Fisher, 2010). According to Lewin and Fisher (2010), erratic rainfall, small farm size, limited use of modern inputs, and poor access to markets have been the major causes for many farmers not meeting their subsistence requirements, with 80% of smallholder farmers being net buyers of maize. This inability to purchase maize is largely due high import prices which are as a result of the geographical landlocked nature of the country coupled with poor road network.

Lewin and Fisher (2010) further notes that one in every three households fails to meet their daily per capita caloric requirement.

It is therefore not surprising that despite recent bumper yields of maize, acute and chronic food insecurity still keeps haunting the people and government of Malawi. This fact is evidenced from the surrounding villages of the MVP which as stated earlier although equally receive the input subsidies through the government subsidy program have not attained the food secure status that the MVs have achieved. This therefore brings out food for further research. Technically, and as stated above, the MVP implements its agriculture subsidy alongside other interventions like education, health and nutrition, water and sanitation and, infrastructure⁶. Could this be the underlying factor for the difference? Has the problem got to do with the policy itself? Or is it the implementation procedure of the policy? Some people have argued that the procedures for the implementation of the subsidy policy need to be looked at critically. For instance, a holistic approach⁷ to the implementation of the policy may be more effective than a single approach. This is the basis for the provision of an integrated service package in the MVP.

In order to answer the above questions, this study took a critical look at yield per village from 2004 to 2010 and assessed whether there had been any significant yield differences over the period. It also tried to attest the success of the subsidy program to the

⁶ Infrastructure includes market infrastructure (grain bank, WFP, private sector), irrigation infrastructure, energy infrastructure and roads infrastructure. All these interventions are being implemented alongside the agriculture input subsidy program in the Millennium Villages Project

⁷ The author notes that this is in line with the integrated rural development policy of the Malawi government

provision of education, health and nutrition, water and sanitation, and infrastructure interventions in the study area.

1.7 Research Objectives

The study is aimed at assessing whether the input subsidy program has had an impact on the sustained food security in Mwandama millennium villages in the Zomba district of Malawi and what factors have driven the success of the program given that the surrounding villages continue to be haunted with hunger and poverty despite receiving subsidy from the government. Specifically, the study has the following objectives:

1. To assess the impact of the Millennium Villages subsidy program on sustained food security in Mwandama, and
2. To assess whether the success of the subsidy program in the MVs can be attributed to the interventions the villages are receiving other than the agriculture subsidy.

1.8 Research Hypotheses

The associated hypotheses for the above objectives are as follows:

1. Input subsidy program has no impact on the sustained food security in Mwandama Millennium Villages.
2. Education, health and nutrition, water and sanitation, and infrastructure interventions have no effect on the success of the input subsidy program in Mwandama Millennium Villages.

1.9 Brief Description of the Research Methods

During this study various research methodologies and techniques were put to use. The follow on paragraphs give a brief explanation of the methodologies.

Secondary research methods were used to examine the literature on food security and input subsidy program. It was also used to assess the impact of the universal subsidy program on food security status in the study area by looking at yield data from 2004/5 to 2009/10.

Primary research was conducted to evaluate whether the interventions that the Millennium Villages project has provided in the study area have had any impact on the success of the subsidy program and hence the food insecurity status of the study area. In essence the primary research tried to assess any changes in livelihoods that the interventions might have brought in the households of Mwandama MVs. This research was conducted in accordance with the following three methods: observation, focus group discussions, and key informant interviews.

Observation was carried out as the researcher was moving around the project site to conduct focus group discussions and noted some infrastructural works (clinics and schools) as well as stock piles of maize in 50kgs bags in the grain bank. The focus group discussion was done in both intervention and non intervention areas, where as key informant interviews were conducted with officials from government, university of Malawi's Center for Social Research (CSR) and MVP. These methods are discussed in full details in chapter four.

1.10 Significance and Relevance of the study

As stated in the preceding chapters, achieving food security is high on the agenda of the Malawi government. This is why it is included in the Malawi's Growth and Development Strategy (MGDS) as a top prerequisite for achieving sustained economic growth and poverty reduction. This study is relevant because it touches the very essence of food security issues in Zomba in particular and Malawi in general. The study would broaden policy makers' minds as it addresses the food security issue by examining how socio-economic characteristics of households, local conditions, and current agricultural policies influence the likelihood that a farm household in rural Malawi is food insecure. Thus, it brings out to bear a good understanding of the determinants of food insecurity required to inform and guide the design and execution of effective and well-targeted policy interventions.

1.11 Organization of the study

The research study is divided into 6 chapters. Chapter one as seen above presents a background to the problem that has prompted the study. It refers to the significance, relevance and objectives of the study and includes a brief explanation of the study area and the research methodologies employed.

The rest of the study is structured as follows: chapter two provides an overview of the food insecurity status in Malawi. It highlights food security as well as subsidy policies in detail. Chapter three presents a review of theoretical and empirical literature that provides an understanding into the relationships under investigation. Chapter four discusses the methodology used in the study. Chapter five and six discuss the findings

and the appropriate policy recommendations respectively, including limitations to and areas of further study.

CHAPTER TWO

HISTORICAL BACKGROUND TO THE FOOD INSECURITY IN MALAWI

2.1 The policy paradigm

2.1.1 Policies Affecting Food Security

Malawi being an agrarian economy, there has been a number of policies aimed at addressing the food security issues. Under Dr H Kamuzu Banda's regime, government produced a Food Security and Nutrition Policy Statement (1990) as part of its larger development policy (DEVPOL3). This policy identified several strategies for improving food security in the country through increased agricultural production, increased employment opportunities, capacity development, and income transfers to the very poor. It also listed various institutions that were to be strengthened to implement the policies.

Since the birth of multiparty democracy, no clearly articulated food security policy has been produced by the government. However, various reforms, plans, policies and programmes have been designed and adopted geared to reducing the food insecurity problem in the country. Thus according to Cammack et al (2003) these policies have included but not limited to the following:

- i. **Structural Adjustment policies** – these have been ongoing since the early 1980s, and have tried to create an economic and regulatory environment favorable to poverty reduction (and food security) through rationalization of interest rates, price liberalization, strengthening public sector institutions, removal of subsidies,

liberalization of agriculture, deregulation of markets, and agricultural credit liberalization.

- ii. **Poverty Alleviation programme (1995)** – emerging soon after the transition and identified as a primary goal of the new ruling party in the multiparty democracy era, the UDF, this policy had increased spending on education, health, and food security.
- iii. **Poverty Reduction Strategy Paper (PRSP).** As a prerequisite for accessing financing from the International Monetary Fund (IMF) and World Bank (WB), poverty reduction strategy papers had been written by many countries including Malawi.
- iv. **An Agricultural and Livestock Sector Development Strategy and Action Plan** was adopted in 1995 and the old **Agricultural and Livestock Marketing Act** was repealed in 1996, which had restricted marketing of certain crops and animals and reduced participation and competition in these sectors. A review of the strategy was done in 1999 and it identified constraints to implementation, recommending new policies and legislation.
- v. **Amendment of Seed Act (1996)** was done to encourage widespread participation in the seed market.
- vi. **Growth Strategy for Malawi (Feb 2003)** outlined two dozen constraints that inhibit economic, including agricultural, growth.
- vii. **National Safety Net Strategy (Sept 2000)** aimed at supporting up to 30% of the population through various welfare programmes like subsidized agricultural

inputs (TIP) and public works, supplementary feeding and ‘direct transfers’ (e.g. food vouchers).

- viii. **Malawi Agricultural Sector Investment Programme (2001)** identified areas in which public expenditure and investment will address constraints to agricultural production and marketing.
- ix. **Humanitarian relief and disaster preparedness programmes** – The *National Disasters Preparedness Plan* was put in place to respond to food crises.
- x. **Targeted Input Programme (TIP) and Starter Packs** – Since 1998 some donors (notably the EU and DFID) have supported government distribution of packets of seeds and fertilizer to smallholder farmers (up to 3 million annually). TIP is now incorporated into policy (PRSP, National Safety Net Strategy, etc) as subsidizing production is believed to be better for Malawi than subsidizing consumption (through importation of relief food).
- xi. The need for **land tenure reform** was voiced during the transitional period when rural populations complained about land shortages and elite resource capture. The subsequent consultations by the *Presidential Land Commission*, donor-funded surveys and studies, and reports by Ministry of Lands culminated in a land policy (2003), which was recently sent to Cabinet (where it was reportedly changed). It is now being drafted into law by the Law Commissioner, apparently for submission to the September 2003 sitting of Parliament. It aims at a more efficient, sustainable, equitable and secure land tenure system.
- xii. Closure of **Smallholder Agricultural Credit Administration** and the establishment of **Malawi Rural Finance Company (1994)** for agricultural credit.

- xiii. **Privatization and market reform.** This saw the birth of *ADMARC and Agricultural Production and Marketing Policy*. The privatization/regulation and reform of ADMARC has been an on-going saga. When the issue first came out, the Malawi parliament outrightly rejected it. The issue under discussion was whether the social function of ADMARC (e.g. reaching remote markets, farmers and consumers who would otherwise not be served by private traders) compensated for its high cost to taxpayers. Other points of debate have been ADMARC's conflict of interest (being a private trader in maize as well as a public agency) and the role it should play in maize market stabilization.
- xiv. **National Food Reserve Agency (NFRA)** created 1999 to take over the maize market stabilization function from ADMARC – that is, to manage the strategic grain reserve.
- xv. **The Essential Healthcare Package** is meant to address the causes of morbidity and mortality, focusing on nutrition, family planning, health service gaps, etc.
- xvi. **National Environmental Action Policy** links poverty and environmental degradation (including land policy) and was meant to strengthen the legal and institutional framework, to develop alternative livelihood strategies and to create mass environmental awareness.
- xvii. **The Smallholder Irrigation Project** and other programmes are meant to foster nontraditional farming methods, by decreasing dependency on rain fall, and encouraging the growing of winter crops.

2.1.2 The Input Target Policy

The debate on the impact of input subsidy on sustained food security has been very variable, with many a number looking at the subsidy policies and their implementation. The implementation of the subsidy program has been criticized left and right. The theory of target input is one such area. Some contributors to the debate have argued that before deciding to target the input vouchers, the government needs to carefully consider the objectives of the targeting policy, the practical feasibility, the costs of implementing a targeted program, including personnel costs, time requirements and potential delays, leakage, and displacement of commercial sales by subsidized inputs (COMESA, 2009). On the other hand, one would argue in favor of the policy. For instance, what does it take to feed a population of 13 million? If for arguments sake, 8 large scale farmers would produce enough to feed the whole nation, then, in my view it would be economically efficient and cost effective for the government to dose the 8 large scale farmers with the subsidy and forget about the smallholder farmers.

2.1.3 The Procurement and Distribution Policy

There is also a debate that the loss of coupons has been one of the weaknesses in the government's procurement and distribution policy. On the distribution front, involving a wide range of fertilizer importers, wholesalers, and retailers in the input voucher scheme, even if it entails additional logistical costs would be a healthy thing to do. Providing tenders to only 2-3 firms to import fertilizer can entrench their position in the market, cause other firms to cease making investments in the system or drop out altogether, leading to a more concentrated input marketing system and restricted

competition when the input subsidy program comes to an end. A system that allows farmers to redeem coupons at the full range of existing independent agro-dealer retail stores will promote additional investment in remote rural areas where it is most needed. By contrast, failure to involve the small rural retailers may lead many of them to stop carrying fertilizer, as was the case in Malawi after the 2005/06 season, leading to erosion rather than development of a private retailing system (COMESA, 2009). The procurement system has equally been challenged. It has been argued that addressing infrastructure and input supply constraints as well as improving procurement efficiency through joint procurement arrangements and regional procurement hubs can help achieve the goal of enhancing farm-level fertilizer supplies at a lower price. Facilitating the movement of fertilizers across borders by removing customs duties and export taxes can also contribute to overall improvements in supply efficiency (COMESA, 2009).

2.2 The Political Context and Inadequate Supplies

It has also been challenged that the inadequate supply of the inputs can yield minimal economic results. If the policy has to be successfully implemented, then, adequate supplies of inputs must be given out to both smallholder and large scale farmers. This again seems to be underscoring the argument against the target policy while stabbing my view of dosing the 8 large scale farmers. Added to this is the fact that other critics have looked at the whole program as merely a political gimmick, questioning the timing of its implementation. Starter Pack (SP) program was introduced in 1998/9 growing season, a Presidential and Parliamentary election year which saw President Elison Bakili Muluzi retain his seat. The introduction of the input subsidy program in

2004/5, again, being a Presidential and Parliamentary election year which saw President Bingu Wa Mutharika win the election under the United Democratic Front (UDF) party is another example. Against strong opposition from other parties in Malawi parliament, President Bingu Wa Mutharika reaffirmed his stand to continue implementing the subsidy policy program in 2008, another Presidential and Parliamentary election year which saw him retain his seat now under the Democratic Progressive Party (DPP). Whether this is by coincidence or not remains to be known and provides another recipe for further research.

2.3 The Dependency Syndrome

The multitude of approaches combined under the heading 'Dependencia' like imperialism theories are based on the assumption of an external dependency of developing countries which makes exploitation possible. However, while imperialism theories hold the dependence relation to be directly responsible for the exploitation of developing countries, the dependencia theories develop this concept further. They postulate that external dependencies lead to an internal structural deformation which perpetuates the external dependency. This over dependency on donor aid has been one such area which has been empirically criticized for stifling the attainment of sustainable food security in Malawi and Africa as a whole. Arguably, the privatization of health, agriculture and education would bring in a decline in the provision of social services. The net effect of this is that prices for goods and services go up and in a bid to strategically compete on the world market; many companies downsize resulting into many people losing their jobs.

The effects of over dependency have been specifically felt in Malawi. For decades the World Bank (WB) and donor nations pressed the country, a predominantly rural society in the Sub Sahara Africa, to cut back or eliminate fertilizer subsidies to farmers through the Structural Adjustment Programmes (SAPs). The SAPs were borne out of the Washington Consensus, a neoliberal bunch of economic policies from Washington's financial institutions known as the Bretton Woods Institutions which advocated for privatization of the agricultural sector. These WB experts also urged the country to have the farmers shift to growing cash crops for exports and to use foreign exchange earnings to import food. The result was that for years, Malawi hovered on the brink of famine. This situation worsened following a particularly disastrous maize harvest in 2005 which saw almost five million of Malawi's 13 million people in dire need of emergency food aid.

The government of Malawi then decided to reverse the policy. It introduced deep fertilizer subsidies (and lesser ones for seed). This assisted by good rains, helped farmers produce record breaking maize harvests in 2006 and 2007. According to government reports, maize production leapt from 1.2 million metric tons in 2005 to 2.7 million metric tons in 2006 and 3.4 million metric tons in 2007. The prevalence of acute hunger fell sharply and Malawi recently turned away emergency food aid. The WB reportedly now supports the temporary use of fertilizer subsidies aimed at the poor and carried out in a way that fosters private markets though criticizes the government for not having a strategy to eventually end the subsidies.

The other danger of dependancia theory is that it creates a centre-periphery relationship that reproduces itself within developing countries. Virtually, between

metropolis and rural hinterland, relations are similar to those existing between industrial and developing countries. Also elites in developing countries known as the Petit Bourgeoisie accept the norms and values of the industrialized countries and cooperate in maintaining status quo. Some dependencia theorists have asserted that inequalities are greater in areas that are more economically and politically dependent.

2.4 Management of Grain Reserve

Some subscribers to the debate have looked at management or mismanagement of grain reserve and lack of produce markets as major player to lack of achieving food security in the country. According to the Grain Traders Association of Malawi, a surplus of 1.3 million tons was registered in Malawi in 2005 following the introduction of the input subsidy program. However, out of the 1.3 million tones surplus, it exported 80,000 tons of maize to drought-hit Kenya and to Zimbabwe at an agreed export price of US\$340 per ton, earning about US\$27 million from the sale. Thus, the Malawi government decided to export 100,000 tons of maize through the National Food Reserve Agency (NFRA) as one means of addressing a stock glut. Maize prices on local markets lately have been even lower than the government's subsidized emergency supply, thus signaling a gradual normalization after years of drought and food crisis. This sale would thus empty parts of its emergency storage of the country's primary staple food. If on the other hand, the government was to retain 100,000 tons of maize in its Strategic Grain Reserve it would hedge against unforeseen domestic food shortages (FEWS, 2010). As stated in the FEWS (2010) report, keeping this food in reserve is important because low

maize prices may result in low informal maize imports and reduced maize supplies in the local markets later in the season.

2.5 Natural Factors

Natural factors have also been pointed out as contributors to the acceleration of Malawi's food insecurity. Adverse climatic conditions in two consecutive growing seasons of 2000/01 and 2001/02 plunged the country into one of its worst food security crises in recent memory with around 30% of the population in need of emergency support. This was aggravated by gross mismanagement of grain reserves. Not surprising, the country was declared a National Food Crisis on 27 May 2002 following an estimated 29% (3.3 million people) of the total population would be affected by the crisis (USAID, 2002). In 2004/5 Malawi was yet again hit by severe hunger crisis which forced the government to introduce the subsidy program against severe donor resistance.

The deteriorating health situation in Southern Africa to which Malawi is part of the family may be eroding nutritional status, not only with the recrudescence of malaria and tuberculosis, but most evidently because of the rapid spread of HIV/AIDS, with an incidence of 25 percent and more amongst the economically active adult population. With deteriorated health, people become more vulnerable, and so the economy more fragile and sensitive to ever-smaller shocks. This is also a reason for reassessing the importance of transitory, acute food insecurity (FAO, 2003). Loss of productive labor is the most direct and significant impact of HIV/AIDS on these rural households who rely on agriculture. Extremely poor and vulnerable households possess no excess capacity to survive additional burdens. HIV/AIDS is also diminishing the human capital of upcoming

generations as children, particularly young girls, are taken out of school to care for sick family members or sent out to work in order to subsidize family income. This severely limits their ability to gain education and life skills. Intergenerational knowledge is also deteriorating as parents die before passing on wisdom and learning to their children.

CHAPTER THREE

LITERATURE REVIEW

3.1 Theoretical Literature on Interventions that Impact on Food Insecurity

The following discussion looks at interventions that affect food security. It begins by defining the integrated rural development concept and then makes an analysis of the interventions.

3.1.1 Background the Concept of Integrated Rural Development

The process of implementing the program has really not been given much attention and discussion, if any. In the author's view, the MVP's subsidy program registers success because of the integrated approach in the implementation. Various interventions like health, education, water and sanitation, energy and infrastructure, just to mention a few, are actually being integrated into the agriculture subsidy program. This integrated approach to rural development in Mwandama MV is emulated from one of the development concepts, *Theory of Development Poles*. This theory emphasizes the promotion of regional development centers. These regional development centers serve as focal points and incentives for further development. Thus according to Kuhn (1987) such regional concentrations help to reap the benefits of technological external economies and make the growth centers attractive to entrepreneurs, thus initiating further development. This theory operates like a regional unbalanced growth theory which uses temporary regional imbalances to initiate development. Little attention is given to the

process which is necessary to ensure a spread or linkage from the centers to the hinterland without which the poles may transform the economy of the region into a dual economy.

This paper will begin by looking at the definition of poverty from Amartya Sen's point of view. In *Development as Freedom*, economist Amartya Sen advances his "capabilities approach" to international development. Sen classifies a capability as a type of freedom that enables one to choose a lifestyle one wants to live. Sen also suggests that freedom is both the end and the means to development (p. 75). Thus, according to Sen, the objective in international development is to expand the freedom of people, and the way to obtain this freedom is to remove restrictions on freedoms that limit one's ability to make free choices. Thus, Sen places a premium on freedom, and it is through freedom that the capabilities approach is grounded. Following Sen, the concept of development goes well beyond considerations of material wealth. GNP ought not to be the sole (nor even the main) indicator of development. Rather, Sen presents development as a process of expanding freedoms people have reason to value. Some of the freedoms include economic freedom, access to education, access to healthcare, access to clean water and sanitation, gender equality and access to political and civil rights. In Sen's view, these are the best indicators of development.

Again following Sen's doctrine through his *Entitlement Approach in Poverty and Famine*, it is interesting to note that he emphasizes that a man chooses to be poor. Sen defines Entitlements as a set of alternative commodity bundles that a person can command in a society using the totality of rights and opportunities that he or she faces. So the question is not whether the food is available but rather whether one is entitled to it

or not such that in Sen's framework, people destitute by famine are not entitled to food; instead they are "entitled to starve" (Edkins, 1996). While this approach has been significantly weakened, both conceptually and empirically, by its methodological individualism and by its privileging of economic aspects of famine above sociopolitical determinants, it still forms a bone of the lengthy discursive expositions on poverty and food security. It is against this background that this study takes a look at these factors.

3.2 Empirical Literature of the Interventions

Empirical studies have shown that interventions like education, health and nutrition, water and sanitation, energy and infrastructure, just to mention a few, have a direct impact on the successful implementation of the agriculture subsidy program.

Studies by World Food Programme (2006) in Lao PDR have shown that household food security is linked with education, hygiene and nutrition, the physical infrastructure, and the agricultural and environmental sector. Stand-alone interventions within these sectors will therefore have a limited effect unless the overall policy environment is favorable to food security. Figure 3 below illustrates that the policy environment is central to all efforts targeted at addressing food insecurity, since it may facilitate and enhance interventions in any given sector. Poor education is often causing food insecurity and malnutrition. Agricultural production and the environment are vital both as a source of income and food. Improving the rural physical infrastructure will also positively affect food security.

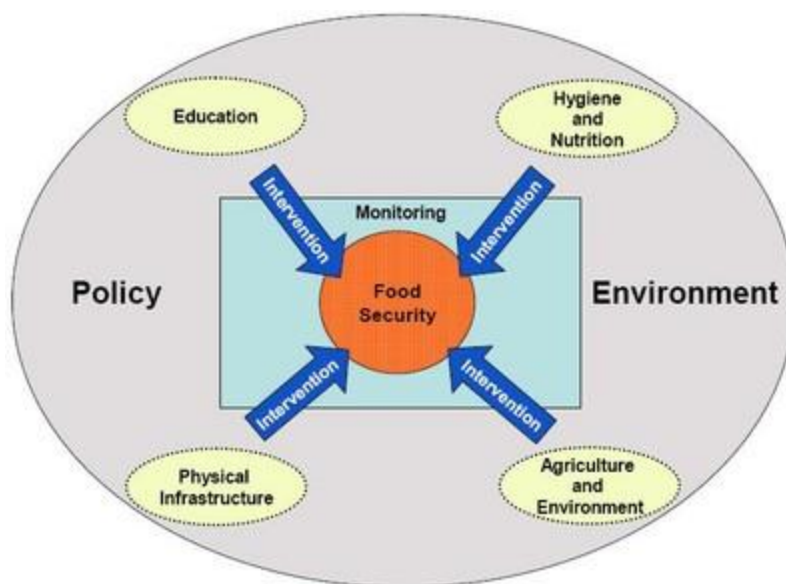


Figure 3: Framework for Responses to Improve Food and Nutrition Security in Lao

Source: Adapted from WFP (2006)

3.2.1 Education

Studies elsewhere have shown there is a direct link between the level of education and poverty levels in a society. According to Tchale (2009), among the socioeconomic characteristics, only the education level of the household head appears to be an important determinant of farm-level efficiency. Well-educated farmers exhibit higher levels of efficiency. A marginal increase in the highest level of formal education of the household head results in a 9% increase in technical efficiency. This is consistent with findings reported in previous studies. For example, Bravo-Ureta and Pinheiro (1997), among others, have reported that formal education is likely to increase farm-level efficiency for three related reasons: (i) educated farmers are able to gather, understand and use information from research and extension more easily than illiterate farmers can and (ii)

educated farmers are very likely to be less risk-averse and therefore (iii) more willing to try out modern technologies.

The above arguments have further been strengthened by other findings. According to FAO (2009) report, nearly one out of six people of the current inhabitants of the world is suffering from hunger and illiteracy with the majority of them living in Africa. The report further stresses that education, labor, land, livestock and infrastructure are the key assets enabling rural households to escape poverty, and Education for Rural People (ERP) which is advocated by FAO is one of the most powerful weapons against hunger. In fact a 2007 report from the British Department for International Development (DfID) indicates that more than US\$ 11 billion are needed annually for education if Africa is to have any hope of getting all children into primary school by 2015. This basically means that there is a strong correlation between education, empowerment and food security, mainly through a number of “good practice” case studies from all over the world. It is therefore essential to strengthen rural education capacity in order to achieve food security.

FAO (2009) report further states that education in all its forms has the potential to empower people, by increasing their self-confidence, their capacity to improve their livelihoods and their participation in wider processes of social and economic change. This is the reason why FAO and Italy have consistently supported efforts aimed at providing stronger linkages between food security and education issues. According to the FAO (2009) report, the dramatic food crisis, exacerbated by the serious financial and economic crisis has given impulse to a renewed effort of the international community to reduce the impact of these events on poor people and to prevent future emergencies. FAO

(2009) report stresses that education for rural people which include rural children, youth and adults, must be an essential part of this endeavor. This is because the great majority of the so-called “hard-to-reach children” are concentrated in rural areas. Giving them a wider access to education therefore has been identified by the G8 as one of the crucial issues of development in the field of education. It responds not only to the basic need of reducing inequalities and creating equal opportunities for all, but also to the imperative of providing rural people with better tools, skills and capacity. In conclusion, ERP is an essential foundation stone for achievement of the MDGs. Better educated rural people have better employment prospects, better health, greater food security, less vulnerability to shocks, and better coping mechanisms in dealing with the forces of climate change, food crises, globalization and challenges to cultural traditions.

Lewin and Fisher (2010) in their study of the impact of government policies on food insecurity among rural farm households in Malawi found out that extending the education of household heads would reduce food insecurity in all the three regions of Malawi. With current figures averaging 4 to 6 years of education, extending that to 12 years to include secondary education would be particularly effective (Lewin and Fisher, 2010). What would be critical is to turn such policies into a sustainable rural development by incorporating skills or vocational training as part of primary and secondary education.

3.2.2 Health and Nutrition

Studies elsewhere have shown that there is a strong link between health and food security. According to WHO (1978) report, the Millennium Development Goals (MDGs) relating to poverty reduction and health improvement are closely related, reflecting the

close relationships between ill-health, vulnerability and poverty. Many aspects of poverty have a negative impact on health and on access to effective health services. In turn, sickness and disability can affect the productivity of individuals, households and communities, making it more likely that they will fall into poverty or be unable to escape poverty for long periods. The way individuals, households and communities respond to risks and manage shocks holds direct implications for the poverty-health linkage. In fact resilience relates strongly to asset stocks and the livelihood approach can be helpful here. This is because it traces the pathways through which ill-health reduces productivity and increases the burden on households, leaving them less able to withstand shocks.

The above point has further been emphasized through the OECD and WHO (2003) report where it is stated that in developing countries, breaking the vicious circle of poverty and ill health is an essential condition for economic development. The fact that three of the eight Millennium Development Goals are specific to health is evidence of the consensus on this point across the international development community. According to the OECD and WHO (2003) report, the poor suffer worse health and die younger. They have higher than average child and maternal mortality, higher levels of disease, more limited access to health care and social protection, and gender inequality disadvantages further the health of poor women and girls.

It should be noted that health is also a crucially important economic asset for poor people. This means that the livelihoods of the poor heavily depend on health. When a poor or socially vulnerable person becomes ill or injured, the entire household can become trapped in a downward spiral of lost income and high health care costs. The cascading effects may include diverting time from generating an income or from

schooling to care for the sick; they may also force the sale of assets required for livelihoods. Poor people are more vulnerable to this downward spiral as they are more prone to disease and have more limited access to health care and social insurance. Measures to improve health are an important aspect of a strategy to reduce poverty. Pro-poor health strategies give priority to common problems for which cost-effective interventions exist.

The above arguments have also further been solidified with the World Food Summit (1996) when it defined food security as existing when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life. Commonly, the concept of food security is defined as including both physical and economic access to food that meets people's dietary needs as well as their food preferences. In many countries, health problems related to dietary excess are an ever increasing threat. In fact, malnutrition and food borne diarrhea have become a double burden. Food security therefore is a complex sustainable development issue, linked to health through malnutrition, but also to sustainable economic development, environment, and trade.

The important link between health and development was also further underscored during the 1950s - 1970s when so many countries invested heavily in health services. This investment saw health indicators improve substantially. The interest in the relationship about illness, development and poverty culminated in the acceptance of primary health care strategy (WHO, 1978). This interest waned and health care became consumption good rather than a developmental necessity. This perception was backed by the noticeable increases in health budgets as countries developed. According to the World Bank (1993) report, Sub Saharan Africa spent 4.5% of the GDP on health compared to

9.2% by the established market economies. This was built on the notion that improvement in health would simply be one of the benefits of economic development (Bloom and Lucas, 1999).

A study in Kenya has also supported the linkage between health and food security with specific reference HIV/AIDS pandemic. According to Agatha et al (2010), the HIV/AIDS pandemic is a global crisis with consequences that will be felt for decades to come. Though there are many chronic diseases in Kenya, HIV/AIDS is presently having a devastating effect by threatening the food production systems, intensifying poverty prevalence, increasing nutritional implications, creating more orphans than existing social networks can cope with and basically affecting all indicators of socioeconomic development in the country. Decreased productivity, along with an increase in medical expenditures often results in a worsening livelihood security situation for people living with HIV/AIDS and other members of their households. The ability of households and communities to ensure their food and nutrition security in the face of AIDS is being severely challenged. Livelihoods are being eroded through the effects of premature illness and death on household labor power and through the fracturing of intergenerational knowledge transfer. Social relations and capacity to care are being put under immense strain by HIV-related stigma and exclusion, increasing orphaning rates, and reduced incentives for collective action. Financial stress is increased as expenditures for health care and funerals increase, and as credit becomes harder to access. Agatha et al (2010) revealed that there is a significant relationship between HIV/AIDS status and expenditure patterns on food and non-food items. Most affected households had most productive persons affected by HIV/AIDS. Thus, people living with HIV/AIDS, their

families and communities are overcome by the effects of the pandemic. The report further makes policy recommendations to the Kenyan government that it can save families from the effects of HIV/AIDS by instituting food security interventions based on sound, sustainable agricultural practices.

3.2.3 Water and Sanitation

Studies have also shown that the water sector is vulnerable to a variety of attacks through contamination with deadly agents, physical attacks-such as the release of toxic gaseous chemicals and cyber attacks. If these attacks were realized, the result could be large numbers of illnesses or casualties and/or a denial of service that would also impact public health and economic vitality. Critical services such as firefighting or healthcare and other dependent and interdependent sectors, such as energy, transport systems and agriculture and food would be negatively impacted by a denial of service from the water sector. A healthy and energetic community would be able to farm and in turn reduce food insecurity in the village.

3.2.4 Infrastructure

Household food security is linked with education, hygiene and nutrition, the physical infrastructure, and the agricultural and environmental sector. Poor education is often causing food insecurity and malnutrition. Agricultural production and the environment are vital both as a source of income and food. Improving the rural physical infrastructure will also positively affect food security.

3.2.4.1 Energy Infrastructure

Energy infrastructure which is divided into electricity, petroleum and natural gas segments, fuels the economy of the 21st century. Without a stable energy supply, health and welfare is threatened and the economy cannot function. It is envisioned that infrastructural development would stimulate development in other sectors like health and agriculture.

3.2.4.2 Market and Roads Infrastructure

Farmers need reliable access to markets for selling and purchasing products. Lewin and Fisher (2010) study reveal that food insecurity increases with increasing distance from a weekly market in northern Malawi, with an increasing distance from an Agricultural Development Marketing Corporation (ADMARC) depot in the central region. Similarly, asphaltting the main community road surfaces would reduce food insecurity by 18 percent in the central region and 19 percent in the south region (Lewin and Fisher, 2010). Thus, given the fact that road density in Malawi currently ranks lowest in Southern Africa and that poor transport infrastructure accounts for up to 55 percent of marketing cost, it is imperative that this infrastructure be given the needed investment if the country is to develop. Any investment in transport infrastructure, particularly roads that link farmers to markets, reduce costs of crop production and transport thereby increasing farmers' ability to buy inputs and sell outputs which would in turn boost profits.

3.2.4.3 Irrigation Infrastructure

It is known fact that Malawi's maize production heavily relies on rain fed water. Drought in 2001 and 2002 heavily contributed to a severe food crisis, which left 30 percent of the population in need of emergency food assistance (Makombe et al, 2010). Thus, although adequate rain in the recent years resulted in surplus maize, investment in irrigation infrastructure can reduce impacts of adverse weather and help increase food security.

The above fact has also been supported by other studies. Lewin and Fisher (2010) found that availability of irrigation would reduce the probability of household food insecurity in south Malawi, where the Shire River could support intensive farming. The study further stated that Malawi has an irrigation potential of at least 162,000 ha, and yet only a small fraction of this area is currently under irrigation. The government of Malawi also recently initiated the Green Belt Initiative as part of the Agriculture Sector Wide Approach (ASWAp), to establish irrigation schemes for more than 30,000 ha of land that are 10 to 20 kilometers or more from Malawi's major lakes and perennial rivers.

CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

This chapter focuses on research methodology. Firstly, it gives a brief description of the research objectives and then proceeds with a discussion of two main research methods: primary and secondary research.

As pointed out in Chapter One of the study, the primary research objective was to assess the impact of the Millennium Villages subsidy program on sustained food security in Mwandama, Zomba. In addition, the study also wanted to establish whether the provision of additional interventions alongside the agriculture subsidy has had any effect on the food security status in the study area. Thus the secondary objective was to answer the question of whether education, health and nutrition, water and sanitation and, infrastructure interventions have had any effect on the success of the input subsidy program in Mwandama millennium villages.

4.2 Research Methodology

This study was confined to Mwandama village, T/A Mlumbe, Zomba. While the results may be pertinent to the village, they can also be relevant to a national level. That said the sample was representative of only Mwandama village. It involved the use of both primary and secondary data.

The major research entity was Mwandama village to capture various aspects of data available. Dzaone in Zomba, Gwengwere in Dedza, Gumulira in Mchinji and Batoni Nzima in Mzimba were minor entities. Different research methods were used in the study area, and an explanation of each is given below.

4.2.1 Secondary Research

Secondary research mainly involved literature review of both published and unpublished material. It included a review of books, journals, working papers, evaluation reports, newspapers, internet, and other materials, like government documents. Yield data for the Millennium Villages from the Earth Institute's Columbia University was also very central to the secondary research. A review of the mid-term evaluation report of the Millennium Villages Project was another important source of the secondary research and offered quite a deep breadth of information to this study.

Yield data from 2004/05 to 2009/10 growing seasons for the Millennium Villages were collected from the Earth Institute's Columbia University. The data collected was from all the 10 Millennium Villages intervention areas in Malawi. These villages include Makoka, Mwaswa, Mwandama, Nambande, Msamba, Katete and Dindi in Zomba district, Gwengere in Dedza district, Gumulira in Mchinji district and Batoni Nzima in Mzimba district. Within the Millennium Villages, one village, Mwandama, is a research village (also known as MV1). The research village was established as a learning ground. The rest are non research villages (also known as MV2s) which are used to scale up any interventions which have been scientifically proven viable in the MV1.

Apart from the intervention areas, the data collected also included all MV non intervention areas (also known as outlier villages). The design of the project was to have outlier villages as control villages. Baseline yield data was collected in all intervention areas in 2004/05 growing season. Apart from Dzaone village, the project started collecting data in all the outlier villages from 2005/06 growing season. For purposes of this study, the data was confined to Mwandama intervention and non intervention areas only. While data was available from Malawi's Ministry of Agriculture and Food Security for all the years for Dzaone, this study used data specifically collected by the Earth Institute's Columbia University from 2006/07 to 2009/10 growing seasons for easy comparison. This was so because the data for the stated period was collected solely as control data for the research village.

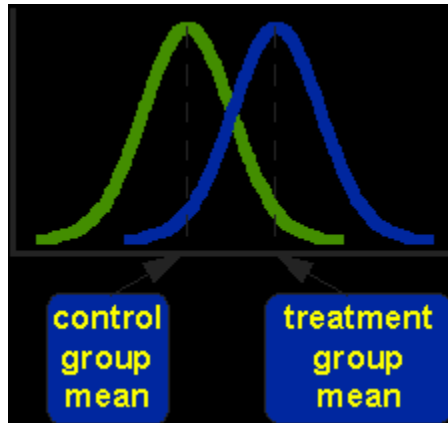
The Project randomly picked a population of 90 households for Dzaone non intervention area. This number has been maintained throughout the study period (2006/07 to 2009/2010) to ensure consistency, credibility and reliability of data. The Millennium Villages had a population of 30 households. Apart from the MV1 which has maintained the number of households throughout the study period⁸ (2004/05 to 2009/2010), the MV2s reduced the number from 30 to 6 households in the last two seasons of 2008/09 and 2009/10. The MV1 being a research village has all the interventions deployed in it. To avoid inconsistency and ensure credibility and reliability of the data, this study was further narrowed to Mwandama research village (MV1). The data from Mwandama research village was compared with that of Dzaone non intervention area.

⁸ The study period refers to the period the MV started collecting data to the present state. For intervention areas, this was in 2004/05 growing season. For non intervention areas, this was in 2006/07 growing season. The study end date is, however, the same, 2009/10 growing season.

Following the literature above, this research study takes the pattern of a designed experiment. Weiss (2002) defines a designed experiment as a type of experiments where researchers impose treatments and controls and then observe characteristics and take measurements. This kind of study is differentiated from observational study in the sense that in observational studies, researchers simply observe characteristics and take measurements, as in a simple survey. Thus according to Weiss (2002), observational studies can reveal only *association*, whereas designed experiments can help establish *causation*. In this study, we compare the government subsidy and the MVP subsidy. Both the government subsidy and MVP subsidy are known as treatments, in experimental design. And in practice, such treatments could be several⁹. This study summed up all the MVP interventions into one specified treatment. Similarly, the trace agriculture subsidy in the non intervention area is another one treatment. The intervention group, which is the Mwandama research village, is known as a treatment group. By definition, a treatment group is any group that receives a specified treatment (Weiss, 2002). On the other hand, Dzaone non intervention area is referred to as control group by virtue of receiving the government agriculture subsidy only. In the study, therefore the treatment group was compared to the control group. The idea is to try and assess the effects of the treatment. One statistical method that is used to assess treatment effect is called the difference between the means. In this statistical model, we try to establish whether there is a difference between the groups. Each group therefore is represented by a "bell-shaped" curve that describes the group's distribution on a single variable as shown in Figure 4 below. A bell curve is a smoothed histogram or bar graph that describes the frequency of

⁹ In this study, such treatments include: agriculture, health and nutrition, education, water and sanitation and infrastructure interventions.

each possible observation. In the figure, the distribution for both the treatment and control groups are shown. The mean values for each group are indicated with dashed lines. The difference between the means is simply the horizontal difference between where the control and treatment group means hit the horizontal axis.



Is there a difference?

Figure 4: Bell shaped curves showing distribution for treatment and control groups

Source: Adapted from www.socialresearchmethods.net (2011)

4.2.1.1 The T-Test

The t-test assesses whether the means of two groups are statistically different from each other. This analysis is appropriate whenever one wants to compare the means of two groups, and especially appropriate as the analysis for the posttest-only two-group randomized experimental designs (Trochim, 2000). Figure 4 above shows the distributions for the treated (blue) and control (green) groups in this study. The treated group is the MV1 whereas the control group is Dzaone. Notice that this is actually an

idealized distribution -- the actual distribution would usually be depicted with a histogram or bar graph.

As stated earlier, Figure 4 indicates where the control and treatment group means are located. The question the t-test addresses is whether the means are statistically different. Since the difference between the means posits three difference scenarios, viz, low variability, moderate variability and high variability, it is important when looking at the differences between scores for two groups to judge the difference between their means relative to the spread or variability of their scores. This in the study was addressed through a t-test statistical analysis. Figure 5 below shows how the formula for a t-test is related to a signal to noise ratio.

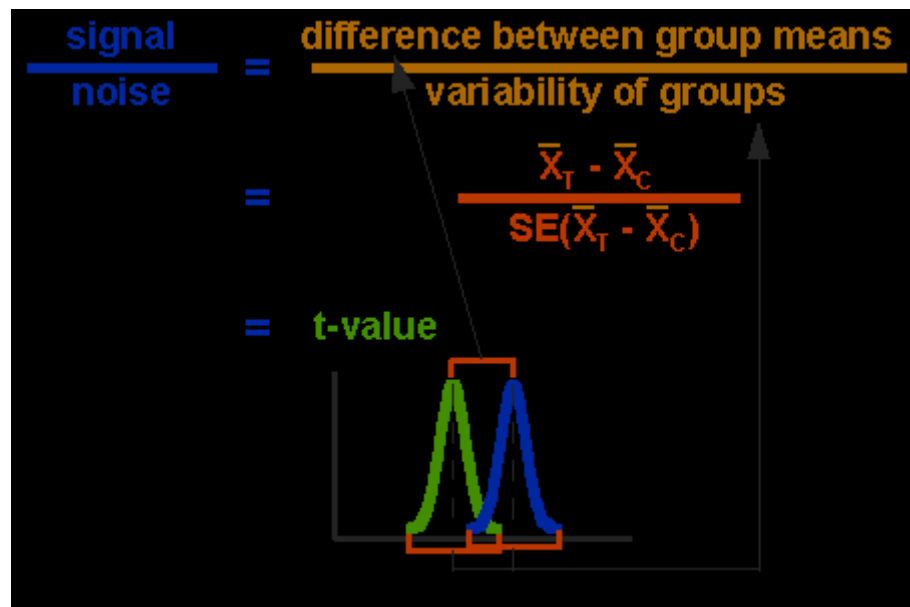


Figure 5: Formula for t-test ratio

Source: Adapted from www.socialresearchmethods.net (2011)

The top part of the ratio is just the difference between the two means or averages. The bottom part is a measure of the variability or dispersion of the scores around the means. It is in effect the standard error of the difference. This formula is essentially another example of the signal-to-noise metaphor in research (Trochim, 2000). In the signal-to-noise metaphor, differences are more apparent when the signal is high and the noise is low. Thus, the difference between the means is the signal that, in this case, we think our program or treatment introduced into the data; the bottom part of the formula is a measure of variability that is essentially noise that may make it harder to see the group difference. So the difference between the groups which is known as the effect size is computed by calculating the standard error of the difference between the means. As mentioned above, the top part of the formula is easy to compute -- just find the difference between the means. The bottom part which is the standard error (SE) of the difference is computed by taking the variance for each group and then dividing it by the number of people in that group. The two values are then summed up before taking their square root such that the formula for a standard error is as seen in equation 1 below.

$$SE(\bar{X}_T - \bar{X}_C) = \sqrt{\frac{\text{var}_T}{n_T} + \frac{\text{var}_C}{n_C}} \quad (1)$$

So rearranging the formula by dividing the difference between the means by the SE, the final formula for the t-test is shown as depicted in equation 2 below.

$$t = \frac{\bar{X}_T - \bar{X}_C}{\sqrt{\frac{\text{var}_T}{n_T} + \frac{\text{var}_C}{n_C}}} \quad (2)$$

4.2.1.2 Interpretation of T-Test Results

The computed t-value was then looked up in a table of significance to test whether the ratio was large enough to say that the difference between the groups is not likely to have been a chance finding. To test for significance, one first sets a risk level, called the alpha level. For purposes of this study, the risk level was set at 0.05. This means that only five times out of a hundred one would find a statistically significant difference between the means even if there was none (i.e., by "chance"). Having done that, one also needs to determine the degrees of freedom (df) for the test. In the t-test, the degrees of freedom are the sum of the persons in both groups minus 2 (Trochim, 2006). Given the alpha level, the df, and the t-value, one can then look the t-value up in a standard table of significance (available as an appendix in the back of most statistics text)¹⁰ to determine whether the t-value is large enough to be significant. If it is, one can conclude that the difference between the means for the two groups is different (even given the variability).

Please note that the t-test is not the only way of assessing the statistical significance of the difference between the means. One can also use one-way Analysis of Variance (ANOVA) and a form of regression analysis which uses dummy variables. All the three methodologies are mathematically equivalent and would yield identical results (Spiegel, 1975). This study however could not use the regression analysis because of the type of data the researcher had access to.

¹⁰This can also be provided through the use of statistical computer programs which routinely print the significance test results and therefore save one the trouble of looking them up in a table.

4.2.2 Primary Research

In this study, three methods were used to carry out the primary research. The methods included observation, focus group discussions and key informant interviews. Observations were made in the course of conducting focus group discussions; focus group discussions took the form of an in depth discussion using structured questions and involved two different beneficiary groups; key informant interviews involved one to one interviews with officials from the Malawi Government, University of Malawi's CSR and MVP.

4.2.2.1 Observation

Observation was carried out during focus group discussions and key informant interviews. As Mouton & Marais (1966) puts it, observations take place when the researcher is in the area and is involved in the events, simultaneously analyzing the past and the present history of the community. Observations provide insight into individuals, events or locales and are useful when one needs to learn more about an event without taking into account biased viewpoints expressed during an interview (Owl Resource, 2006). In this study, observation was done by the researcher himself noting carefully any infrastructural developments, maize stock piles as evidence of improved food insecurity¹¹, the Sasakawa technology¹² as well as agro-forestry technologies. Results from the observation study are contained in Appendix 1.

¹¹ Food security in this case is defined by the availability of surplus maize at household level. The surplus maize is paid back to the Project by contributing to the communal grain bank.

¹² As the research was done in late December which is the maize growing season, the author was able to observe the one seed one hole planting technology known as Sasakawa.

4.2.2.2 Focus Group Discussion

In this study, households were asked about their knowledge and understanding of food security in their area, the benefit of the MVP's subsidy program and, changes in their livelihoods since the coming of MVP including what the project has brought in their area in general. As stated earlier, the whole gist was to establish the impact of the project's universal subsidy program on food insecurity and also assess whether the project's interventions have had any impact on their livelihood and indeed the food insecurity status in the area. Using the moderator, questions were asked in a free group setting and participants were able to talk to each other. The researcher was able to study the participants and gather information in a natural way.

4.2.2.2.1 Procedure and sampling for Focus Group Discussion

The focus group discussion was conducted in two areas, namely, Dzaone and Mwandama. Dzaone group is a non intervention area whereas Mwandama is an intervention area. As the study looked at yield differences between intervention and non intervention area, the researcher used judgment sampling to pick on the two areas. The subsequent paragraphs present a detailed analysis of the two focus groups.

4.2.2.2.1a Dzaone Focus Group

Dzaone is a non intervention area located in TA Chikowi, in Zomba district. It is an outlier village which the Millennium Villages Project uses as a comparative site. Based on this, it was selected for a focus group discussion. Within the Dzaone grouping, the researcher then used judgment sampling to select the FGD participants.

McDaniel and Gates (1998) define judgment sampling as quota sampling which uses geographic or classification factors of interest. In this study, the researcher used geographic or classification factors of interest based on his judgment.

Dzaone focus group comprised of six members and this falls within the recommended number per focus group. As Gibbs (1997) points out the recommended number of people per group is usually six to ten, although one can use up to 15 people. Of the six members, four were female, representing 67%, and two were men, representing 33%. The average age in Dzaone FG was 40.5 years old.

An interview guide with four open ended questions was developed for the Dzaone focus group. The questions having been reviewed by my supervisor were translated into the local language, Chichewa, and pre-tested. The questions focused on the primary and secondary objectives of the research, and were used to guide the focus group discussion all throughout (Refer to Appendix 2 for the Dzaone questionnaire). The researcher conducted the 25 minutes group discussion which was facilitated by MVP Agriculture Coordinator.

4.2.2.2.1b Mwandama Focus Group

Mwandama focus group comprised of 13 members with an average age of 38.2 years. Of the 13 members, six were women averaging 41.3 years old and seven were men with an average age of 36.9 years. While efforts were made to have a good representation of women, this focus group only achieved a 30% women representation. In order to have a balanced representation, the group had at least one representative from each of the seven Millennium villages. And for purposes of objectivity and comprehensiveness of

results, the group members apart from representing the seven Millennium villages also represented the seven interventions¹³ the project provides in the area. These intervention areas are stratified into development committees, namely, village agriculture committee (VAC), village grain bank committee (VGC), village development committee (VDC), village irrigation committee (VIC), village water committee (VWC), village health committee (VHC) and, village education committee (VEC). Again judgment sampling was used to select the group member composition.

A questionnaire with 11 open ended questions was developed for the Mwandama focus group. The questions were reviewed by my supervisor, translated into the local language, Chichewa, and pre-tested. As with Dzaone FG, the questions focused on the primary and secondary objectives of the research, and were used to guide the focus group throughout the discussion (Refer to Appendix 3 for the Mwandama questionnaire). The researcher conducted the 120 minutes group discussion which was facilitated by MVP Community Facilitator.

After all the focus group discussion had been conducted, the written records from the two FGs were analyzed in a matrix that allowed the researcher to compare information. The information obtained from the discussion was also used for triangulation with the information collected during the key informant interviews.

4.2.2.3 Key informant interview

Owl Resource (2006) defines key informant interview also known as personal interview as a one-on-one or small group question-and-answer sessions where the

¹³ The intervention areas being referred to here are: agriculture, education, health, water and sanitation and, infrastructure (irrigation, market, energy).

interviewer asks individuals or a small group, questions to obtain needed answers. Key informant interviews garner a great deal of information from a small number of people and are particularly useful when one needs to obtain an expert or knowledgeable opinion on a subject matter (Madziakapita, 2008).

During this research, key informant interview targeted four groups of people from the ministries of Agriculture and Food Security, Health, and Local Government. It also included a management official from the Millennium Villages Project and one social scientist/academician from Center for Social Research. Again, using judgment sampling, the target group was selected based on key intervention areas of agriculture, health, education, and infrastructure. The MVP management official who is also a Team Leader and Science Coordinator was included in order to give a broader perspective of the project interventions and successes of the MVP subsidy in as far as food security in the project area is concerned.

From the Ministry of Agriculture and Food Security, the researcher included the District Agricultural Development Officer (DADO) for Zomba in order to glean an in depth information about the agriculture intervention and the general food security status in the study area. The health intervention had a representative from the Ministry of Health who was an Assistant District Health Officer (DHO) for Zomba. The education and infrastructure interventions were represented by the Director of Planning and Development (DPD) from the Ministry of Local Government in Zomba. The inclusion of a social scientist/academician was to have an independent opinion so as to make the data more objective and credible.

The researcher used a questionnaire of ten questions, recorded in English, specifically designed for the key informants to conduct the interviews personally. The questions which were reviewed by my research supervisor are included in Appendix 4. The duration of the interview depended on the respondents ability to provide the needed information but ranged from anywhere between 20 to 25 minutes.

The information as collected using the above discussed methods was triangulated for analysis of the results. Mouton & Marais (1966) define triangulation as the use of multiple methods of collecting data to ensure increased reliability of the results of the research.

4.2.3 Conclusion

The primary research went on very well without any pronounced problems. The research involved focus group discussion of both intervention and non intervention areas, facilitated by the MVP community facilitator and agriculture coordinator. It also involved a discussion with key informants sampled from key intervention areas of the project. Pieces of information collected using all these research methods were triangulated to come up with the final findings.

CHAPTER FIVE

EMPIRICAL RESULTS AND DISCUSSION OF RESULTS

5.0 Introduction

This chapter presents and interprets the results of the statistical as well as primary research analyses. We first give the statistical analysis followed by the primary research findings.

5.1 Statistical Analysis

Table 1: Mean Yield in MT/Ha in Treatment and Control Groups

Season	MV1(T)	Dzaone (C)
2006/07	3.39	1.5
2007/08	3.96	1.64
2008/09	4.94	1.57
2009/10	3.41	1.46

Source: MVP, Earth Institute's Columbia University

The data tabulated in 1 above was sourced from Millennium Villages Project. It represents yield in metric tons in both treatment group (MV1) and control group (Dzaone). Using STATA version 10.1, the data was analyzed to determine the mean, the

standard deviation, and the minimum and maximum values of both the treatment and control groups. The results of the analysis are tabulated in 2 below.

Table 2: Mean Scores for Treatment and Control Groups

Variable	MV1 (T)	Dzaone (C)
Observations	4	4
Mean	3.925	1.5425
Standard Deviation	0.7263837	0.07932
Variance ¹⁴	0.52763328	0.006291662
Minimum	3.39	1.46
Maximum	4.94	1.64
Number of persons (n)	30	90
Degrees of freedom ¹⁵	118	118
Difference between the means = 2.3825		
Standard Error (SE) = 0.132882216		
Computed t-value = $2.3825/0.132882216 = 17.929412$		
Observed t-value ¹⁶ at 100 df = 1.660; at 200 df = 1.653		

Source: Author's own calculations

¹⁴ Note that the variance is simply the square of the standard deviation

¹⁵ In the t-test, according to Trochim (2000), the df is the sum of the persons in both groups minus 2, that is $(n_T + n_C) - 2$

¹⁶ This figure was looked up in a standard table of significance which was available as an appendix in the back of Introductory Statistics, Sixth edition text by Weiss, N.A. This standard table of significance card was provided by Larry R. Griffey.

As stated in the objective, the purpose of the study was to determine whether the interventions had any treatment effect on the food security status in Mwandama. We used a statistical treatment model known as difference between the means to check the score differences between the treatment group (MV1) and control group (Dzaone). And since the results of the difference between the means would give us three different variability scenarios, ranging from low to moderate to high, we conducted a t-test to determine whether the two groups are statistically different from each other using equation 2 below.

$$t = \frac{\bar{X}_T - \bar{X}_C}{\sqrt{\frac{\text{var}_T}{n_T} + \frac{\text{var}_C}{n_C}}} \quad (2)$$

Where: $\bar{X}_T$ is the mean of the treatment group, $\bar{X}_C$ is the mean of the control group, var_T is the variance of the treatment group, var_C is the variance of the control group, n_T is the sample size of the treatment group, and n_C is the sample size of the control group. It follows a t-distribution with degrees of freedom equal to $(n_T + n_C) - 2$. The null hypotheses being tested here can be stated as follows:

H_0 : The difference in the mean scores between the treatment group and control group is statistically large enough to be significant.

H_1 : The difference in the mean scores between the treatment group and control group is not statistically large enough to be significant.

The level of significance was set at 5%¹⁷. The statistical results tabulated in 2 above indicate that the treatment group has a mean score of 3.925 while the control group has a mean score of 1.5425. This gives the difference between the means of 2.3825. With an SE of 0.132882216, the computed t-value using the t-test formula above is 17.929412. Thus, at 0.05 alpha level, with a 118 degrees of freedom (df), the computed t-value of 17.929412 is much higher than the observed t-value at both 100 df (t-value was found to be 1.660) and 200 df (t-value was found to be 1.653)¹⁸. This means that the computed t-value is statistically significant or indeed the effect size is large. We therefore accept the null hypothesis and conclude that the difference between the means for the two groups is different, even given the variability. Put it differently, this means that the interventions that the Millennium Villages Project had provided to the community have had a significant effect on the food security status in the area.

Similarly, secondary data as collected by Earth Institute's Millennium Villages Project indicate that there has been an increase in food security status in the project site since the coming of the Project in 2005/06 growing season. Statistics indicate that there is no doubt that the food insecurity status in the Mwandama's Millennium Villages has been reduced. As Figure 6 shows, the average yield has increased from as low as 1.44mt/ha in 2004/05 (baseline, i.e. the year before the interventions) to as high as 5.18mt/ha in 2005/06 (the year immediately after the interventions). Although the average yield declined in years 2007/08 and 2009/10 due to poor rainfall, the yields achieved over the 4 years life of the project were way above the yield achieved before the project came into the study area. This continued increase in yield, signify sustenance in food security since the project's inception. Also, there

¹⁷ In most social research, the "rule of thumb" is to set a 0.05 alpha level (www.socialresearchmethods.net).

¹⁸ The computed t-value was checked against 100 df as well as 200 df since we could not establish the t-value for 118 df. In either way, the results yielded were the same; the computed t-value was much larger than the observed -value

is a wide variation between average yields in intervention and non intervention areas (See Figure 6 and Figure 7).

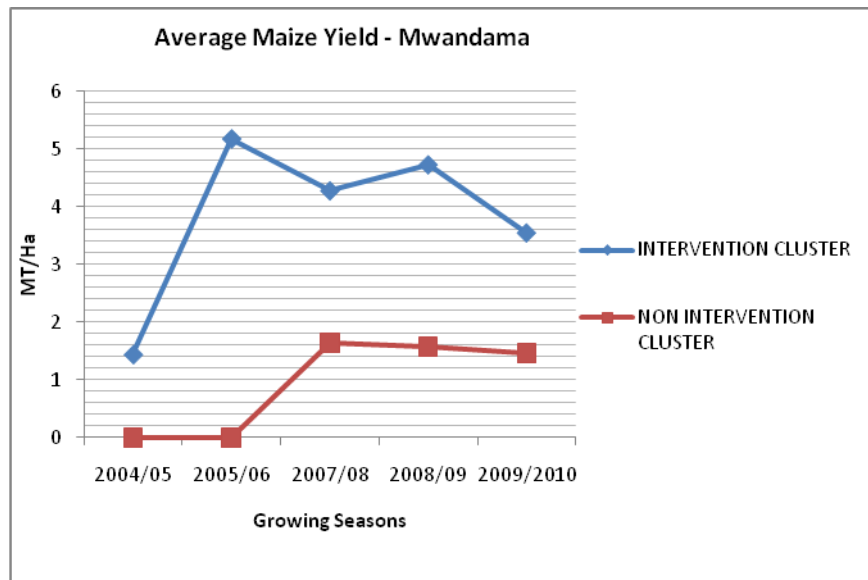


Figure 6: Comparison of Maize yield BEFORE intervention (2004/05) and AFTER the intervention (2005/06)

Source: Author's own calculation

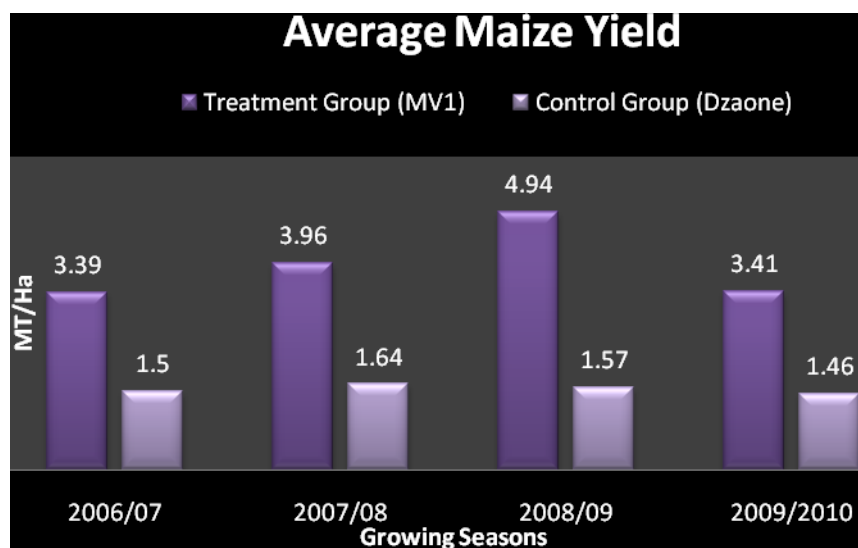


Figure 7: Comparison of maize yield between Treatment and Control groups

Source: Author's own calculations

Similar yield trends are observed in all MVP sites in the country (See Appendices 5a, 5b and 5c). These findings and conclusions have been also supported by the primary research results discussed below.

5.2 Observation Results

A summary of the results of the researcher's observation are tabulated in appendix 1. In brief, the researcher observed one clear food security sign, the Grainbank which was full of maize. Thus it can be concluded that the Mwandama community is food secure. This phenomenal yield can be attributed to the universal subsidy program the project has been implementing. The researcher also noticed that part of the bags of maize were marked, 'sold to WFP', a clear indicator that the community has achieved the food security status and can even afford to sell some maize to big outside private markets like World Food Program (WFP). This is also an indication of market infrastructure intervention. The researcher also observed agro-forestry seedlings, cross cropping through legumes and a lot of crop diversification in the project area. Seedlings for mangos, paw-paws, guavas and Mexican apples (masuku) were seen being distributed to households. These have had effect of improving soil fertility, nutrition and income of households. Boreholes, school blocks and health infrastructure were also clearly seen in the project area. These findings were clearly absent in Dzaone non intervention area. The researcher is quick to point out here that some traces of diffusion effects or what is also known as neighborhood effects were seen in some parts of the neighboring community particularly in the area of the Sasakawa agricultural technology.

5.3 Focus Group Discussion

The focus group discussion dwelt on two groups. We begin looking at Dzaone and then move to Mwandama focus group.

5.3.1 Dzaone Focus Group

The Dzaone focus group discussion singled lack of access to fertilizer and seed as a major challenge to the food security status in the community. The discussion revealed that households harvest very low yields to the extent that they start buying maize from elsewhere as early as October every year. In response to the question as to whether the households are food secure, one member of the FG said, '*panopa, December, tayamba kale kugonera mango*' which literary translates to, 'right now we have already started living on mangoes as main food'. This poor yield, the group attributed to lack of access to free fertilizer and seed as well as the selective process of the government subsidy program. According to the group, a 50kg bag of fertilizer is shared between two households pointing to the fact that the government targeted system cannot be effective in reducing the food security status in country.

It was also revealed from the discussion that the government subsidy distribution system has lots of flaws and creates room for corruption. Households are forced to buy the subsidized fertilizer at an inflated price of MK2, 500 or as high as MK4, 000 (when they buy from chiefs). The approved government price is MK500 per 50kg bag of fertilizer. This group was also quick to mention that development initiatives that help curb food insecurity in their community. These initiatives are summarized in Table 6 below. As we notice from the table, these are among the key intervention areas that the

MVP is providing to the MVs through their integrated rural development initiative as a vehicle to food security and overall economic growth.

In summary, the focus group discussions revealed key developmental interventions that would reduce food insecurity. These interventions included free fertilizer and seed, water infrastructure (boreholes), energy infrastructure (electricity), clinics (health intervention), schools, including adult literacy (education intervention), and bridges (road infrastructure)

5.3.2 Mwandama Focus Group

The Mwandama focus group clearly stated that the universal 100% agriculture subsidy program that the MVP has been practicing has tremendously improved yield in the households. This has been the major cause for the increased food security in the community as evidenced by surplus maize in the Grainbank in the community. The Mwandama FG also stated that crop diversification and new agricultural technologies have also played a major role in improving the food security status. The group was also quick to point out that apart from the agriculture subsidy, the crop diversification and the new agricultural technologies, the project introduced a number of interventions that have significantly contributed to reducing the food insecurity in households. Such interventions include: health and nutrition, education, water and sanitation, and infrastructure (See Appendix 3 for a full list of interventions).

5.4 Key informants

For purposes of this study, key informants were classified as Key Informant 1(KI1), Key Informant 2 (KI2), Key Informant 3 (KI3), Key Informant 4 (KI4) and Key Informant 5 (KI5). Table 3 below gives a summary of responses from these key informants.

Table 3: Summary of Key Food Security Responses from Key Informants

Key Question	KI1	KI2	KI3	KI4	KI5
Has food security status improved since the coming of MVP in Mwandama?	Yes, as evidenced by the surplus maize the their grain bank	Yes, the surplus maize in the grain bank speaks for itself	Yes	Yes, 100%	Yes, yield has been phenomenal
Has the MVP universal subsidy program been successful	Yes, I would put it at 100%	yes	yes	Yes, very successful	Yes, 100%.
What interventions would you attribute to the success of the food security status in Mwandama	Agriculture technologies (sasakawa, cross cropping), extension services that promote conservation agriculture, school feeding program, education, water and sanitation, market infrastructure, group dynamics, roads.	Agriculture technologies (sasakawa, cross cropping), extension services that promote conservation agriculture, school feeding program, education, water and sanitation, market infrastructure, group dynamics, roads.	Agriculture technologies (sasakawa, cross cropping), extension services that promote conservation agriculture, school feeding program, education, water and sanitation, market infrastructure, group dynamics, roads.	Agriculture technologies (sasakawa, cross cropping), extension services that promote conservation agriculture, school feeding program, education, water and sanitation, market infrastructure, group dynamics, roads.	Agriculture technologies (sasakawa, cross cropping), extension services that promote conservation agriculture, school feeding program, education, water and sanitation, market infrastructure, group dynamics, roads.

From Table 3 above, it can be concluded that the universal subsidy program that the MVP has been implementing has yielded successful results in as far as food security in Mwandama area is concerned. Thus one can conclude that it is possible to increase production of maize by intensification through inputs. These findings are in tandem with earlier findings from secondary data which graphically showed yield increases over a 5 year period as depicted in Figure 6.

Further, it can also be concluded that the success of the input subsidy program in Mwandama can largely be attributed to the integrated service provision policy of the MVP which is provided as a package in the form of health, education, agriculture, infrastructure, water and sanitation. This finding too supports earlier findings that interventions in the MVP have had a statistically large treatment effect on the food security status in the area. Studies elsewhere have supported this view. Dorward et al., 2010) in their assessment of the 2005/6 to 2008/9 Malawi Agriculture Input Subsidy Program included as one of their key conclusions, complementary policies and investments, that if a subsidy programme is seen as part of a wide and long term strategy for poverty reduction and economic development then investments in complementary activities must be made in, for example, extension, research, organic soil fertility improvement, health, education, and market, transport and communications.

As noted in Appendix 4, the inclusion of legumes through cross cropping (also known as crop diversification) improves soil fertility and nutrition while at the same time improves the income of the households through sales. This in turn has a positive impact on the food security as maize escapes such sales for income as is therefore reserved for consumption only. The improvement in education as noted in Appendix 5e improves

food utilization (proper use of food). Similarly, water and sanitation through the use of portable water reduces water borne diseases and by implication, a healthy household is a food secure household.

Other studies which have supported this integrated approach to food security include studies by WFP (2006) in Lao PDR which have shown that household food security is linked with education, hygiene and nutrition, the physical infrastructure, and the agricultural and environmental sector. Stand-alone interventions within these sectors will therefore have a limited effect unless the overall policy environment is favorable to food security. Studies by Lewin and Fisher (2010) have also strengthened the idea of integrated service provision approach to ending food insecurity. A good understanding of the determinants of food insecurity is required to inform and guide the design and execution of effective and well-targeted policy interventions. Thus according to Lewin and Fisher (2010), key policies that can reduce food insecurity include: expanding the use of modern inputs to increase agricultural land productivity; increasing investment in road infrastructure to improve market access; expanding irrigation, agricultural extension activities, and social safety net programs; and investing in skills training and education for farmers. Policies aimed at reducing costs of food and farm inputs were also shown to reduce the probability of food insecurity (Lewin and Fisher 2010). What is important is to ensure that these policies target the poorest farmers, are cost effective and fiscally sustainable, and avoid negative impacts on private sector participation.

CHAPTER SIX

CONCLUSION

6.1 Summary

In this study, we set out to find whether the universal agricultural input subsidy program being implemented by the MVP has had an impact on the food security status in Mwandama. We also set out to find whether the food security status in the MVP can be attributed to the integrated service provision, that is to say, whether education, health and nutrition, water and sanitation, and infrastructure interventions have had an impact on the improved food security status in Mwandama.

To address the first objective, a primary research was done through focus group discussions, key informant interviews and observation. We also analyzed yield data from the MVP by comparing baseline yield with yield after 5 years of the project's implementation of the universal subsidy program. As discussed in Chapter 5 above, it has been found that it is possible to increase production of maize by intensification through agricultural inputs. The MVP has registered a phenomenal increase in yield as seen when baseline yield is compared to subsequent yield after the universal subsidy. Similarly, the Dzaone FG pointed out that one of the key challenges to the food security in the area was the lack of universal agriculture subsidy, which according to the group has been instrumental to the massive yield observed in their neighboring Mwandama villages.

The second objective was addressed by employing a difference between the mean, a statistical treatment model which establishes the differences in mean between the

treatment group and control group. Using data from the MVP, the mean differences were established and because of the different levels of variability, we subjected the data to a t-test to assess whether the treatment size is statistically significant to conclude that the interventions in the MVP have had an impact on the food security status in Mwandama. Our empirical results have revealed that the computed t-value of 17.929412 was much higher than the observed t-value at 0.05 alpha level. This means that the computed t-value was found to be statistically significant or indeed the effect size was large enough. We therefore accepted the null hypothesis and concluded that the difference between the means for the two groups was different, even given the variability. This means that the interventions that the Millennium Villages Project had injected into the community have had a significant effect on the food security status. Impliedly this means that we can afford a food security status through an integrated service provision of interventions as a single package.

6.2 Policy Implications

Based on the foregoing results, it is clear that with good rainfall and good input distribution system, the universal input subsidy program can yield significant results in improving food security situation in the country. However, a cost benefit analysis should first be made before implementing such a program. This can be likened to the correction of market failure, a situation that calls for government intervention in addressing the market hiccups.

Also, a good understanding of the determinants of food insecurity is required to inform and guide the design and execution of effective and well-targeted policy

interventions. Given that household food security is linked with education, hygiene and nutrition, the physical infrastructure, and the agricultural and environmental sector, stand-alone interventions within these sectors will therefore have a limited effect unless the overall policy environment is favorable to food security. The government needs to approach food security in an integrated service delivery as a single package. Thus the government, therefore, should expand the use of modern inputs to increase agricultural land productivity; increase investment in road infrastructure to improve market access; expand irrigation, agricultural extension activities, and social safety net programs; and invest in skills training and education for farmers. Policies that are aimed at reducing costs of food and farm inputs are therefore necessary to reduce the probability of food insecurity in the country. This study therefore contributes to the literature on input subsidies and integrated approach to achieving food security by pointing out that if households are given subsidized agricultural inputs alongside with interventions that contribute to food security as a package, they become food secure.

It is important to ensure that these policies target the poorest farmers, are cost effective and fiscally sustainable, and avoid negative impacts on private sector participation.

6.3 Study Limitations and Areas for Further Study

This study was not without limitations, which makes the result contained herein to be interpreted with caution. The first limitation is that the study area is highly political, given that Mwandama MVP also acts a pilot project for the UN MDGs. The MVP data used could have been subjected to political influence. Secondly, it was challenging to get

information from some key informants. This was largely due to lack of collaboration by the project implementers with partners at district level. Thirdly, there is a likelihood of diffusion effects and double effects as evidenced by some of the agricultural technologies present also in Dzaone non intervention area.

The researcher was only able to use the independent t-test for checking statistical significance levels. The study failed to apply regression analysis on dummies, an alternative method for calculation of the t-test. This limitation was due to the nature of the data made available to the researcher. The researcher used mean yield per cluster while the regression analysis required that data be disintegrated by household.

Future research in the area should endeavor to investigate the treatment size from treatment and control groups that do not have double or diffusion effects which this study failed to achieve. Similarly, while the results can be taken to a national level, further research needs to be done in other parts of the country to see if similar findings will be yielded.

ETHICAL CONSIDERATION

Since the data sources were both primary and secondary, and that the research village is under the Earth Institute, Columbia University, prior clearance was obtained from the Earth Institute.

REFERENCES

- Agatha, C.O., Walingo, M.A. and Othuon, L., (2010). Expenditure Patterns on Food and Non-Food Items in HIV/AIDS Affected and Non-Affected Households in Kisumu District, Kenya. *African Journal of Food, Agriculture, Nutrition and Development*, 10, (4), pp. 2344-2357. Kenya.
- Bloom, G. and Lucas, H., (2000). Health and Poverty in Sub Saharan Africa (IDS Working Paper 103). Brighton: Institute of Development Studies.
- Bravo-Ureta, B.E., Pinheiro, A.E., (1997). Technical, economic and allocative efficiency in peasant farming: evidence from the Dominican Republic. *Development Economics*, 35, 48–67.
- Cammack, D., Chulu, O., Khaila, S., and Ng'ong'ola, D., (2003). Malawi Food Security Issues. Draft paper for Forum for Food Security in Southern Africa. Accessed on January 9, 2011 from www.odi.org.uk/food-security-forum
- Chinsinga, B., (26-30 June 2006). The Clash of Voices: Community-based Targeting of Safety-net Interventions in Malawi. Paper presented at the Third International Conference on Conditional Cash Transfers Istanbul, Turkey.
- Chinsinga, B., (2007). Reclaiming Policy Space: Lessons from Malawi's 2005/2006 Fertilizer Subsidy Programme: Working Paper for Futures Group.

- Chirwa, E.W., Kydd, J and Doward, A., (2006). Future Scenarios for Agriculture in Malawi: Challenges and Dilemmas. Paper Presented at the *Future Agricultures Consortium* held at the Institute of Development Studies, Sussex.
- Clay, E., (11-12 July 2002). Expert Consultation on Trade and Food Security: Conceptualizing the Linkages. Paper presented at the FAO forum on Trade and Food Security, Rome. London: Overseas Development Institute.
- COMESA, (2009). Fertilizer Subsidies in Eastern and Southern Africa. (Synthesis Policy #2). Lusaka: The African Agricultural Market Programme, COMESA.
- Denning, G. et al., (2009). Input Subsidies to Improve Smallholder Maize Productivity in Malawi: Toward an African Green Revolution. *PLoS Biology*, 7, pp 1 – 3.
- DfID (2007): Development on the Record. Annual Report. Accessed on December 19, 2010 from www.dfid.gov.uk .
- Dorward, A. R. and Chirwa, E., (2009). The Agricultural Input Subsidy Programme 2005 to 2008: Achievements and Challenges. London: School of Oriental and African Studies.

- Dorward, A. R., Chirwa, E., and Jayne T.S., (2010). The Malawi Agricultural Inputs Subsidy Programme 2005/6 to 2008/9. London: School of Oriental and African Studies.
- Economist Intelligence Unit, (2008). Lifting African and Asian farmers out of poverty: Assessing the investment needs: A custom research project for the Bill and Melinda Gates Foundation. New York: Economist Intelligence Unit
- Edkins, J., (1996). Whose hunger? Concept of famine, Practices of aid. Minneapolis: University of Minnesota Press.
- Fan, S., Gulati, A and Thorat, S., (2007). Investment, Subsidies, and Pro-Poor Growth in Rural India (IFPRI Discussion Paper 716). Washington, DC: IFPRI.
- FAO, (2003). The State of Food Insecurity in the World. Rome: FAO.
- FAO, (2009). The State of Food Insecurity in the World: Economic crises-Impacts and Lessons learned, Rome: FAO.
- FEWS Net, (2010). Malawi food security outlook update. Accessed on February 6, 2011 from <http://www.fews.net>.
- Gibbs, A., (1997). Focus Group Sociology at Survey. Guildford: University of Surrey.

Kuhnen, F., (1987). Causes of Underdevelopment and Concepts for Development: An Introduction to Development Theories. Pakistan: University of Peshawar.

Madziakapita, A., (2008). An evaluation of the impact of food aid on food security: The case of Ngabu area in Malawi. Unpublished master's thesis, University of South Africa, Pretoria, South Africa.

Makombe, T., Lewin, P and Fisher, M., (2010). Determinants of Food Insecurity in Rural Malawi: Implications for Agricultural Policy. (*Malawi Strategy Support Program MaSSP Policy Note 4*). Washington, DC: IFPRI.

Malawi Government (1987), *Statement of Development Policies 1987-1996*. Lilongwe: Office of the President and Cabinet: Department of Economic Planning and Development

McDaniel, C.D. and Gates, R., (1998). Marketing Research Essentials (2nd ed.). Cincinnati, Ohio: South-West College Publishing.

Mouton, J and Marais, H.C., (1966). Basic Concepts in the methodology of the social sciences. Pretoria: HSRC

NSO, (2008). Population and Household Census. Zomba: NSO

OECD and WHO (2003). DAC Guidelines and Reference Series: Poverty and Health.

Paris: OECD

Rubey, L., (2004). How Well-Intentioned Government Actions Exacerbate Food Insecurity. USAID/Malawi Agriculture Office. (Unpublished Paper).

Sanchez, P., Swaminathan, M.S., Dobie, P and Yuksel, N., (2005). (UN Millennium Project 2005). Halving hunger: it can be done. London: Task force on hunger.

Sen, A., (2000). Development as Freedom. New York: Anchor Books.

Sen, A., (1983). Poverty and Famine: An Essay on Entitlement and Deprivation. New York: Oxford University Press.

Spiegel, M.R., (1975). The Theory and Problems of Probability and Statistics (Schaum's Outline Series). New York: McGraw-Hill.

Stevens, C., Greenhill, R., Kenman, J., and Devereux, S., (2000). The WTO Agreement on Agriculture and Food Security. Sussex: Institute of Development Studies.

Tchale, H., (2009). The efficiency of smallholder agriculture in Malawi (AFJARE Vol. 3 No 2). Durban: AAAE.

The Owl Resource, (2006). The Owl at Purdue University Conducting Primary Research.

Accessed on February 12, 2011 from <http://owl.english.purdue.edu>.

Trochim, W.M.K., (2006). The Research Methods Knowledge Base (2nd ed.). Cincinnati Ohio: Atomic Dog Publishing.

USAID Bureau for Africa (1986). Food Aid and Food Security USAID Policy Paper.

Accessed on December 19, 2010 from www.usaid.gov.

USAID (2002). Complex Food Security Crisis in Southern Africa (Situation Report #4).

Accessed on January 12, 2011 from www.usaid.gov/hum_response.

Weiss, N.A., (2002). Introductory Statistics (6th ed.). USA: Addison Wesley.

WHO, (1978). World Health Organization's Knowledge Network on Health Systems:

Health, poverty and vulnerability, Challenging inequity through health systems: A final report of the Knowledge Network on Health Systems. Geneva: WHO.

World Bank, (1993). Investing in Health. World Development Report. Washington:

World Bank.

World Food Program, (2007). Lao PDR, Comprehensive Food Security and Vulnerability

Analysis (CFSVA). Rome: WFP.

World Food Summit, (1996). Rome Declaration of World Food Security: Monitoring Progress of World Food Summit. Rome: WFP.

APPENDICES

Appendix 1: Summary of Observation Results

- Grainbank full of bags of maize. Some bags were marked, ‘sold to WFP’
- Completed School block at Mwandama research village (MV1) as one evidence of education intervention. There was also a school feeding block.
- Completed clinic block as evidence of Health intervention
- Boreholes and clean toilets which points to water and sanitation intervention
- Maize healthily planted using the sasakawa technology. This was the case in both Mwandama and Dzaone areas
- Plenty of agro forestry seedlings like the vertiver grass being distributed to households in the community
- There is a lot of crop diversification as evidenced by the distribution of mango, guava, pawpaw and mexican apple (masuku) seedlings. Cassava cuttings and sweet potato vines were also seen to be distributed to the households
- Rural ITC as evidenced by Zain (now Airtel) mobile network in the community.
In fact this helped even in the mobilization of focus group for the MV1

Appendix 2: Dzaone Focus Group Questionnaire with Answers

How is the food security status in our village? <i>Nkhani ya chakudya mu makhoma mwathu yili bwanji?</i> <i>Poor. Very low yields. We start buying maize as early as Oct; right now we have already started living on mangoes as main food.</i>
- What development challenges do we face in our villages? Plenty: <i>Ndi ziphinjo zotani zimene timakumana nazo pa nkhani ya chitukuko mumadera mwathu mumo?</i> Plenty: <i>Access to fertilizer and seed subsidy is the major challenge. Input subsidy is selective. People have coupons but no fertilizer. A 50kg bag is shared between 2 household. We also buy fertilizer at inflated prices from K500 to K2,500We either share a 50kg bag</i> <i>We also do not have water (lack of boreholes). We currently draw water from a dambo which is 1.5kms away</i> <i>Lack of clinics. The nearest clinic is at Thondwe and Jiya which are both more than 10kms away.</i> <i>Lack of energy infrastructure, electricity in particular</i> <i>Lack of schools, including adult literacy centers</i> <i>Lack of bridge infrastructure</i>
What development initiatives would you want to be done in our villages to improve our food security status? <i>Nanga ndi chitukuko chotani chomwe tingafuna mu dera mwathu muno?</i>

- *Increase access to input subsidy.*
- *Distribution of the input subsidy program. Use of ADMARC has proved a failure. Some households suggested to going back to the old system of using GHV. Others were for Direct Distribution Procedure or using agricultural frontline staff*
- *Stop the coupon system in favor of reducing the price (government standardized price) and people should buy direct from various markets. There is a lot of corruption with the coupon system (chiefs buy in bulks and sell later at inflated prices like K4,000*

- What other development initiatives do you think would contribute to change in our livelihood status? ***Nanga ndi chitukuko chanji china chomwe chingathe kusintha miyoyo yathu mudera mwathu muno?***

- *Access to fertilizer and seed subsidy is the major challenge. Input subsidy is selective. People have coupons but no fertilizer. A 50kg bag is shared between 2 household. We also buy fertilizer at inflated prices from K500 to K2,500We either share a 50kg bag*
- *We also do not have water (lack of boreholes). We currently draw water from a dambo which is 1.5kms away*
- *Lack of clinics. The nearest clinic is at Thondwe and Jiya which are both more than 10kms away.*
- *Lack of energy infrastructure, electricity in particular*
- *Lack of schools, including adult literacy centers*
- *Lack of bridge infrastructure*

Appendix 3: Mwandama Focus Group Discussion Data Sheet

FOCUS QUESTIONS	GROUP	FOCUS GROUP ANSWERS
1. What changes have you experienced since the coming of MVP? <i>Ndi zinthu ziti zimene mukuona kuti zasintha pa banja panu kamba ka kubwera kwa projects ya Millennium?</i>		Free fertilizer, Borehole infrastructure, community clinics which have reduced travel time to Thondwe health Centre, roads infrastructure, Increased income as seen by many people having corrugated iron sheet houses (previously houses were grass thatched and could leak during rainy season), increased livestock through the goat and pig pass on project which has also increased household incomes, Bridge infrastructure which has eased transport network, irrigation farming (household have green maize throughout the year), Community nursing Insecticide treated nets (ITNs), school feeding program which has increased primary school intake, new farming technologies (the sasakawa) which have complemented fertilizer's efforts to achieving high yield.
2. Why have you experienced that change? <i>Mukuganiza kuti kusintha kumeneku kwabwera bwanji pa banja lanu?</i>		Because of MVP and Extension workers (Facilitators), inspiration from other household, commitment to development work, following what extension workers tell us, free fertilizer and new agriculture technologies (sasakawa), increased household income made it possible to iron sheets

3. What factors have contributed to the change of our lives since the coming of MVP? <i>Ndizinthu ziti zomwe project ya Millennium yakuchitirani kuti moyo wa pa banja lanu usinthe?</i>	Free fertilizer increased maize yields (making it possible to sell surplus generating income for other household developments), improved household health due to community nursing services, increased access to medical services and lessons (able to detect illnesses at an early stage and take preventive measures), education infrastructure has enabled an early enrolment of school children(the long distances were a challenge for children to start school at a younger age), school intake has also improved because of the infrastructure, the MVP school grant to deserving needy students has also helped improve education standards in the community (John Yuda is one of the beneficiaries of the grant and has this year, 2010, been selected for University of Malawi's Bunda College), Irrigation farming complements rain fed farming (ensures sustainable food security at household level), crop diversification (tomatoes, sweet potatoes, cabbage) which could be either eaten or sold) has ensured household income and food availability resulting in improved livelihoods, access to food has increased due to the availability of grain bank (previously community relied on ADMARC which was not only very far away but could not even have corn at times), improved business skills
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	(There are a number of women clubs engaged in GSB Unilever direct door to door women project. Women in these clubs order Unilever products at reduced prices and sell them in their respective villages), improved water and sanitation at household level through borehole infrastructure has improved the health standards of the people through supply of safe clean drinking water in the community
4. Has there been any changes in yield since the MV Project came to birth? <i>Pa nkhani ya malimidwe mwaona kusingha kotani pa zokolora zanu chibwererani project ya MV?</i>	Yes. Yields have improved from say 13 bags per household to over 30 or 35 bags per household. This has been due to improved agriculture technology called sasakawa and use of hybrid maize seed variety as advocated by the MVP
5. What are the socio and cultural contexts that define economic development? <i>Akati munthu wayamba kupeza bwino ku mudzi kuno, timaonera chani?</i>	Good diet, high yield, availability of livestock such as goats. Pigs and chickens , good dressing, good houses (iron sheet roofed), self reliant as evidenced by kuchepa kupemphapempha (reduced number of people relying on begging from relatives and neighbors) and more importantly reduced number of people employed in tobacco estates for piecework for their survival known as <i>ganyu</i>
6. What factors inhibit the	Weevils (due to lack of post harvest ideologies), some

attainment of food security in the MVP? <i>Ndi zinthu ziti zimene mukuona kuti zikulempheretsa kuthetsa njala pa banja lanu?</i>	household still sell inputs(seeds and fertilizer) instead of using them on the field, some household sell produce without proper planning, some household are resistant to change (follow new technologies – cling to local varieties and old planting system), gender (misunderstanding in the family between husband and wife – domestic violence - the husband would sell the produce to generate income for beer)
7. What factors can be attributed to the attainment of food security in the MVP? <i>Ndi zinthu ziti zimene mukuona kuti zikuthandizila kuthesa njala pa banja lanu?</i>	Adhering to new agriculture technologies like crop diversification, sasakawa and irrigation farming. Crop diversification results into savings on maize hence ensures food security at household level
8. What sustainable policies, procedures, lessons etc can be learnt from the MVP? <i>Chibwerereni project ya Millennium, ndimamphunziro ati amene tapezapo?</i>	Health refresher courses (how diseases come and can be dealt with), Gender training (how men and women can work together in development work), HIV/AIDS Testing knowledge, post harvest methodologies, Kumasukirana mbanja (openness between husband and wife in the family in sexual reproductive health), new farming technologies, care and maintenance of boreholes. New irrigation technologies (water conservation)
9. What problems have we	Reduced input subsidy, reduced refresher courses, lack of

faced since the coming of the Project? <i>Kodi nanga ndi mabvuto anji amene mwakumana nawo chifukwa cha kubwera kwa project iyi?</i>	produce markets, lack of electricity at grain bank, lack of transport to ferry produce to markets, reluctance of communities to contribute funds for the maintenance of boreholes, lack of community ownership of development activities (affects sustainability of activities)
10. If we had a chance to implement the project again, what would we do differently, why and how? <i>Titakhala ndi mpata woti tiyambirensa project ya Millennium, ndi zinthu ziti zomwe mungafune kuti zizasinthe? Chifukwa chani ndipo tingazisinthe bwanji?</i>	Input subsidy should continue, introduce farm input credit facility (farmers should be able to get inputs on loan). This is because farmers community has not matured economically yet to afford buying inputs on their own. The first 5 years were spent on improving household infrastructure; the second phase should now focus on savings for the procurements of inputs. This should be the weaning strategy. Rural electrification, tarred roads, business development enterprise activities, Cash transfers (access to financial lending institutions). Access to cash transfer may boost business and make household self reliant – can in the end afford to buy farm inputs on their own
11. Has politics or culture had any effects on the Millennium Project	No. culture or politics have had no effects on the project. We work together as a community with chiefs, politicians

Appendix 4: Key Informant Interview Data Sheet

Appendix 4a: Key Informant Interview Answers – KI1
- How successful has been the universal subsidy implementation in the MVP? <i>This can be defined in terms of yield. We have seen a remarkable increase in yield which has tremendously decreased food insecurity in the project site</i> <i>The yield increase has also been as a result of 1) an increase in the uptake of fertilizer and seed, and 2) an increase in technology adoption (communities have moved away from their conventional to the new Sasakawa technology). On the same technology front, we have also seen an increase in the use Compost manure (organic fertilizer) which is blended with the inorganic fertilizer</i>
- What has been the pattern of yield in both MVs and out layer villages over the past 6 years? <i>There has been massive differences in yield between MV areas and those areas outside the MVs. MV areas have registered higher yield than those villages outside the MVs.</i>
What has been the pattern of yield distributed by age, sex, and family inequalities?
- To what extent can we attribute the attainment of food security to the input subsidy program in the MVP? <i>All households are food secure (100%). This is because every household benefits from the input subsidy – universal application.</i>

- What factors inhibit or promote attainment of food security in the MVP?

INHIBITING FACTORS:

- *Some households are still laggards in terms of technology adoption. They still cling to the old conventional ways*
- *Some households sell the inputs*
- *Chronically ill patients (HIV/AIDS) fail to manage the crop*
- *Weather challenges like dry spells, low rainfall are also a major inhibiting factors*

PROMOTING FACTORS

- *High input uptake*
- *High technology adoption*

- How have the socio and cultural contexts played a role in the implementation of the subsidy program in Mwandama area?

- *Leaders in community tend to benefit more than then poor of the poorest*
- *Village politics has also played a role in terms of who benefits (chiefs would have their own approach to issues of development e.g. when the beneficiary list was reduced from the program design of 10,000 households to 7,000 households, it was the village leaders who decided who to benefit.*
- *Local chiefs were also the entry point of the project and have been very instrumental in championing the implementation of the project*
- *Currently, development is through VDCs and ADCs. These committees exist in the MVs and are responsible for articulating demands of the*

community

- How have policies, procedures shaped the pattern of success towards food security?

POLICIES

- *Political will has initiated the program through two ways:*
 1. *Demand driven Agricultural extension services (DDAES) and*
 2. *Pluralism.*

DDAES

- *On DDAES, the government policy is that communities must demand services from service providers. In this case the MVP is a service provider and the community is demanding services from them (in essence, MVP responds to community demands)*

PLURALISM

- *The government policy on Pluralism is that those institutions that can ably provide agricultural extension services should be allowed to do so. MVP has well qualified personnel in the name of agriculture facilitators, health facilitators, community nurses besides the physical infrastructure which the project has put in place the area like clinics, schools, boreholes, roads, and therefore the government has allowed the project to provide the services the area since it has the capacity to do so.*

PROCEDURES

In terms of procedures, the MVP's Universal subsidy program plus the provision of free fertilizer and seed (at zero cost to the community) has undoubtedly remarkable

contributed to the reduction of food insecurity in the project area. This is different from the Government subsidy program whose procedure is targeted and cost sharing. The beneficiary of the target subsidy contributes MK500 PER 50KG of fertilizer and MK100 PER 50KG bag of maize seed. Under the MVP subsidy the only commitment that the community makes is a pay back of 100kgs of grain after harvest after each harvest season

- What sustainable policies, procedures, lessons etc can be learnt from the MVP

Sustainability is a big question in two folds: 1) grain bank management is a problem and 2) marketing or market linkage is still far fetched a dream.

The community seems not to have received adequate training to build their capacity in grain bank management (to be able to sell and raise money from the grain bank for sustainability which was and still is the idea for the establishment of the grain bank). As such the community is not able to stand on their own. This problem gets even more exacerbated when one looks at the stopping of the free fertilizer and seed (2010/2011 season). Apparently the community is not happy since they are not prepared to stand on their own...they have been caught off guard, so they say.

On a positive note, the following lessons have been learnt from the project:

- *Soil improvement through agro-forestry technologies*
- *Compost manure making and application.*

The two interventions are the only sustainable ways that will enable farmers to still harvest some good yield for at least the next two growing season even with the inorganic fertilizer.

Otherwise, the project brought in a lot of excitement into the community to the extent that it affected sustainability. Communication was not as to what the project intended to do:

- 1) The project approach was not participatory (no community involvement). It was a top down approach and not bottom up.*
- 2) In DADO's own words, its concept was a 'borrowed concept'. The way it is done in other countries is what was being done in Malawi too (universal implementation). It should have been done in the Malawi way, not the Kisumu (in Kenya) way by involving the community to determine what they perceive as development challenges in their households.*
- 3) Sustainability was also hampered by lack of government involvement. The project was not very transparent in terms of resources for the DC and there was no district level participation (no joint planning, joint implementation and joint monitoring). The government involvement was only at national level (policy level) where UNDP could interact with the Ministry of Agriculture and food Security. As such the government as number one stakeholder is not ready to take over the project activities.*

- If we had a chance to implement the project again, what would we do differently, why and how?
 - *Bottom up approach. Services should be demanded by the community and the project's role should be to respond to the community demands. This increases ownership which is key to sustainability of the project*

○ <i>Partners' involvement. Joint planning, implementation, monitoring and evaluation.</i> ○ <i>An element of cost sharing especially in agriculture</i>
4b: Key Informant Interview Answers – KI2
1. How successful has been the universal subsidy implementation in the MVP? • <i>All I know is that there has been success as evidenced by the grain bank. Beyond this, I cannot say anything because the Project did not involve district level partnership.</i>
2. What has been the pattern of yield in both MVs and out layer villages over the past 6 years? N/A
3. What has been the pattern of yield distributed by age, sex, and family inequalities? N/A
4. To what extent can we attribute the attainment of food security to the input subsidy program in the MVP? N/A
5. What factors inhibit or promote attainment of food security in the MVP? N/A
6. What are the socio and cultural contexts that define economic development? N/A
7. How have the socio and cultural contexts played a role in the implementation of the subsidy program in Mwandama area? N/A
8. How have policies, procedures shaped the pattern of success towards food security? N/A
9. What sustainable policies, procedures, lessons etc can be learnt from the MVP? N/A
10. If we had a chance to implement the project again, what would we do differently,

why and how? N/A
4c: Key Informant Interview Answers – KI3
1. What are the key successes registered by the MVP? • <i>Improved household health and sanitation status</i> • <i>Improved household poverty status</i> • <i>Improved household food security status</i> • <i>Improved household education</i>
2. What has MVP done that has contributed to the aforementioned successes? • <i>MVP has employed and deployed qualified health personnel (42 Health Surveillance Assistants (HSAs), 6 community health nurses, 1clinician, and 1 laboratory technician) for community outreach services</i> • <i>MVP has constructed 2 clinics at Maera and Mwandama clusters and 1 health post at Katete cluster</i> • <i>MVP has supplied a total of 15 bicycle ambulances</i> • <i>MVP has distributed 29,000 Insecticide Treated Nets (ITNs) by sleeping sites. These nets are retreated after a 5 year life. To complement the ITNs, the project has also embarked the Indoor Residual Spray (IRS) intervention</i> • <i>Through the Vision 2020 organization in Washington DC, the MVP has conducted eye clinics and distributed reading and distance glasses to all eye problem individuals in the project area.</i> • <i>Through the Himalaya Cataract, the project working hand in hand with</i>

Ministry of Health through Queen Elizabeth Central Hospital to address cataract conditions in the project area by carrying out eye surgeries

- *Increased maize yield as seen from the surplus which they keep in the grain bank is indicative of food security status in the project area*
- *At least when we go to the project site, we see that there are lots of houses with roofed with corrugated iron sheets*
- *Similar visits have also revealed that household even rare pigs and goats through their project known as pass on. This is a source of income and prevents households from selling maize making the household sustainably food secure.*
- *By our records (DHO's) MVP has also sponsored 9 students (3 for clinical medicine to become Medical Assistants and 6 nurses) in various colleges of Health Sciences in the country. This is at a cost of MK300, 000 per participant and is undoubtedly a remarkable breakthrough in education in the project area. These students have signed bonds to the extent that once they complete their education training they will work in the MVP clinics and health centers. This at least ensures sustainability of the projects' activities*

3. What lessons can be learned from the project?

Nothing. Nothing can be emulated from the project. This is because there are a number of unaccomplished projects under the health sector. For instance, the expansion of Matawale Health Center into a district hospital and refurbishment of Thondwe Health Center into a fully fledged HC have not taken off the ground

yet, 5 years after start of the project.

May be the grant/scholarship program can be worth mentioning

Otherwise the concept is good but the implementation has been a challenge.

4d: Key Informant Interview Answers – KI4 & K15

1. How successful has been the universal subsidy implementation in the MVP?

- *Very successful:*
 - *Yield levels achieved have been very high as compared to neighboring villages*
 - *There is strong resistance from the community to stop the subsidy underscoring the fact that it has been successful.*

2. What has been the pattern of yield in both MVs and out layer villages over the past 6 years?

- *Between 1: 4 tons to 1: 6 tons, except for last year when yield reduced by 25% due to low rainfall*

3. What has been the pattern of yield distributed by age, sex, and family inequalities?

- *Not much different e.g. I widow (a family of 8) said he had 5 bags BEFORE the MVP subsidy but registered 60 bags (3 big granaries) AFTER the MVP subsidy*

4. To what extent can we attribute the attainment of food security to the input subsidy program in the MVP?

- *Generally to a very large extension but has been a combination of a*

number of factors which include:

- *Increased adoption of improved agricultural technologies, in particular Sasakawa which reduces competition on the hole*
- *Increased adoption of compost manure which improves water holding capacity and therefore improves soil nutrients*
- *Occupational extension methodologies*
- *Increased use of improved seeds (MONSATO SEED)*

5. What factors inhibit or promote attainment of food security in the MVP?

INHIBITING FACTORS:

- *Storage (post harvest management) is a challenge*
- *Nutrition demands. Maize should not be treated as food on its own. There is need for crop diversification and hence food variety. This would ensure security of the grain.*
- *Inability to achieve the potential yield (10 tons). Currently, the project is producing at 6 tons; there is still a deficiency of 4 tons to be met. This is primarily due to the following:*
 - *Most farmers intercrop and this reduces potential yield*
 - *A few farmers have adopted the new ridge spacing technology of 75cm or 80cm apart to have better plant population. Ridges are still widely spaced.*
 - *Labor is still a major challenge (not weeding on time). This reduces yield by 40%. The inability to weed on time is due to our social set up (when there is an illness, we have to attend to the*

sick; when there is death, we have to stop everything and attend the funeral)

- *Cancellation of the 2009/2010 and 2010/2011 fertilizer donation. The cancellation notification came very late while the government had already distributed Urea. So we only managed to access MPK because of the late communication*
- *Lack of agro dealer structures in the project area because of the universal subsidy program. This would affect the future(from 2010/2011 growing season onwards) as the MVP has stopped the universal subsidy program*
- *Failure of grain bank to find market last year (2009/2010 growing season) due to bumper yields.*

PROMOTE

- *New value chain adding technology which would include:*
 - *Corn/soya blend flour which is fortified and is used to make Likuni Phala for the school feeding program. Mwandama can supply up to 3 or 4 districts*
 - *Livestock feed*
 - *Processed maize (corn flour)*
- *Link to outside market which include:*
 - *World Food Program (WFP)*
 - *Malawi Commodity Exchange Market (MACE)*
 - *Private Institutions like Domasi Likuni Processing Plant*

- *Warehouse receipt initiative by International Opportunity Bank of Malawi(OIBM)*
- *Community contribution (100kgs of corn maize). It is cost effective and sustainable*
- *Grain bank has caused price stabilization, unlike in the past when traders could capitalize on forces of demand and supply*

6. What are the socio and cultural contexts that define economic development?

- *Batoni Nzima is still going on up to now, 3 years after the project pulled out. Mwandama has not been empowered to that level. There is virtually no leadership*
- *Culturally – the part lineal and matrilineal marriage systems have affected development initiatives. In a part lineal system, it a man invests unlike in matrilineal system (where a man can be kicked anytime and therefore has no incentive to invest) apart from those that have a) gone to school and b) migrated to a neutral ground. This is why:*
 - *Batoni Nzima has survived up to now (North practices part lineal system while south practices mat lineal)*
 - *Most farmer cooperatives in the south have died; north cooperatives have been sustained*
 - *Development is not by indigenous but migrants*
 - *Overall development is affected. Women are more active than men (south has more female headed households than north).*

Note that women that are economically empowered do not last long in marriages

7. How have the socio and cultural contexts played a role in the implementation of the subsidy program in Mwandama area?

- *Leaders in community tend to benefit more than the poor of the poorest*
- *Village politics has also played a role in terms of who benefits (chiefs would have their own approach to issues of development e.g. when the beneficiary list was reduced from the program design of 10,000 households to 7,000 households, it was the village leaders who decided who to benefit.*
- *Local chiefs were also the entry point of the project and have been very instrumental in championing the implementation of the project*
- *Currently, development is through VDCs and ADCs. These committees exist in the MVs and are responsible for articulating demands of the community*

8. How have policies, procedures shaped the pattern of success towards food security?

- *The project model has been implemented at 100% subsidy. This has created a problem of sustainability*
- *Farmers are not used to buying but receiving*
- *Economically farmers are not empowered apart from the Unilever group from farmers. The project's business development sector has not done much on this area either because resources have not been*

there at all or not been there on time.

- *Since a few individuals have been empowered, there is need for holistic empowerment. The project needs to move into a more business angle in the next phase, including changing agriculture into agriculture for business with enough rate of return from investment e.g. pigeon peas*

- *Crop processing needs to be done within the MVs to gain the following:*

- i. *Low cost of production (the village becomes the primary market*

- ii. *Employment within the village*

- iii. *Store packaged products (to increase shelf life).
Currently Universal Industries has opened a Cassava Factory at Njuli which needs to moved to Mwandama project site*

9. What sustainable policies, procedures, lessons etc can be learnt from the MVP

- *The integrated approach to development. The government needs to emulate this and form its own MVP since all sections are interdependent (health system, road system, education system e.t.c.)*
- *Post harvest management (grain storage) to take advantage of scarcity – demand increases and supply decreases – prices go up. This brings more economic benefits*

- *Distribution of ITNs per sleeping site (Government has already adopted this). The government was only distributing to pregnant women.*
- *IRS which is combined with ITNs*
- *PHASE – own hygiene which can be scaled up countrywide*
- *Outreach clinics which is integrated with school health*
- *School meals program (MVP/WFP has a joint work plan) coordinated through the Ministry of Education. Education committee is working on the budget which is expected to be included in the next budget session*

Note that the universal subsidy program would be expensive for government. Instead the government would introduce a mark up for commercial companies – say about 60% - to cushion the government subsidized cost

10. If we had a chance to implement the project again, what would we do differently, why and how?

- *Economic empowerment/sustainability. The grain bank should be able to:*
 - *Expand market linkages*
 - *Recruit qualified managers and accounts staff*
 - *Community board of directors which should be able to provide proper markets with good prices to realize excess profits for:*
 - i. *Paying staff and*
 - ii. *Social infrastructure activities determined by the board*

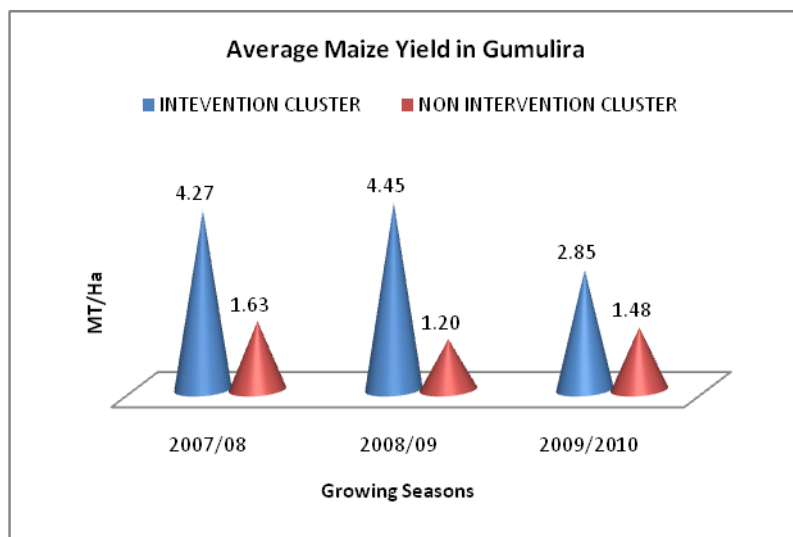
The idea is to turn the grain bank into an economic entity

- *Production of value added products e.g. maize/millet/sorghum blend*

*which is good for diabetic patients, corn/soya blend,
cassava/corn/sorghum blend*

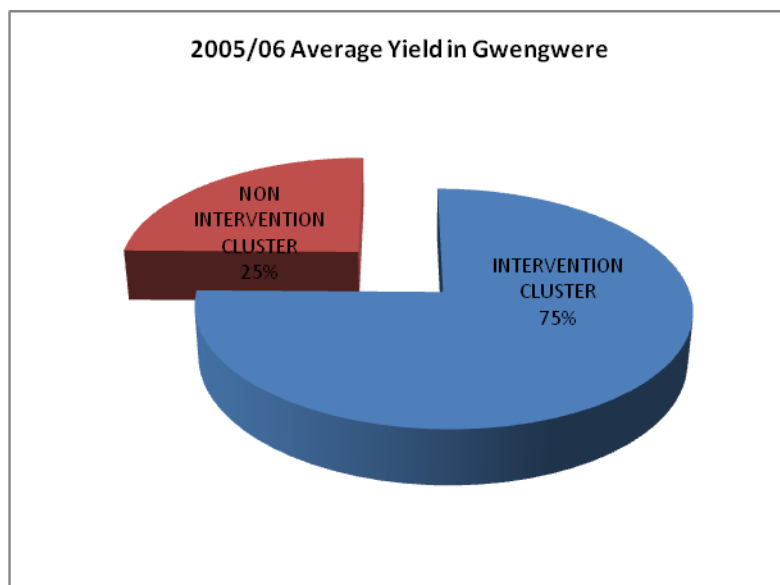
- *Step up cassava bakery*
- *Fruit juices*
- *Honey production*
- *Pond fish farming*

APPENDIX 5a: Average Maize Yield in Gumulira, Mchinji



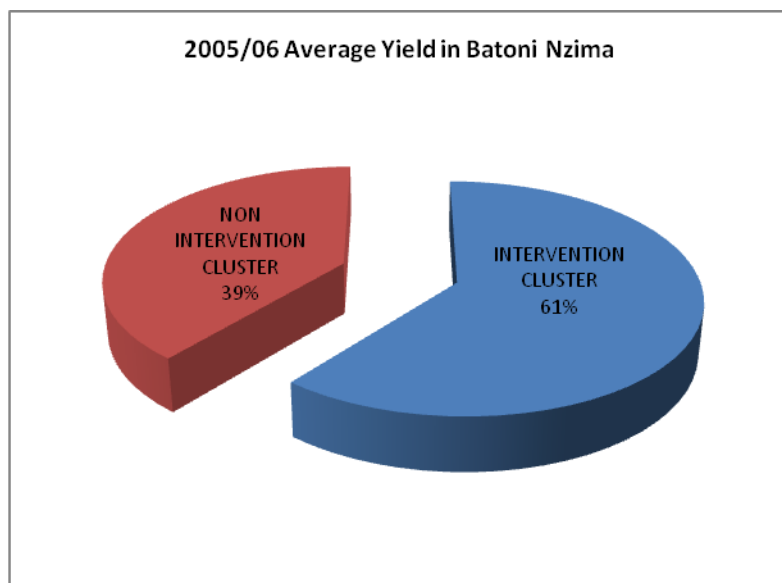
Source: Author's own calculations

APPENDIX 5b: Average Maize Yield in Gwengwere, Dedza



Source: Author's own calculations

APPENDIX 5c: Average Maize Yield in Batoni Nzima, Mzimba



Source: Author's own calculations

Appendix 6: Map of Malawi Showing Mwandama MV Cluster



Source: Adapted from MVP Midterm Evaluation Report