

APPROVAL FORM

The undersigned certify that they have read and recommended to the Midlands State University for acceptance a dissertation entitled: **LOCALLY INITIATED COMMUNITY GARDENS AS AN ADAPTATION STRATEGY TO CLIMATE CHANGE-INDUCED FOOD INSECURITY: CASE OF SHURUGWI PARTNERS CHIKATO GARDENS, ZIMBABWE.**



Submitted in partial fulfilment of the requirements of a Master of Science in Safety, Health and Environment Management.

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Abstract

This study assesses the sustainability of locally initiated community gardens as an adaptation strategy against climate change-induced food insecurity in Chikato ward 7 of Shurugwi district. Triangulation approach was employed in this study in which both qualitative and quantitative methods were used to collect data. Qualitative techniques included open-ended questionnaires, interviews, observations, focus group discussions and secondary data. Quantitative techniques comprised of close ended questionnaires and pre existing database from Shurugwi Partners. Analysis was done using Statistical Package for Social Scientists (SPSS), content analysis and Microsoft Excel. The study revealed that before Shurugwi Partners Community Gardens Initiative (SPCGI), the community of Chikato ward depended largely on rain fed agriculture which was, however, affected by effects of climate change such as low and unreliable rainfall. The introduction of community gardens brought with it changes into the Chikato community. There was an increase in vegetable diversity, nutrition changes, increase in income acquired from selling vegetables and production improved. Community gardens performed well in adapting to the effects of climate change by focusing on organic farming, traditional methods of dealing with pests and diseases and improving water security. Community gardens initiated by Shurugwi Partners are sustainable in enhancing food security as an adaptation strategy against climate change-induced food insecurity despite the withdrawal of assistance by the benefactor. The major reason for this is the overseer role which Shurugwi Partners continues to maintain after the decommissioning stage which is a characteristic unique to them as a locally headquartered Non Governmental Organisation (NGO). Local leaders and key stakeholders exhibit a pivotal role as local pillars for sustainability of these community gardens through regular visits to community gardens solving any arising matters to ensure continuity of the project. The garden beneficiaries themselves are highly committed to the success of the community gardens and this has ensured high production and sustainability due to their commitment. The research recommends local leaders, Shurugwi Partners and garden beneficiaries to continue maintaining the roles which they play for the sustainability of community gardens. The beneficiaries should continue practising organic farming in community gardens to maintain the productive capacity of the soil without degrading the environment. This ensures sustainability of community gardens. The marketing committee should be vibrant in sourcing markets of vegetables because income is important for the procurement of diverse seeds.



Our Hands Our Minds Our Destiny

Dedication

I give special dedication of this project to my husband, not forgetting my sister and friends for their encouragement which made this research a success.



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I wish to acknowledge contributions by academics, professionals and friends whom I share ownership of this document with. My appreciation goes to the management and the rest of the staff at Midlands State University for accepting me to be part of the University family and for imparting to me their vast knowledge. They assisted me with words of wisdom, hope and courage during my academic period. I also give gratitude to the unwavering support and guidance i constantly got from my supervisor Dr. M.M Matsa throughout this project. My thanks also go to the Chairperson of Geography and Environmental Studies Department, Dr S. Jerie. Great thanks to all lecturers in various departments, not forgetting my fellow classmates of MSHE Class of 2014. Great thanks also go to all respondents and key stakeholders in this project (Shurugwi Partners, Environmental Management Agency, Shurugwi Rural District Council and Agritex Shurugwi District) for their support and ideas they shared with me during the course of my project.

I give credit to the compilation of this Dissertation to all the above mentioned professionals for believing in me and for their constant support during good and difficult times of my academic period. My heartfelt appreciation goes to my family especially my husband, and friends for their unmerited support (economic, social, moral and otherwise) throughout my academic period. Above all I give all the glory to the Lord Almighty for a one and a half years academic period full of life and fun, not forgetting how educating it was in every dimension. May the Lord God edify and bring continual success to you all.

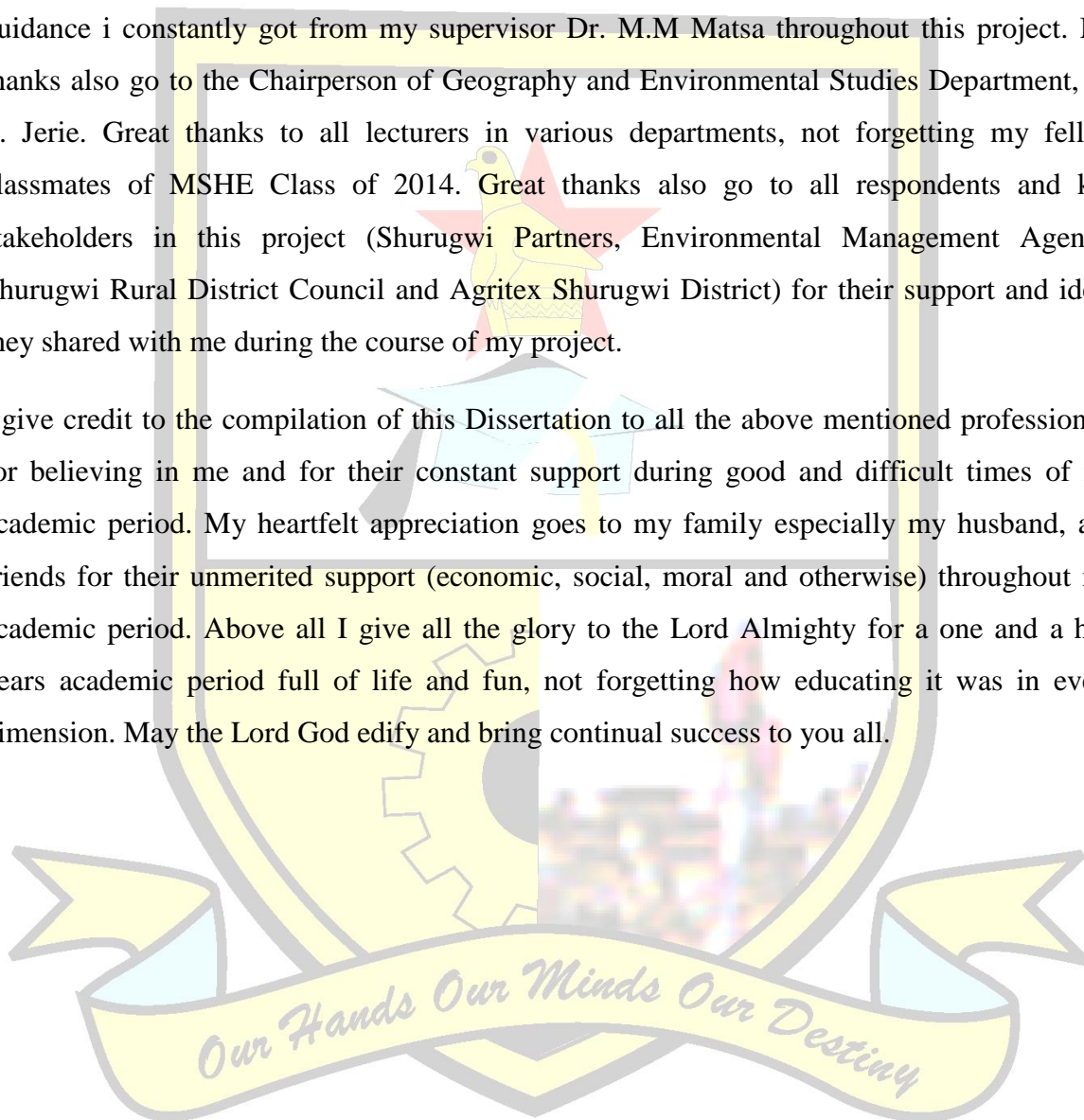
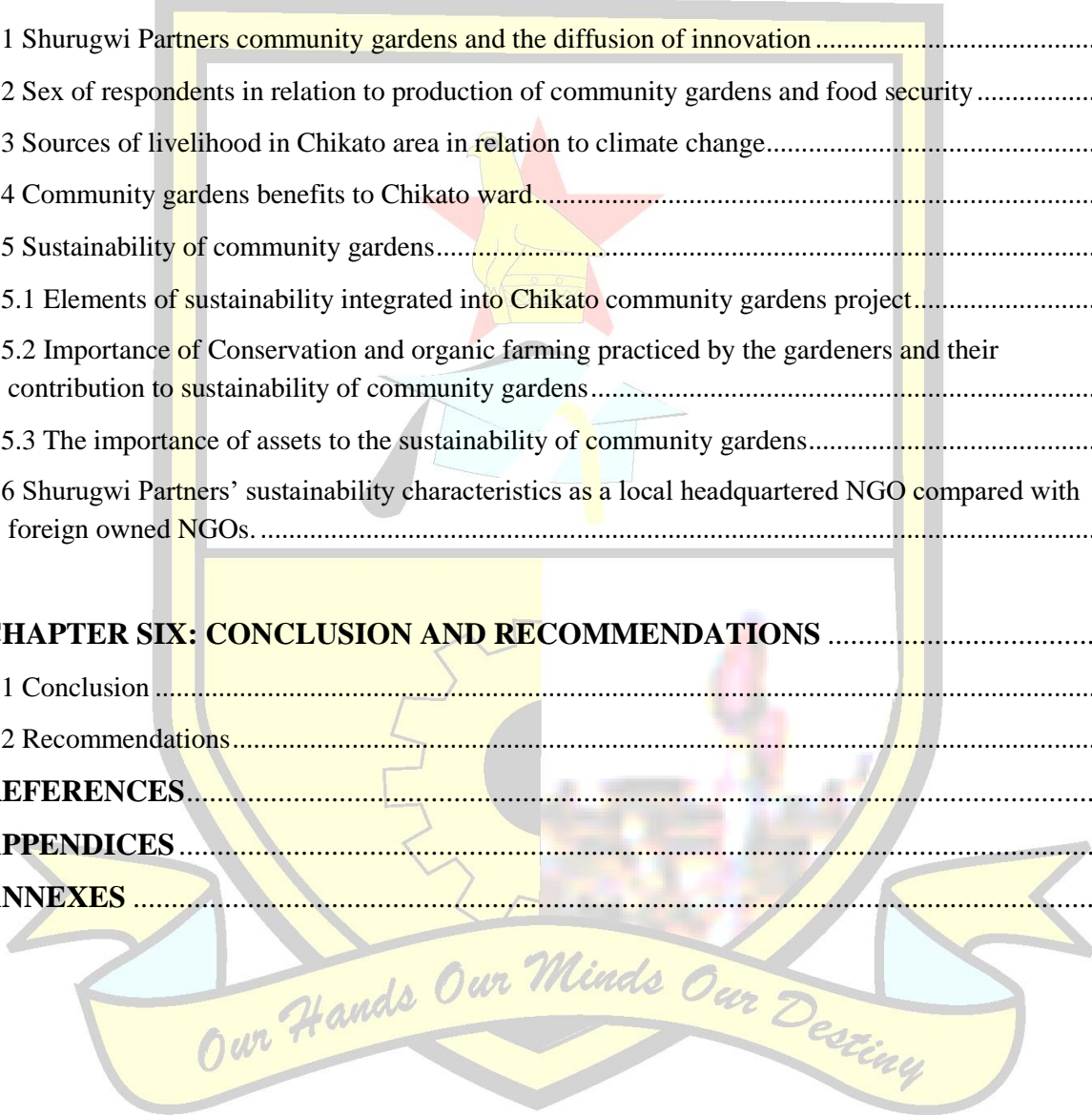


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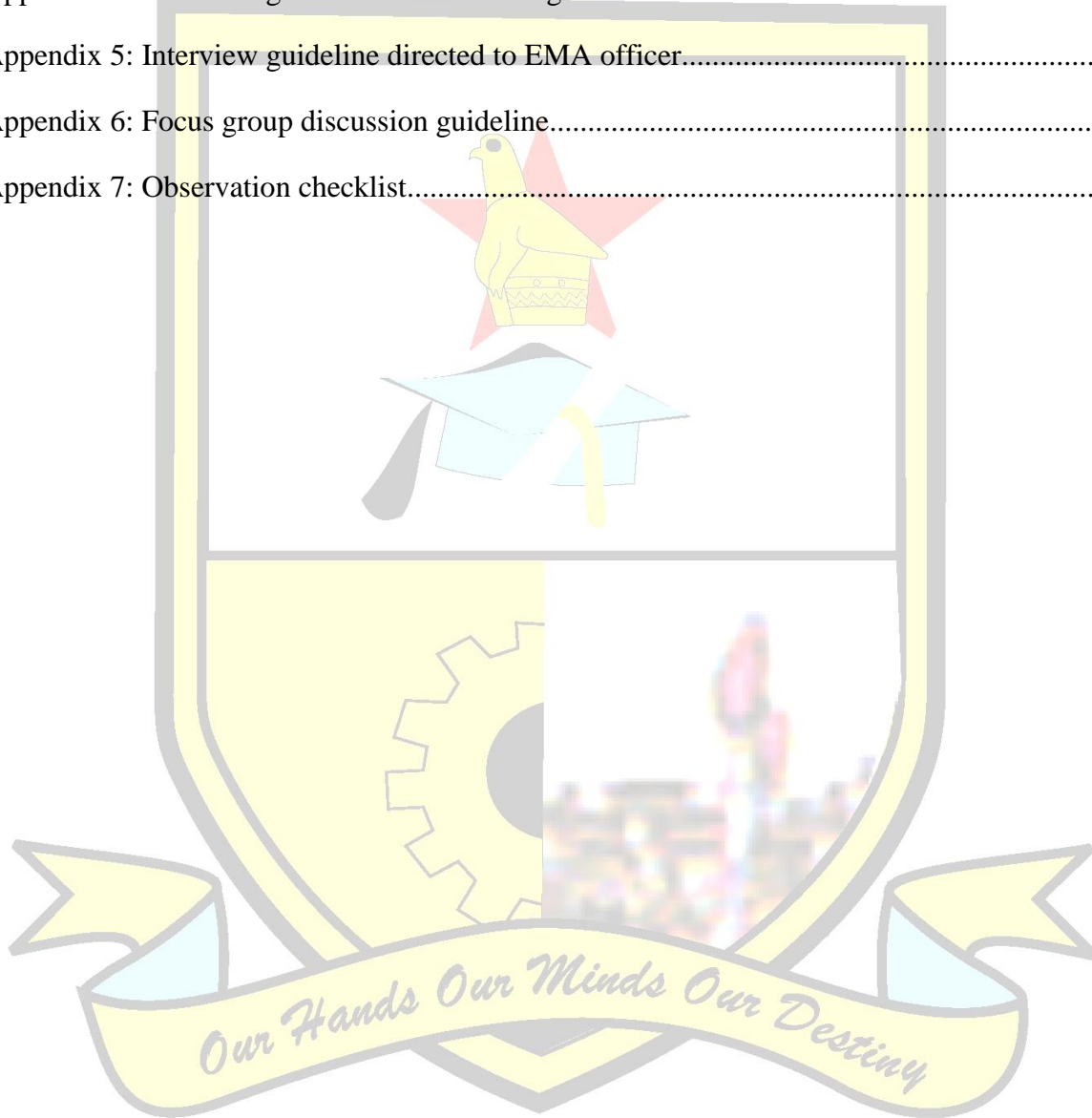


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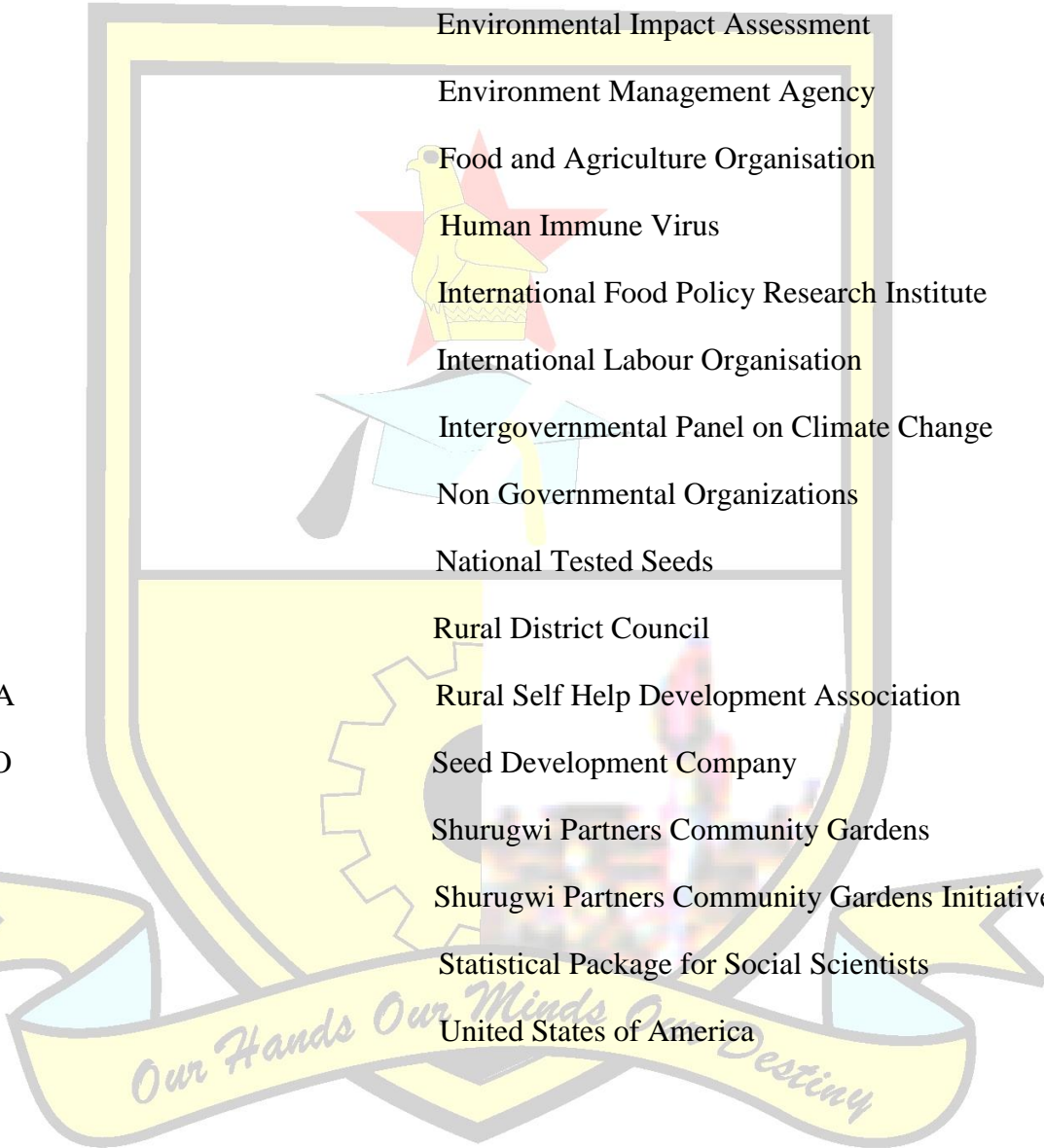
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Abbreviations/Acronyms

AGRITEX	Agricultural Technical Extension Services
CARE	Cooperative for Assistance and Relief Everywhere
DFID	Department for International Development
EIA	Environmental Impact Assessment
EMA	Environment Management Agency
FAO	Food and Agriculture Organisation
HIV	Human Immune Virus
IFPRI	International Food Policy Research Institute
ILO	International Labour Organisation
IPCC	Intergovernmental Panel on Climate Change
NGO	Non Governmental Organizations
NTS	National Tested Seeds
RDC	Rural District Council
RSHDA	Rural Self Help Development Association
SEDCO	Seed Development Company
SPCG	Shurugwi Partners Community Gardens
SPCGI	Shurugwi Partners Community Gardens Initiative
SPSS	Statistical Package for Social Scientists
USA	United States of America



CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Berman (1997) defines a community garden as a collective space where people draw together to grow fruits, vegetables, and/or flowers communally. Community gardens can be initiated by the community as a whole, by a local Non Governmental Organisation (NGO), by the government or by foreign NGOs. Harris (2009) argues that gardeners may form a grassroots group to initiate the garden, such as the Green Guerrillas of New York City, or a garden may be organized "top down" by a municipal agency. The Los Gatos, California-based non-profit Community Gardens offers free assistance in starting up new community gardens around the world. The main purpose of such gardens is to provide food security as evidenced by different types of vegetables grown in these community gardens. According to Woollahra council (2008) the innovation of community gardens was invented in the United Kingdom during the 18th century in reaction to the needs of the poor to enhance their food sources. This resulted in growing concern to set up more community gardens around the world in acknowledgment of benefits of gardens on the community. This is supported by Mckelvey (2009) who asserts that a community garden can help improve food security for participants by escalating physical and economic access to sufficient amounts of healthy food. Rychetnic *et al* (2003) define food security as the ability of individuals, households and communities to attain proper and nutritious food on a standard and consistent basis and using socially acceptable means.

Community gardening is internationally recognized as an important community development strategy for improving local food supplies and locally defined problems (Ferris *et al* 2001). However while community gardening initially began as a way to improve local food supplies in the early 20th century, it has evolved into a strategy for recuperating overall community and sustainable development in neighbourhoods, including promoting social, environmental, and economic concerns (Saldivar and Krasny 2004). The earliest documented cases of community gardening occurred in Detroit, New York and Philadelphia to address unemployment and poverty during economic crisis in the late 1880's (Middleton 2009).

In Africa the utilization of the concept and practice of community gardening has been based on a response to an economic and social crisis caused by climate change. Africa is considered very vulnerable to climate change because of widespread poverty (Eriksen *et al* 2008).

Henceforth community gardens have been used to alleviate challenges of climate change which have largely led to a global decline in agricultural output making fresh produce increasingly unaffordable especially in communal areas of developing countries.

Community gardens can be a successful intervention to curb challenges of food security if managed properly. However there have been challenges with foreign owned NGOs to sustain their own initiated community gardens projects due to lack of continual support on the part of the NGO and the dependency syndrome on the part of the community. Cotthem (2010) argues that in South Africa the Corporate Social Investment Funders have failed to recognise that food security projects require sustained ongoing support, to the extent that a project is funded just long enough to see the food garden established without ensuring that the requisite support structures that need to exist to support the micro-farmer are in place and are themselves sustainable. The challenge with community gardens that are funded and owned by foreign NGOs is that once the lifespan of the project has ended the funding and support to the project will also end hence these community gardens do flourish only during donor assistance and deteriorate after their departure. A study undertaken by Matsa and Dzawanda (2014) revealed that Caritas community gardens in Chirumanzu District flourished during Caritas reign but quickly shrivelled and even folded after the NGO's departure. This raises questions about their capacity for sustainability and resilience among communities. That is why Nieuwoudt (2009) argues that designed expertly; managed efficiently and funded earnestly community gardens projects can lay the foundation of a prosperous food security nation.

Auret (1990) argues that in Zimbabwe community gardens were set up by government in the 1990s after research showed that families were failing to keep pace with the rising cost of fresh food. Current studies disclose that global temperature is ever escalating and the world is experiencing severe climate change (Mawere 2011) From 2008 there was climate change awareness as evidenced by the formation of the Zimbabwe Climate Change Working Group (Dawes and Sibanda 2012). The calamities of climate change did not spare the agricultural sector of Zimbabwe. The recent mass establishment of community gardens in Zimbabwe was done by NGOs both local and foreign in a bid to maintain food security and sustainable livelihoods among urban and rural poor households being threatened by effects of climate change and economic hardships. Examples of foreign NGOs include CARE, Caritas and Action Faim. Local NGOs include Rural Self Help Development Association and Shurugwi Partners. Chikato community in ward 7 of Shurugwi district, was under the threat of drought leading to hunger, water problems, income challenges and environmental degradation which

led to the establishment of Shurugwi Partners to cater for the challenges introduced by climate change. Women and children who constitute more than three quarters of the population of the area were highly vulnerable to socio-economic shock of the drought induced food insecurity and poverty (Shurugwi Partners Project Report 2012).

Cotthem (2010) and Matsa and Dzawanda (2014) have undertaken studies that revealed that community gardens that are foreign owned tend to thrive most during donor assistance and once the assistance is withdrawn such projects deteriorate in their performance. However, regarding locally owned community gardens taking the case of the area under study, Shurugwi Partners community gardens seem to flourish even with limited donor assistance. Nevertheless there hasn't been a study undertaken to determine the effectiveness of such locally owned community gardens in enhancing food and nutrition security as an adaptation strategy to climate change. It is against this realization that this study seeks to analyse the effectiveness of Shurugwi Partners Community Gardens Initiative (SPCGI) to the climate change- induced communal food security threat in Chikato area of Shurugwi.

1.2 Statement of the problem

Over the past 15 years rain fed agriculture, changing weather conditions and significant changes in global climate have led to a decline in food production and widespread rural poverty. To tackle these challenges in Zimbabwe, many foreign and locally owned NGOs launched rural community garden projects focusing on food and security targeting impoverished families. Studies undertaken by different researchers like Cotthem (2010); Mpfu (2012), and Matsa and Dzawanda (2014) discovered that dependency syndrome and lack of community ownership in gardens initiated by foreign NGOs affect their sustainability after handover to the community. There is, however, an observation that community gardens initiated by local NGOs seem to continue thriving even after withdrawal of benefactor assistance. These locally headquartered NGOs are a new phenomenon and there is scant information about the sustainability of their initiated community gardens in enhancing food security in the face of climate change effects. In Chikato area, Shurugwi District, community gardens were introduced by a local NGO called Shurugwi Partners in 2011 as a strategy to counter challenges of climate change to food security. Being located in the semi – arid Natural Region 3, Chikato community was under the threat of drought leading to hunger, water problems, income challenges and environmental degradation (Shurugwi Partners Project Report 2012). Since their establishment, these gardens seem to thrive even without donor assistance. However, there hasn't been a study undertaken to determine whether these

locally owned NGOs are better than their foreign owned counterparts in enhancing food security. It is against this background and this realization that this study seeks to analyse the effectiveness of Shurugwi Partners Community Gardens Initiative (SPCGI) to the climate change-induced communal food security threat in Chikato area of Shurugwi.

1.3 Objectives

1.3.1 General objective

To assess the sustainability of Shurugwi Partners community gardens as an adaptation strategy to the climate change-induced food security threat in Chikato Ward

1.3.2 Specific objectives

- ❖ To establish Chikato ward's food regime before the inception of Shurugwi Partners Community Gardens
- ❖ To determine food and nutrition changes introduced by Shurugwi Partners Community Gardens Initiative in Chikato Ward.
- ❖ To assess the performance of Shurugwi Partners Community Gardens in enhancing food security to counteract challenges of climate change in Chikato Ward.
- ❖ To analyse the sustainability of the Shurugwi Partners Community Gardens Initiative as a strategy to cushion the Chikato community against climate change related food insecurity.

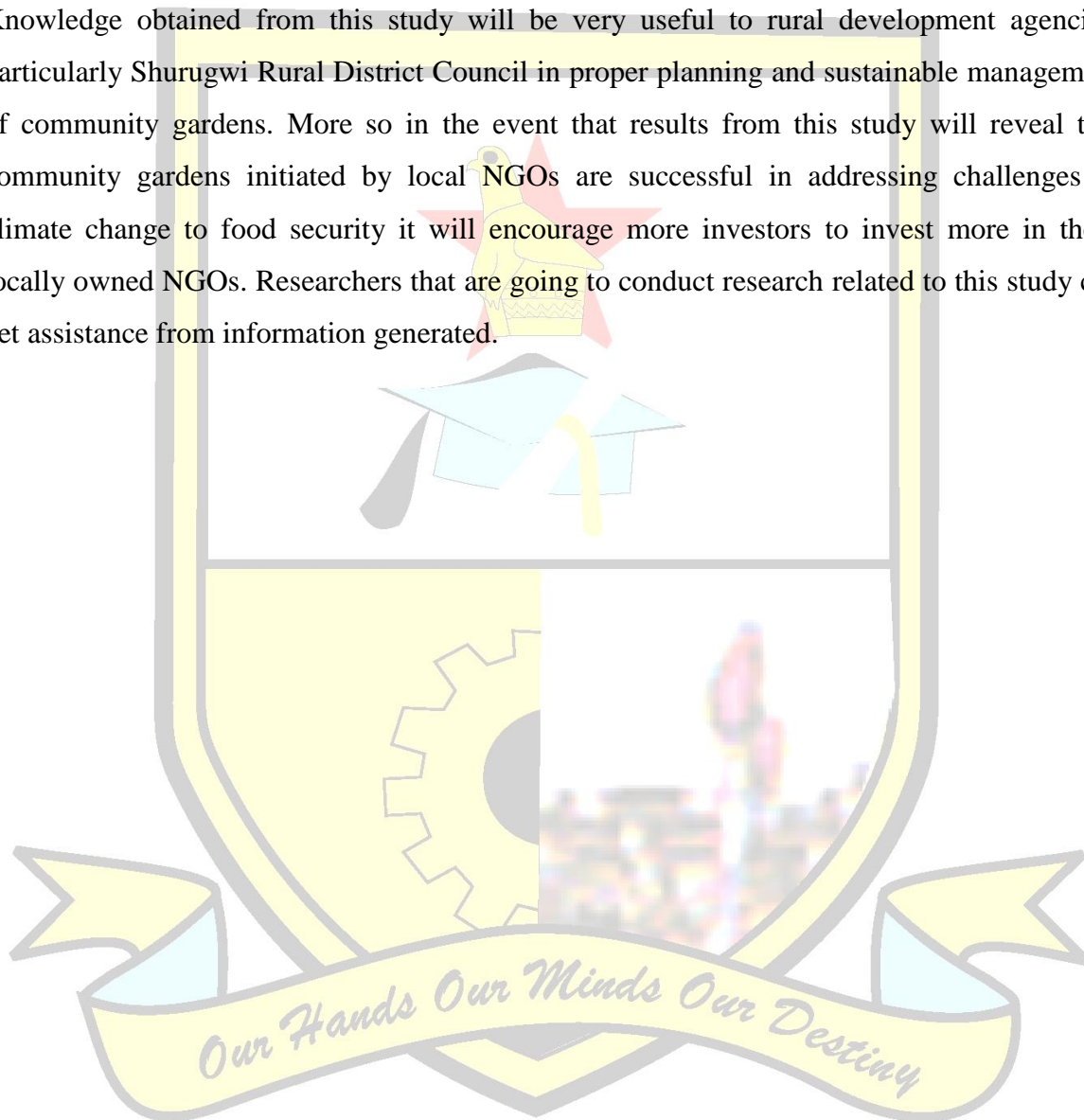
1.4 Hypothesis

- ❖ H_0 = There is no significant difference between the levels of vegetable production before and after the operation of Shurugwi Partners Community Gardens.
- ❖ H_1 = There is a significant difference between the levels of vegetable production before and after the operation of Shurugwi Partners Community Gardens.

1.5 Justification

Studies of community gardens have raised questions about their capacity to address issues of food security being caused by climate change. Many studies have been undertaken about community gardens initiated by foreign NGOs in relation to their contribution to food security. However, a gap in knowledge exists on the effectiveness of community gardens

initiated by local NGOs to address the challenges of climate change to food security. Information generated from this study will contribute to improve understanding of the efficiency of community gardens initiated by local NGOs in addressing challenges of climate change to food security in the communal area of Shurugwi. This study will also go further to assess the operation of these community gardens initiated by local NGOs and compare them with community gardens initiated by foreign NGOs from findings of other researches. Knowledge obtained from this study will be very useful to rural development agencies, particularly Shurugwi Rural District Council in proper planning and sustainable management of community gardens. More so in the event that results from this study will reveal that community gardens initiated by local NGOs are successful in addressing challenges of climate change to food security it will encourage more investors to invest more in these locally owned NGOs. Researchers that are going to conduct research related to this study can get assistance from information generated.



1.6 The study area

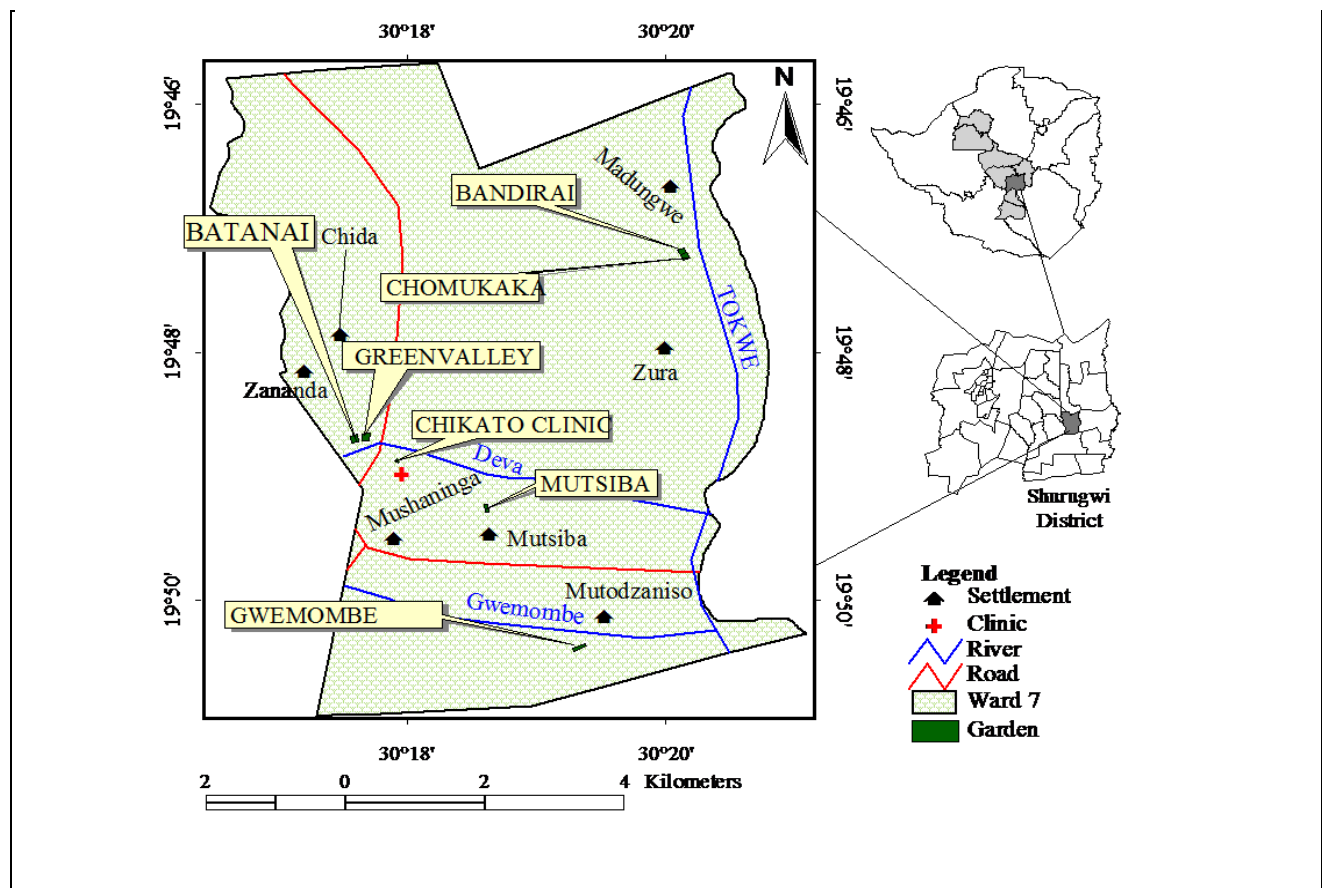


Figure 1.1 Map of Chikato Ward 7, Shurugwi District

1.6.1 Physical characteristics of the study area.

Chikato area is found in Shurugwi district which is situated about 30 km to the southeast of the city of Gweru in the Midlands Province of Zimbabwe (Matsa and Muringaniza 2010). The study area is in Ward 7 of Shurugwi district and lies between 19°57'S to 20°30'S latitude and 30°00'E to 30°58'E longitude. The study area lies in agro-ecological region 3, a semi-intensive agricultural region characterized by annual rainfall of between 650–800 mm a year. According to the Shurugwi Partners Project Report (2012) being located in the semi – arid Natural Region 3, the Chikato community is under the threat of drought. In the hottest month, October, the mean temperature is 31°C, and in the coldest month, July, the mean temperature is 9°C. Severe mid-season dry spells and an unreliable start to the rainy season make the area marginal for maize, tobacco and cotton. Soils are sandy loam largely derived from granitic-gneissic rocks characterized by low agricultural potential due to low fertility, water-holding capacity, low pH and deficiencies in nitrogen, phosphorus, and sulphur. The most extensive vegetation type is dry miombo woodland, such as *Brachystegia spiciformis* and *Julbernardia*

globiflora. The rivers which are found in the area are Gwemombe, Deva, Tugwi and Tugwane which supply the community with water for different purposes. Dams have been constructed along Deva and Gwemombe River. However during times of unreliable rainfall these rivers sometimes dry up causing the community to suffer from water scarcity. The wetlands found in the area include Deva, Bumha and Chinho and most of these have shrivelled because of altering climatic conditions and extreme temperatures.

1.6.2 Socio-economic characteristics of the study area.

With poverty, low levels of economic activity and the poor quality land the community have available to them, non-farm activities are potentially an important source of income. The poorest families depend on the natural environment for resources such as construction timber, firewood, and fencing materials, as well as their daily food which include insects, wild fruits, vegetables and medicine. Their agricultural practices are essentially subsistence in nature, with land and livestock being the primary household assets. This is confirmed by Matsa and Muringaniza (2010) who argue that subsistence crop and livestock farming are the dominant human activities. Maize is the main crop grown, with other grains such as sorghum and millet being planted by most households as insurance against poor rains, which in some years are inadequate to produce a good maize crop. Subsistence grain crops are supplemented by household vegetable production such as, pumpkins, covo, rape, cabbage and beans. Agricultural mechanization is relatively low, with most farmers using hand tools and oxen for ploughing. Other principal assets include ploughs, ox-drawn carts, wheelbarrows, axes, hoes, and the like. Use of chemical fertilizer and improved seeds is becoming increasingly common as the government sometimes provides these in an effort to boost agricultural production in support of the fast track land reform programme. Informal trading is also practised in the area with farmers exchanging used clothes, poultry products and livestock for grains.

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CHAPTER TWO: LITERATURE REVIEW

2.1 Theoretical Framework

This study is premised on the diffusion of innovations theory as propounded by Rogers (1962), in which he identified four stages of diffusion of new ideas which include invention, diffusion through the social system, time and consequences. Hawley (1946) postulated that relative advantage, compatibility, complexity and triability are characteristics of an innovation which are observed by individuals and assist in explaining rate of adoption.

The diffusion of innovation theory as applied in agricultural production centre on how and why things occur given that for farmers the applied production technique must actually work. As according to Aeberhard (2008) once there is an affirmative outcome, farmers are eager to exercise a certain farming technique and accept the fundamental scientific and theoretical explanation. As applied in organic agriculture, the diffusion of innovation theory followed the phases stipulated Rogers 1962 where the organic movement was stirred by innovators coming up with new ideas and concepts and currently it is broadly accepted in the world (Aeberhard, 2008).

Farmers adopt innovations if there are benefits and internal needs for adopting the innovations (Morgan and Murdoch 2000). In recent years many agricultural innovations have been disseminated in rural communities due to their benefits which are perceived by the farmers as the adopters. These innovations include conservation farming, integrated pest management, soil and water conservation strategies and zero tillage. Spielman (2009) describes two cases of successful introduction of zero-tillage in soyabean cultivation in Argentina and rice-wheat cultivation in the Indo-Gangetic plains. The spread of zero-tillage was instigated by the awareness of diminishing yields. Ajayi (2007) postulate that conservation agriculture has been diffused in 14 countries of Sub-Saharan region. The innovation of kitchen gardens was diffused in Nepal, where vitamin A deficiency contributes to very high rates of infant and maternal mortality, resulting in increased vegetable and fruit growing and consumption, and improvements in vitamin A nutrition (Bordenave 1976).

To spread agricultural innovations the diffusion systems had to be put into place to interact with rural communities (Knowler and Bradshaw 2007). The innovation of establishing community gardens initially started in the United Kingdom in the 18th century in response to

the need for supplementing food sources for low income labourers (Woollahra Council, 2008). Later, Australia adopted the idea of community gardens by establishing its first community garden in Nunawading, Victoria in 1977 that became an innovation model upon which other community gardens were based (Woollahra Council 2008). A lot of community gardens were later initiated in many developed and developing countries in recognition of the positive impact of gardens on community life.

Opinion leaders are the reason why diffusion can be a very efficient process to jump-start an innovation (Katz, 1963). The opinion leaders that have been utilised to spearhead the diffusion of agriculture innovation in rural communities include the local leadership and key stakeholders. In Zimbabwe, for instance, the diffusion of community gardens in rural communities have been observed to be successful as long as opinion leaders are in favour of this new practice. This is because these opinion leaders are perceived as influential, once they accept an innovation the adopters will also accept the innovation.

Community gardens were diffused as innovations in developing countries like Zimbabwe with the aim to enhance food security in both urban and rural areas. In rural areas of Zimbabwe the agriculture sector upon which most people depend for livelihood is being threatened by climate change effects (Gukurume 2013). This raised concerns amongst different NGOs to diffuse the innovation of community gardens in communal areas to augment food security after observing the success of gardens which were established in Western countries.

The Diffusion theory as designed by Roger applies to this study in that community gardens in Chikato community, Shurugwi district was a new innovation that was introduced by Shurugwi Partners. It was a new idea in that there were no other community gardens that were functioning in the community except traditional household gardens. The idea of community gardens originally started in developed countries and was later diffused to developing countries including Zimbabwe with the aim to curb challenges of food insecurity which was exacerbated by climate change effects. Chikato community formed the social system in which agriculture production was largely affected by climate change effects such as unreliable rainfall. Shurugwi Partners Project Report (2012) postulates that Chikato community in ward 7 of Shurugwi district was under the threat of drought-induced food insecurity. The new innovation of community gardens was diffused and adopted by members

of the community to serve a common goal of counteracting food insecurity which was worsened by climate change effects.

2.2 Climate change and communal areas food regimes

Overwhelming challenges to the agricultural sector have been presented by climate change, in turn this has affected agricultural sustainability especially in many developing countries like Zimbabwe. Agriculture sector plays a significant role in enhancing the food security of the communal people hence its tremulous affects food security of the rural people. Worse still the situation can be further exacerbated by the fact that the agricultural sector of most communal areas particularly in developing nations especially Sub Saharan Africa is rain fed. Slater *et al* (2007) assert that agriculture has been a focal point of those modelling the impact of climate change on poverty because the agriculture sector is greatly reliant on the climate and human reliance on agricultural livelihoods predominantly by the poor is high.

2.2.1 Food security in communal areas

Food security has been defined by the World Food Summit 1996 as a condition in which all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2003).

Agriculture is an important contributor to food security because it produces the food people eat and provide the primary source of livelihood for a significant percentage of the world's total workforce. This is supported by ILO (2007) which noted that in the heavily populated countries of Asia and the Pacific, this share ranges from 40% to 50%, and two-thirds of the working population still make their living from agriculture. Given such significant percentage of populations that depends on agriculture for survival in the low income developing countries of Asia and Africa, the livelihoods of the rural poor in communal areas are put at risk once their agricultural production is adversely affected by climate change thereby increasing their vulnerability to food insecurity

Generally most people in rural areas are underprivileged and marginalized small holder farmers who depend partly on rain-fed subsistence production and partially on cash earnings from selling surplus and wage labour (WWAP 2006). In most cases all these sources of food are inadequate and cannot be depended on to sustain livelihoods. The poverty of rural people is generally characterized by lack of different assets which prevent them from accessing the fiscal capital they need in order to boost their productivity and they characteristically reside

in inaccessible areas with scant access to markets and services (WWAP 2006). All these restrictions make them extremely susceptible to shocks especially those linked to climate change. In communal areas malnutrition is also rampant because it is mostly associated with food insecurity. According to FAO (2003) malnutrition is associated with food insecurity because diets of people who are incapable of satisfying all their food needs have high percentage of staple foods whilst lacking the diversity crucial for nutritional needs.

2.2.2 Effects of climate change on food security in communal areas

Manyatsi et al (2010) asserts that climate change refers to the long-term momentous alteration in the average weather that a given constituency experiences. Climate change goes hand in hand with climate variability which refers to deviation in the mean state and other figures of climate on all temporal and spatial scales beyond that of individual weather events (Bates 2007). Food insecurity and widespread poverty in rural areas particularly of African countries are inextricably related to low agricultural productivity exacerbated by climate change and variability (Gukurume 2013). Of late, climate change has presented overwhelming challenges to the agricultural sector and its sustainability in many third world countries like Zimbabwe.

All four facets of food security which are food accessibility, food utilization, food availability and food systems stability are affected by climate change (Gregory *et al* 2005). Climate change impact on food production, livelihood assets, human health and food distribution channels, as well as changing buying power and market flows. The impact of climate change are both long term, caused by altering temperatures and precipitation patterns, and short term, resulting from more frequent and more intense extreme weather events (Gregory *et al* 2005).

Most communal areas particularly in developing nations depend on agriculture-based livelihood systems for survival. Stevens *et al* (2003) argue that most of these agriculture based livelihood systems are rain fed which makes them become more vulnerable to food insecurity due to impacts of climate change. According to Stevens *et al* (2003) they face abrupt risk of augmented crop failure, new patterns of pests and diseases, lack of proper seeds and planting material and loss of livestock. Chazovachii *et al* (2012) cited that owing to global warming, rainfall declined by 8% resulting in augmented mid-season dry spell durations in sub-Saharan Africa. Of Zimbabwe's 32 million ha of agricultural land, 16,4 million ha are in communal areas where smallholder peasant farmers resides, whose livelihoods are dependent upon tilling the land under rain fed conditions (Gukurume 2013).

Therefore a scenario cited by Chazovachii *et al* (2012) above meant that most smallholder peasant farmers in communal areas of Zimbabwe are directly threatened by food insecurity and poverty given their direct dependence on agriculture for livelihood.

Devereux and Maxwell (2001) argue that climate change may lower agricultural production owing to alterations in average temperature or precipitation particularly in African countries. A study undertaken by Gukurume (2013) in Bikita, Zimbabwe revealed that increase in temperatures, dwindling soil moisture and fertility, declining rainfall and shortening of the crop growing season have coalesced to impinge on agricultural productivity in Bikita making people susceptible to food insecurity. Erratic rainfall thus hindered the production of agriculture particularly in regions that naturally receives very low annual rainfall like Bikita, given the reality that water availability is a key element of agricultural productivity and by annexe food security. Slater *et al* (2007) supports this by arguing that without the adoption of crop rotation and improved water conservation techniques agricultural production could decline by 10-25percent by 2020.

Biophysical factors, such as plant and animal growth, biodiversity, nutrient cycling and water cycles, and the ways in which they are controlled through agricultural practices and land use for food production are manipulated by climate change variables (Stevens *et al* 2003). Climate variables impact also on human or physical capital, such as productive assets, storage and marketing infrastructure, electricity grids, houses, human health and roads, which ultimately changes the economic and socio- economic factors that administer food access and use and can threaten the stability of food systems. To support such arguments (Gregory *et al* 2005) assert that evidence from many studies show that more frequent extreme weather events such as droughts, heavy storms, escalating irregularities in seasonal rainfall patterns together with flooding, heat and cold waves, are already having direct impact on food production, food distribution infrastructure, incidence of food emergencies, livelihood assets and human health in communal areas. More so less abrupt impacts are anticipated to result from gradual alterations in mean temperatures and rainfall which have an effect on the suitability of land for different types of crops and pasture, the health and productivity of forests, the incidence and vectors of different types of pests and disease, the availability of good quality water for crop and livestock production (Devereux and Maxwell 2001).

Arable land is being lost due to escalating aridity, sea level rise and groundwater depletion. Decreases in the availability of wild foods, and restrictions on small-scale horticultural production due to scarcity of water resulting from climate change could impinge on nutritional status negatively. In general, however, the main impact of climate change on nutrition is likely to be felt indirectly, through its effects on income and capacity to purchase a diversity of foods (Butt *et al* 2005).

2.3 Food and nutrition changes and community gardens

Community gardening is one type of agriculture that has seen remarkable growth in the previous few decades (Irvine, 1999; Zimmerman, 2008). According to Ecolife (2011) and American Community Garden Association (2007) a community garden is a portion of land gardened communally by a group of people. Today, several communities in the world have animated and ever-expanding community gardening programs, which stand for one part of a bigger, community-wide response to community food security. These community gardens followed the diffusion theory in which they were diffused from developed countries like Canada to developing countries like Zimbabwe with the communal goal of achieving food security.

Malakoff (1995) argues that need for emergency food rose from 25 million pounds in 1979 to 450 million pounds in 1990 in United States of America (U.S.A). This caused many communities to start identifying the risks of relying mainly on U.S.A federal aid programs especially when they have not been predictably funded and cannot deal with the problem of access, no matter their degree of funding. As an outcome, food security campaigners have started to advocate for better food self-sufficiency and rethinking broader food production and consumption patterns (Bellows and Hamm 2002). Therefore as an alternative of inactively relying on external aid to help the famished, food security movement activists lay emphasis on community self-sufficiency and empowerment in addressing nutrition linked problems. Bellows and Hamm (2002) assert that in order to achieve this aim community food security activists have focused on the production of food through a more local and sustainable system. Community gardening has been at the forefront of the advocacy efforts of the Community Food Security Coalition to combat food insecurity in the United States (Bellows and Hamm 2002). This innovation of adopting community gardens to enhance food security in communities was later diffused to other nations that include Zimbabwe.

Of course community gardens differ a lot in what they offer according to local needs and situation (Ferris 2001). Community gardens can be developed to deal with many priorities and goals, which include improving community food security, crime reduction, community development, sustainable communal design, and environmental education. However the major aim in communal areas is achieving food security which is affected by effects of climate change especially in developing nations where rain fed agriculture is dominant. Armstrong (2000) conducted research on 20 community gardening programs in Upstate New York, United States of America which explored motivations for participations in community gardening and the most commonly expressed reasons were for health benefits and food security. Gukurume (2013) conducted a study in Bilkita, Zimbabwe which revealed that community gardens were being supported by NGOs in the communal area of Bikita in an endeavour to improve food security and adapt to the negative consequences of climate change and variability on food security. Following the diffusion theory it is apparent that most individuals are persuaded to adopt the concept of community gardens due to its advantageous results or benefits of increasing food security which has a positive impact on health. Kantor (2001) accounted that community gardening enhanced households food security through rising the quantity, quality, and affordability of food for local citizens.

Studies by Johnson and Smith (2006), Wakefield *et al* (2007), Alaimo *et al* (2008) and Lackey and Associates (2009), all stated that community gardeners and those residing with community garden participants eat more fruits and vegetables than their non- gardening counterparts. For instance, a Vitamin A survey conducted in rural Bangladesh illustrated that children of non-participants in community gardening were at greater risk of vitamin A deficiency than children of participants in community gardening (HKI/AVDRC 1993). A study undertaken by Sithole *et al* (2012) in Bulawayo, Zimbabwe showed that 80% of community garden participants depended on harvested vegetables from their gardens meaning high levels of self sufficiency in vitamins. Gardening enhances the variety of foods which generally results in improved utilization of nutrients. They also can be a source of supplementary earnings, when a proportion of the garden produce is put on the market, which is commonly used to procure extra food items thereby escalating the diversification of the diet (Kantor 2001). Participants in community gardens established by Rural Self Development Association, a local NGO in Nyanga, revealed that besides growing vegetables for family consumption they also grow fruit trees and vegetables for sale and make a living

out of the initiative (Masekesa 2014). Thus community gardens are very crucial in surmounting seasonal availability of foods and they maintain household self-reliance.

2.4 Community gardens, food security and climate change

Hallberg (2009) asserts that the food security movement has centred on the problems of distribution and earnings in bid to deal with food insecurity. The impediments to access sufficient foods have resulted in societies across the nations anguishing from food insecurity. The situation is further aggravated by the fact that most livelihoods in communal areas especially of developing nations depends on agriculture which is climate dependent. Climate change effects have caused decreases in the production of the agriculture sector particularly the one that is climate reliant. Only reliable and strong adaptation strategies can be utilized in order to sustain the production in the face of climate change. Hallberg (2009) argue that local governments, NGOs and community development organizations have a chance to play a crucial role in achieving food security in their communities as they can support a range of programs that permit their low income citizens to get better access to nourishing foods. The author further asserts that the variety of programs to fight food security may require outside assistance from organizations with large funds. Community gardening is one innovation that has been implemented to improve food security of communities by adopting different conservation farming mechanism to counteract effects of climate change. Hallberg (2009) argues that community gardens enhance food security by escalating the availability of nourishing foods to low income urban citizens. In developing nations most of the community gardens implemented in communities are donor funded. In Zimbabwe, for instance, foreign NGOs that have established and funded community gardens include Care International, Caritas, Action Faim while local NGOs include Rural Self Help Development Association (RSHDA) and Shurugwi Partners.

2.4.1 Performance of community gardens in enhancing food security

For communal and low income societies, to augment access to dietary foods, community gardening is a cost effectual measure. For instance the study undertaken by Rudd Report (2008) in the metropolitan of Cleveland in 2008 revealed that participants in about 200 gardens produced more than \$2.1 million value of produce that provided every neighbourhood with healthy and nourishing foods. Doron (2005) asserted that in community gardens \$6 of vegetables is attained for every \$1 spend. A research undertaken by Brown and Carter (2003) at one garden in Philadelphia has shown that average annual savings are \$700 per family. Given such approximations from different studies it is apparent that community

gardens investment provides considerable fiscal returns per dollar invested which enhance at large the food security of a society since other dietary supplements can be purchased from the profits. More so in terms of access Masekesa (2014) revealed that participants in community gardens established by RSHDA in Nyanga spoke loudly arguing that they no longer had to travel long distances to access vegetables, even when they were sick they could still pick vegetables in their gardens nearby their homestead hence these gardens lifted their families out of hunger.

In communal, low income areas susceptible to food insecurity citizens have higher risk of cancer, diabetes, asthma, heart disease, stroke, obesity and other chronic health issues (Salomon and Shenot 2006). This is caused by lack of sufficient access to nutritional foods and results in poor diets. Hallberg (2009) asserts that lack of access to dietary foods in low income areas has resulted in poor diets that are high in caloric intake yet insufficient in nutrients. The author further argues that the vital stride towards curtailing chronic diseases related to poor diets is guaranteeing access to healthy nutritious foods in the most susceptible areas. Fresh fruits and vegetables that are tasty are offered by community gardens which make gardeners to consume more of them than non gardeners; however the latter can also acquire these vegetables at a relatively cheap price (Doron 2005). Given such an argument by Doron (2005) it is apparent that whilst community gardens augment food security they also offers vegetables that are nutritious thereby improving health. A study undertaken by Sithole et al (2012) concluded that community gardens in Bulawayo city provided food security and livelihoods security for beneficiaries who have been affected by the negative impacts of the unsteady socio-economic environment in Zimbabwe. More so, Masekesa (2014) revealed that community gardens launched by RSHDA in Nyanga Ward 18 have changed the economic and social face of the community.

2.4.2 The potential of community gardens as a strategy to counteract climate change

Bates (2007) asserted that there should be innovative solutions that merge climate change mitigation and adaptation with consideration to local development requirements in a bid to generate momentous co-benefits. The implementation and upholding of sustainable, secure and multi-functional community gardens is one of the innovative strategies that meet this need. Following the diffusion theory it becomes apparent that the innovation of community gardens is being diffused with attention to local development needs of enhancing food security, nutrition and income in a society at the same time mitigating challenges of climate change to farming by introducing adaptation methods.

Authors like Sanchez (2005) argue that gardening alone cannot solve the calamity posed by global climate change since gardeners manage very little land. This presupposition however does not imply that it is insignificant because collectively gardeners actions can have a major impact and ultimately make our communities sustainable (Harris 2009). Moreso Masekesa (2014) asserts that Rural Self Help Development Association, a local NGO in Zimbabwe, instigated rural community gardens projects in Nyanga to deal with challenges of altering weather conditions, dependence on rain fed agriculture and severe land degradation that had caused a decrease in food production and rampant poverty. The author further asserts that the community gardens are effectively used to grow food in harsh climates making the best use of poor soils. Given such an assertion it is apparent that community gardens can play a pivotal role in enhancing food security by introducing adaptation strategies that can deal with effects of climate change.

Harris (2009) argue that community gardening can play a strong role in augmenting food security, improving the surrounding climate while invigorating the productive recycle of organic wastes and dropping the energy footprint. For instance community gardening, agriculture and forestry were acknowledged as having high prospective for urban adaptation to climate change and recuperating the urban environment at the International Tripartite Conference on Urban Challenges and Poverty Reduction in African, Caribbean and Pacific countries (UN- HABITAT, 2009). Community gardens allow the production of fruit trees and vegetables which enhances biodiversity and evapo-transpiration whilst capturing carbon dioxide and dust thereby acting as carbon sinks reducing the carbon footprint of an area. Reid and Satterthwaite (2007) argue that as trees mature they can absorb and store as much as a ton of carbon dioxide, a greenhouse gas mainly accountable for global warming. These authors further assert that if all of America's 91 million gardening households would plant just one fruit tree or young shade tree, 2.25 million tons of carbon dioxide would be absorbed each year. By enhancing evapo-transpiration trees can promote the water cycle and ultimately resulting in rainfall.

Roberts (2001) argue that community gardening allows the production of fresh vegetables and fruits close to communal areas hence less energy is utilized for long-distance transportation, storage and packaging. The recycle of organic waste in community gardens through the process of composting reduces the emission of methane from dumpsites and energy utilization in the manufacturing of fertilizers which in turn facilitates the recycling of nutrients. Birch and Wachter (2008) purport that composting can drastically diminish the

input to global warming pollution, particularly methane, a highly potent greenhouse gas and provides a source of nutrients decreasing the need for fossil fuel based pesticides and fertilizers. Diminished dependence on fossil fuels by promoting organic farming ultimately reduces pollution such as carbon dioxide emission. Mulching is also exercised in community gardens which tackle the challenge of water shortages due to unreliable rainfall posed by climate change through conserving and retaining moisture. In addition to that, community gardens are very effective in managing storm water runoff by making use of rainwater, which would have else turned into runoff, as a resource for food production. Roberts (2001) argue that generally gardens absorbs 15% extra rain water than lawns or vacant land.

2.5 Community gardens sustainability, food security and climate change

People have the ability to grow their own food in community gardens which assists in decreasing the dependence on emergency supplies at the same time increasing the poor's access to nutritious foods (Salomon and Shenot 2006). Once community gardens are managed successfully they are sustainable in enhancing the food security of a society. Hallberg (2009) asserts that there are numerous challenges that should be dealt with before community gardening can be executed effectively that consist of assuring land tenure and start up costs because these limit the aptitude of community members to create and sustain gardens. In most developing countries because of lack of funds community gardens are usually funded by different nongovernmental organisations from developed nations. However such gardens have been seen to flourish only during times of funding and once the donor departs the gardens either reduce the capacity at which they were operating or cease to exist at all.

Redland City Council (2010) postulate that the initiation of community gardens mostly takes two approaches which are bottom-up approach and top down approach. Bottom-up approach is where the community leads the process of initiating community gardens and top-down approach is when government associations or private sectors start the idea of community gardens (Redland City Council, 2010). The bottom-up approach is more effective in the long term because there is stronger feeling of ownership by the community since all members put in all their input and effort to develop the gardens. However, the top-down approach may alienate community members as initiators do most of the work affecting the sense of ownership by the community unless a participatory and community development approach is fostered in all stages of implementing community gardens. Therefore to ensure sustainability of community gardens there is need for an effective participatory strategy at every stage

because it builds a sense of involvement and ownership from the community. More so Hallberg (2009) assert that effective management and resource availability are very crucial for the sustainability of community gardens after handover to community ownership.

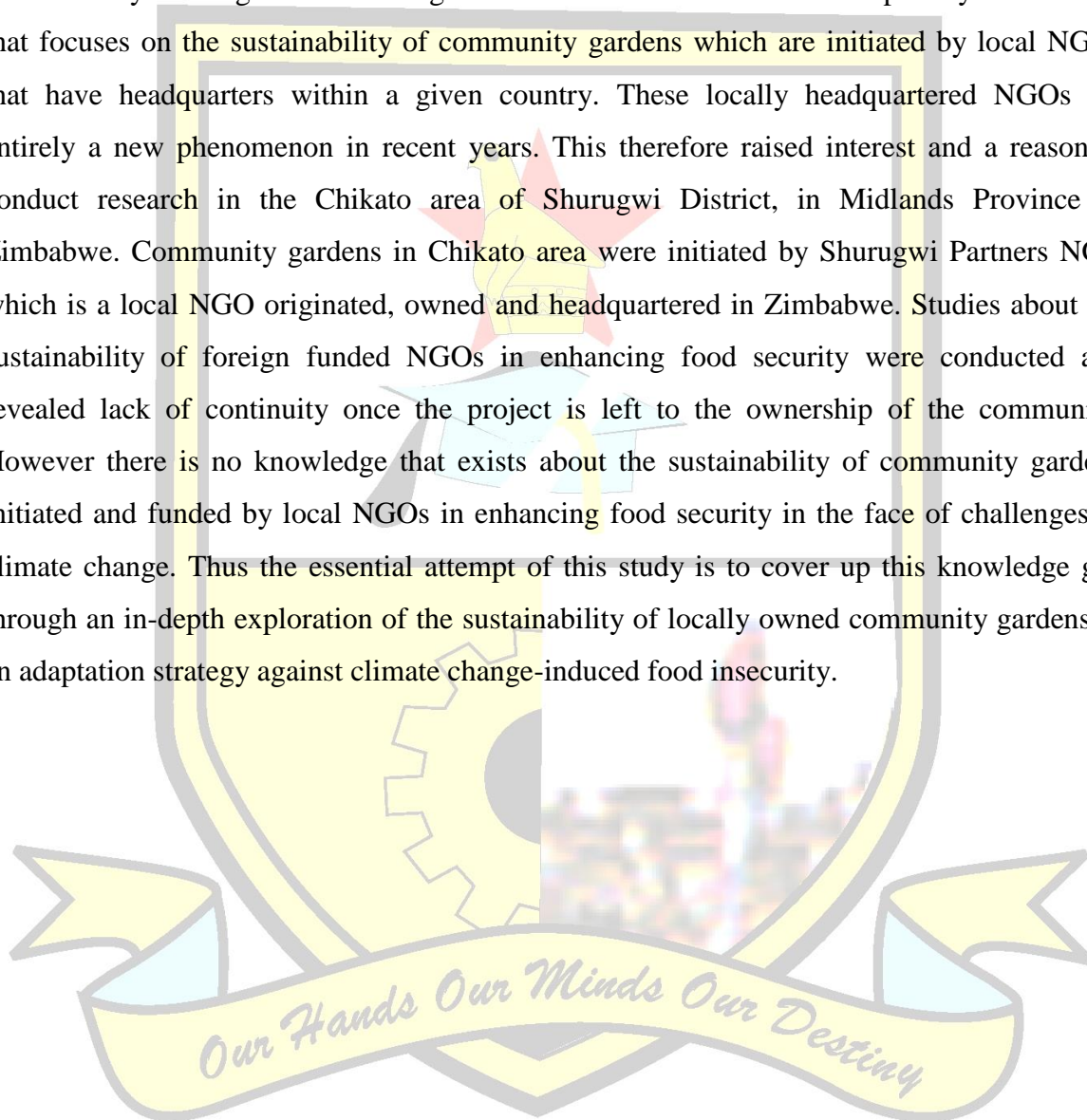
In Zimbabwe a study undertaken by Matsa and Dzawanda (2014) of Caritas sponsored community gardens in Chirumanzu District has shown that gardens burgeoned only during Caritas reign but hastily shrank and even collapsed after the NGO departure. Given such results the sustainability of community gardens in enhancing food security of a community becomes questionable. Instead of creating sustainable communities by empowering them to stand on their own after handover of the project to the ownership of the community, some of these NGO sponsored community gardens in developing nations are creating and exacerbating the dependency syndrome. The major challenge as revealed by Matsa and Dzawanda (2014) is that such NGOs fail to do strong capacity building training within the community so that they can manage and maintain these gardens on their own once funding stops hence they view the running of the project as the responsibility of the donor. Therefore, for community gardens to be a sustainable innovation diffused in a society to assist in solving climate change related food insecurity, there is need for proper management involving the influential local leaders in all activities so that the adopters can quickly espouse the projects as theirs and beneficial to them (Matsa and Dzawanda 2014).

2.6 Literature knowledge gap

Many studies have been undertaken by different scholars concerning the issue of community gardens in addressing different situations in societies. Armstrong (2000) conducted research about the motivations for participation in community gardens which revealed enhancing food security and improving health of people as motivation towards implementation of community gardens. Gukurume (2013) conducted research in Bikita, Zimbabwe and concluded that NGOs were supporting community gardens in the area with the aim to improve food security. Hallberg (2009) conducted research of community gardens in Toronto and Philadelphia and he talked about challenges faced in implementing community gardens that limit the ability of community members to create and maintain gardens but did not go further to explore the sustainability of such gardens in ensuring food security in the long run and challenges that need to be addressed to sustain such gardens. Matsa and Dzawanda (2014) conducted research in Chirumanzu Caritas community gardening projects about foreign supported community gardens. The results revealed that the community developed a dependency

syndrome where by the projects only thrived during the support of the donor and collapsed when it was handed over to the ownership of the community.

It is paradoxical that while there is capacious literature on the sustainability of community gardens that are initiated by foreign NGOs little has been done to understand the sustainability of community gardens initiated by locally headquartered NGOs in enhancing food security. It is against this background that the researcher observed paucity on research that focuses on the sustainability of community gardens which are initiated by local NGOs that have headquarters within a given country. These locally headquartered NGOs are entirely a new phenomenon in recent years. This therefore raised interest and a reason to conduct research in the Chikato area of Shurugwi District, in Midlands Province of Zimbabwe. Community gardens in Chikato area were initiated by Shurugwi Partners NGO which is a local NGO originated, owned and headquartered in Zimbabwe. Studies about the sustainability of foreign funded NGOs in enhancing food security were conducted and revealed lack of continuity once the project is left to the ownership of the community. However there is no knowledge that exists about the sustainability of community gardens initiated and funded by local NGOs in enhancing food security in the face of challenges of climate change. Thus the essential attempt of this study is to cover up this knowledge gap through an in-depth exploration of the sustainability of locally owned community gardens as an adaptation strategy against climate change-induced food insecurity.



CHAPTER THREE: METHODOLOGY

3.1 Research Design

Research design is a plan of how to conduct research and gives direction of the research. Neuman and Hirsch (2002) define research design as the format and structure under which the study will be carried out. Both qualitative and quantitative approaches were employed by the researcher resulting in data triangulation where questionnaires, interviews, focus group discussions and observations were utilized. Data triangulation enabled the researcher to look at information from more than one stand point. The research was undertaken in Chikato area of Shurugwi Rural District.

Qualitative research model involves the use of non-numeric data to describe and generate an understanding about a given phenomenon (Struwig and Stead 2001). Qualitative research allowed the researcher to gain an understanding of people's views, opinions and interpretations, focusing on the participant's viewpoint since reality is subjective. Qualitative data pertaining to the food regime of the community before the inception of community gardens and; food and nutrition changes introduced by the gardens was obtained through observations, open ended questionnaires and interviews that were conducted by the researcher. Qualitative approach enabled rigorous capturing of data on the performance of community gardens in enhancing food and nutrition security to counteract challenges of climate change to date. This enabled the researcher to have a better understanding of local culture, politics, economics, social aspects and how they affect the progress of community gardens in Chikato area. Furthermore qualitative approach bestowed the opportunity to conduct research in a natural setting making use of various interactive and humanistic methods and also gave flexibility to the researcher. In this study quantitative data collected was used to support qualitative data.

Quantitative research design is the collection and analysis of numeric data (Newman 2000). Quantitative research model is merely based on the premise that social phenomena can be quantified, measured and expressed numerically, making the data liable to be analyzed by statistical methods. Data for quantitative research is measurable hence was obtained through pre existing database and closed questionnaires administered to respondents. Quantitative research was used in coming out with statistical graphs on the number of beneficiaries involved in community gardening, production level per year and incomes obtained from selling crops.

3.2 Target Population

Target population is the whole group of individuals or objects to which researchers are attracted in simplifying conclusions (Newman 2000). The targeted populations for this research were the 210 households in seven community gardens of Chikato Ward 7 of Shurugwi Rural District and the key informants in the area namely; Chief Executive Officer of Rural District Council, Director of Shurugwi Partners, Agriculture technical extension (Agritex) ward officer and Environmental Management Agency (EMA) Officer.

Households were targeted since they constitute the number of beneficiaries who are directly involved in community gardening, who happen to know the food regime before the commencement of community gardens and the food security and nutrition changes introduced by the community gardens. Information on the challenges of climate change to food security that was counteracted by community gardens is also known by the households.

The Chief Executive Officer of Rural District Council (RDC) is the entry point of all developmental issues and takes part in supporting community gardens in collaboration with NGOs and AGRITEX through participating in workshops and other activities which support community gardening. Records of all improvements done in community gardening and the number of households benefiting from the projects together with timeframe of the project are kept by the council which makes them key respondents.

The ward officer for AGRITEX was crucial because he is responsible for the training of farmers on the types of crops to adopt based on suitability; has first hand information on community gardeners' daily experiences and works hand in hand with the project officer of Shurugwi Partners. Since the ward officer works with farmers in Chikato area, he had first hand information on the challenges that were introduced by climate change and how Shurugwi Partners intervened to curb the problems.

The Director of Shurugwi Partners was important because he is the one who established Shurugwi Partners and knows the motive behind establishment of community gardens in Chikato area. The criteria used to select beneficiaries and how they managed to make the community gardens to continue flourishing even without donor assistance is also known to him.

The District EMA officer was interviewed because EMA are the custodians of the environment. The officer knows which projects falls under EMA's prescribed list of projects

which must undergo Environmental Impact Assessment before their commencement. Since drainage of wetlands and irrigation schemes both fall under projects that requires Environmental Impact Assessment [EMA 1st Schedule (sections 2 and 97)], EMA district officer was therefore important in clarifying whether or not the project underwent a proper EIA process as required by law.

3.3 Sample size determination and sampling procedure

Crouch and Houseden (2001) define sample size as a limited number taken from a large group (the target population) for testing and analysis on the assumption that the sample can be taken as representative of the entire target population. Sampling was done in seven gardens of Chikato ward 7. These are Gwemombe garden in Mutodzaniso village, Mutsiba garden in Mutsiba village, Batanai garden in Zananda village, Green Valley garden in Chida village, Chomukaka garden in Zura village, Vindirai garden in Madungwe village and Chikato clinic garden in Mushaninga village. The researcher was given a beneficiary list for all the gardens by the councillor of the ward. The beneficiary lists had all names of the beneficiaries. These seven gardens had a total of 210 beneficiaries, 30 per each garden. A sample size of 30% of the population was used to represent the seven gardens with 210 beneficiaries. As a result 70 beneficiary households were selected. The sample size was chosen to increase the authenticity of the results (Crouch and Houseden, 2001). To get the sample size for each garden the number of beneficiaries per garden was divided by the total number of garden beneficiaries in Chikato ward and then multiplied by the sample size 70.

Thus, $30/210 \times 70$

$$= 10$$

Both probability and non probability sampling methods were employed in this study. Convenience sampling a non probability method was employed to select men and simple random sampling a non probability method was employed to select women. During the pre-survey of the study area the researcher observed that on average there were 18 women and 3 men at each garden. More so on the list of beneficiaries that was presented by the councillor men were fewer as compared to women. For this reason all men who were available during data collection in each garden were chosen conveniently by virtue of being present because they were fewer as compared to women so they all became part of the sample size. Thus, convenience sampling was used to select men to try to achieve some measure of gender balance without misrepresentation of men. To get the complete sample size, given that men

were fewer compared to women, simple random sampling of the hat format was employed to select women. This gave a full sample size of 10 beneficiaries per each garden. Simple random sampling was employed because it involves the selection of units from a population such that every attribute has an equal chance of being selected (Thompson, 2002). Every woman was assigned a number. Matching numbers to those assigned to women were written on small pieces of paper and put into the hat. The hat was shaken before the researcher randomly picked numbers from it once at a time. Women with same numbers as those randomly picked by the researcher from the hat became part of the sample size. This made the data collected representative of the population under study and gave a sample size of 70 beneficiaries to whom questionnaires were distributed for all the gardens.

3.4 Research Instruments

3.4.1 Questionnaire design and administration

Franklin and Osborne (1971) view a questionnaire as an instrument consisting of a series of questions designed to elicit responses which can be converted into measures of the variable under investigation. In this study questionnaires (Appendix 1) were used to extract data from garden beneficiaries. The researcher personally administered a total of 70 questionnaires targeting only the selected sample of beneficiaries in the study area with the help of research assistants. This made it possible for the researcher to interpret questions that were challenging to them.

After questionnaires were answered the researcher collected them to avoid losing the questionnaires if they stay uncollected for too long. Questionnaires were also employed owing to their easiness to compare and analyze data, anonymity which encourage truthful replies, and aptitude to get lots of data (Cooper and Schindler 2003).

To attain the above mentioned data, both closed and open ended questions were used. Closed ended questions restricted respondents to choosing answers only from particular options which made the data collected unproblematic to analyze, especially demographic data. Open ended questions gave the respondent freedom to decide on structure, point and extent of his or her answer.

3.4.2 Interviews

The researcher employed semi structured interviews to meet research objectives in order to gather information on performance of community gardens. Robson (1993) defines interviews

as purposeful conversations initiated by the interviewer for the specific purpose of obtaining research relevant information to satisfy set research objectives. Semi structured interviews were conducted with key informants from Shurugwi Rural District Council, Agritex, Shurugwi Partners and EMA. Interviews are flexible and allowed the researcher to probe for more clarifications and explanations during the interview in order to obtain the desired information.

The potential interviewees were contacted in advance and requests for the interviews were made. Specific time, place, duration and topic to be interviewed on the day of the interview were specified to avoid interference with interviewee's work schedules. The researcher personally conducted the interview using an interview guide consisting of a list of questions prepared before the interview day (Appendix 2, 3, 4 and 5). The interview guide enabled the researcher to avoid getting carried away and losing track of the discussion, which would have ended up compromising the quality of data gathered. Probing additional questions, pursuing on fascinating responses and exploration of principal motives improved the quality of data that was amassed by the researcher.

Notes were taken down during the interview process and a tape recorder was used to transcribe the conversation during the interview process. After the interview, the researcher expressed gratitude to the interviewee for goodwill.

3.4.3 Focus Group Discussions

Focus group discussions were employed in this study because group dynamics can provide important and more developed facts that individual data collection cannot supply. Morgan (1998) asserts that focus group discussion unearth bona fide opinions and issues; and give better off and extra deep information than individual interviews and surveys. Focus group discussions were employed in each garden to a group of 10 people on average as cited by Kumar (1987) that focus group consists of six to twelve persons. The remaining beneficiaries who were not part of the sample size were not left out but they became part of the discussants of focus group discussions. The focus group discussion was intended to get insights into beneficiary's perceptions about community gardens and elucidate responses obtained from questionnaires. The researcher facilitated the focus group discussion using the focus group discussion guide which consisted of list of questions to guide the discussion (Appendix 6). Notes were taken down during the focus group discussion. Audio recording of the discussion was done using tape recorder to transcribe the discussion.

3.4.4 Direct field observations

Dewalt and Dewalt (2002) state that observational research is a social research technique that enables researchers to learn about the activities of the people under study in the natural setting through observing and participating in those activities. Direct field observation was used in this study targeting mainly garden beneficiaries, vegetables grown, source of water, the site of the community gardens among others. This technique was applied to assess the performance of community gardens in enhancing food and nutrition security to counteract challenges of climate change to date in addition to the use of information obtained from written documents, questionnaires and interviews.

Observations were conducted using an observation checklist (Appendix 7) during field survey studying things like types of crops grown and their status. Photographs were taken using cameras as research tools.

3.4.5 Secondary data

The researcher reviewed literature published on the internet, books and newspapers about community gardens; and from Shurugwi Partners offices which include project documents, annual reports and project review reports on community gardens. The technique was vital in providing background information about the project under study, other findings from different studies and cross checking primary data that was collected in the field. Pictures obtained from published annual reports were very useful in comparing with pictures obtained from fieldwork to see whether there is any significant change in the production of vegetables in gardens from previous years.

3.5 Limitations of the study

Questionnaires posed the disadvantage of restricting respondents to suggested responses. However the researcher partially overcame this disadvantage by availing frequent space for clarification and further probing more explanations during focus group discussions. Since questionnaires are standardised, it was cumbersome and time consuming for the researcher to explain points in the questions that research subjects misinterpreted since the majority were elderly and illiterate. To lessen this challenge the researcher trained two research assistants who assisted in the administering of questionnaires. More so focus group discussions were used to give the elderly an opportunity to expound more information which they did not manage to deliver in questionnaires.

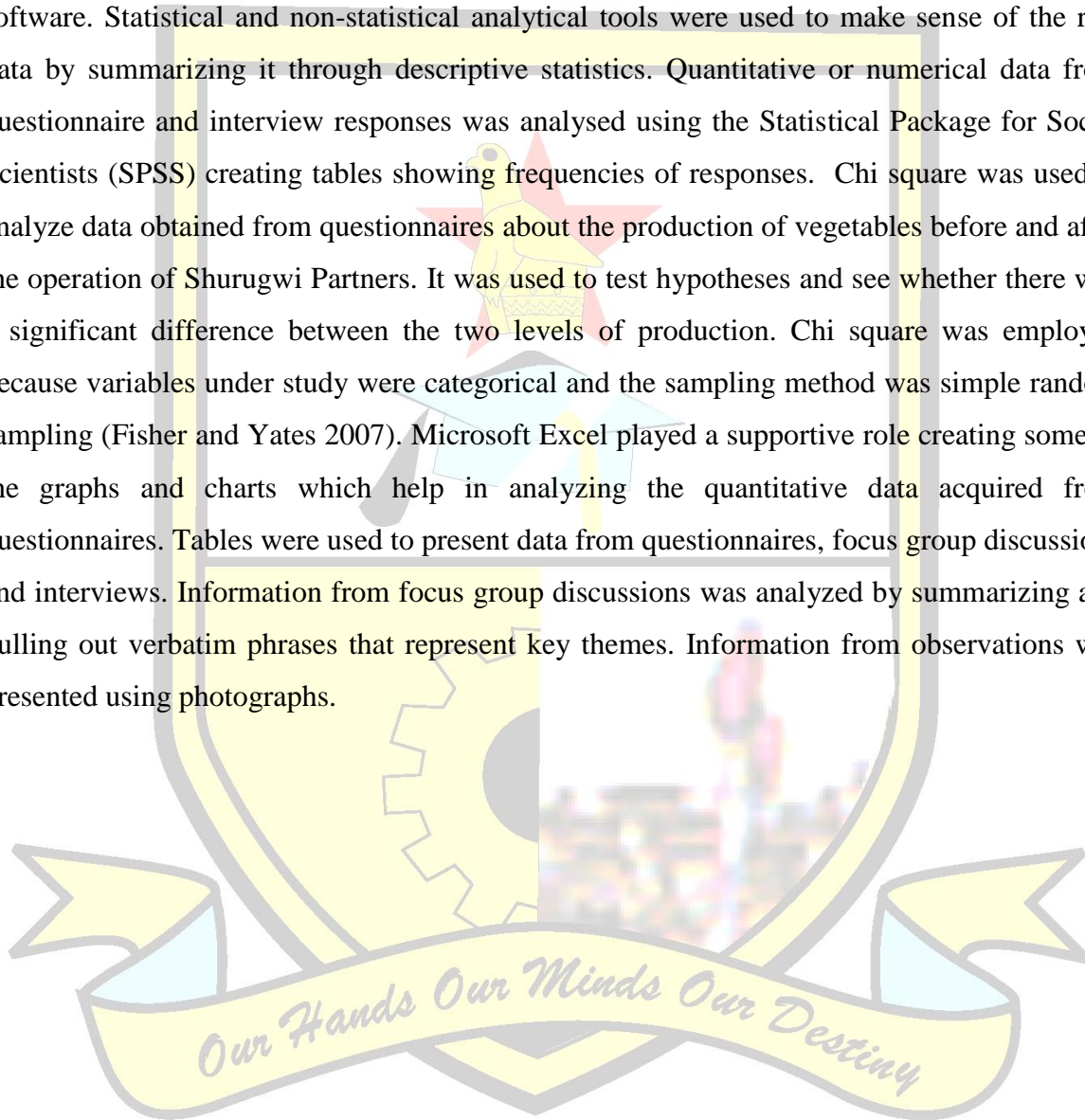
3.6 Ethical considerations

All appropriate protocol (social, cultural and legal) was followed before conducting the research. To avoid infringing the rights and dignity of research participants, the researcher informed all participants of the objectives of the investigation and all aspects of the research that might logically be expected to influence compliance to participate. Prior to participation, the research purpose and end-uses of the information were explained to the research participants. Respondents were given the opportunity to decide whether they wanted to participate or not. At the onset of each interview the researcher made it plain to participants their right to withdraw from the research at any time. The participants which included EMA officer, Agritex officer, Director of Shurugwi Partners and Chief Executive Officer of Rural District Council were given a consent form which they signed to show approval of participating in the research. The researcher sought permission from the Chief Executive Officer of Tongogara Rural District Council and the local headman to enter their area to carry out the study. Permission was also sought from the Director of Shurugwi Partners to get access to and study the community gardens. Research participants were treated with dignity and respect.

Participants were guaranteed that results of the study will be treated and presented in keeping with their individual preferences of whether they preferred anonymity or recognition. The name, address and telephone number of the researcher, the institution and Chairperson of the relevant Ethics Review Committee who may be contacted were provided to build trust among stakeholders. A letter from the Department of Geography and Environmental Studies was offered to the Director of Shurugwi Partners which served to confirm that the researcher is a student at Midlands State University and requested permission to carry out a research which was for academic purposes only. The researcher recognized the daily routines and cultural days of the community by carrying out the study during the resting days of the community to avoid infringing on their daily routines and chores knowing that they could give all their time to the research without the researcher disadvantaging them. Fieldwork was conducted during holidays considering the presence of school children at home assisting their elders with chores thereby giving them an opportunity to avail enough time for the research.

3.7 Data analysis and presentation

Working with original data is very cumbersome therefore the researcher coded the data obtained from questionnaires into a form that could be handled easily especially by computer programs and to make it unproblematic for the researcher to interpret the data. Hay (2005) asserts that data coding is an analytical process in which both qualitative and quantitative data is categorised to facilitate analysis by transforming it into a form understandable by computer software. Statistical and non-statistical analytical tools were used to make sense of the raw data by summarizing it through descriptive statistics. Quantitative or numerical data from questionnaire and interview responses was analysed using the Statistical Package for Social Scientists (SPSS) creating tables showing frequencies of responses. Chi square was used to analyze data obtained from questionnaires about the production of vegetables before and after the operation of Shurugwi Partners. It was used to test hypotheses and see whether there was a significant difference between the two levels of production. Chi square was employed because variables under study were categorical and the sampling method was simple random sampling (Fisher and Yates 2007). Microsoft Excel played a supportive role creating some of the graphs and charts which help in analyzing the quantitative data acquired from questionnaires. Tables were used to present data from questionnaires, focus group discussions and interviews. Information from focus group discussions was analyzed by summarizing and pulling out verbatim phrases that represent key themes. Information from observations was presented using photographs.



CHAPTER FOUR: RESULTS PRESENTATION

4.1 Socio demographic characteristics of research participants

Of the 70 questionnaires administered in seven gardens of Chikato area, 57 respondents were females and 13 respondents were males. The Director of Shurugwi Partners explained the rationale behind this being the fact that women were the marginalized group in the community hence they were targeted by the project. They also participated most in traditional household gardens which were consolidated by Shurugwi Partners as compared to their male counterparts. He further explained that the project targeted the disadvantaged group living with Human Immune Deficiency Virus (HIV), orphans and children. He mentioned that men are few in rural areas because of migration to urban areas in search of jobs. Their commitment and contribution to rural development projects is very low. Each community garden was represented by 10 people. The age of the research participants ranged from 18 to 50 and above. Of all the respondents that participated in the study the elderly (50 years and above) constituted 47.1 %, the middle aged within the age range 21-49 constituted 45.6% and lastly those within the age range of 18-20 composed of 7.1%.

In an interview, Director of Shurugwi Partners revealed that the elderly were the majority that used to operate in traditional gardens which were consolidated by Shurugwi Partners and they depend much on these community gardens for their livelihood especially in the face of diminishing harvests from agriculture due to climate change effects. The young had the least percentage and the reason was explained by the Councillor of the ward that most of them had left the community for greener pastures in towns. He mentioned that they integrated the youth officer in these gardens to motivate the youths to participate in community gardens so as to ensure sustainability and continuity when the elderly no longer perform competitively. The Director of Shurugwi Partners argued that the middle aged comprised a fair number because most of them were widows and widowers living in poverty therefore they tried to fight food insecurity by diversifying livelihoods in their traditional gardens which were later consolidated by Shurugwi Partners into community gardens.

The married constituted 57.1% of all the respondents. Information from the questionnaire revealed that most of these were elderly people who explained that they depended mostly on these gardens for their livelihood and nutritious foods as they had no other means of acquiring such vegetables because of poverty. The widows and widowers comprised 34.3% of the respondents. Results from questionnaires administered showed that most of these were

amongst the middle aged with limited source of livelihood. Those not yet married constituted 8.6% and these were amongst the young.

Forty nine percent (49%) of respondents had family sizes of between 4 to 7 people, 31% of respondents had family sizes of between 1-4 people and 20% of respondents had family sizes of above 7 people. Information obtained from questionnaires revealed that household headship was male dominated (54.3%). Female headed households comprised of 45.7% respondents and most of these are widows who took over the headship of the family after the passing away of their husbands. There were no child headed households from questionnaire response.

4.2: Chikato ward's food regime before the inception of Shurugwi Partners Community Gardens

4.2.1 Source of livelihood before inception of community gardens

Table 4.1: Source of food before SPCGI (N=70)

Source of livelihood	No. of respondents	Percentage %
Farming and livestock rearing	70	100
Traditional family gardens	45	64.3
Informal trading	10	14.3
Fishing	5	7.1
Gainful employment	4	6
Food for work	40	57.1
Knitting	2	3

The Chikato's community source of livelihood before the commencement of community gardens was mainly based on agriculture as shown in Table 4.1. The research participants however made it clear that the produce was inadequate to furnish their families with enough food for survival hence poverty was rampant. They explained that the main challenge was climate change effects that comprise of unreliable rainfall, extreme temperatures and the emerging of new pests and diseases that affected crop growth. This was worsened by the fact that the community largely depended on rain fed agriculture. Sixty four percent (64 %) of respondents explained that the individual traditional household gardens which supplemented agricultural produce were very small in size. Income to buy diversified vegetable seeds in

these gardens was difficult to acquire and lack of access to adequate water resulted in poor production. Plates 4.1 and 4.2 show the unproductive vegetable garden and unprotected source of water that sustained Mutsiba village households before the commencement of Shurugwi Partners Community Gardens.



Plate 4.1 Chigudu household garden without Water source

Plate 4.2 Unprotected water source used by Mutsiba villagers

(Source: Shurugwi Chikato Report, 2012)

Fifty seven percent (57%) of the respondents indicated that when the situation demanded they would resort to working for food where a small amount would be paid for the work done or sometimes in exchange for a portion of maize meal. Respondents also explained that this was inadequate because sometimes such opportunities would arise only once in a while, not regularly. Fourteen percent (14%) of the respondents indicated that informal trading was also a part of their livelihood where they exchanged poultry with agricultural produce. Fishing (7.1%), rearing and selling livestock (6%), knitting and selling (3%) and gainful employment (6%) were other sources of livelihood which few of the respondents indicated that they used to supplement their agricultural produce. Those who indicated that they were employed were working at Chikato Clinic and they joined the community garden of Chikato clinic which constituted of mainly the sick.

Eighty six percent (86%) of the research participants explained that most of their source of livelihoods was inadequate to provide enough food for survival and secure them from poverty. Their major reason was that their main source of livelihood which was farming depended largely on climate which had become very variable resulting in low harvests. Those who indicated that their source of livelihood was adequate to cater for their families were

mainly those with diversified sources of income and low family sizes. The Director of Shurugwi Partners indicated that the source of livelihood for the community was inadequate that is the reason Shurugwi Partners intervened. He explained that a large proportion of the population of the area had no access to the traditional household gardens. The Director also indicated that Ward 7 is a very dry area classified under region 3 of the natural regions of Zimbabwe and it depends on rain fed agriculture. This affects production considering unpredictable change of seasons and unreliable rainfall.

4.2.2 Types of vegetables consumed before the inception of Shurugwi Partners Community Gardens Initiative

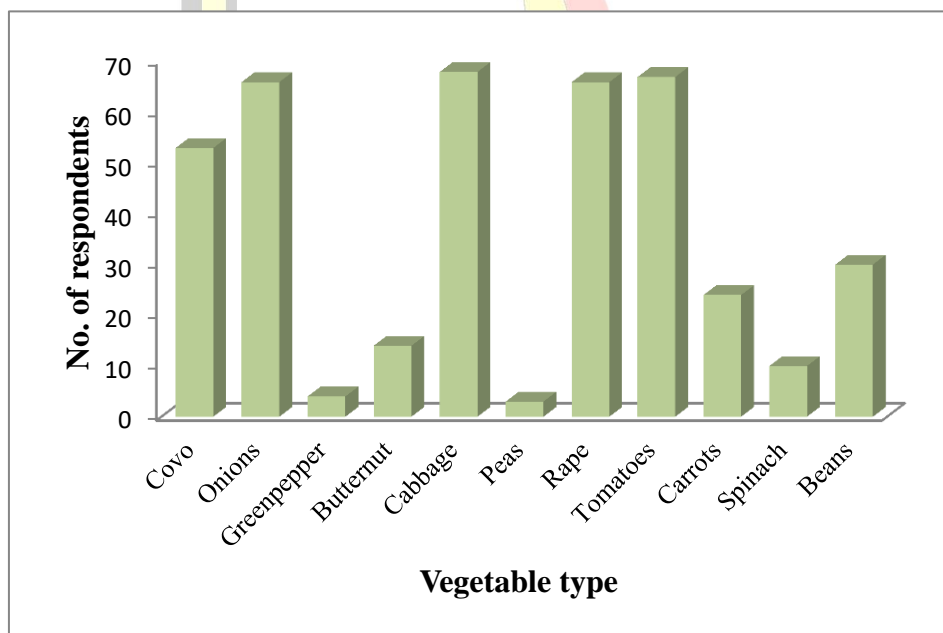


Figure 4.1 *Vegetables consumed before SPCGI*

Butternut, Green paper, Peas, Carrots and Beans constituted the least number of respondents who consumed these vegetables before Shurugwi Partners. The reason was revealed in focus group discussions that these types of vegetables were not readily available within the community therefore it was difficult to access the seeds hence their low consumption. The few who consumed such vegetables explained that they had opportunities to receive the seeds from their family members who reside in towns and some accessed such vegetables from NGOs during relief food aid. The majority consumed Cabbages, Tomatoes, Rape, Onions and Covo and indicated the seeds were easily accessible. Of note is the fact that no vegetable was consumed by all respondents.

The average estimated vegetable production generated from traditional family gardens annually was very low. Fifty six percent (56%) of respondents indicated that they produced around 20 kilograms of vegetables annually, 17.1% said they produced around 30kilograms, 19% produced around 40kilograms and lastly 8.6% produced around 50kilograms. Respondents argued that the major reason for poor production in family gardens was that income to buy diversified seeds was very challenging. Water scarcity was also a major challenge to offer better harvests to the extent that in some seasons they would produce nothing. Councillor of the ward explained that most of the gardens were very small to produce profound harvests, worse still their security was very poor that livestock would constantly break in and eat the vegetables. These were the major reasons why respondents would get very little income if any from the gardens. A beneficiary of Gwemombe garden, Tobius Musambasi was quoted saying “there was really nothing to sale from the traditional household gardens, the produce was too little to support my family throughout the year”. Very few respondents (30%) indicated that \$3 per week was the highest amount they would obtain if they manage to produce for sale but if the vegetable produce was high, which rarely occurred, they would get \$5. The majority of respondents (70%) indicated that they had no income from traditional household gardens because the produce was too little to sale.

During periods of unforeseen events like droughts, 99% of respondents revealed that they would get support from NGOs like Oxfam and Christian Care which offered a variety of food aid items such as beans, cooking oil, mealie meal, money and peas. Twenty nine percent (29%) of the respondents affirmed that the government would also intervene by providing maize meal and forming alliances with these NGOs so that they assist.

4.3 Food and nutrition changes introduced by Shurugwi Partners Community Gardens Initiative in Chikato Ward.

4.3.1 Benefits attained from Shurugwi Partners Community Gardens Initiative

One hundred percent (100%) of respondents stated that community gardens diversified their source of food and increased nutritious foods, improved health status and income, and lastly they were a form of employment to the rural poor. Respondents indicated that Shurugwi Partners introduced different types of crops that were not easily accessible to the majority. These included Green Pepper, Peas, Butternut, Fruits, Beans and Carrots. They emphasized that this improved their health status especially the sick beneficiaries from Chikato clinic and the elderly. Vegetables that are grown in community gardens established by Shurugwi

Partners are Rape, Beans, Rape, Tomatoes, Carrots, Butternut, Cabbage, Peas and Beans. Fruits grown are Oranges, Guavas and Naartjies. The Agritex officer indicated that there was an increase in nutrients uptake of vitamin A and C, potassium, fibre, iron and folate. This reduced the risk of many chronic diseases like heart diseases, cancer, stroke and diabetes. The respondents also indicated that they are allowed to grow any type of vegetable accessible to them even if not offered by Shurugwi Partners hence they also grow pumpkins, and cucumbers. Fifty one percent (51%) said that they also grow green maize and sweet potatoes to supplement their food.

The Ward 7 councillor, Phebeni, indicated that community gardens are a huge success, they can support at least the production of seven varieties of vegetables per beneficiary thereby ensuring nutritional diversity. He further stated that each garden produces adequate harvests to provide for a family of nine and he has observed beneficiaries sending children to schools with the income they attain from selling their vegetables. The chairperson of Gwemombe garden Siboneni Chikudzumbi explained that in their garden there is a beehive project and orchard development which is also part of the garden (Plates 4.3 and 4.4). The Director of Shurugwi Partners indicated that they worked with Forestry Commission on orchard development and launching of bee keeping at Gwemombe garden. The councillor stated that Gwemombe garden was assisted with 30 fruit tree seedlings to plant in the orchard that include Oranges, Lemons and Naartjies.



Plate 4.3 Chairperson of Gwemombe garden Siboneni Chikudzumbi showing one of the beehive projects.

(Source: Field data, 2015)



Plate 4.4 Orange tree grown in Gwemombe garden orchard.

4.3.2 Production from community gardens

To ensure that the gardens produce good harvests, the Director of Shurugwi Partners explained that there are factors that they considered in relation to location of gardens. Factors considered were availability of water, the terrain of the landscape, whether it encourages erosion or not, the density of vegetation and type of soil in terms of water holding capacity and fertility. Other factors included the proximity of the intended beneficiaries to the garden site since the majority of the beneficiaries are the elderly. They also observed traditional beliefs and norms whether the place is sacred or not.

He explained that they wanted to focus on organic farming so they targeted virgin lands avoiding the use of old land. This is because artificial fertilizer had been applied on the old lands hence they required long period of time without use so that they fit into organic type of farming. They worked with the Tongogara Rural District Council in terms of land allocation. Traditional leaders giving indigenous knowledge systems on land allocation contributed a lot on baseline survey. Environmental Management Agency assisted in pegging of plots. The Environmental Management Agency Officer indicated that they targeted wetlands to ensure they are utilized and preserved at the same time. Gardeners acquire water from wetlands whilst protecting them from extinction through fencing and the use of organic farming. He explained that areas with high stream bank cultivation and deforestation were also targeted to ensure there is only one standard garden established there to eradicate siltation, soil erosion and reduce deforestation. He also mentioned that the project did not go through an Environmental Impact Assessment (EIA) process because it is not prescribed under the list of projects which are supposed to undergo EIA.

One hundred percent (100%) of respondents from questionnaires confirmed that community gardens introduced by Shurugwi Partners are highly productive. Fifty percent (50%) of respondents stated that annually they produce 100 kg of vegetables, 36% produce 80 kg and 14% said they produce 150kg. Chi-square test was used to calculate whether there is a significant difference between the levels of vegetable production before and after the operation of Shurugwi Partners annually and results are shown in table 4.2

Chi-square formula

$$X^2 = \sum \frac{(O - E)^2}{E}$$

Where: **O** is the observed frequency of vegetable production in community gardens

E is the expected frequency of vegetable production before community gardens

Hypothesis is;

H₀: There is no association between SPCGI and level of production

H₁: There is an association between SPCGI and level of production

Table 4.2 Observed frequency and expected frequency.

Class	Observed Frequency	Expected Frequency	(O-E)	$\frac{(O-E)^2}{E}$
Gwemombe	100	28	72	185
Mutsiba	150	31	119	457
Chikato clinic	80	30	50	83
Vandirai	100	28	72	185
Chomukaka	100	31	69	154
Greenvalley	100	30	70	163
Batanai	80	30	50	83
				$X^2=1310$

Degrees of freedom (df) = Number of classes-1

$$= 7-1$$

$$= 6$$

Expected value = $\frac{\text{Total production before SPCGI}}{\text{Total no. of respondent (10 per garden)}}$

By statistical convention, 0.05 probability level is used as the critical value. If the calculated X^2 value is less than the 0.05 value, we accept the null hypothesis (H₀) and reject H₁. If the

calculated X^2 value is greater than the critical value, reject the null hypothesis (H_0) and accept alternative hypothesis (H_1). Using 5% probability to determine the critical value, the critical value at 6 degrees of freedom is 12.59.

The calculated X^2 1310 is greater than the critical value 12.59 we accept H_1 and reject H_0 . There is an association between Shurugwi Partners Community Gardens Initiative and level of production. Hence there is a significant difference between the levels of production in gardens before Shurugwi Partners Community Gardens Initiative (SPCGI) and those established by Shurugwi Partners. This means that there is a very low chance of producing the same quantities of vegetables in community gardens as those that used to be produced before SPCGI. The Intervention by SPCGI had a momentous impact on the production of vegetables in the community which improved their food security. Plates 4.5 and 4.6 show the production of community gardens established by Shurugwi Partners in Chikato community.



Plate 4.5 Beans production at Chomukaka garden
(Source: Field data, 2015)



Plate 4.6 Butternuts after harvesting and ready for market at Batanai garden
(Source: Shurugwi Chikato Project Report, 2012)

The Director of Shurugwi Partners stated that production increased as compared to what the gardeners were producing from traditional household gardens. He explained that in community gardens the first produce in 2011 was fair but started rising in 2012, 2013 and 2014. In 2015 he stated that production decreased just a bit from what they were producing since gardeners are now sourcing funds on their own, however the change is not significant.

4.3.3 Assistance received from Shurugwi Partners



Plate 4.7 Mutsiba Garden borehole and 2,400 litres capacity water trough



Plate 4.8 The gate, fence and treated poles offered to Gwemombe Garden



Plate 4.9 Deva dam weir collection point for Batanai and Green Valley gardens

(Source: Field data, 2015)

During focus group discussions respondents affirmed that each garden received seeds, garden tools like watering cans, boreholes, fencing material, treated poles, cement and equipment to build dam weirs and garden gates from Shurugwi Partners. The Director of Shurugwi Partners revealed that boreholes were constructed in Mutsiba and Chikato clinic gardens and dam weirs were constructed on Deva river for Green valley and Zananda Gardens, and on Gwemombe river for Gwemombe garden. Plates 4.7 and 4.9 show the borehole in Mutsiba garden and dam weir constructed for Green Valley and Zananda gardens. He explained that at Mutsiba garden people now use the borehole to access scarce water that was a challenge in the community for domestic purposes and at Gwemombe the dam weir that was constructed

now acts as a natural fish pond. He also stated that some of the community members were travelling more than 2 kilometres to the shopping center to fetch water at the borehole developed in the 1990s. The borehole constructed at Mutsiba garden is currently saving three villages with a daily average of 65 households fetching at least 40 litres of water each for domestic purposes and providing a total of 9,600litres of water for Mutsiba garden irrigation project per week (Shurugwi Chikato Project, 2012).

All gardens were offered treated poles and fencing material which last longer (Plate 4.8). One beneficiary from Zananda garden, Mutope Allison explained that the fencing material provided increased security of vegetables in community gardens as compared to traditional household gardens where livestock would constantly break in and destroy vegetables. This was another reason for the low production in household gardens.

Training was another benefit which the respondents alluded to as assistance they got from Shurugwi Partners. They got training in leadership and management, marketing, compost making, garden bed making and spacing, and specifically for beneficiaries from Gwemombe garden they got trained to create beehives. Agritex officer explained that they train farmers on intercropping vegetable varieties, natural methods of increasing soil fertility and integrated pest management. The Director of Shurugwi Partners indicated that they conducted training on market linkages, workshops on capacity building, operation and maintenance and production skills like designing a cropping calendar. He clarified that their major assistance for the community was sourcing of funds from donors and private sectors to upscale their activities. As such the provision of seeds, fence, watering cans, boreholes and dam weirs depended on the package of the donor per each garden. Mutsiba was financed by Netherlands, Gwemombe by Britain and Batanai, Chomukaka, Vandirai, GreenValley and Chikato clinic by Germany. EMA officer indicated that they trained beneficiaries on how to utilize and protect wetlands and the advantages of using organic farming both to the environment and in enhancing their production.

4.4 Performance of Shurugwi Partners Community Gardens in enhancing food security in Chikato Ward.

4.4.1 Challenges introduced by climate change in food security before SPCGI

One hundred percent (100%) of respondents indicated that effects of climate change that jeopardized their food security are unreliable rainfall, extreme temperatures, emerging of new pests and diseases. High temperatures and shortage of rainfall resulted in wilting of crops and

drying up of small streams. The councillor indicated that Tugwi River has shrunken in width and wetlands like Deva, Bumha and Chinho have withered. Respondents also said that sometimes excessive rains would occur causing the flooding of crops. Excessive cold also destroyed vegetables and together with all the aforementioned factors respondents stated that they failed to produce enough food to feed families. Seventy percent (70%) of respondents further explained that they were forced to keep food for their livestock especially cattle because most of the grasslands were no longer existent. The director of Shurugwi Partners indicated that the challenges which the community were facing from effects of climate change were total disruption of food production leading to poverty induced by low unreliable rainfall and water shortages.

4.4.2 Strategies introduced by Shurugwi Partners to adapt and counteract such challenges

Respondents stated that Shurugwi Partners introduced conservation methods of farming in community gardens to deal with the effects of climate change on the production of vegetables. They emphasized that they were encouraged to focus only on organic farming which ensure production whilst protecting the environment. In gardens which are a distant from rivers like Mutsiba and Chikato clinic boreholes were constructed to deal with the challenge of unreliable rainfall and water scarcity. More so this was to ensure production of vegetables throughout the year even in dry seasons unlike growing vegetables during the rainy season which they used to do. Sixty percent (60%) of respondents also testified that boreholes provided them with safe clean drinking water which was scarce to them, reduced prevalence of waterborne illnesses and significantly diminished the time women would spend in search of water. In gardens like Batanai, Greenvalley and Gwemombe which are close to rivers, dam weirs were constructed so that flowing water collects in these dams and makes it easy for gardeners to water their crops.

In addition respondents stated that they were trained by Shurugwi Partners in collaboration with Agritex on water conservation and water use efficiency strategies. The strategies are planting in furrows, mulching, applying vegetable residue and manure into the soil to lessen surface sealing, reduce water loss due to evaporation and facilitate infiltration by reducing soil compaction. Respondents stated that they were taught to add clay materials to enhance light garden soils moisture retention and organic matter given that clay is rich in nutrients. In an interview, the Agritex officer affirmed that besides improving water use efficiency, mulching and manure maintain and enhance soil fertility when they decompose and discharge

nutrients into the soil thereby improving soil water retention capacity as shown in plate 4.10 and 4.11.



Plate 4.10 Mulched peas at early germination stage at Chikato clinic garden (Source: Field data, 2015)

Plate 4.11 Application of goat manure to onion beds at Green Valley garden (Source: Field data, 2015)

The Director of Shurugwi Partners indicated that community gardens focus on organic farming to fight soil erosion, pollution and land degradation whilst enhancing production. He further asserted that fruit orchard development is a strategy to redress effects of climate change since trees play a role in carbon sequestration. Beekeeping was also meant to show the importance of trees thereby discouraging deforestation. Intercropping of vegetables was also another strategy introduced by Shurugwi Partners in community gardens and the Agritex officer asserted that intercropping is advantageous when nutrient and moisture stresses are more rampant.

Respondents indicated that they were taught various methods to deal with pests and diseases. At Gwemombe garden they stated that they incorporate bones residue from any meat when planting trees in the orchard, these bones attract ants which repel termites from destroying the tree plant. All respondents indicated that to deal with excessive cold which destroy vegetables they burn dry manure in used cans and the smoke that rise do away with the cold. Spraying ash in garden beds is also another method which was introduced by Shurugwi Partners to do away with termites as shown in plate 4.12. Respondents also stated that they were trained on methods of integrated pest management that includes crop rotation.



Plate 4.12. Ash sprayed in rape and onion beds to repel termites at Chomukaka garden (Source: Field data)

Respondents also explained that provision of fencing material by Shurugwi Partners assisted a lot in enhancing production because livestock used to constantly break into their former gardens due to shortage of grazing land caused by lack of rainfall, as they had no firm security. The diversity of vegetables introduced by Shurugwi Partners was alluded to as an advantage by respondents when they stated that the failure of one or two types of vegetables did not result in hunger as they grew many vegetable types.

The Director of Shurugwi Partners explained that to a greater extent the challenges of effects of climate change were solved especially to the families benefitting from community gardens. However he mentioned that taking the whole population of Chikato into consideration against the number of people benefitting there is need for collaboration with other ministries to train the whole community of Chikato on conservation farming. This is to ensure that the whole community have mitigation and adaptation strategies against effects of climate change by engaging in sustainable means of production. He also said that there is need for awareness campaigns for the whole community encouraging them to protect and utilize their water sources sustainably.

4.4.3 Changes that occurred since the operation of SPCGI

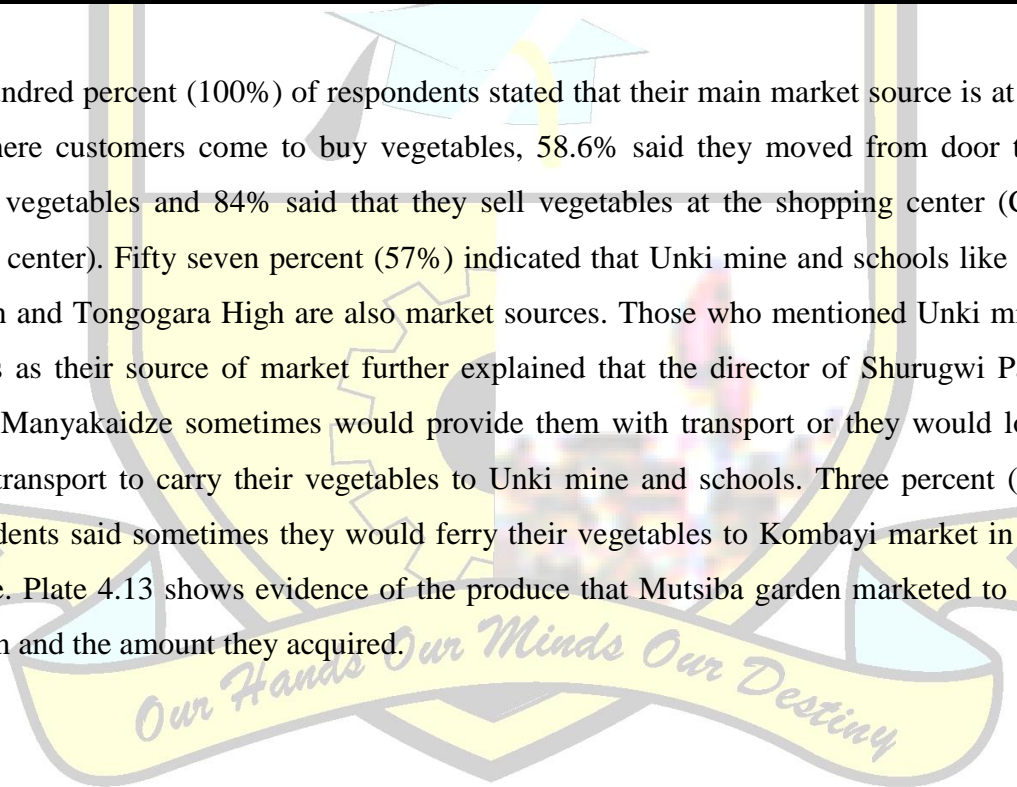
All respondents stated that community gardens are highly productive and since their operation production improved, income increased and food diversity increased. In terms of income before the commencement of community gardens, 30% of respondents indicated that at most they would get \$3 per week from selling vegetables. However since the initiation of community gardens, 100% of respondents said that they were producing surplus in gardens

for sale and their income increased as shown in table 4.2. The largest amount which respondents said they would attain per week is \$30 which had 14.3% respondents and the least amount was \$5 which had 28.6% of respondents. Fifteen dollars (\$15) had the largest percentage of respondents meaning income doubled five times from \$3 which some indicated they acquired before SPCGI.

Table 4.2 Income per week acquired by respondents from selling vegetables

Income Per Week				
\$	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 5	20	28.6	28.6	28.6
10	19	27.1	27.1	55.7
15	21	30.0	30.0	85.7
30	10	14.3	14.3	100.0
Total	70	100.0	100.0	

One hundred percent (100%) of respondents stated that their main market source is at garden site where customers come to buy vegetables, 58.6% said they moved from door to door selling vegetables and 84% said that they sell vegetables at the shopping center (Chikato service center). Fifty seven percent (57%) indicated that Unki mine and schools like Hankie mission and Tongogara High are also market sources. Those who mentioned Unki mine and schools as their source of market further explained that the director of Shurugwi Partners, Pascal Manyakaidze sometimes would provide them with transport or they would look for cheap transport to carry their vegetables to Unki mine and schools. Three percent (3%) of respondents said sometimes they would ferry their vegetables to Kombayi market in Gweru for sale. Plate 4.13 shows evidence of the produce that Mutsiba garden marketed to Hankie Mission and the amount they acquired.



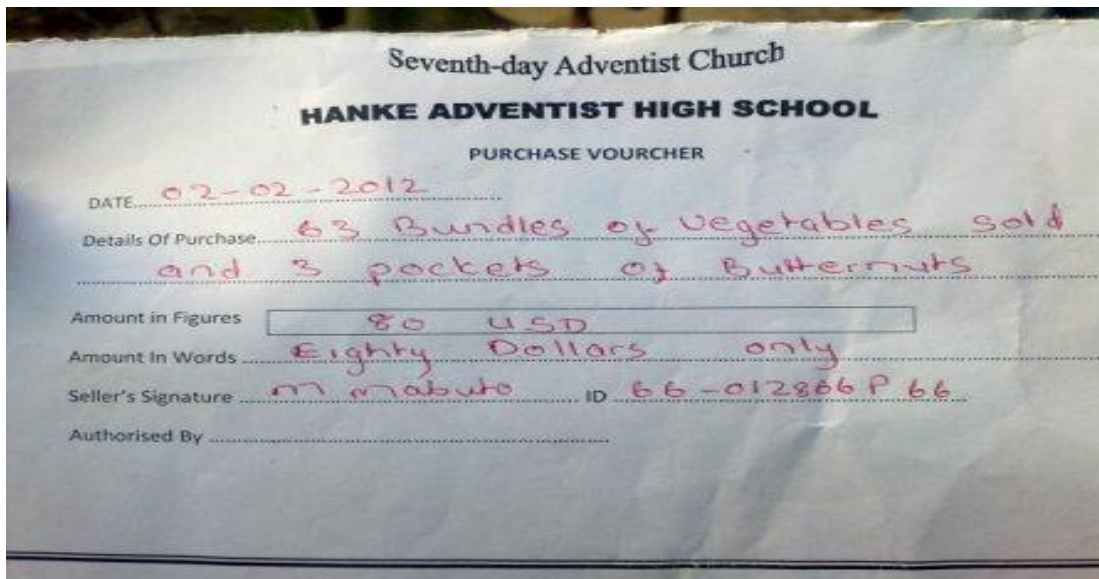


Plate 4.13 Recorded transaction of US\$80.00 in one day for vegetables sold to Hankie Mission from Mutsiba garden

(Source: Shurugwi Chikato Project Report, 2012)

Respondents also stated that the protection of the environment increased because the cutting down of trees for fencing over gardens reduced because of the provision of fencing material by Shurugwi Partners. This was confirmed by EMA officer who asserted that there is decrease in deforestation and decrease in degradation of wetlands as livestock no longer trample on wetlands as they are now protected. He also mentioned that besides improving living standards of the community, species were also protected because of the focus on organic farming by community gardens. Rivers were also protected from siltation by removing all the individual gardens which had mushroomed over riverbanks and having one standard community garden. He indicated that the fact that environmental awareness on its own increased in the community was a great success because that is a major factor to ensure sustainability of projects that depend on natural environment.

Increase of nutritional food and improvement in working relations amongst gardeners were also mentioned as changes that occurred since the operation of Shurugwi Partners community gardens. Thirty percent (30%) of respondents said that from the income they got from selling vegetables they managed to buy chickens and goats for rearing. On this the Director of Shurugwi Partners stated that they managed to start small livestock pass on projects with the income from gardens and this small livestock component assisted about 100 households with 2 goats and 2 chickens received for breeding and pass on to other beneficiaries. The

councillor further elaborated that there was an increase in the number of women with possessions. Plate 4.14 shows Ms Mapfumo with her chickens that breed from the pass on project and plate 4.15 shows distribution of goats in Zananda village where Batanai and Green Valley gardens are located. Water security for domestic purposes from the boreholes was also mentioned as another change that occurred because of community gardens.



Plate 4.14 Ms Mapfumo and her chickens multiplying from the pass on project.
(Souce: Field data, 2015)



Plate 4.15 Distribution of goats in Zananda village.

All respondents indicated that their community gardens had already been handed over to the ownership of the community; they are now in full control of the management of the community gardens since the project cycle had reached its final stage. Of all the community gardens Gwemombe garden was the only one which was given full ownership within a period of 9 months. It started in May 2014 under the ownership of Shurugwi Partners and it was handed over to the community in February 2015 because the rate at which they developed was faster than other gardens. Following the diffusion theory the characteristic of observability worked to a greater extent for quick adoption in Gwemombe garden because adopters had seen the relative advantages of community gardens in other villages in the Ward and when this innovation was brought to them they hastily adopted it.

The Director of Shurugwi Partners indicated that they just receive funding once in packages and when the project cycle has ended they hand over the project to the ownership of the community. However, if they discover that there is need for assistance they can apply for

another fund. He mentioned that the project of community gardens in Chikato area already reached a level where they were handed over to the ownership of the community. He explained that there are strategies that they put to strengthen the community to continue surviving without donor assistance. These include training them in internal savings, linking them to markets like Unki mine, SEDCO, National Tested seeds (NTS). NTS assists the community with inputs like beans and after harvest time they take one-third of what they would have produced and the rest is taken by the community. He expressed that local leaders like councillor and youth officer were given major roles in the project so that they can still cooperate and coordinate the beneficiaries since they are the focal point for development

Seventeen percent (17%) of respondents said that from the time they started taking full ownership of community gardens they faced no challenges. Forty six percent (46%) of respondents indicated that market was becoming a challenge as production was increasing causing vegetables to be flooded that they would end up competing for market at Chikato service centre and at garden sites. This was caused by lack of funds to hire transport to ferry their products to big markets. Thirty seven percent (37%) of respondents from Batanai, Greenvalley, Chomukaka, Vandirai and Gwemombe asserted that the distance between garden site and dam weirs, which is about 100meters, is making it difficult especially for the elderly who are the majority to fetch water from that distance for watering the vegetable beds. From the observation undertaken at Vandirai and Chomukaka garden, the point at which they fetch water from Tugwi river is a hazard because it is too deep and steep (Plate 4.16). More so at Gwemombe garden respondents said that the dam weir was built about 100metres away from the garden so they sought for an easily accessible point in the river to fetch water which is proximity to the garden. The researcher observed that the point at which they fetch water is dangerous as confirmed by the respondents because its deep and the ground is too slippery caused by water that will be spilling from the buckets as shown in plate 4.17.



Plate 4.16 point source at which Vandirai and Chomukaka gardeners fetch water in Tugwi river



Plate 4.17 Gardeners fetching water for watering vegetables at Gwemombe river

(Source: Field data, 2015)

The Director of Shurugwi Partners said that the major challenge is management as they used to train the committee that was present so after two years that committee should pass on to the next committee so mostly the latter lack skills and in terms of production it affects. However he mentioned that though it is a challenge it did not affect much because they gave powers to youth officer, Agritex officer and councillor who constantly visit the gardens to solve conflicts. More so Shurugwi Partners searched for organizations which offer funds for capacity building like Switzerland Embassy and they are doing refresher courses training the leaders and everyone in the gardens. This was also observed by the researcher during her field work when Shurugwi Partners was doing their refresher courses at Gwemombe garden.

On the issue of water the Director affirmed that they are trying to have solar water pumps and it is a pilot project. The only challenge is funds once they get funding these solar water pumps will be installed in the gardens as they noted. He further elaborated that in Mutsiba garden they have already drilled a second borehole. Rainfall variability was also alluded to as another challenge to community gardens by the Director of Shurugwi Partners. On the issue of market challenge he explained that they had created a strong link between the gardens and the markets to ensure continued uptake of produce and generation of income for the households. He then indicated that the major challenge is that the marketing committee is failing to do the work effectively probably because of challenges of transport to ferry the

produce. However he mentioned that this issue was being looked into during the refresher courses which they were undertaking in the project area.

4.5 The sustainability of the SPCGI as a strategy to cushion the Chikato community against climate change related food insecurity.

4.5.1 Community gardens sustainability

Since all respondents stated that full ownership of community gardens was now in the hands of the community since it had been handed over to community by Shurugwi Partners, they were asked whether these community gardens are still maintaining their capacity to supplement food since their operation. 70% of respondents indicated that the community gardens are still maintaining their capacity to supplement food since their operation, 14% stated that they are not only maintaining but rather the production has increased and 16% asserted that the capacity of production reduced a bit because income to buy seeds is decreasing because of market challenges. Plate 4.18 and 4.19 below shows the production of community gardens before and after hand over to the community are maintaining their capacity to supplement food, by comparing production before handover of project to the hands of the community and after.



Plate 4.18 Production of rape at Vandirai garden before the project was handed over to the of the community

(Source: Shurugwi Chikato Project Report 2012)



Plate 4.19 Production of rape at Vandirai at present after handover of project to community ownership

(Source: Field data, 2015)

One hundred percent (100%) of respondents affirmed that the community gardens are sustainable in assisting the community against climate change related food insecurity.

Seventy three percent (73%) of respondents gave their reason for asserting the aforementioned statement as that these community gardens are productive, diversified and focus much on conservation methods of farming which overcome some of the challenges being posed by climate change in farming. Fourteen percent (14%) of respondents stated that these gardens are near water sources hence they are productive throughout the year making them more sustainable in assisting the community against food insecurity even during the dry seasons. The councillor further mentioned that the construction of a 2,400litres capacity water trough answered water management and sustainability issues within the project in Mutsiba garden.

Thirteen percent (13%) of respondents mentioned their reason being that Shurugwi Partners is a local NGO which understand their livelihood hence it does not restrict them from growing any type of crop in the gardens therefore when there is enough space they grow maize and sweet potatoes to complement the bread basket of their families. One respondent from the 13%, Loveness Muhwandavaka indicated that maize planted in fields was affected by unreliable rainfall but in community gardens they harvested maize better as compared to fields. She elaborated that this maize together with vegetable produce is enhancing their food security hence sustainability ascended. Plates 4. 20 and 4. 21 show the production of maize and sweet potatoes from Chomukaka garden.



Plate 4.20 Production of Sweet potatoes at Chomukaka garden



Plate 4.21 Maize production at Vandirai garden

(Source: Field data, 2015)

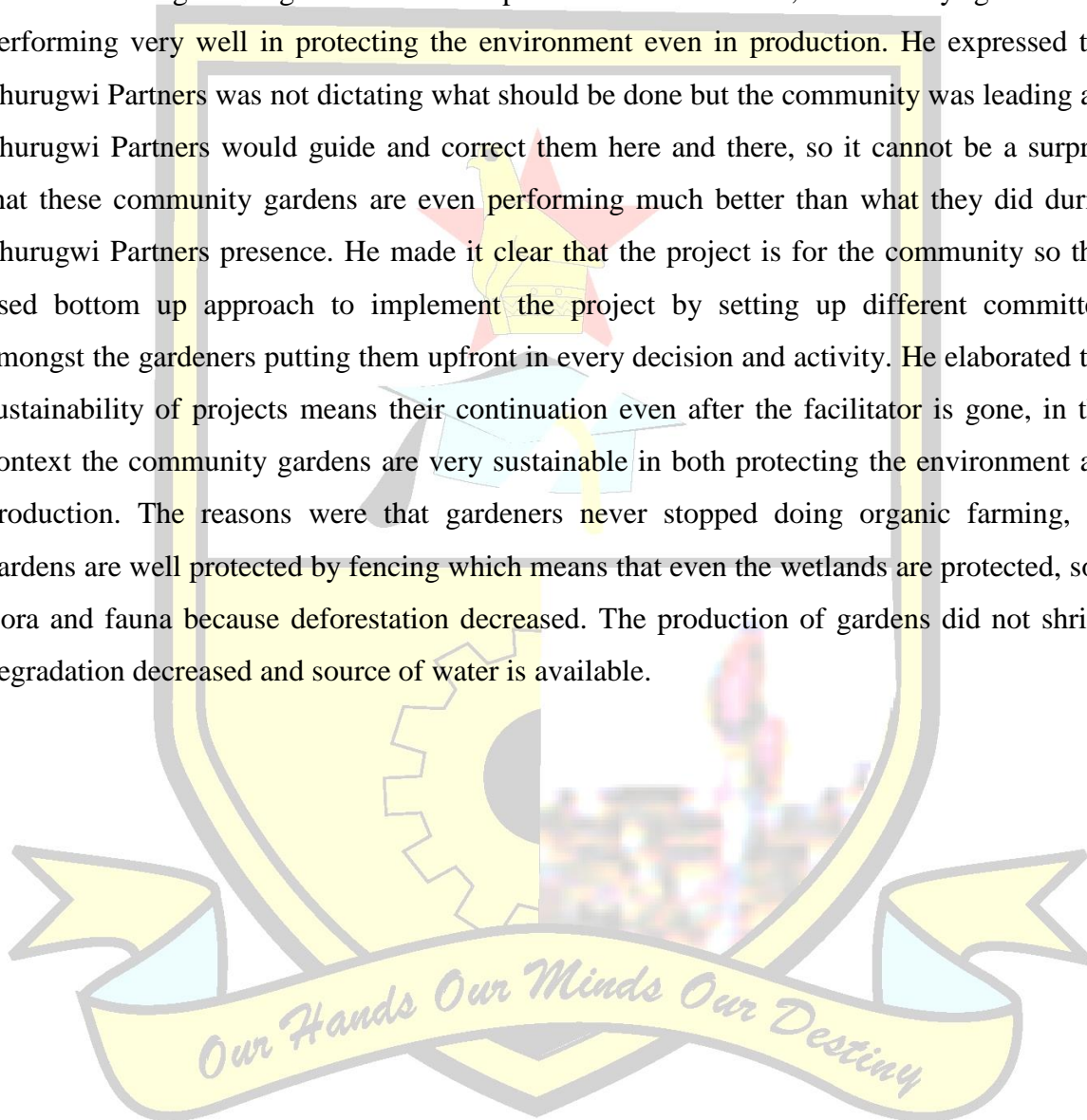
4.5.2 Difference between Shurugwi Partners and other NGOs in the district.

All respondents stated that Shurugwi Partners is different from other NGOs in the district because it is the only one in the district offering community gardens and it is a local NGO unlike other foreign NGOs which offer emergency food aid such as cooking oil, mealie meal and beans. One hundred percent (100%) of respondents asserted that given a choice they would choose Shurugwi Partners ahead of other NGOs in the district to continue working. The main reason was that Shurugwi Partners does not withdraw completely from the project like other NGOs, it maintains an overseer role on the project through local leadership. This was confirmed by the Director of Shurugwi Partners who stated that their project is structured in the traditional format of project implementation following the project cycle. However as a local based organisation they do not totally withdraw, though they might not offer direct assistance they continue keeping an eye on these gardens giving indirect assistance. For instance beneficiaries from Chikato clinic submitted their request that the initial site where their garden was located within the clinic premise was becoming too small compared to the number of the sick benefitting. Shurugwi Partners responded by offering them with fencing material to extend the garden at another site close to the clinic near Deva river. Agritex officer confirmed this by stating that Shurugwi Partners keep on coming back here and there training farmers increasing their zeal to move on.

Fifty seven percent (57%) of respondents said that Shurugwi Partners raised them up from poverty and gave them the legacy of life by giving them sustainable assistance. Fifty three percent (53%) of respondents stated that Shurugwi Partners empowers them to work on their own and teaches them to farm. This was also seen by the researcher when she went on an unannounced reconnaissance tour (pre survey). It was an amazement to see all members present and busy in their gardens showing dedication and commitment to duty. The councillor elaborated that even if Shurugwi Partners was to come after 5 years it will see them moving because the gardens are sustainable and will serve generations to come. He explained that the motive of the youth officer into these gardens is to serve the purpose of encouraging the youth to partake in these gardens so that even when the elderly are long gone community gardens will still flourish. He noted that the major reason why these gardens continue to thrive even without Shurugwi Partners is the routine visits paid by local leadership checking progress, discussing and solving conflicts to ensure continuation of the gardens. He further stated that they also take part in the activities that need to be done in the gardens like installing fence wire, creating beds and mulching so that gardeners get motivation that the

project is theirs. So the sustainability of the gardens lies in the fact that Shurugwi Partners worked well with community stakeholders and gave them power over the project which was observed by the researcher during field work with the way gardeners respected and listened to the youth officer as if they had seen the Donor.

The EMA officer, Mr Kangara indicated that according to the visits which they regularly undertake being an organisation that operates in the district, community gardens are performing very well in protecting the environment even in production. He expressed that Shurugwi Partners was not dictating what should be done but the community was leading and Shurugwi Partners would guide and correct them here and there, so it cannot be a surprise that these community gardens are even performing much better than what they did during Shurugwi Partners presence. He made it clear that the project is for the community so they used bottom up approach to implement the project by setting up different committees amongst the gardeners putting them upfront in every decision and activity. He elaborated that sustainability of projects means their continuation even after the facilitator is gone, in that context the community gardens are very sustainable in both protecting the environment and production. The reasons were that gardeners never stopped doing organic farming, the gardens are well protected by fencing which means that even the wetlands are protected, so is flora and fauna because deforestation decreased. The production of gardens did not shrink, degradation decreased and source of water is available.



CHAPTER FIVE: DISCUSSION AND IMPLICATION OF RESULTS

5.1 Shurugwi Partners community gardens and the diffusion of innovation

The establishment of Chikato community gardens by Shurugwi Partners followed the diffusion of innovation theory. The innovation of community gardens originally started in the United Kingdom in the 18th century in order to curtail the food insecurity issues as alluded by Woollahra Council (2008). In Chikato Ward before Shurugwi Partners traditional household gardens were operating, however, at a very small scale with poor production because of challenges of income and climate change effects. Farming, which is the major source of livelihood for the community was being threatened by low and erratic rainfall due to climate change given that farming in this region is rainfed thereby affecting food security. Nevertheless, Shurugwi Partners intervened by introducing the innovation of community gardens into the community.

Mutsiba garden was the first to be established in 2012 and its production was very high compared to traditional household gardens. This caused high rate of adoption of other gardens which were established the following years because benefits of community gardens had been seen from Mutsiba garden. This supports the assertion by Hawley (1946) who argues that innovations that are alleged by receivers as having greater benefits, triability, observability, compatibility and less complexity are adopted more hastily than others. Community gardens had relative advantages of increasing income and production, improving health, protecting the environment and enhancing food security at large which explains their high rate of adoption in Chikato ward. Community gardens and methods of farming introduced in them were compatible and consistent with traditional knowledge of farming hence they were not intricate for the community to adopt. More so opinion leaders like councillor, Agritex, EMA and youth officer were in favour of the innovation because of its benefits to the community hence they played a major role in the adoption of community gardens in Chikato area.

5.2 Sex of respondents in relation to production of community gardens and food security

Most of the beneficiaries in community gardens were women. This is because they are the marginalized group in Chikato area and their source of livelihood depends largely on the natural environment therefore they are more vulnerable to effects of climate change. This supports the idea proven by IFPRI (2009) that women are the most vulnerable and poorest in least developing countries and are at greatest risk to suffer from the potential impacts of climate change. Women have limited capacity to adapt to and cope with climate change impacts because this ability depends largely on the level of economic development and the means required for adaptation, such as economic entitlements, land, capital, credit, and tenure rights; and also the possibility to influence decision making. All these factors lack in women of Chikato Ward in Shurugwi district. The project therefore was targeting women and children who are the vulnerable and marginalized groups in Chikato to improve their food security which was being threatened by climate change effects.

All garden committees were headed by a chair woman. In garden committees the proportion of women was high as compared to men to empower women and ensure that they have influence in decision making. The assertion by the Director of Shurugwi Partners that women were the majority in traditional household gardens which they consolidated is supported by Derman and Hellum (2007) who stated that family gardens have constantly been the accountability of women. The dominance of women in community gardens of Chikato Ward contributed much to success of the community gardens because men are very few in the study area as they migrate to urban areas in search of greener pastures. This results in low commitment, on the men's side, to rural development. Thus, women who are ever present in the community can effectively ensure the continuance of community gardens as they are directly affected by climate change related food insecurity than their male counterparts. These results from the study oppose what was observed by Mudavanhu *et al* (2012) who stated that the fact that gardening in the study area of Chikwanda communal land in Gutu is the responsibility of women and children whilst men are engaged in other activities weakens the sustainability of gardening as a rural livelihood strategy. The fact that women are the ones taking responsibility in SPCG is a crucial element which is making them sustainable because women's commitment to community gardens is high as compared to their male counterparts who partake in other working environments.

5.3 Sources of livelihood in Chikato area in relation to climate change

The major sources of livelihood for the community of Chikato are mainly depended upon the natural environment given that the majority depend on rainfed agriculture for survival. This result supports the idea revealed by Mamimine (1999) who stated that in Zimbabwe rural populations depend primarily on the natural environment for their livelihoods. This is why food security is largely threatened by effects of climate change because production from the natural environment depends on natural climate.

5.4 Community gardens benefits to Chikato ward

In terms of changes that were introduced by community gardens to the community all respondents stated that community gardens improved their health status, increased income and crop diversity. This appears to tally with what was examined by Gari (2003) and Friesen (1998) who advocated that gardening symbolize a supplementary source of food and a source for nutritional quality in rural households, a basis of income and assist in coping with food shortage periods and failure of staple crops.

5.5 Sustainability of community gardens

5.5.1 Elements of sustainability integrated into Chikato community gardens project

Sustainability is defined by Symth and Dumanski (1993) as a harmonized combination of policy, science and technology and activities aimed at integrating socio-economic principles with environmental concerns so as to simultaneously increase production, reduce risk of production, conserve natural resources, be economically viable and socially acceptable. These five objectives (productivity, security, protection, viability and acceptability) constitute the five pillars of sustainable development. Community gardens introduced by Shurugwi Partners meet these objectives as presented in figure 5.1. Community gardens increase production of vegetables through the use of conservation methods of farming which improves soil fertility, protects the environment, reduce rate of pollution and environmental degradation. The provision of fencing material and treated poles by Shurugwi Partners reduced the rate at which deforestation was taking place in the community in order to access tree branches to surround their traditional household gardens thereby conserving the environment. Shurugwi Partners sourced markets for the community to sale vegetables and started the small livestock pass on project from the income acquired from selling vegetables thereby making the project-economically viable.

Risk of production was reduced by first making a proper baseline survey to find the best site suitable for locating gardens that also ensures good production without compromising the health of the environment. Here they worked with the Environmental Management Agency as this is synchronized into relevant legal framework. Community gardens were located on wetlands to ensure the protection of wetlands whilst utilizing them by using sustainable methods of farming. The Orchard development and beekeeping projects alongside Gwemombe garden were meant to show the importance of flora and fauna to the community so as to encourage their protection. Finally, if any form of project is to prosper in the long term it has to address the social concerns of various stakeholders including the surrounding community. This was achieved by Shurugwi Partners through the involvement of local stakeholders like Shurugwi RDC, EMA, Councillor, Forestry Commission and youth officer in all stages of implementing Chikato community gardens. UN (1997) states the need for integration of economic development, social development and environmental protection as major attributes of sustainability.

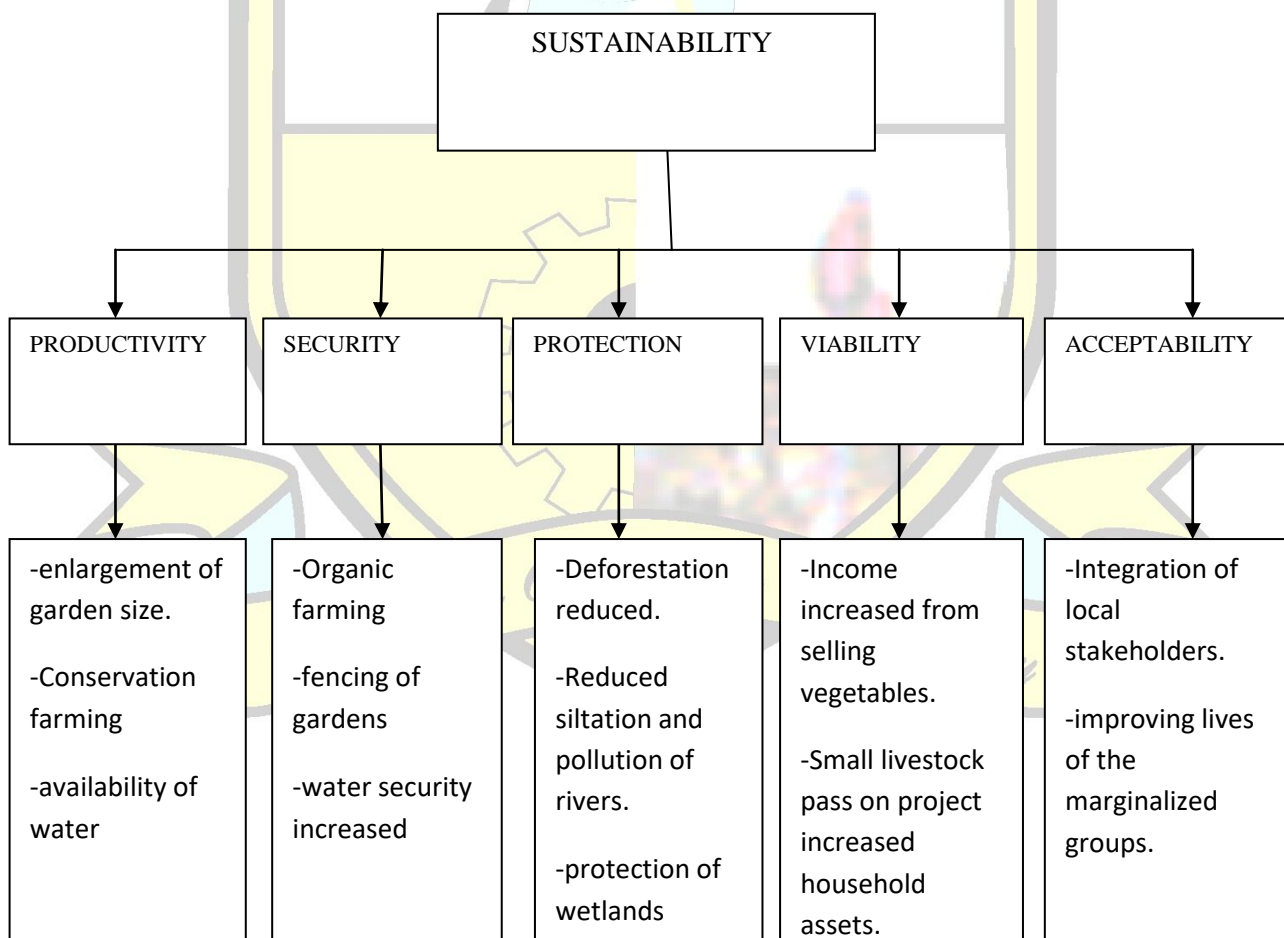


Figure 5.1 Sustainability as practised at Shurugwi Partners Community Gardens Projects
(Source: illustrated by author)

5.5.2 Importance of Conservation and organic farming practiced by the gardeners and their contribution to sustainability of community gardens

Sibanda (2000) asserts that the preface of exotic vegetables like cabbages, covo, tomatoes, and rape has led to new pest and disease problems which are difficult to deal with resulting in profound reliance on pesticides giving little concern to the environment. This assertion by Sibanda has been proven wrong in SPCG projects. New vegetables were introduced in community gardens whilst embarking on traditional ways of controlling pests and disease, which threaten production, without depending on pesticides hence they maintained their original focus on organic farming giving consideration to the environment. Though pests and diseases were stated by few respondents as some of the problems being encountered in community gardens, they did not threaten production, neither did they lead to heavy reliance on pesticides. Even when Shurugwi Partners handed over the project to the ownership of the community, no attempt was made to apply pesticides on vegetables meaning the community had been effectively trained and is aware of the risk of using pesticides.

Kuntashula *et al* (2004) and Sibanda (2000) stated that the potentiality of changing small holder gardening into sustainable livelihood strategy is compromised by lack of agronomic information relating to soil fertility management methods resulting in a general decline in soil fertility and consequently decline in vegetable production. Shurugwi Partners evidently dealt with this challenge by training all the beneficiaries of community gardens on methods of improving soil fertility which are friendly to the environment. Even when Shurugwi Partners handed over the project to the ownership of the community the skills which they imparted into the beneficiaries continued to be worked on to enhance production and ensure sustainability.

The introduction of conservation farming by Shurugwi Partners made the community gardens to be sustainable in the face of climate change effects. Adding manure to the vegetable beds as was said by gardeners' meant high rate of upholding the productive capacity of community gardens. Manure is a good basis of phosphorus which is essential for plant growth. Svotwa *et al* (2008) asserts that besides safeguarding of soil fertility, the manorial effect is vital for controlling pests and diseases. This complemented the focus of community gardens on

organic farming. Crop rotation improved the nitrogen status of vegetable beds by leguminous plants such as beans and peas as asserted by Grant (1981) cited in Swotwa *et al* 2008) that crop rotation boost the nutrient status of the soil when deep embedded crops draw nutrients to soil surface. As alluded to by respondents, crop rotation is playing a multiplier effect in community gardens of maintaining soil fertility, preventing soil erosion and reducing diseases and pests. In tree planting in the orchard of Gwemombe garden an innovation which is cost effective is being embarked upon whereby bones are planted together with the tree plant. The bones attract ants which in turn repel termites from destroying the tree plant. All these practices make the land to continue maintaining its productive capacity and in turn promote the sustainability of community gardens in the face of effects of climate change. This conservation awareness amongst the gardeners is very critical as it contributes to environmental protection since the majority of gardens are located close to rivers and on wetlands. Baez *et al* (1987) cited in Campbell *et al* (2002) stated that environmental knowledge assist community members in developing useful commitment to partake in environmental conservation.

5.5.3 The importance of assets to the sustainability of community gardens

Mudavanhu *et al* (2012) asserted that the different assets that individuals have can improve and or maintain the food security situation in their households by transforming small holder gardening into a livelihood strategy that is sustainable. These assets include physical, financial, social and natural capital. On natural capital Shurugwi Partners in collaboration with other stakeholders such as RDC, EMA officer, traditional healers and ARES officer considered access to land, water and fertile soils that transformed the traditional household gardens into sustainable livelihood community gardens strategy. Community gardens were located in areas close to major perennial rivers in the community to access water for vegetables. Those which were located a distance from water sources like Mutsiba and Chikato clinic boreholes were constructed. This was done because community gardening is meant to be an all year round activity. This supports the fact asserted by Mudavanhu *et al* (2012) that the source of water and its dependability play an important role in the conversion of small holder gardening into a sustainable livelihood strategy. This is because water is the major ingredient and it is difficult to attain sustainability in the absence of dependable water sources. Shurugwi Partners Director argued that they were in the process of sourcing funds to make sure each garden has its own reliable borehole to counter the challenge of low and

erratic rainfall which can threaten the existence of perennial rivers thereby affecting sustainability.

Community gardens were also located on virgin lands to incorporate the issue of organic farming and avoid the use of degraded land with depleted nutrients where there was excessive use of synthetic fertilizers and pesticides that compromise good production. The initiation of small livestock pass-on project in these gardens communities increased financial income on top of that acquired from selling vegetables. This made the challenge of inputs to be little. More so the Director of Shurugwi Partners stated that gardeners were trained in internal savings and lending which sustained them in terms of income to buy inputs and augment their financial capital. DFID (1999) define social capital as social resources upon which people draw support in pursuit of their livelihood objectives. Research revealed that gardeners assist each other to access markets and inputs. For instance, at Gwemombe garden the focus group discussion conducted showed that gardeners wait for each other to access inputs so that they start planting together and when they get a big market they make sure every gardener sends a portion of their produce to acquire income.

Transport to market places was a challenge to gardeners. Given the fact that their major market source like Hanke Mission and Unki mine are a distant from the Ward there was need for large vehicles to transport vegetables to markets. Gardeners explained that before handover of the project the Director of Shurugwi Partners used to provide transport for them. Challenges started arising when the project was handed over to the ownership of the community. This is in agreement with what Mudavanhu *et al* (2012) observed in his study where gardeners faced the problem of overproduction at certain times, transport problems and of locals without cash hence they ended up selling at low prices or barter trading. All these challenges can compromise sustainability. However the Councillor of the Ward said that together with marketing committee they are trying to rectify the problem by looking for cheaper transport in the event of the need to ferry large produce to big markets.

5.6 Shurugwi Partners' sustainability characteristics as a local headquartered NGO compared with foreign owned NGOs.

Shurugwi Partners Community gardens are sustainable in counteracting climate change related food insecurity because the bottom up approach was used in initiating them which is why their continuation is not questionable. The project was initiated by the needs of the

people which were represented by a local NGO that sought funding from donors and approval from local government associations to implement the project. From the onset it was a project of the community, they took part in fencing the garden sites, construction of dam weirs and boreholes and decision making process among others. Sense of ownership was intense amongst the community members to the extent that they continued functioning well after the funding of the project. This approves what was observed by Woollahra council (2008) who postulated that if a community development approach is adopted and a participatory approach is fostered in the planning and implementation phases of community gardens they can succeed and become sustainable. This is because a participatory strategy integrated within the bottom up approach builds a sense of attachment, connectedness and concern from the community.

However, this is not the case with foreign NGOs as observed by Mpofu (2012) in community gardens established by Care International. He asserted that they did not undertake needs analysis in the high density suburbs of Gweru because if Care International had done so none would suggest gardens considering needs of housing, urban infrastructural development, employment and revamping of industries. They employed the top down approach in implementing the project without intense participatory process, which is hostile in building community competence. This largely contributed to the unsustainability of these community gardens as they lacked self-sufficiency in their operations. In his study Mpofu (2012) concluded by stating that development fought for by NGOs in Zimbabwe does not consider self-sufficiency, independence and cultural liberty of the cultural communities in the country. However this is different from what was observed in this study because Shurugwi Partners is a local NGO which puts the needs of the community upfront making them participate in every decision ensuring the sustainability of projects in the long term.

Another factor that made the community gardens to be sustainable is the continued support from local government workers like the councillor, youth officer, the Agritex ward officer and EMA officer. All these stakeholders mentioned that they pay regular visits to the community gardens to monitor progress and assist where there is need. The researcher even observed the respect that gardeners gave to the youth officer during data collection. The beneficiaries reported their issues to him and his proposed solutions were considered, to beneficiaries the youth officer was no different from the Director of Shurugwi Partners. The youth officer asserted that he was working towards encouraging more youths to join

community gardens to ensure that when the elderly are no longer competitive in terms of the production capacity the youths will take over thereby ensuring future generations continue to benefit from community gardens. Such zeal and commitment for community development and success of community gardens amongst the local government institutions indicate the sustainability of community gardens in the long term. This is because initially Shurugwi Partners gave the local leaders more power in the project to work with community members to ensure that even when Shurugwi Partners is no longer working with them they can still operate as local pillars for the continuation of these gardens.

However, the strong feature of Shurugwi Partners community gardens discussed above lacked amongst the community gardens that are initiated by foreign NGOs as observed by Matsa and Dzawanda (2014) in their study of community gardens established by Caritas in Chirumanzu district. After the exit of Caritas, government institutions which participated in the implementation of the community gardens withdrew their assistance and there was no longer effective monitoring of progress in these gardens, not even paying regular visits to solve conflicts and work with the community. This affected production of the community gardens to the extent that sustainability vanished and some projects which off-shoot from the gardens, like the mushroom project ceased to exist in November 2012. The exit of Caritas made the cooperation of government institutions in community gardens to weaken meaning at the onset there was no strong foundation of sense of ownership that was built amongst the local stakeholders. They viewed the project as an NGO project not belonging to them.

Shurugwi Partners created strong garden committees in each garden which were responsible for different departments. These included the marketing committee, production committee, internal savings committee and the overall garden committee. All these were trained to run their different departments and they worked hard without any form of payment for their duties even in the absence of Shurugwi Partners. This is because they had learnt that the project was theirs hence its success was in committing themselves fully to it. However this contradicts what was observed by Matsa and Dzawanda (2014) in community gardens established by Caritas in Chaka ward of Chirumanzu district. The Caritas committee which had been created to manage and monitor community gardens progress lost track after the exit of Caritas. This was mainly because during the operation of Caritas the committee was receiving incentives for their duty and when Caritas left there were no more incentives hence this weakened their role in community gardens thereby affecting sustainability of the gardens.

A project by nature has got duration through which it is planned, incepted, implemented and up to its final stage where it is handed over to the ownership of the community. Shurugwi Partners community gardens were structured in this traditional approach. However this was adjusted and adapted to ensure sustainability in the long run. On decommissioning stage Shurugwi Partners does not withdraw completely from the project. Being a local based organisation they continue to play an overseer role through local leadership and key stakeholders to ensure sustainability of community gardens.

The above mentioned aspect is not a characteristic of foreign NGOs projects which strictly follow the conventional project cycle because they withdraw completely from projects once it has reached its decommissioning stage. Figure 5.2 shows the normal project cycle followed by NGOs when implementing projects.

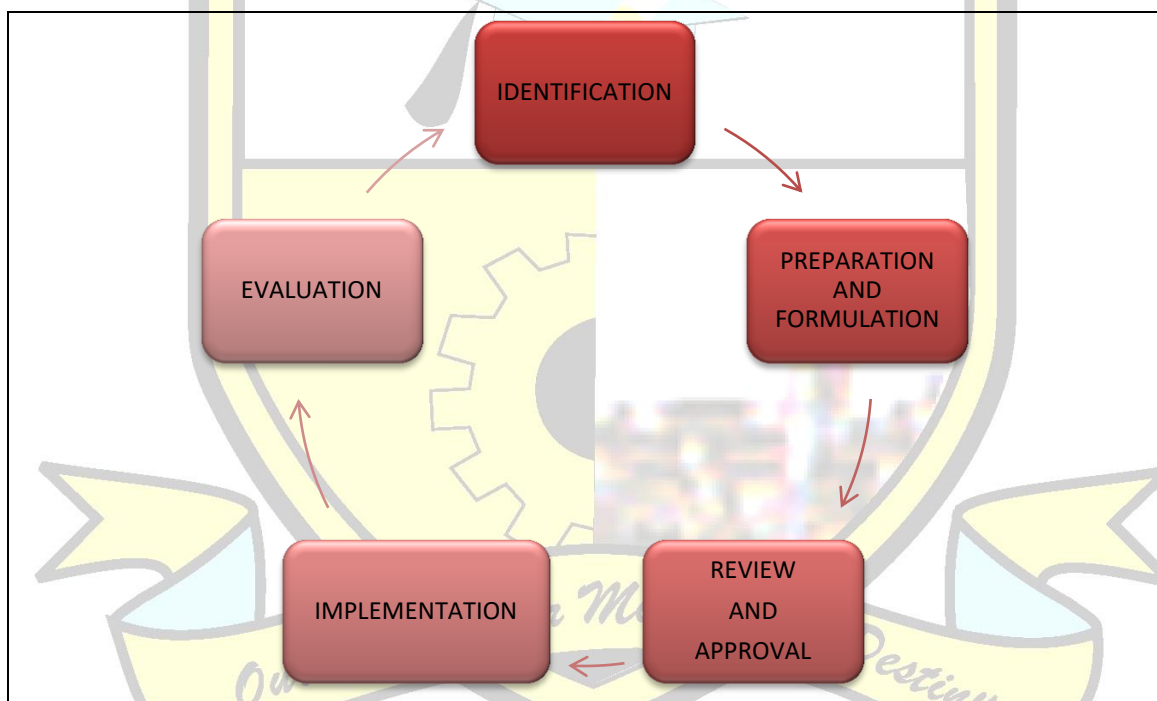


Figure 5.2 Project Cycle (European Commission, 2004)

This was observed by Mpofu (2012) who postulated that the exit of Care International resulted in the demise of Gweru urban community gardens. Matsa and Dzawanda (2014) also observed the same with Caritas when it handed over community gardens to the ownership of the community of Chaka ward. Caritas withdrew completely and no attempt was made to just

pay a visit to see how the gardens were operating. The handover of the project to the ownership of the community signals their complete exit from the project. Mpofu (2012) argue that this project approach has resulted in insufficient local possession of projects with negative repercussion for sustainability of benefits. However Shurugwi Partners continue to keep an eye on its project even when operating in other areas and this has stimulated the community to work hard thereby ensuring sustainability. Figure 5.3 shows how Shurugwi Partners operates after the decommissioning stage which is not a characteristic of other NGOs.

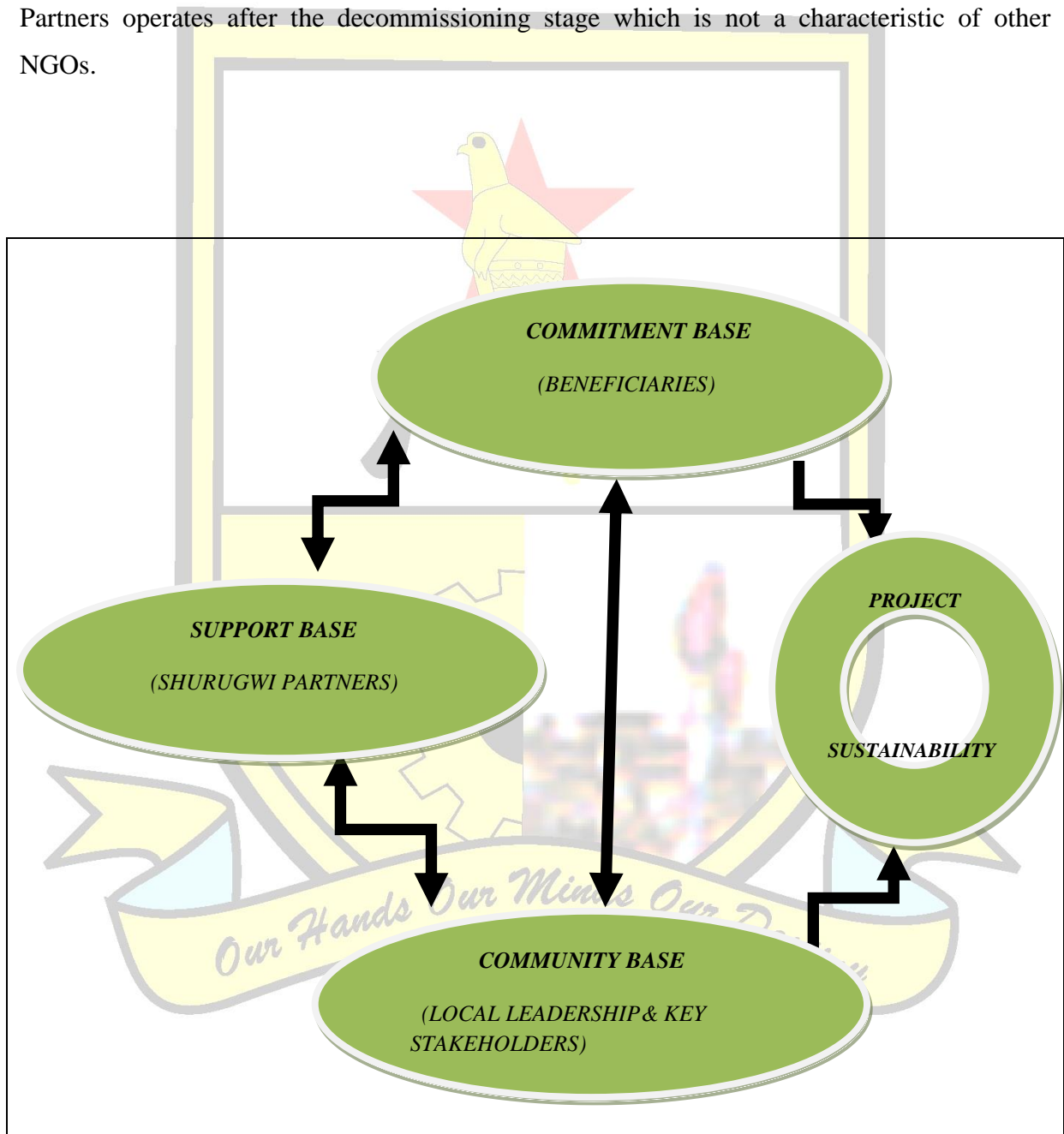
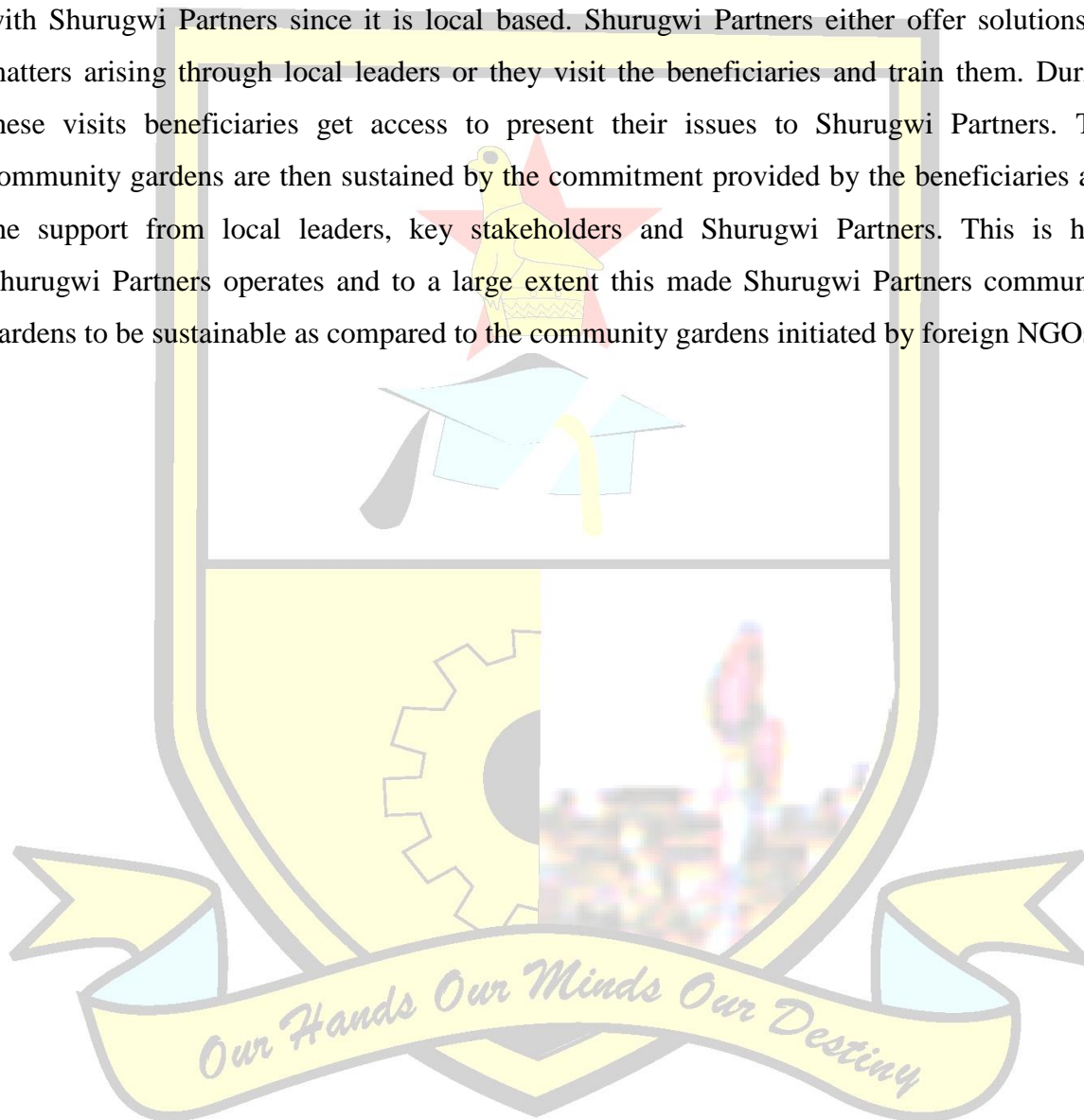


Figure 5.3 SPCG Sustainability Armour

(Source: illustrated by author)

Figure 5.3 represents Shurugwi Partners Community Gardens Sustainability Armour which ensures sustainability of its projects. Figure 5.3 shows interaction between three groups which Shurugwi Partners and local leaders, local leaders and beneficiaries and lastly Shurugwi Partners and beneficiaries. Local leaders interact with beneficiaries on day to day activities, paying regular visits at garden sites, solving conflicts and matters affecting production. If there are matters which are beyond the solutions of leaders, they share them with Shurugwi Partners since it is local based. Shurugwi Partners either offer solutions to matters arising through local leaders or they visit the beneficiaries and train them. During these visits beneficiaries get access to present their issues to Shurugwi Partners. The community gardens are then sustained by the commitment provided by the beneficiaries and the support from local leaders, key stakeholders and Shurugwi Partners. This is how Shurugwi Partners operates and to a large extent this made Shurugwi Partners community gardens to be sustainable as compared to the community gardens initiated by foreign NGOs.



CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Chikato's community depended mainly on rain fed agriculture as their source of livelihood before the inception of community gardens. Farming in this region was affected by low and erratic rainfall introduced by climate change. The region is found in Natural Farming Region 3 of Zimbabwe which receives low rainfall and this exacerbates the production of rain fed agriculture. All these factors affected the production of agriculture and resulted in food insecurity.

Shurugwi Partners Community Gardens Initiative introduced a variety of vegetables, some were not even consumed by the community before. Production in community gardens was very high compared to traditional household gardens. This improved the food security status of the community as vegetables were easily accessible to them.

The focus on conservation farming and organic farming in community gardens improved production and environmental protection at the same time. Organic farming improved soil fertility which enhanced production whilst reducing soil and water pollution. Organic farming and traditional methods of controlling pests and diseases greatly protected the soil living organisms which are important in soil aggregation. Fencing of community gardens improved production by denying livestock access into community gardens. It also reduced the cutting down of trees to fence gardens for security. These factors resulted in the protection wetlands and flora and fauna.

Community gardens instigated orchard development and bee keeping projects at Gwemombe garden. A small livestock project was initiated with the income acquired from selling vegetables. This improved the household assets of beneficiary families. Women's possessions at household level were increased as chickens multiplied leading to community development. The construction of boreholes improved water security and as a result production increased because water is a necessity for production of vegetables.

The beneficiaries of community gardens are highly committed to the project and are zealous to keep it going for the benefit of generations to come. There is no major difference between production of community gardens before and after handover of the project to the ownership of the community. Market source is the major challenge affecting the income of beneficiaries in community gardens after they took over the ownership of the gardens. Once this is solved

community gardens will flourish form many generations to come because this is critical since income to buy more seeds is acquired through selling of vegetables.

Being a locally headquartered NGO, Shurugwi Partners managed to continue keeping an eye on community gardens even after handover of the project to the ownership of the community. To a large extent this contributed a lot to the sustainability of the project. This aspect of Shurugwi Partners is not a characteristic of foreign NGOs who mainly follow the conventional format of the project cycle. They withdraw completely from the project once it has reached the decommissioning stage. This has been seen by other authors as a weakness that affect sustainability of projects initiated by foreign NGOs. This is because there is no strong base left for the continuation of the project in the long run.

The role played by local leadership and key stakeholders in Chikato's ward community gardens is crucial for the sustainability of community gardens. The Councillor, youth officer and Agritex officer frequently pay visits to the community gardens to solve any rising matters and check on progress. These local leaders act as local pillars for sustainability of community gardens. This paper concludes by affirming that community gardens initiated by Shurugwi Partners are sustainable in enhancing food security against effects of climate change.

6.2 Recommendations

Shurugwi Partners should source funds from donors to establish solar pumps in community gardens that pump water from rivers to gardens for watering vegetables. This is to lessen the challenges faced by the elderly when fetching water from the river to the garden at points which are deep and slippery.

Shurugwi Partners should source funds from donors for the construction of boreholes in all the community gardens. This will ensure continued supply of water for the production of vegetables throughout the year in the event that low and erratic rainfall shortens the lifespan of perennial rives to seasonal rivers. This is meant to ensure sustainability of community gardens in enhancing food security throughout the year.

Local stakeholders like the Rural District Council, youth officer and Agritex officer should assist gardeners to search for markets to sell their produce. This will maintain the variety of vegetables in community gardens since the income acquired will be utilized in procuring seeds of various types of vegetables. The diversity of vegetables in community gardens enhances food security of the community.

Key stakeholders such as Agritex, Shurugwi RDC, EMA and youth officer should maintain the regular visits which they pay to community gardens to monitor progress and solve any arising matters. This is because they are the local pillars crucial for sustainability of projects in communities. They have played an important role in continuation of community gardens after the handover to community ownership.

The Youth officer should continue motivating more youths in the community to partake in gardening activities. This is to ensure continuity long after the elderly, who represent the majority of beneficiaries, are no longer competitive in production within community gardens. Once this gap is filled amongst beneficiaries many generations will benefit from the community gardens.

Shurugwi Partners should maintain the overseer role that it exercises in its initiated projects after the decommissioning stage. This important aspect of Shurugwi Partners is the one that has made its initiated community gardens to be more sustainable compared to other community gardens started by foreign NGOs which do not exhibit this aspect.

Beneficiaries should continue to practise organic farming in community gardens. Organic farming maintains the productive capacity of the soil without degrading or polluting the environment. This will guarantee sustainability in production of community gardens.

The marketing committee of each community garden should be vibrant in sourcing for markets and utilise the marketing skills imparted on them in search of markets. Income is important to procure diverse seeds in order to maintain the diversity of vegetables in community gardens and also purchase other food supplements.



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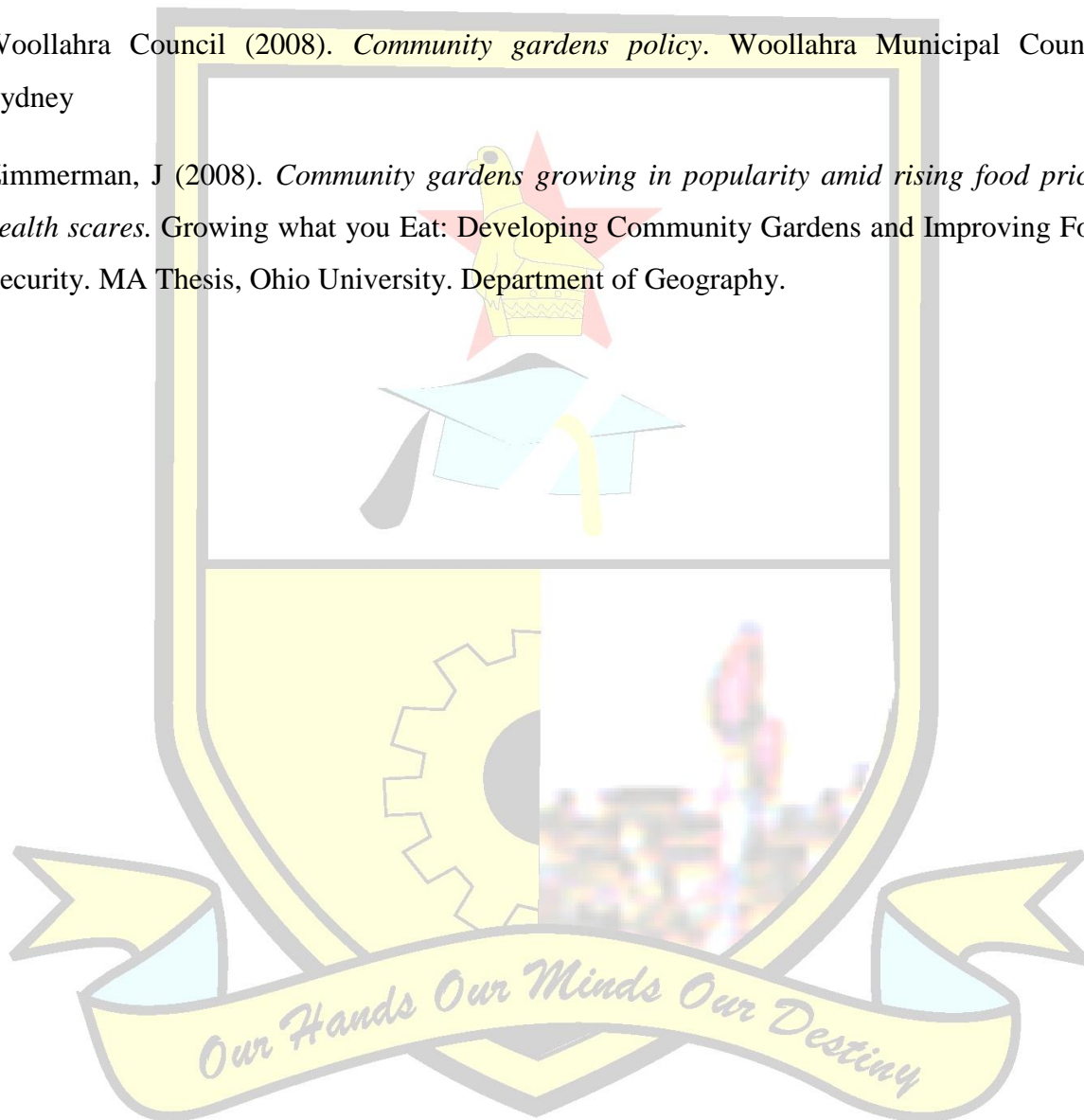
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APPENDICES

APPENDIX 1

Questionnaire for garden beneficiaries

My name is Beauty Dzawanda. I am a Post graduate student doing Masters of Science in Safety Health and Environment at Midlands State University. I am requesting for your participation in this survey by answering the scheduled questions below. This study seeks to assess the sustainability of Shurugwi Partners community gardens as an adaptation strategy to climate change-induced food security threat in Chikato Ward. Data collected will be used strictly for academic purposes and will be treated with utmost confidentiality.

Garden Name..... Date.....

Section A: Demographic Data (Tick appropriate)

1. Sex Female Male
2. Age
18-20yrs 21-30yrs 31-40yrs 41-50yrs 50+yrs
3. Marital status
Single Married Widowed
4. Nature of household
Male headed Female headed Child headed
5. Family size
1-4 people 4-7 people above 7 people

Section B: Questions

Objective 1: To establish Chikato ward's food regime of the community before the inception of community gardens

1. What was your household's source of food before Shurugwi Partners introduced community gardens?

- | | | | |
|---------------|--------------------------|--------------------|--------------------------|
| Farming | <input type="checkbox"/> | Informal Trading | <input type="checkbox"/> |
| Fishing | <input type="checkbox"/> | Gainful employment | <input type="checkbox"/> |
| Food for work | <input type="checkbox"/> | | |

Other specify.....

2. Was the source you mentioned above sufficient for the household to depend on for survival?

Adequate

Inadequate

3. What type of vegetables was the household consuming before the community gardens?

- | | | | |
|-------------|--------------------------|------------|--------------------------|
| Covo | <input type="checkbox"/> | Rape | <input type="checkbox"/> |
| Onions | <input type="checkbox"/> | Tomatoes | <input type="checkbox"/> |
| Lettuce | <input type="checkbox"/> | Beetroot | <input type="checkbox"/> |
| Green paper | <input type="checkbox"/> | Carrots | <input type="checkbox"/> |
| Butternut | <input type="checkbox"/> | Any fruits | <input type="checkbox"/> |
| Cabbage | <input type="checkbox"/> | Spinach | <input type="checkbox"/> |
| Peas | <input type="checkbox"/> | Beans | <input type="checkbox"/> |

Others specify.....

4. How many kilograms annually were you producing from gardens before the operation of Shurugwi Partners community gardens?

- | | | | |
|-------|--------------------------|-------|--------------------------|
| 10-20 | <input type="checkbox"/> | 20-30 | <input type="checkbox"/> |
| 30-40 | <input type="checkbox"/> | 40-50 | <input type="checkbox"/> |

Others specify.....

5. During the episode of unforeseen events like droughts how did you survive?

- Support from government specify.....
- Support from other NGOs specify.....
- Other strategies specify.....

6. In terms of income how much did you get per week from your gardens before the operation Shurugwi Partners Community Gardens Initiative?

- \$5 \$10 \$15 \$20

Objective 2: To determine food and nutrition changes introduced by Shurugwi Partners Community Gardens Initiative in Chikato ward.

7. Since the operation of Shurugwi Partners what benefits did you attain from community gardens?

Diversity of fresh foods	<input type="checkbox"/>	Source of income	<input type="checkbox"/>
Employment	<input type="checkbox"/>	Nutritious foods	<input type="checkbox"/>
Improved health status	<input type="checkbox"/>		
Others specify.....			

8. What type of vegetables is the household consuming since the establishment of community gardens?

Covo	<input type="checkbox"/>	Rape	<input type="checkbox"/>
Onions	<input type="checkbox"/>	Tomatoes	<input type="checkbox"/>
Lettuce	<input type="checkbox"/>	Beetroot	<input type="checkbox"/>
Green paper	<input type="checkbox"/>	Carrots	<input type="checkbox"/>
Butternut	<input type="checkbox"/>	Any fruits	<input type="checkbox"/>
Cabbage	<input type="checkbox"/>	Spinach	<input type="checkbox"/>
Peas	<input type="checkbox"/>	Beans	<input type="checkbox"/>
Others specify.....			

9. How many kilograms are you producing annually from community gardens?

10-20	<input type="checkbox"/>	20-30	<input type="checkbox"/>
30-40	<input type="checkbox"/>	40-50	<input type="checkbox"/>
Others specify.....			

10. What type of assistance are you receiving from Shurugwi Partners?

Seeds	<input type="checkbox"/>	Garden tools	<input type="checkbox"/>
Management	<input type="checkbox"/>	Boreholes	<input type="checkbox"/>

Any training specify.....

Objective 3: To assess the performance of community gardens in enhancing food and nutrition security to counteract challenges of climate change in Chikato ward.

11. What were the challenges that were introduced by climate change in food security before Shurugwi Partners community gardens?

Unreliable rainfall Wilting of crops
Flooding of crops High temperatures
Others specify.....

12. What changes were introduced by Shurugwi Partners to counteract these challenges?

Drilling of boreholes/wells Conservation methods of farming
Crop diversity
Others specify.....

13. In terms of progress how are the community gardens functioning to curb climate change induced food insecurity

Highly productive
Lowly productive

14. What changes occurred since the operation of Shurugwi Partners community gardens?

Production improved Production decreased
Income increased Income decreased
Food diversity increased Food diversity decreased
Others specify.....

15. Are there any phases in which the community gardens did not receive funding from donors?

Yes No

16. If yes did you face any challenges during those phases? If yes specify

17. Do you produce surpluses from gardens for sale?

Yes No

18. If yes what is your source of market?

Growth point Garden site

Others specify.....

19. In terms of income from selling vegetables how much do you get per week since the operation of gardens?

\$5 \$10 \$15

Objective 4: To analyse the sustainability of the Shurugwi Partners Community Gardens Initiative as a strategy to cushion the Chikato community against climate change related food insecurity.

18. Are the community gardens established by Shurugwi Partners maintaining their capacity to supplement food since their operation?

Yes No

19. In your view can you say these community gardens are sustainable in assisting the community against climate change related food insecurity?

Yes No

Give reasons for your answer.....

20. Is Shurugwi Partners different from other Non Governmental Organization (NGO) in the district?

If so how.....

21. Given a choice would you choose Shurugwi Partners ahead of other NGO in the district to continue working with you?

If so why.....

APPENDIX 2

Interview guideline directed to the Director of Shurugwi Partners

Objective 1. To establish Chikato ward's food regime before the inception of community gardens

1. What motivated you to initiate this community gardens project?
2. What was the purpose of establishing community gardens in Chikato area?
3. What type of people were targeted by the project?
4. What was the major source of livelihood of the targeted people before you introduced community gardens?
5. How was the status of livelihood of the households benefiting in community gardens before the operation of the project?

Objective 2. To determine food and nutrition changes introduced by Shurugwi the Partners Community Gardens Initiative in Chikato ward.

1. When were the gardens established in Chikato area?
2. What type of support do Shurugwi Partners offer to the community?
3. What factors were considered in relation to the location of community gardens and why?
4. Were they virgin areas specifically opened for the project or old farmland were utilized? Why?
6. Are there any organizations that assisted in the implementation and running of the gardens? If they are specify their role.
7. What are the changes that emerged as a result of the establishment of community gardens in terms of food and nutrition security
8. What type of crops and vegetables are grown by the garden beneficiaries?
9. Since the establishment of community gardens are there any phases that you have not received assistance from donors? If there are, what strategies did you put in place for the beneficiaries to survive without donor assistance?
10. In the absence of donor assistance are there any challenges faced by the community gardeners in food production? If there are challenges how do you solve them?
11. Since the establishment of community gardens what changes have occurred periodically in food security and nutrition of the garden beneficiaries.

12. What other benefits does the community achieve from the gardens to enhance food security besides supplementing food products?

13. What is the annual production trend of the gardens since their operation and during phases when they did not receive donations?

Objective 3. To assess the performance of community gardens in enhancing food and nutrition security to counteract challenges of climate change in Chikato ward.

1. What were the challenges in food security that were introduced by climate change that you were trying to address?

2. How did the community gardens solve these challenges and ensure food security?

3. To what extent in your view were these challenges of food security curtailed? Explain your answer.

Objective 4: To analyse the sustainability of the Shurugwi Partners Community Gardens Initiative as a strategy to cushion the Chikato community against climate change related food insecurity.

1. Is Shurugwi Partners Gardens Initiative sustainable in solving food insecurity introduced by climate change in Chikato area? Give reasons for your answer.

2. If Shurugwi Partners were to withdraw from the gardens, would the gardens continue to operate?

3. A project by nature has a cycle (that is, from planning, inception.... up to its withdrawal) Is Shurugwi Partners structured in the traditional format of projects implementation?



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APPENDIX 3

Interview guideline directed to the Chief Executive Officer of Shurugwi Rural District Council

Objective 1. To establish Chikato ward's food regime before the inception of community gardens.

1. What was the major source of livelihood for the beneficiaries before project was initiated?
2. Did Shurugwi Partners consult you with their proposal to establish community gardens?
3. What criteria did you use in the selection of beneficiaries of the project?
4. What type of vegetables was being consumed by the community before the operation of Shurugwi Partners.

Objective 2. To determine food and nutrition changes introduced by Shurugwi the Partners Community Gardens Initiative in Chikato ward.

4. What is the role of Rural District Council in the establishment/progress of the gardens?
5. Are there any new vegetables that were introduced by Shurugwi Partners?
6. What are the changes in terms of food and nutrition security that accrued after the inception of community gardens?

Objective 3. To assess the performance of community gardens in enhancing food and nutrition security to counteract challenges of climate change in Chikato ward.

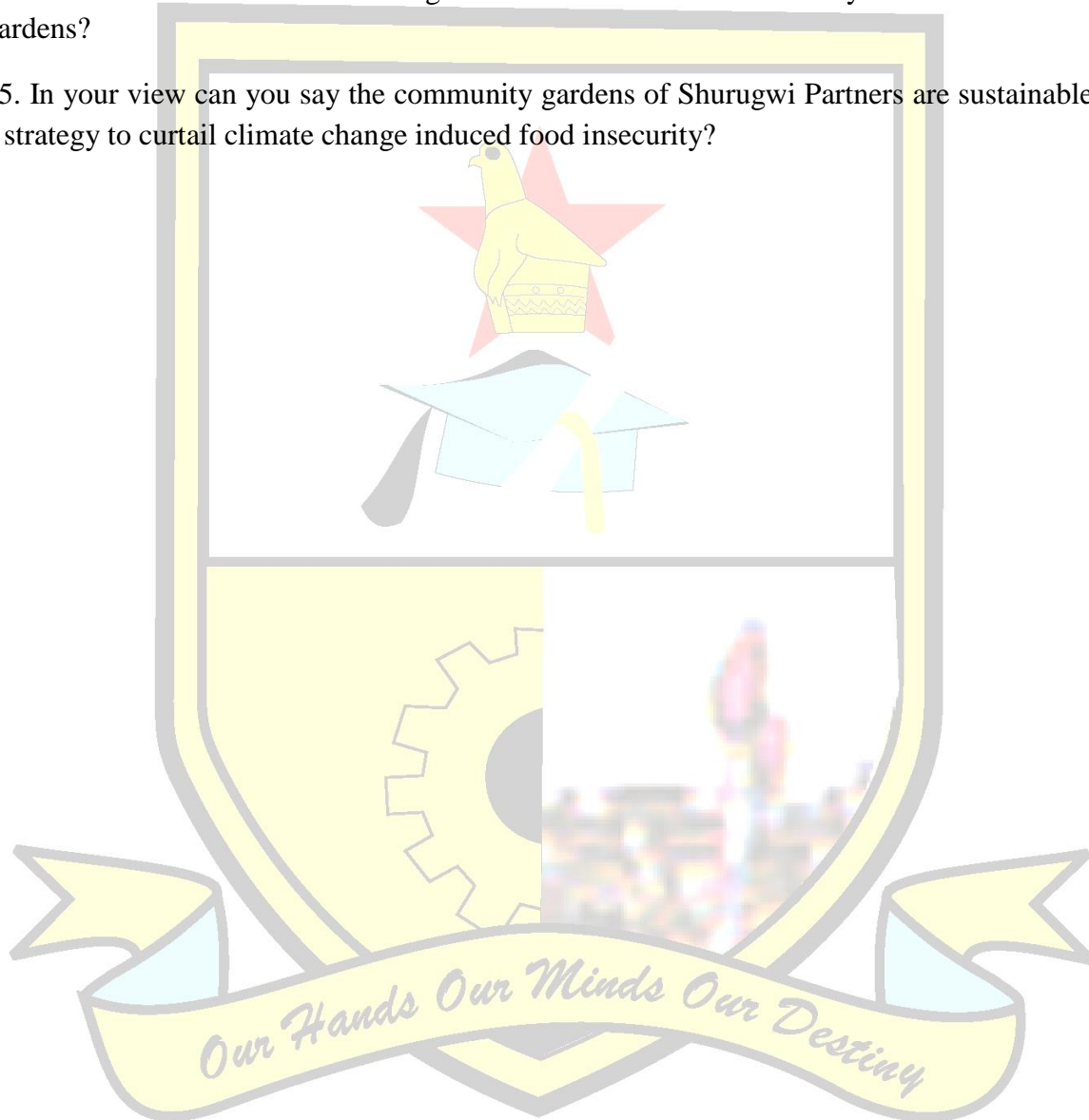
7. Since the establishment of community gardens are there any phases where the community faced some challenges in food security?
8. If challenges were faced can you specify them and how each of them were solved.
9. Besides providing vegetables what are the other roles being played by community gardens in enhancing food and nutrition security?
10. Are there any notable differences in the functioning of community gardens during phases of donor assistance and phases of no assistance?
11. Are there any other projects meant to address climate change and food security challenges in the district?
12. Is Shurugwi Partners different from these other NGOs, if so how?

Objective 4: To analyse the sustainability of the Shurugwi Partners Community Gardens Initiative as a strategy to cushion the Chikato community against climate change related food insecurity.

13. How sustainable have the gardens been in curbing climate change induced food insecurity since their establishment up to date?

14. Does donor assistance have a greater effect on the sustainability of these community gardens?

15. In your view can you say the community gardens of Shurugwi Partners are sustainable as a strategy to curtail climate change induced food insecurity?



APPENDIX 4

Interview guideline directed to Agritex ward officer

Objective 1. To establish Chikato ward's food regime before the inception of community gardens.

1. Before the operation of Shurugwi Partners community gardens what type of crops and vegetables were being consumed by the community of Chikato area.
2. What were the major sources of livelihood and food provision for the community of Chikato area?
3. How sufficient was this source of food provision in ensuring food security in the community?

Objective 2. To determine food and nutrition changes introduced by Shurugwi Partners Community Gardens Initiative in Chikato ward.

4. Are there any new crops and vegetables that were brought by the Shurugwi Partners community gardens? If so, specify.
5. In terms of nutrition what were the changes that were noticed through the vegetables and crops introduced by Shurugwi Partners community gardens.
6. What factors were considered in relation to the location of community gardens and why?

Objective 3. To assess the performance of community gardens in enhancing food and nutrition security to counteract challenges of climate change in Chikato ward.

6. What were the challenges and changes that were brought about in food security by climate change?
7. How did the Shurugwi Partners Community Gardens Initiative intervene to solve the climate change induced food insecurity?
8. What is the role of AGRITEX in the execution of Shurugwi Partners community gardens?
9. During phases of none donor assistance are there any challenges that have been experienced in the operation of community gardens to enhance food security? If they are specify.

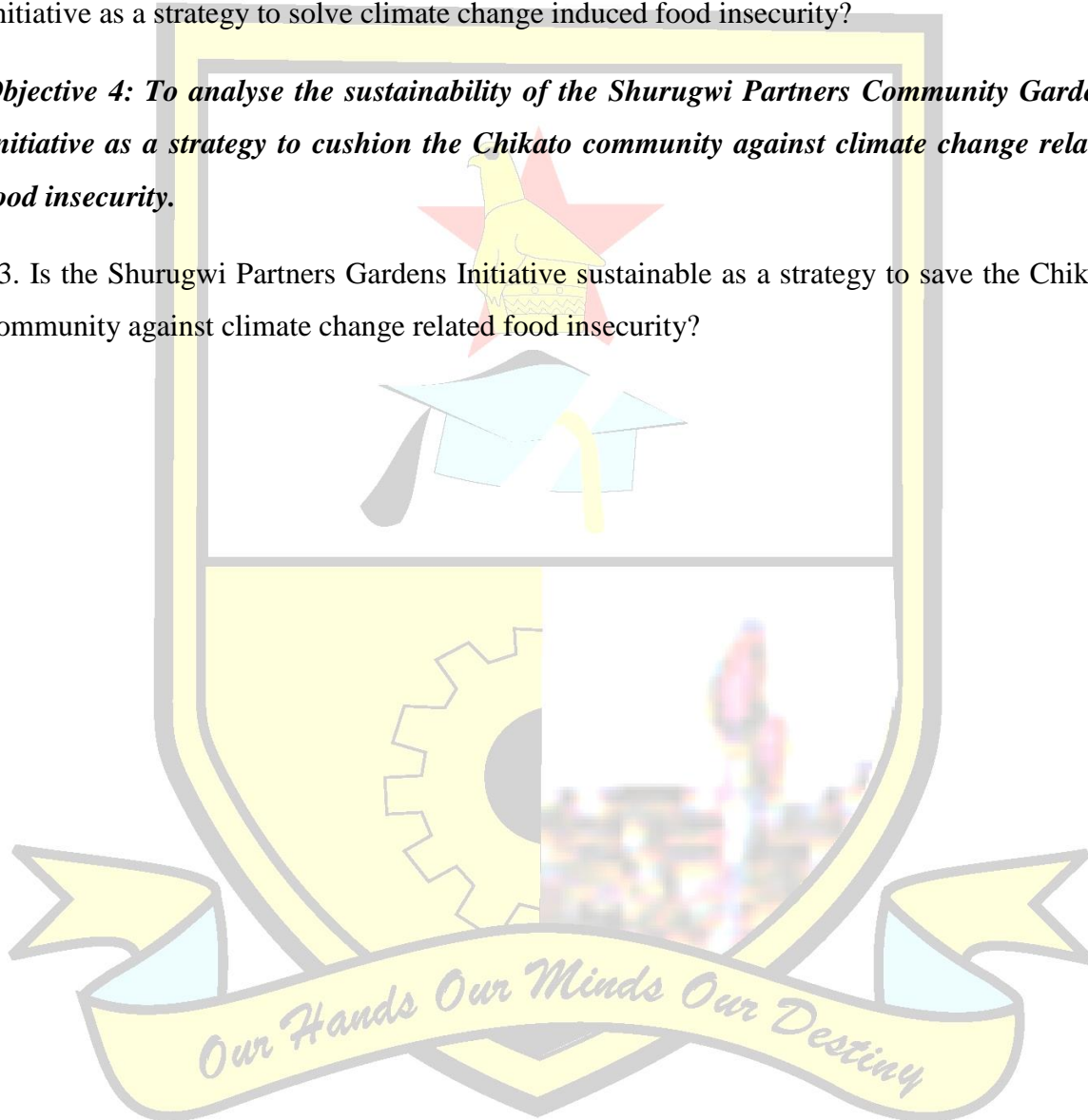
10. How were these challenges solved for the community gardens to continue providing food to the community?

11. Besides food provision are there any other roles being played by the community gardens in enhancing food security in the community?

12. What is your comment on the performance of Shurugwi Partners Community Gardens Initiative as a strategy to solve climate change induced food insecurity?

Objective 4: To analyse the sustainability of the Shurugwi Partners Community Gardens Initiative as a strategy to cushion the Chikato community against climate change related food insecurity.

13. Is the Shurugwi Partners Gardens Initiative sustainable as a strategy to save the Chikato community against climate change related food insecurity?



APPENDIX 5

Interview guideline directed to Environmental Management Agency officer.

Objective 2. To determine food and nutrition changes introduced by Shurugwi the Partners Community Gardens Initiative in Chikato ward.

1. What are the factors (in relation to site of community gardens) that were supposed to be followed by Shurugwi Partners to conserve the environment?
2. What was the contribution of EMA to Shurugwi Partners Community Gardens Initiative as far as the protection of the environment is concerned?
3. Besides conservation of the environment are there any roles that EMA play with regards to the production of community gardens?
4. Are there any changes to the environment that resulted from the establishment of community gardens? If so specify?
5. Do the community gardens fall under the prescribed list of projects that are supposed to undergo an Environmental Impact Assessment (EIA) process?
6. If they do was the EIA process carried out before the establishment of the community gardens?

Objective 3. To assess the performance of community gardens in enhancing food and nutrition security to counteract challenges of climate change in Chikato ward.

5. Since the operation of Shurugwi Partners community gardens up to date how are they performing as far as the protection of the environment is concerned?
6. Comparing with other NGOs operating in the district can you say the Shurugwi Partners Community Gardens Initiative is performing better in protecting the environment?

Objective 4: To analyse the sustainability of the Shurugwi Partners Community Gardens Initiative as a strategy to cushion the Chikato community against climate change related food insecurity.

7. Are the community gardens of Shurugwi Partners sustainable in protecting the environment as compared to other projects operating within the Shurugwi District?

APPENDIX 6

Focus group discussion guideline

Engagement questions

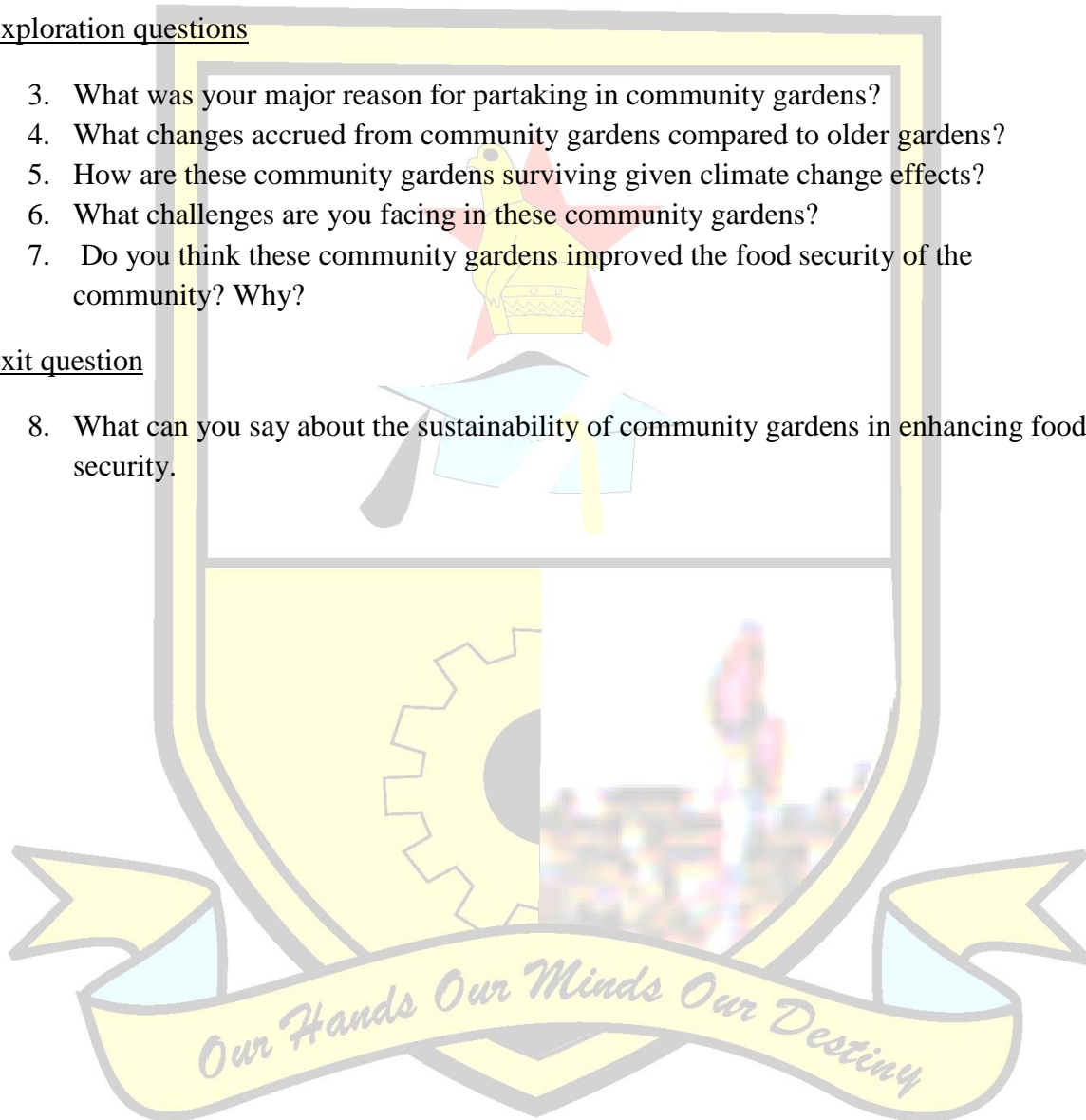
1. What challenges were introduced by climate change in farming?
2. What was your source of livelihood before the introduction of community gardens?

Exploration questions

3. What was your major reason for partaking in community gardens?
4. What changes accrued from community gardens compared to older gardens?
5. How are these community gardens surviving given climate change effects?
6. What challenges are you facing in these community gardens?
7. Do you think these community gardens improved the food security of the community? Why?

Exit question

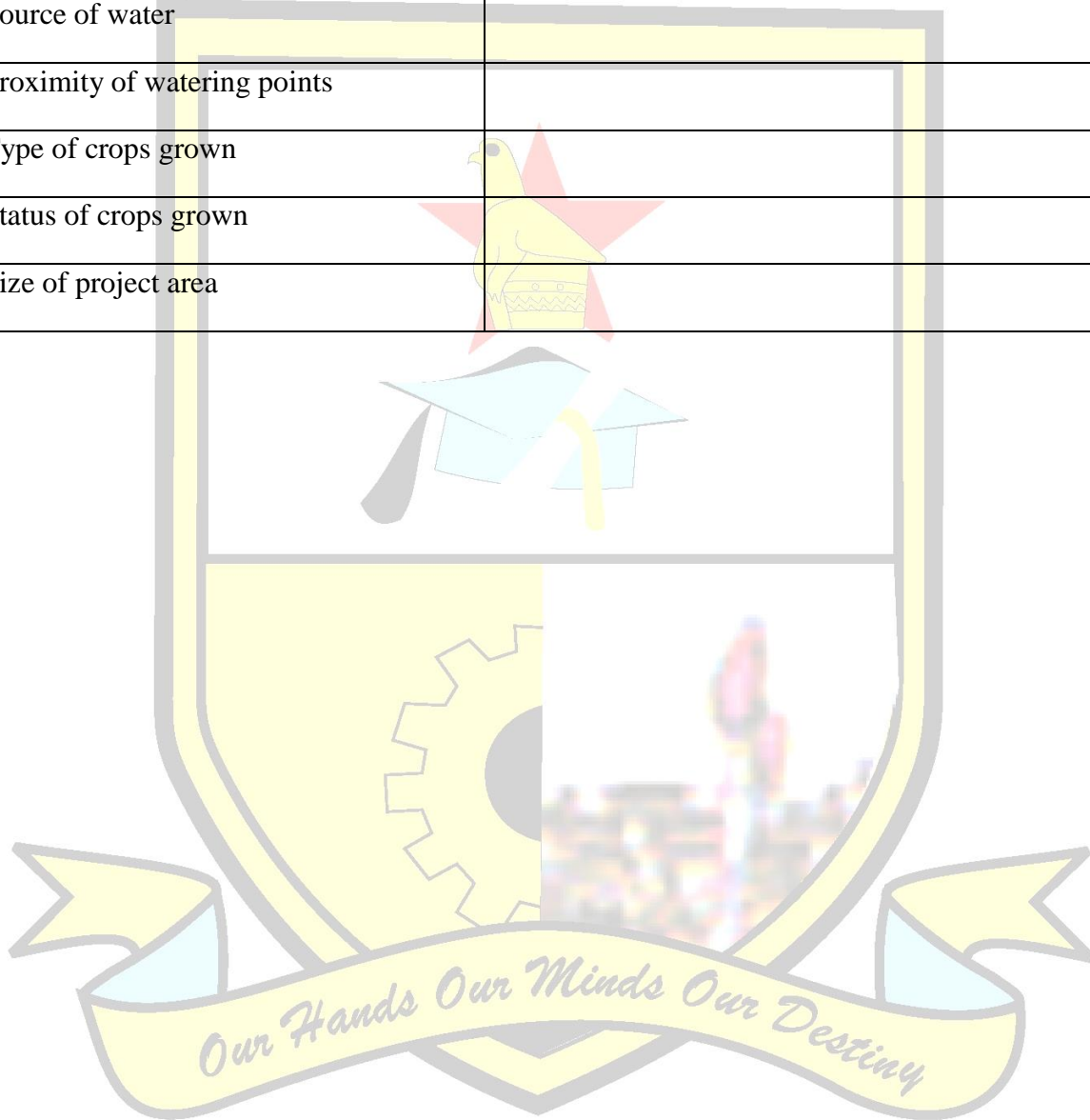
8. What can you say about the sustainability of community gardens in enhancing food security.



APPENDIX 7


Observation checklist

<i>What to observe</i>	<i>Comment</i>
Location of gardens (on wetlands, near rivers etc)	
Source of water	
Proximity of watering points	
Type of crops grown	
Status of crops grown	
Size of project area	



ANNEXES

Annex A

 MIDLANDS STATE UNIVERSITY	
<p>THIS INFORMED CONSENT FORM IS FOR ALL KEY PARTICIPANTS IN THE COMMUNITY OF CHIKATO INVOLVED IN THE OPERATION OF SHURUGWI PARTNERS COMMUNITY GARDENS. THEY ARE INVITED TO PARTICIPATE IN THIS RESEARCH TITLED "LOCALLY OWNED COMMUNITY GARDENS AS AN ADAPTATION STRATEGY TO THE CLIMATE CHANGE-INDUCED FOOD SECURITY THREAT: THE CASE OF SHURUGWI PARTNERS"</p>	
Name of Principal Researcher	Beauty Dzawanda
Name of Organization	Midlands State University
Name of Sponsor	Beauty Dzawanda
Introduction	
<p>My name is Beauty Dzawanda. I am a student studying for a Masters degree in Safety Health and Environment. I am doing a research titled "locally owned community gardens as an adaptation strategy to the climate change-induced food security threat: the case of shurugwi partners". I am going to give you information and invite you to be part of this research. You do not have to decide today whether or not you will participate in the research. Before you decide, you can talk to anyone you feel comfortable with about the research. This consent form may contain words that you do not understand. Please ask me to stop as we go through the information and I will take time to explain. If you have questions later, you can ask them of me or of another researcher.</p>	

Purpose of the Research

Community gardens have been used worldwide particularly in Zimbabwe as an adaptation strategy to climate change induced food security threat. Most of the gardens established by foreigners were short lived because of mismanagement, lack of funds and cooperation amongst the local community after handover of the projects to the community. However locally owned community gardens like those established by Shurugwi Partners seem to thrive better but no study have been carried out to examine their effectiveness as an adaptation strategy to the climate change induced food security threat. Therefore the researcher want to carry out a study to examine the effectiveness of Shurugwi Partners Community Gardens as an adaptation strategy to the climate change induced food security threat.

Type of Research Intervention

This research will involve your participation in an interview that will take about thirty to forty five minutes. You are being invited to take part in this research because your knowledge and experience with the operation of the community gardens can contribute much to our understanding of the Shurugwi Partners community gardens.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. You do not have to give the researcher any reason for not taking part in the interview and it will not affect you relations with the researcher. If you do not wish to answer any of the questions during the interview, you may say so and the interviewer will move on to the next question. If you decide to withdraw from the study for any reason, do not hesitate to inform the researcher as there will be no blame laid against you

Confidentiality

During the interview, the researcher will sit down with you in a comfortable place suitable to you. No one else but the interviewer will be present unless you would like someone else to be there. The information recorded is confidential, and no one else except the interviewer will get access to the information documented during your interview. The entire interview will be tape-recorded, but no-one will be identified by name on the tape. The information recorded is confidential, and no one else except the interviewer will have access to the tapes. The tapes will be destroyed after three weeks. I will give you an opportunity at the end of the interview to review your remarks,

and you can ask to modify or remove portions of those, if you do not agree with my notes or if I did not understand you correctly.

Benefits

There will be no direct benefit to you, but your participation is likely to help us find out more about effectiveness of Shurugwi Partners in counteracting the climate change induced, food security threat.

Who to Contact

If you have any questions concerning this study or consent form , beyond those answered by the researcher you may contact the Chairperson of the Department of Geography and Environmental Studies, Midlands State University, Gweru. Tel No (054) 260331 or 260337.

Authorization

If you agree to participate in this study kindly sign this form in the space provided below as an indication that you have understood the information provided above and have decided to participate.

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study

SHURUGWI PARTNERS

Name of Participant P. M. MUYAMBE

Signature of Participant [Signature]

Date 20 05 2015

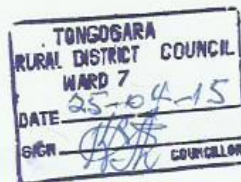
Day/month/year



RURAL DISTRICT COUNCIL

Name of Participant K. B. PHEBENI

Signature of Participant [Signature]



Date 25-04-15

Day/month/year

AGRITEX

Name of Participant CHIEDZA MCHIZIMBI

Signature of Participant [Signature]

Date 13-06-15

Day/month/year

ENVIRONMENTAL MANAGEMENT AGENCY

Name of Participant [Signature]

Signature of Participant [Signature]

Date 26/8/15

Day/month/year

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of Researcher _____

Signature of Researcher _____

Date _____

Day/month/year

Environmental Man. Agency
District Environmental Officer
Shurugwi

26 AUG 2015

P.O. BOX 212 SHURUGWI
ZIMBABWE TELEPHONE 0258

Annex B

22 APRIL 2015

Midlands State University
P Bag 9055
Gweru

RE CONSENT GRANT, BEAUTY DZAWANDA STUDENT-MSU

Shurugwi District Council is providing this written consent to Beauty Dzawanda a Masters student in Safety Health and Environment with the University of Midlands State University to conduct his academic research titled "Locally owned community gardens as an adaptation strategy to the climate change-induced food security threat: the case of shurugwi partners". The purpose of this permission is solely limited to academic research.

Yours Sincerely
Chief Executive Officer
Shurugwi District Council



Annex C



Shurugwi Partners - Community Based Organization
Corner Mersey / Oxford Road, H1S, Private Box 2799,
Gweru, Zimbabwe
Tel: +263 (0) 54-228372; +263(0)772 582 211; +263(0)733610880
Email: shurugwipartners@gmail.com
Website: www.shurugwipartners.org; www.facebook.com/ShurugwiPartners

20 May 2015

Midlands State University
P Bag 9055
Gweru

RE. CONSENT GRANT, BEAUTY DZAWANDA STUDENT-MSU

Shurugwi Partners Director is providing this written consent to Beauty Dzawanda a Masters student in Safety Health and Environment with the University of Midlands State University to conduct his academic research titled "Locally owned community gardens as an adaptation strategy to the climate change-induced food security threat: the case of shurugwi partners". The student is granted permission to access the Shurugwi Partners community gardens in Chikato area and collect the data for the research. The purpose of this permission is solely limited to academic research.

Yours Sincerely
The Director- Shurugwi Partners

