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The implementation of sustainable agricultural strategies to alleviate poverty in Topiya village of Emalahleni district municipality in Mpumalanga province

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CHAPTER 1
INTRODUCTION

1. INTRODUCTION

1.1 Overview

The introductory chapter covers the background of the study. The background informs us the contextual issues pertinent to the research. The background is followed by the statement of the problem whereby the researcher articulates the nature of the problem under investigation. Sustainable agriculture which entails mainly scientific methods of improving crop yield as a strategy to alleviate poverty has received a negative reception in Topiya village hence failed to deliver on its mandate that is to alleviate poverty. Topiya as community is generally food insecure; the current agricultural practices can hardly meet the demands of the increasing population. The failure to uptake sustainable agriculture as a poverty alleviation strategy in Topiya village highlights the complexities of implementing macro policy level interventions at local level.

1.2 Poverty in rural South Africa

As one of the continent's richest countries, South Africa occupies a low global position in international poverty rankings but is also one of the world's most unequal societies (Human Sciences Research Council, 2004). Globally, social conditions in most rural areas resonates with a number of various rural set ups in South Africa, which are quite uneven per province. They have been mainly influenced by the sharp land partition and multi-dimensional deprivation emanating from the physical settlement of colonialist and apartheid (Machete, 2004).

One of the factors that have led to land reform targeting mainly people living in the rural areas is the fact that extreme poverty has been seen to be aggravated by limited access to arable and grazing land. In 2005, 75% of the one million African households with land, had access to less than one hectare (Stats SA 2008). Between 40 and 50 % of South Africa's population can be classified as living in poverty (Terreblanche, 2002; Woolard and Leibrandt cited in Food and Agriculture Organisation, 2004), while 25 percent of the population can be categorized as ultra-poor. Although the country is self-sufficient in

food production, about 14 million people are said to be vulnerable to food insecurity and 43 percent of the households suffer from food poverty (National Treasury, 2003).
Commenting on poverty in developing countries, Ashely and Maxwell (2001:395) state that 'Poverty is not only widespread in rural areas, but most poverty is rural,...Yet this core problem is neglected'. They further note that the decline in resource flows to the rural areas has negatively affected the agricultural sector. Former homelands have relatively higher incidence of poverty. The majority (65 percent) of the poor is found in rural areas and 78 percent of those likely to be chronically poor are also in rural areas (Woolard and Leibrandt cited in Food and Agriculture Organisation, 2004).

1.3 Statement of the problem

Sustainable agriculture which entails mainly scientific methods of improving crop yield as a strategy to alleviate poverty has received a negative reception in Topiya village hence failed to deliver on its mandate that is to alleviate poverty.

The current livelihood generation strategies in Topiya village fall short of meeting the food demands of the community. The current agricultural practices in terms of crop production strategies are inadequate in quality and quantity to meet the exponentially burgeoning population of Topiya village. The majority of households are food insecure; there is a pressing need to improve food production per household in order to consequently alleviate the dire poverty front threatening the livelihood of Topiya community.

It is of paramount importance to address food security at a community level so as to adopt community specific livelihood generation strategies customized to address specific food security challenges faced by Topiya community. Evidently there are a plethora of livelihood generation strategies at global, national, provincial and local levels that could be adopted by Topiya village to improve livelihoods and ensure long term food security. However, this has not been the case partly as a result of lack of understanding of policy formulation and concomitant implementation by Topiya community. It is thus imperative to understand and ensure community participation in policy formulation so as to ensure uptake of the proposed policy, which is failure to uptake sustainable agriculture as a poverty alleviation strategy by the Topiya community in this instance.

It is noteworthy that food security in Topiya village can be improved through interplay of a wide range of initiatives, but critically sustainable agriculture is the key to improving food security and consequently alleviating poverty in Topiya. However for sustainable agriculture to deliver on its premise to improve food security there is a need for the concept to be embraced by the Topiya community. This could be achieved through a conceited effort aimed at ensuring that the sustainable agriculture discourse is well understood and should be dovetailed with other indigenous livelihood strategies of Topiya village. A more participatory approach to the food security agenda is fulcrum to achieving the objective of alleviating poverty in Topiya village.

Addressing food security at a micro community level is important; it can be argued that policy formulated at a macro level such as provincial level tends to neglect the specific needs of peripheral communities like Topiya village. This partly accounts for poor uptake of sustainable agriculture in poverty vulnerable rural communities like Topiya village. The failure to uptake sustainable agriculture as a poverty alleviation strategy highlights the dynamics of policy formulation and policy implementation

1.4 Research questions

Are the perceptions of food security in Topiya a testimony to a food insecure community?

a. How can crop yield per household farm be increased so as to improve food security
b. How can sustainable agriculture be mutually adopted in Topiya with minimal environmental consequences and negativity.

1.5 Hypothesis

Topiya community is food insecure because of inadequacy of the current agricultural strategies to meet the food demand per household. Agricultural productivity can be improved through community participation in the development of sustainable agricultural strategies that combine indigenous knowledge systems and other scientific methods.

1.6 Objectives

1.6.1 Broad objectives

- How can household farm productivity be improved such that the dependents acknowledge that they are food secure.
- To establish whether policy interventions formulated at macro levels are easily accepted and implemented by recipient local communities.
- To establish whether raising agricultural productivity per household farm is sufficient to improve food security.

1.6.2 Specific Objectives

To establish whether the Topiya community is food insecure

- To establish how sustainable agricultural strategies have been implemented in Topiya
- To establish the extent to which sustainable agricultural strategies 'western perspective' reflects the true values of the Topiya community
- To establish the extent of environmental degradation as a result of livelihood constriction perpetuated by shrinking of the productive land.
- To asses community participation with respect to policy formulation and implementation thereof.
- To establish the extent to which environmental scarcity has presented best conditions for conflict to thrive.

1.7 Overview of dissertation chapters

The introduction chapter is outlined above. Chapter two discusses the literature review. Chapter three discusses the study area, Topiya village. The methodology of the study is articulated in Chapter four; all the procedures, data analysis and ethical issues pertinent to the research are outlined. In chapter five research findings, data analysis and discussion are presented. Recommendations, limitations and conclusion are embodied in Chapter six of the research.

1.8 Conclusion

The introductory chapter has spelt out the nature of the research and the trajectory. The background to the study was highlighted encompassing; significance of the study, the problem statement, research questions, hypothesis and the main research objectives of the study.

CHAPTER 2
LITERATURE REVIEW

2.1 Overview

The Literature review chapter investigates the various arguments from different scholars concerning food security, sustainable agriculture and poverty alleviation in general. The chapter looks at various debates and definitions around food security, the nexus between globalization and food security in the world and particularly in South Africa is also explored. Sustainable agriculture is also defined from different perspectives, the chapter further looks at the state of agriculture in South Africa, population growth and environmental degradation and the impact of climate change on food security respectively. The aim of the chapter is to raise pertinent issues to the subject that have been overlooked by renowned scholars and eventually contribute to the body of knowledge around food security, sustainable agriculture, poverty, livelihood strategies respectively.

2.2 Global food security at a glance and various conceptions of food security

In looking at the global food security literature it is possible to see its significance in that it looks at various global factors such as unbalanced trade and volatility of markets as a contributing factor to food insecurity. The global perspective on food security also enables the researcher to analyze and gain insight into the global staus in terms of food security, which is then further narrowed down to the research area (Topiya). Effects of globalization are seen to have an impact on local communities in terms of general vulnerability to food security and causes of poverty.

According to Food and Agriculture Organisation, 2001 food security exists at various scales namely: at the individual, household, national, regional, and global levels when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for a healthy and active life (Food and Agriculture Organsiation, 2001). According to the Toronto Public Health, 2006:

Food security can be analyzed at a global, regional, national, community, household and individual level, with a focus on any or all of the following five dimensions: universality

(food for all people), stability (at all times), dignity (psychological, social and cultural acceptability), quantity (enough to meet basic needs) and quality (safe and nutritious, to support health and wellbeing)

(Development Planning Division working paper series No 16, 2006, page 24).

The link between food insecurity, starvation and crop failure diminished in the 1990s, which necessitated social and political analysis discourse (Devereux, 2000). Other developmental imperatives such as social protection, sources of income, rural and urban development, changing household structures, health, access to land, water and inputs, retail markets, or education and nutritional knowledge also has a hand in shaping food security in different communities (Hart et al, 2009). Social and political construct on food security aids broad based policy formulation towards national and consequently household food security. This also resonates with Amryta Sen's (2002) notion that development objectives relating to food security cannot be met by macro –level interventions alone, but should also take into cognisance improvement of human capability, which comes with better governance, less corruption and better democratic systems (Drimie Mini, 2003).

The integration of the social and political construct into the food security discourse enables the researcher to understand that food security and poverty alleviation is not solely a deprivation challenge. Other factors that are political and social in nature may exacerbate vulnerability to food security and various stressors of poverty.

Dorward & Kydd, 2002 further articulate that a detailed examination of the processes and immediate causes of food shortages must be complimented by underlying questions regarding the vulnerability of the rural economy to production shocks and the institutional capacity (of government, markets and other actors) to respond to and manage the effects of such shocks.

Vulnerability of the rural economy to production and the institutional capacity of key sectors such as the public sector, markets and the private sector are also factors that have been examined and proven to contribute immensely to the rubric of food shortage

in particular (Dorward & Kydd, 2002). Food security is intertwined with human security issues, a detailed, conceptual analyses to address the causes of vulnerability is key (Vogel & Smith, 2002). In this regard, it is imperative that identification of policy for food security and livelihood protection must grasp the complex realities of the vulnerabilities, assets and capabilities of different socio economic groups.

Analysing Dorward & Kydd, 2002 perspective on institutional capacity and vulnerability of rural communities to production shocks helps to elaborate that exposure to food insecurity may be reduced through improved institutional capacity like government's response to production shocks. This also has a profound effect on reducing poverty. Understanding the link between vulnerability to poverty and food security helps to further clarify that the implementation of sustainable agricultural strategies comes to naught in economically stratified communities that are vulnerable to poverty.

According to the World Food Summit organised in Rome in 1996, 'food security exists when all people, at all times, have physical and economic access to sufficient, safe, nutritious food to meet their dietary needs and food preferences for an active life'. This definition is critical in that it covers totality and frequency aspects of food security.

The work of the renowned economist Amryta Sen, 2009 has also explored the other dimension of food security from the simple concept of 'national food availability' to the 'food entitlements of individuals and groups' (Drimie & Mini, 2003). Food availability is not the core and only cause of starvation but rather food entitlement failure lies at the center of starvation. Sen articulates additional dimensions of advanced traditional welfare economics, including the incorporation of individual entitlements, functioning opportunities, capabilities, freedoms and rights into the conceptual foundations and technical apparatus of economics and social choice as key to shaping food security of societies. Sen additionally enunciates that the prevalence of starvation and famines across the world emanates from lack of entitlement in the prevailing legal system of institutional rights that compromises survival means (ODI, 2001). Food might be available in abundance in any given social set up, but lack of entitlement might render the subjects insecure.

According to Sen (2009), there are four different types of entitlements that individuals or households may possess or acquire in a market economy namely: trade based entitlement, production based entitlement, own labour entitlement and inheritage or transfer entitlement (cited in Ellis, 1992: 307). The ability to trade labour power or skills is also a key component in ensuring that starvation does not prevail in specific social set ups as Sen (2009) alleges. In light of this notion, legitimacy practiced with reference to legal terms may shift entitlement and exacerbate the incidence of starvation.

The work of Sen (2009), further casts doubt on the fact that increasing food production consequently addresses the dire consequences of global food shortage This is epitomized in South Africa, the country is generally regarded as food secure nationally, based on the fact that it has enough food to feed its population, paradoxically more than 40 percent of the population is believed to be food insecure which cements the essence of food entitlement discourse (Drimie & Mini, 2003).

The former president of US Jimmy Carter was famously quoted as saying ‘Providing enough food for the world's poor is a continuing challenge’. According to a study issued by the International Food Policy Research Institute (IFRI) in 2005, by 2020 world population will increase to at least 8 billion. Most of this growth will take place in the developing world and will account for about 85 percent of the increase in demand for cereals and meat. Already, almost 1 billion people live in poverty and suffer chronic hunger, approximately two-thirds of these are farmers. The United Nations Population Division (2005) has made similar population projections. It is against this background that sustainable agricultural strategies should be used as part of a broad strategy to provide food for the exponentially burgeoning population.

It is noteworthy that achieving long term food security does not focus on only increasing food production but should encompass a surfeit of other parameters that are intricately intertwined such as overcoming other global crises, such as population growth, unemployment, debt, energy consumption, environmental and political insecurity and other problems with significant national and local components that interface and impact negatively on one another (ODI, 1997).

The links between population growth, unemployment environmental and political insecurity to food security all help to show that, the food security agenda has a plethora of dimensions. Achieving the broad objectives of poverty alleviation should not only look at sustainable agricultural strategies as the only panacea, but should also consider factors of population density, levels of employment, political and environmental factors.

The burgeoning world population has by far outpaced the constant available arable land resource. Only about 10 percent of the world's land surface is suitable for farming. Soil erosion and over farming are becoming a thorny issue in some areas especially in Southern Africa including South Africa (King, 2006). The hunger crisis that afflicts more than 240 million Africans has been exacerbated by the incessant degradation of farmland across sub- Saharan Africa in the past decade (New York Times, 2006). The area for cultivation is constant and arable land is shrinking, improving yields of the most widely grown staple crops is envisaged to be the panacea to increased demand for food in developing countries. An estimated 17% of global cropland is irrigated and produces about 40% of the world’s food, the remaining 83% is rain fed, with population growth and economic development, the agricultural sector is facing an uphill task to produce more food with less water (Williams et al, 2006).

The shrinking of arable land can also lead to dire environmental consequences. The demand for food production has resulted in the conversion of wilderness areas such as tropical rainforests into farmland thereby threatening biodiversity and sustainable development. This has been prevalent in many developing countries; therefore, governments need to find new ways to accelerate food production at the same time tempering less with the natural resource base (Agriculture and food security in developing countries, Bio2003). It is noteworthy that this is not only a government mandate but should incorporate the participation of stakeholders from different platforms including the recipient communities.

Availability of arable land is a critical construct to implement sustainable agricultural strategies; abundant unproductive land has little effects on poverty alleviation and providing enough food to a rural community. Food security can be partly achieved in the presence of arable land with a reasonable population density that does not stress the environment and become unsustainable in the long run.

High global food prices have a negative impact on food security. The assessment of the current scenario is that global food prices have significantly eased from their highs in the first part of 2008, however the current prices remain unaffordable particularly to the more vulnerable low-income import dependent countries and for the poor across the world (Evans, 2009). The World Bank estimates that higher food prices have increased the number of undernourished people by as much as 100million from its pre-price-spike level of 850 million. It is against this background that a comprehensive global food security strategy that reflects a cocktail of values from developed and developing countries need to be developed and implemented at macro and micro scales (Evans, 2009).

High food prices impact negatively on rural households in countries like South Africa. Rural communities in South Africa are not entirely dependent on farm produce hence high food prices imply unaffordable food on the shelves given low income levels of most rural households. Food security and consequent poverty alleviation remains a challenge in an environment with high food prices.

Various conceptions on food security have enabled the researcher to gain insight to various parameters that contribute to food insecurity. In essence the work of Sen (2002), who discusses the lack of entitlement as one of the dimensions that contribute to food insecurity, has helped elaborate that food insecurity is not only a lack of adequate meals per ser but a nexus of various factors which are social, economic and political in nature. The study area of Topiya also fit squarely to renowned perspectives from different scholars who assert that food insecurity is promulgated by a plethora of factors such as lack of entitlement, vulnerability of different social groups, lack of human and social capital amongst other factors.

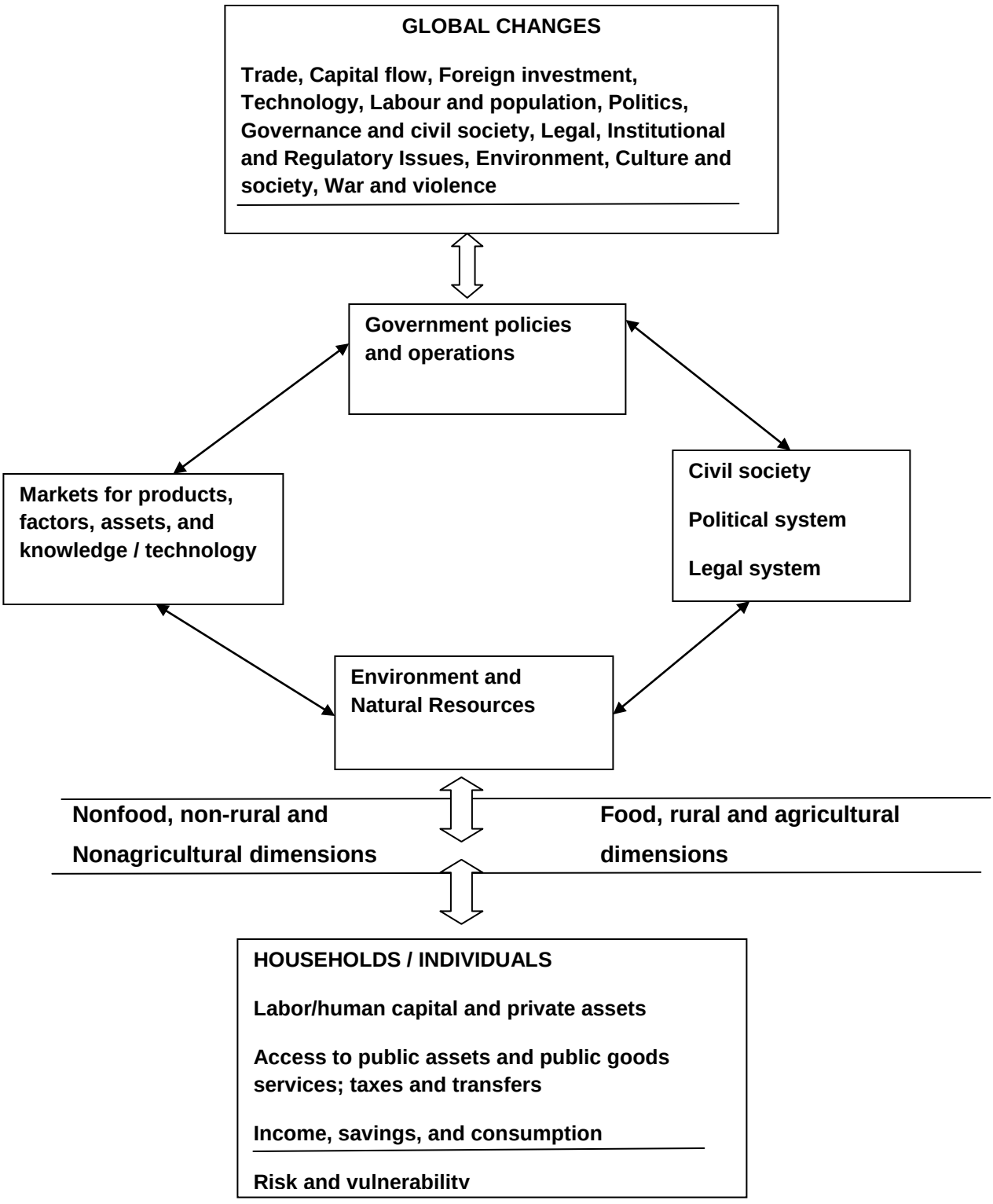
2.3 The links between globalization, food security and poverty

It is imperative to look at the link between globalization, food security and poverty in that manifestation of poverty at a local scale might be a result of various global factors such as politics, war and violence. Hence policy formulation to eradicate poverty has to take

cognizance of external global trends that may affect the capabilities of local vulnerable communities like Topiya.

According to Diaz- Bonilla & Robinson, 2001 ‘globalization refers to the multiplication and intensification of economic, political, social, and cultural linkages among people, organizations, and countries at the world level. This notion includes a greater flow of trade and finance; expansion of cross-border communications; greater international interactions among political groups, nongovernmental organizations (NGOs), and other members of civil society; and even increased levels of tourism’ (Diaz- Bonilla & Robinson pg 22). Furthermore Diaz- Bonilla and Robinson 2001 further interrogates a second dimension of globalization which is the ‘tendency toward the universal application of economic, institutional, legal, political, and cultural practices’. The outline of a framework linking globalization, poverty, and food security is presented in the figure below:

Figure 2.1 Globalization, poverty and food security framework



Source: Diaz- Bonilla and Robinson 2001

According to the above framework, cultures and values may be affected by at the same token globalization may affect cultures and values while allowing new cross-country alliances in civil society. Large environmental consequences may result in the wake of change of role players and the structure of markets domestically and globally. As a result, these changes may have ramifications to sectors such as: agricultural/industrial, rural/urban, food/non-food. Finally, the different dimensions of globalization affect poverty through their impact on economic and noneconomic assets and capabilities, mechanisms for the redistribution of income, and institutional factors. Globalization may change the use, and relative value, of the economic assets and capabilities of the poor. It may also have an impact on non-economic assets and capabilities, such as social capital (civil contacts, networks, and institutions) and political processes that determine the participation and empowerment of the poor (Diaz- Bonilla & Robinson, 2001).

Globalization has its merits and demerits; some hold the school of thought that 'increasing integration into a single global system is hurting Africa, on the other side there are those who feel Africa needs to become even more tightly linked into the system' (Kent, 2002 pg 32). In this regard, it is essential to look at the context specific dynamics like culture, socio economic activity, demographics of a place so as to fully understand the impact of globalization on food security. Globalization should be dovetailed with strategies of self-sufficiency and sustenance aimed at protecting the weak from potentially exploitative relationships with those who are stronger (Kent, 2002).

Albeit the positive spill overs of globalization on issues of food and nutrition in that it favours market liberalization and export oriented agriculture, the darker side of globalization is that it has negative effects on Africa's food security. Pricing patterns consistently favour the rich, poor countries coaxed into a volatile global economy are compelled to bear a disproportionate share of the risk (World Bank development Report 2000/2001).

Other scholars like Jayne and Bird (2003) further ascertain that food insecurity in Southern Africa has been immensely attributed to the practice of economic liberalization. For example as part of the response to perceived political harm posed by reform, there has been 'taming' of economic liberalization in Southern Africa reform (Jayne et al. 2002; Bird et al. 2003).

South African consumers react to changes in both the local and global food system markets and changes. Global changes and events which might be political, economic, social and environmental do impact the most remote rural households in any community of South Africa. In the food security rubric, the impact of rising food prices in South Africa that was triggered mainly by political and socio economic activities outside the country consequently had a sharp negative on the remote rural households (Von Braun, 2007). Such households are vulnerable and lack the required asset base and fall back option in the form of livelihood diversification strategy in such times, acute poverty prevails as a result.

Local consumers are bearing the brunt of global recession, which consequently has given rise to escalating food prices. In adequacy of livelihood strategies and the weak asset base has exposed households to stress, access to food and failure to adapt to such economic quagmire. The most severely affected will probably be the poor and those currently food-insecure (Hendriks, 2005). Ability to access to food should be viewed from a kaleidoscopic lens given that a combination of factors are at play and these include broader context (local, national and global) and systems or networks (economic, social, political and environmental) in which South African households pursue their livelihoods (Hart et al, 2009).

The globalization discourse helps to advance other contributing factors to food insecurity; this also gives a perspective on how global changes affect households at a micro scale. Strategies of poverty alleviation hence should take into cognizance other challenges and developments such as wars, which might negatively affect policies like the implementation of agricultural strategies to alleviate poverty.

2.4 Food Security in South Africa

A perspective on South Africa's food security status helps ascertain whether food security is a national problem or just a case based problem that does not warrant immediate attention. It is noteworthy that food security is a national challenge that needs policy intervention at national level. However the spatial variability of food insecurity is also a cause for concern and gives motive for deeper investigation. This points to the fact that addressing food security does not only imply looking at improving food

production but also addressing various social and cultural set ups that have a bearing on access to food.

In a more general sense, South Africa is considered a food secure nation with the capacity of producing enough food and potential to import food whenever there is a necessity in order to meet the nutritional requirements of its population (Food and Agriculture Organisation, 2008). Hart et al (2009) supported the notion that South Africa seems to be food secure at national level but the same cannot be said about households in rural areas. This is also supported by Machete et al (2004) in his study which affirms the position that food insecurity is more pervasive in rural areas. According to the report, 75 % of those that are chronically poor are found in the rural areas, which points to a majority representation. This point to the fact that policy formulation on food security should have more inclination towards the rural areas where there are more poverty stricken and food insecure communities. ‘’Against this backdrop of contradictions between positive macro trends and indicators and the challenging reality on the ground, the (Integrated Food Security Strategy) IFSS should be explored further in order to deepen the understanding of policy directions and priorities on food security” (Koch, 2011).

Understanding the dynamics of food security at macro and micro scales helps to clarify that implementation of sustainable agricultural strategies need to be tailor made to suite specific poverty stricken rural areas. Such policy interventions should also recognise various economic, social and cultural values of the target community.

The nexus between food security and poverty should not be over looked; the United Nation Development Programme (UNDP) report of 2006 also supports this notion. The report highlighted the close link between poverty, income and unemployment respectively. Furthermore the report articulates that food insecurity is strongly shaped by poverty and unemployment. All this points to the fact that food insecurity is not just failure to produce enough food but also other factors such as unemployment also contribute to food insecurity as they act as safety nets during agricultural dry spells.

Chronic poverty and unemployment are widely regarded as the main causes of structural household food insecurity in South Africa (Human Sciences Research Council, 2007).

Anderson, 1990 also brings in the impacts of globalization on food security. He contends that access to food at household level does not only depend on total agro-food but on how food markets and the distribution systems function. South Africa is amongst the top countries in terms of income inequality in the world. It has extremely high levels of absolute poverty when viewed against other middle income countries (Hart et al, 2009). Furthermore, millions of South African women and children's lives are affected by malnutrition. Despite some pointers showing improvement, several conditions seem to have worsened over the past decade (Human Sciences Research Council, 2007).

Income inequality determines disposable income that could be used to augment farm produce. Low income exacerbates the conditions of the poor and thrusts them into chronic poverty. It is thus imperative to supplement rural income through other sources of revenue like temporary employment in order to supplement farm yields especially in cases of dry spells.

It is quite significant that the right to food is enshrined in international and national law, in South Africa Section 26 and 27 of the South African Constitutional Law of 1996 clearly articulates the right to access to sufficient food. It is a constitutional right for every South African citizen to have access to sufficient food and water and social security (Du Toit., et al, 2011). The right to adequate nutrition is one of the values entrenched in the constitution, and this is the framework for the national Integrated Food Security Strategy (IFSS). All this cements a need for rallying towards a common goal of ensuring food security mainly for the poor and eradicate poverty (Du Toit.,et al, 2011).

Despite South Africa being into more than fifteen years of democracy, food (in) security unfortunately still poses serious threat to the survival of households and economic prosperity (Landman, 2004). National foods security indicators reveal that South Africa has managed to meet the food demands of its growing population over the 8 past years. However contrary to this, other scholars like Demetre et al (2004), confirm South Africa's national food secure status but suggests that more than 14 million people, or about 35 % of the population in the country are estimated to be vulnerable to food insecurity. This further cements the notion that large numbers of households within the country are food

insecure despite the fact that South Africa is food secure as a country (Altman et al, 2009).

The lack of specific and accepted measures of food security and standardised ways of monitoring it has been worrying in South Africa and has deeply affected conceited efforts to develop policy for food security both at national and household scales Hart *et al* (2009). It is against this back drop that policy makers are restricted in their ability to propose interventions pertinent to different scenarios and social set ups. The weaker links between government, private sector and the civil society has compounded this problem (The Department of Agriculture, Forestry and Fisheries - DAFF, 2011).

South Africa is food secure as a country but the same could not be said at a household level. Such a paradox gives reason to investigate the underlying factors to food insecurity. Policy formulation should target specific communities and consequently households so as to achieve household food security.

2.5 Sustainable agriculture

It is important to examine various aspects of sustainable agriculture since it is subjectively defined from place to place. The common aspects of sustainability in agriculture entail; economic, social and ecological balance. This definition also applies to the area of study, Topiya. Understanding the varied dimensions of sustainable agriculture mainly from an economic and ecological point of view has helped the researcher understand that for agriculture to be sustainable, the influencing factors of economics, society and ecology should be analyzed holistically rather than in isolation.

Sustainable agriculture is defined as ‘agriculture which meets today’s livelihood needs without preventing the needs of neighbours or future generations from being met’. The dimensions of ecology, economy and society are combined in this definition (Whiteside et al. 1996). Charles & Francis, 1988 defines sustainable agriculture as a “management strategy” whose goal is to reduce input costs, minimize environmental damage, and provide production and profit over time. Agriculture faces broad challenges in sustainable development, such as ensuring a materially sufficient society that is not growth oriented. The main goal of sustainable agriculture should be centred on satisfying

human needs and equity in resource allocation and use (Allen et al. 1991). In light of this, sustainable agriculture should encompass a combination of these factors and no aspect should take precedence over the other. The concept of sustainable agriculture should be centred on the protection of natural resource base, prevention of degradation of soil and aquatic life, conservation of biodiversity, active contribution to the economy and general well of the society, ensure a safe and high-quality supply of agricultural products; and safeguard the livelihood and provide for agricultural workers and their families (Department of Environmental Affairs and Tourism, 1999).

Fundamentally, a number of scholars including Harwood (1992) acknowledge a common position that for agriculture to be sustainable there is a need to balance environmental integrity, social benefit and economic viability. Ruttan (1995) emphasises that productivity must be a key factor in any sustainability definition. Altieri is critical of the definitions of sustainable agriculture which appear to be technocentric and reductionist in view he thus advocates for a more social inclination to the sustainable agriculture discourse. He thus contends that the development and use of technology should always take into cognisance the cultural, infrastructural, and political connotations that shape how it is designed and implemented (Altieri, 1994). Scientific paradigms, fiscal policy, international trade, domestic commodity programmes and consumer preferences are other key factors of technology with respect to sustainable agriculture (Allen et al. 1991).

It is noteworthy that sustainable agriculture from a global perspective could be defined from two different lenses namely from an ecological and economical perspectives respectively. The economist perspective agriculture as a sector of the economy should be structured with an objective of increasing production to meet the growing consumer demand (Harris, 2001). In order to achieve ongoing growth in agricultural output, technological advancements should be the key to agriculture as an input. The flip side of sustainable agriculture from an ecologist perspective advocates for a more ecological dimension to sustainable agriculture rubric. Agro ecosystems are seen as modifications of natural ecosystems, subject to the same biophysical principles which govern all plant and animal ecosystems (Harris, 2001).

The cornucopian perspectives further cement the minimal impact of carrying capacity to humans. The regional and global carrying capacities of human populations have been

equally met by contemporary economic growth models coupled with Green Revolution and other technologically- driven increases in agricultural (Harris, 2001). He further advocates for mutuality between economics and ecology to ameliorate the differences in analysis and policy recommendations regarding agricultural futures.

Given the fact that there are perceptible environmental effects from most methods of increasing agriculture output such as soil salinization from irrigation and pollution from use of pesticides and fertiliser, it is of paramount importance to dovetail organic farming as an important paradigm of sustainable agriculture (Bjelkeman- Pettersson, 2004). Organic farming is unique and varies from other farming systems in different ways. Its key feature is that it concentrates mainly on renewable resources and recycling, nutrients found in waste products are returned back to the soil. Organic farming lets the environment's own system take precedence in terms of improving crop yields and disease outbreak. It avoids the use of synthetic pesticides, herbicides, chemical fertilisers, growth hormones, antibiotics or gene manipulation. Techniques used by organic farmers have an objective of ensuring sustainable ecosystems and pollution reduction (Bjelkeman- Pettersson, 2004).

Other scholars like Killerby & Fukuyana, 2001 highlight the significance of social capital to long term sustainability of local economies. They contend that social capital basic fundamental principles such as cohesion, resource management, and increased public participation are key to long term sustainability in agricultural terms. Policy makers have notable identified and acknowledged the significance of social capital as a key tool for environmentally, socially and economically sustainable development (Killerby, 2001). Social capital is intertwined in a cocktail of indiscernible factors that include generalized trust, shared values, cooperative norms, formal and informal networks, stable and effective institutions, and social cohesion. Other scholars like Putman, 1993 advanced another critical dimension of social capital which is centered on 'civic engagement' (Putman, 1993), resulting in cultural proclivity for 'spontaneous sociability' (Fukuyama, 1995). In this light social capital has a profound influence in long term sustainability of agricultural initiatives.

Sustainable agriculture has helped to shape the research in terms of understanding what sustainability should mean in a community like Topiya. This entails agricultural practices

that meet the human needs at the same time not compromising the land productivity for future generations. Furthermore agricultural sustainability should borrow from the global perspective of sustainability at the same time realizing the cultural values and ethics of Topiya community.

2.6 The state of agriculture in South Africa

2.6.1 Commercial Agriculture

Commercial agriculture has absorbed a significant portion of rural labour force in rural South Africa. This has both positive and negative impacts on food security. Temporary employment in commercial farms helps augment household food supply in times of stress. It is important to understand the role of adjacent commercial farms in Topiya, whether they act as a food safety net in times of need or they simply exacerbate the condition of the poor by acting as a labour drain and affecting the net productivity of the small farms in the study area.

South Africa is a country lacking sufficient water supplies. According to the South African Yearbook (2008/9: pg 14), "the average rainfall of South Africa is just over half of the world average. In South Africa only 1, 5% of the land is under irrigation, producing 30% of the country¹s crops. While the idea of expanding irrigation could help increase productivity, most of South Africa¹s irrigable land (estimated at 1,2% of the country) is already cultivated. Expanding irrigation into unsuitable areas creates real problems for the environment and water consumption in South Africa (South African Yearbook, 2008/9). The South African National Committee on Irrigation and Drainage (SANCID, 2002) notes, of the current area under irrigation, 86.5% is classified as very suitable and suitable (class 1 and 2 soils). But there is pressure to expand into unsuitable areas as there is an increasing demand to use high potential agricultural land for other purposes like commercial and manufacturing development (SANCID, 2002).

The relationship between commercial farms and food security helps to clarify that food maybe available at a commercial scale, but the same could not be said at a subsistence scale. This also further account for the relevance and significance of the implementation of sustainable agricultural strategies at a community scale so as to alleviate poverty in food insecure and consequently poverty stricken rural communities of South Africa.

2.6.2 Small holder farming

It is important to study the significance of small holder farming towards improving food security in any given community. Small holder farming has the potential to alleviate poverty through improving the household food basket and reducing vulnerability to various stresses of hunger. It is noteworthy that small holder farming cannot reduce incidences of hunger in isolation but has to be dovetailed to other livelihood off farm activities notably temporary employment.

Altaman, et al 2009 contends that it is apparently counter-intuitive to encourage subsistence or small-scale agricultural production in a semi-industrialized economy like South Africa (Altaman et al, 2009). It is noteworthy that other countries in Europe such as Japan and Indonesia have successfully supported small-scale production as partial contributors to household food baskets and livelihoods as Altaman points out. South Africa as a country, has invested so little in small scale farming hence this deserves further investigation despite the fact that some controversy surrounds the potential contribution of this to food security (Altaman, et al, 2009).

The role of agricultural development in reducing hunger and poverty in rural areas is quite significant; however non growth that is not agriculturally oriented is also important (Diao et al., 2007). Rural off-farm activities have a profound impact on poverty reduction in most African countries with high population growth and shrinking agricultural resources. Barret et al 2001 further cements the fact that off farm income is of paramount importance, he further advocates for an articulate policy strategy that promotes the off farm sector as potential and key livelihood diversification strategy in rural communities (Barrett et al., 2001).

The study of the relevance of smallholder farming to food security helps to understand the fact that smallholder farming is not a solution to food security in isolation, other off farm activities like temporary employment also contribute immensely to food security and consequently poverty alleviation.

Most rural communities and the general structure of agriculture in South Africa have uneven income distribution as a key feature and challenge. This daunting challenge can be tackled using policy change aimed at ensuring a broader access to the agricultural economy by the majority under resourced small-scale farmers. This can be achieved

through a carefully planned reform that will bring small scale farmers into the mainstream of the Government's technical and financial assistance to agriculture. Critical rural infrastructure such as access roads, telephone services, electricity etc that are pertinent to agricultural development are inadequate and affecting the potential pace of participation of small holder farmers in the country's agricultural economy. (MEC for Agriculture, Rural development and Land Administration Hon Mr MT Malinga, 2009).

Land reform remains a critical component to food security. Access to land is an enabling factor for the successful implementation of agricultural strategies in rural South Africa. For agriculture to be sustainable there is a need to ensure equitable land distribution, targeting mainly rural households that are squeezed in marginal agriculturally unproductive land. It is noteworthy that land quality and location are more important than quantity, there is hence a need to ensure that land is optimally used at all times so as to fully meet the objectives of land reform.

The past agricultural and economic policies presented best conditions for commercial farmers to increase farm sizes and substitute labour with capital. Agricultural resources were grossly mis-allocated as a result of several factors such as cross- subsidization of agricultural product prices and transport costs that distorted price relationships (Randela, 2005). The productive potential of many areas is compromised by such factors thereby resulting in dire economic and social ramifications for the country. The development of decentralized agribusiness in rural areas has also suffered immensely as a result of this. The flip side of marketing schemes that has the single-channel fixed price scheme as the only one is that it provided the environment convenient for farmers to thrive albeit adverse weather, physical and biological conditions, however this has to be supported by sound agricultural research. (White Paper on Agriculture, 2005).

The goal of agricultural policy had self-sufficiency as the main tenet despite small-scale farming envisaged as a hindrance to this objective. Within the context of food production, but more in line with food security at national and household level, the potential and role of small-holder farming become important. Small- holder farming is quite significant from a food production perspective and from the view point of national and household food security respectively (White Paper on Agriculture, 2005).

South Africa has a well-developed infrastructure in Africa and is hence expected to play a leading and supportive role in developmental issues continentally and regionally (South African Foreign Policy and African Drivers (SAFPAD), 2006). The role of Government research institutes, Universities and the private sector can play a significant role to achieve this. Strategic partnerships can also be forged to further enrich and capacitate these institutions in the process (White Paper on Agriculture, 1995).

For small holder farming to effectively contribute to a food secure society, there is a need for policy intervention to target specific rural communities to ensure broad based community participation. Government support is also needed for various interventions such as the provision of technical expertise and seed capital to ensure the long term viability of small holder farming.

2.6.3 Apartheid and subsistence farming

South Africa's past political landscape could have a bearing on the current state of food security in most rural communities. Marginalization of communities into clusters of low potential agricultural land could explain the current trends of food insecurity in communities like Topiya. The adoption of sustainable agricultural strategies will hardly achieve the objectives of poverty alleviation in such communities. Deeper understanding of the significance of past political policies will help to properly channel efforts towards land distribution and equitable access so as to increase agricultural potential of rural communities. This will go a long way towards achieving rural food security.

Agricultural systems are positioned within social and political set ups that shape the way in which they operate (Acher et al, 2008). South Africa's political history, which favored the elite and marginalized the majority in terms of land ownership, has a negative impact on agriculture especially amongst the poor in rural areas. The poor performance by black farmers in South Africa is partly attributable to the legacy of inequality and land dispossession (Kepe, 2008). Kepe further argues that the historic imbalances that centre around political processes and land use planning has dented the prospects of success of smallholder agriculture in South Africa's rural areas that are dominated by black people. Consequently there was a significant reduction in farm sizes in order to settle as many

blacks which meant that any form of agriculture in these areas was reduced to household gardening (De Wet, 1995). Such historic imbalances account for the ignorance to agriculture as a source of livelihood by most rural communities.

Other legislative instruments enacted during the apartheid era cemented the marginalization of black farmers. For instance the Group Areas Act of 1950 restricted different races from living together in urban areas. The urban blacks were forced to resettle on already crowded reserves, consequently putting more pressure on the marginal land (Kepe et al. 2008). Despite the apartheid land tenure imbalances, the post-apartheid partly shoulders the blame for its failure to come up with an effective strategy of reversing the past injustices (Kepe et al. 2008).

To date the South African government has introduced land and agrarian reform which has been deemed disappointing by many (Lahiff & Cousins, 2004). The pro market approach to land reform based on willing buyer, willing seller principle has failed to deliver on its premise to ensure access to productive land by the black majority (Hall, 2007). The failure of the market approach is exacerbated by the lack of post-transfer support by the state for beneficiaries of land reform (Nel and Davies 1999, Twyman et al. 2004, Bradstock 2005). All these factors contribute to the current negative perception adopted by the poor in rural areas regarding to the adoption of agriculture as a strategy to sustain livelihoods.

It is imperative to understand the relationship between past political processes and subsistence farming. This enables the researcher to account for the current state of agriculture which was partially shaped by past political policies. Hence for agriculture to be sustainably implemented there is also a need to redress past political policies that infringed and marginalized the rural poor.

2.7 Poverty in rural South Africa

Poverty is widely regarded as a manifestation of a food insecure society; it is noteworthy that it can also be a major cause of food insecurity. It is important to understand vulnerability to poverty as this has wide effects on food security respectively. Sustainable agriculture can be used as a strategy to alleviate poverty; however sustainable

agriculture should not be viewed as a solution to poverty alleviation in isolation. Poverty is multi-faceted and hence will require other economic and social interventions to be integrated with sustainable agriculture so as to meet the broad objective of poverty alleviation.

Rural poverty has worsened in recent decades as a result of globalization, the commercialization of agriculture, land use changes, degradation, climate variability and increasing levels of urban migration (Bryceson, 2002a: 2002b; 2004, Mertz, Wadley and Christensen, 2005). There has been a focus on urban industrial development at the expense of rural economy in South Africa, which has worsened the condition of the majority rural poor (Bryceson, 2002a: 2002b). As a result of historical legacies, 70% of South Africa's poor live in densely populated rural areas whose economic development is compromised by a lack of development and employment opportunities (Machethe, 2004; Kariuki, 2004).

Various government initiatives meant to reduce poverty in South Africa has also impacted negatively on subsistence agriculture. The South African government makes universal tax provision. The elderly people (the large majority) who receive a pension thus have a consistent source of income, negatively affecting the link between old age and extreme poverty (Francis, 2006). This has negatively affected the adoption of subsistence agriculture as a livelihood strategy in rural South Africa. Ramifications of such consequences have been seen in instances whereby the beneficiary of the pension passes away throwing the entire household dependent on the pension into acute poverty (Francis, 2006). Subsistence farming remains a relevant and essential livelihood strategy in this regard.

Access to productive agricultural land remains a challenge in South African rural communities. While older people have access to government pension which has tended to negatively affect the effort expended to agriculture as means of sustaining livelihoods (Francis, 2000). Francis also concur that historically generated inequalities are one of the root causes of rural poverty in South Africa. In the 1990s, the rise of the real interest rates further marginalized small landowners from the farming sector. This has severely affected land owners, with the small land owners bearing the brunt. This has also been exacerbated by reproachment of between capital and the small, African middle class, which has also aggravated poverty conditions in rural South Africa (Francis, 2000).

In South Africa, institutional changes will be key to the adoption of subsistence farming as a sustainable livelihood generation strategy. It rests on a form of 'decentralized despotism' which separates the urban from the rural as well as one ethnic group from the other (Mamdani, 1996). On Mamdani's account, the most important imperative and the most intractable task of post-colonial African regimes is to dismantle and replace the overarching power structure by 'detribalising' social power, which happens to be the one that post-transition South Africa is also facing today (Munro, 1996). Taken together, these arguments represent power structures in the Bantustans as driven by centralizing logics of accumulation and domination (Munro, 1996). Therefore the challenge of post-apartheid state construction is to secure institutions that can rectify the historic imbalances and ensure that rural populations equally partake in economic development (Munro, 1996).

Rural poverty is prevalent in South Africa; subsistence farming has been endorsed as one of the strategies meant to reduce the incidence of hunger and consequently poverty in rural South Africa.

2.8 Population growth, environmental degradation and the concomitant violent conflict

It is important to understand the dynamics of population growth and their overall impact on food security in rural South Africa. The effects of bigger families that continue to increase against a constant size of agricultural land is also significant to investigate. The flip side of bigger households in providing more labour for cultivation should not be overlooked. Environmental degradation as a result of overcrowding can also contribute to food insecurity through decreased farm productivity.

In the developing world, the pressure of a rapidly increasing population changes the environment more dramatically: wetlands and tropical forests are converted into farmland, while on the other hand farmland and pasture are given up, swallowed by urban sprawl. Fragile marginal environments prone to degradation can exacerbate poverty, giving rise to further environmental degradation (Blaikie, 1985)

It is imperative to examine the relationship between population growth and resource availability. The Malthusian theory has been widely held as a theory that negatively purports the effects of a growing population on the finite earth's resources. Malthus stated that while 'the populations of the world would increase in geometric proportions the food resources available for them would increase only in arithmetic proportions'. He further alludes to the fact that the human population would reach a point whereby food sources would not be able to support it. The unabated further population growth would eventually lead to population crashed caused by natural disasters like famine or disease (Malthus, 1798).

Indeed contemporary researchers have adopted a neo- Malthusian stance. Some scholars contend that, resource shortages would be attributable to global population growth that would outpace the agricultural potential to support it (Kaplan, 2000). Kaplan's assertion concurs with contemporary debates about how resource shortages in general can lead to conflict 'neo malthusian' (Dalby, 2002). However, some critics of Malthus, like Karl Marx, argued that Malthus failed to acknowledge the fact an increase in human population can also translate to a consequent increase in food production and supply. Most critics of Malthus are particular about the fact that man has the ability to use science and technology to increase food production and meet the demands of the increasing population.

Population growth may lead to environmental scarcity and may perpetuate ecological wars. Homer-Dixon and others note that violent conflict may result from environmental scarcity in combination with other variables. This cemented by the following paragraph

Environmental scarcity...can contribute to civil violence, including insurgencies and ethnic clashes...The incidence of such violence will probably increase as scarcities of cropland, freshwater, and forests worsen in many developing world. Scarcity's role in such violence, however, is often obscure and indirect. It interacts with political, economic and other factors to generate harsh social effects that in turn help to produce violence (Homer-Dixon, 1999, p. 177).

Significantly critics of Homer-Dixon assert that conditions of resource scarcity do not have a monopoly on violence (Peluso & Watts, 2001). This supports the notion that

conflict is a result of a combination of various factors that are socio economic and political not solely resource scarcity.

It is noteworthy that some scholars contend that cooperation over natural resources establishes a relationship of alliance essential to all parties that violent conflict seems less conceivable (Ken Conca, 2002). Environmental scarcity remains a salient factor that may aid violent conflict in developing countries.

Understanding the relationship between environmental scarcity and food security helps to elaborate that the implementation of sustainable agriculture should be tied with environmental goals. It further nuances the fact that for agriculture to be sustainable and achieve the goals of poverty alleviation there is a need for adequate arable agricultural land so as to avert 'eco-wars'.

It is challenging to implement sustainable agricultural strategies within over crowded communities where wars on scarce natural resources are prevalent. Population growth has to be matched by an increased land for agricultural purposes including support for agricultural research and development.

2.9 Climate change and food security

Climate change both human induced and natural has an impact on food security. Negative impacts of climate change which are mainly global warming affect food availability at various scales. It is important to understand the impacts of climate on specific households so as to formulate adaptation strategies that will also contribute immensely to net food availability.

Anthropogenic (human driven) emissions of greenhouse gases, resulting from the burning of fossil fuels and deforestation have increased the atmosphere's ability to absorb the Earth's outgoing infrared radiation 'enhanced greenhouse effect'. The consequence of this has been seen in the worldwide rise of temperature in the form of global warming (Engelbrecht & Landman, 2009)

Africa as a whole is projected to be warm during the 21st century, with the warming very likely to be greater than the global annual mean warming throughout the continent and in

all seasons. The drier subtropical regions are projected to warm more than the moist tropics. This result is consistent with the observed temperature trends over South Africa (Kruger & Shongwe, 2004), which indicates that change is already occurring.

There are varying schools of thought in terms of those that are so sure about the reality of human induced climate change and those who are contrarians, for the majority of the rural poor and those that depend on rain fed agriculture past impacts of climate variability including droughts have been acutely felt (Sokona & Denton, 2000). In semi-arid and arid parts of the continent, the decrease of rainfall to below average has been the main cause of lower crop yields (Mondelsohn et al. 2000).

South Africa has a warm climate, and much of the country experiences average annual temperatures of above 17 degrees. The warmest areas are the coastal areas of KwaZulu Natal, the Lowveld of KwaZulu Natal and Mpumalanga, the Limpopo valley and the interior of Northern Cape.

According to a dynamic regional climate model (Engelbrecht et al., 2009) an increase of over three degrees celcius in median temperature over the central and northern interior regions is projected. Over the coastal regions of the country, a smaller two degrees celcius increase is projected (Engelbrecht et al., 2009).

The relationship between climate change and food security helps to show that, for sustainable agricultural strategies to be successfully implemented there is a need for climate stability. The good intentions of sustainable agriculture will come to naught with the concomitant global warming. Climate change has a profound effect on food security and consequently on poverty alleviation. Various adaptation strategies can be used as a strategy to cope with climate change.

South Africa produces sufficient food to feed its population; however this does not translate to food security at individual household level (Bonti- Ankomah, 2001). Climate change, both natural variability and human induced have a profound influence on food security. Essentially, some scholars contend that climate change will have a very marginal effect on food security, instead socio economic development or under development will have a profound effect on food security (Schmidhuberand Tubiolle, 2007). According to Vogel, 2005 Sub Saharan Africa is a leading example in the world in

terms of vulnerability to food insecurity (Vogel, 2005). Climate change impacts negatively on the economic output of agriculture and this is strongly felt in Sub Saharan Africa, the largest contraction of agricultural incomes is acutely felt by the poorest and food insecure communities (Food and Agriculture Organisation, 2006). The dire impact of climate variability falls disproportionately on the poor.

It is noteworthy that climate stress is worsened by other multiple stressors, such as HIV/ AIDS, governance and conflict. Other factors that also contribute to this include globalization, trade, market access and the role of food supply, outlets and access (IDS Bulletin, Vol 36, June 2005, New Directions for African Agriculture).

Local livelihoods and national economies in Africa have been partly shaped by climate change. It is important to improve the level of understanding of climate change in Africa, this could be achieve through mobilizing resources that would ensure, improved modeling capacity, better early warning systems, and improved understanding of the role, value and uptake of forecasts (e.g O'Brien and Vogel 2003, Washington et al. 2004). All this will ensure better planning and anticipation in quest to a food secure society.

Gap in knowledge

There is a dearth in information pertaining to on the ground food experiences and understanding. Food security in peripheral rural communities like Topiya village deserves scrutiny. Notably, South Africa as a country is deemed food secure whilst the same could not be said of communities like Topiya village. The experiences of such communities reflect how policy interventions on food security fail to deliver on their mandate at micro rural scales. A detailed understanding of the dynamics of public participation in policy development and implementation at such local micro scales is of paramount importance.

Contribution to the body of knowledge

The study on the implementation of sustainable agricultural strategies to alleviate poverty in Topiya village sheds light on the challenges confronting fringe rural

communities in terms of adopting sustainable livelihood strategies to ensure long term food security. This study helps devise policy for the future in terms of incorporation of indigenous knowledge at policy formulation level so as to ensure uptake and effective implementation by recipient communities.

The study also outlines the significance of interacting with such rural peripheral communities with regards to challenges of implementing policy interventions formed at remote macro levels. The experiences of Topiya are not unique to Topiya only, this study will go a long way towards ensuring the incorporation of indigenous knowledge systems and values in policy formulation so as to ensure effective implementation of sustainable agricultural strategies to improve food security and consequently alleviate poverty.

2.10 Conclusion

It is imperative to acknowledge that food security exists, at the individual, household, national, regional, and global levels. The link between globalization, food security and poverty is also important to understand in that manifestation of poverty at a local scale might be a result of various global factors such as politics, war and violence. A perspective on South Africa's food security status helps ascertain whether food security is a national problem or just a case based problem that does not warrant immediate attention. The state of agriculture in South Africa particularly small holder farming is determinant and key to improving food security in any given community, including the analysis of the sustainability of agricultural practices from an environmental and food security perspective. The chapter also analyses poverty driving factors specifically in rural South Africa. Climate change both human induced and natural and the concomitant impact on food security is also under review in this chapter.

CHAPTER 3
STUDY AREA

3.1 Introduction

Chapter three investigates the area of study. It looks at Mpumalanga's various economic indicators, the Province's Human Development Index which is below the national average, the province's Local Economic Development strategies including its Millennium Development Goals amongst other economic and social well-being indicators. It also highlights various issues like the study area's demographic facts, local climate, livelihood strategies and different agricultural practices in Mpumalanga. Food security and poverty in Mpumalanga is also discussed. A map depicting the physical location of Topiya village is also attached.

3.2 Background of area of study

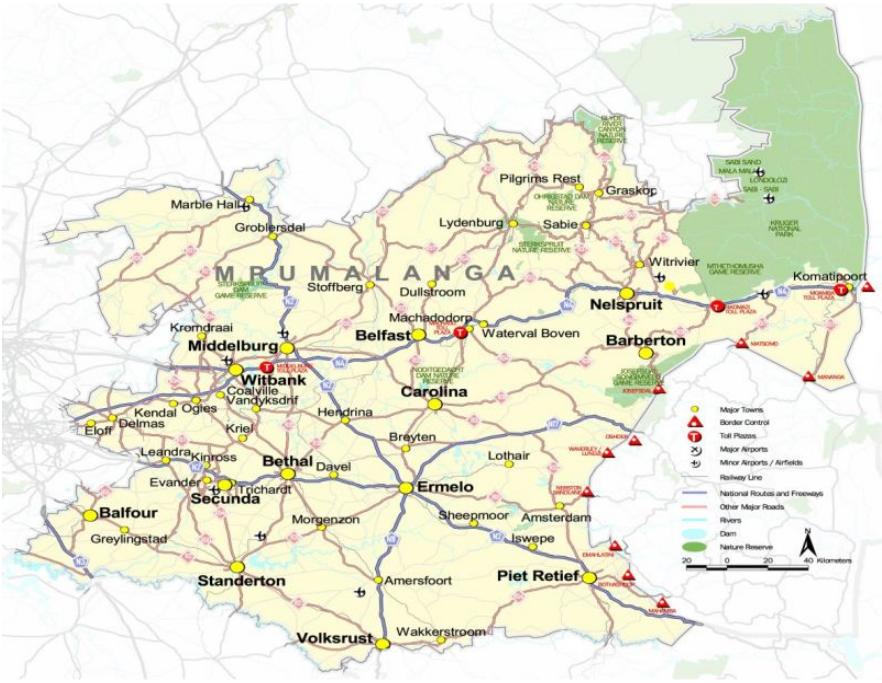


Figure 3.1 Map of Mpumalanga

eMalahleni is located in Mpumalanga Province, it is one of the six local municipalities in the Nkangala District. It forms part of the Western regions of Mpumalanga Province and

borders onto Gauteng Province. The national transport network is one of the best in the eMalahleni Municipality. The Southern parts of eMalahleni Municipality form part of the precinct known as the energy Mecca of South Africa; this is attributable to the abundance of deposits of coal reserves and power stations such as Kendal, Matla, Duvha and Kriel. The southward road and rail network connect the eMalahleni area to the Richards and Maputo harbors, making the export of coal reserves more possible and convenient.

In terms of population, eMalahleni Municipality amounts to about 435 217 persons, this is about 27% of the total Nkangala District's population (1 020 589 persons) and 9% of Mpumalanga's population (3 606 800 persons) (Emalahleni Local Municipality Integrated Development Plan, March 2009). In terms of development, Witbank and Middleburg are the highest order settlements in the Nkangala District.

There is a prevalence of large dams, disbursed urban settlements, coal mines and power stations; hence eMalahleni Municipality can be described as a rural area. Uneven development is quite discernible in the eMalahleni Municipality; this is partly attributable to previous dispensation that prioritized development according to race. This marginalized disadvantaged communities of Linnville, KwaGuqa and Pineridge from Witbank Town to the east. Further physical separation of these areas has been worsened by the fact that expansive land in the municipality is under mining rights. The integration of these communities is further restricted by other natural features like floodplains and marshlands.

Farms and agricultural holdings are the dominant landscape in non-urban areas. At the fringe of urban settlements lie most of the agricultural holding. Agricultural activity and livestock rearing are practiced mainly at along the river basin, which attests to the dryness of the region.

The agricultural landscape is not dominated by a single type of agriculture this is partly as a result of the diverse topography, climate and soil varieties which offers opportunity to different types of farming. The agricultural sector accounts for 4.3% of the gross geographical product (GGP) of the province and approximately 12 % of employment. The province as a whole is quite a significant and most productive agricultural region in the country (Emalahleni Local Municipality, Prospectus on Emalahleni, 2009)

Cereals, legumes and nuts are grown mainly in the Highveld region where winters are predominantly cold. Irrigation is also practiced in the eMalahleni municipality mainly in the areas of Loskop Dam. Sheep farming and wool production is practiced at Emerlo, which is in the centre of Mpumalanga province.

3.3 Mpumalanga Province Economic Indicators

The following table is a comparison between Mpumalanga province and the country's economic indicators:

Table 1: Mpumalanga Economic Indicators

Indicator	South Africa	Mpumalanga	Latest period	Data source
Population	49 320 500	3 606 800	2009	StatsSA Mid Year population estimates
Gross Domestic Product (GDP)	0.9%	2.8%	3rd quarter 2009	StatsSA GDP
Consumer Price Index (CPI)	5.9%	6.8%	Oct-2009	StatsSA CPI
Unemployment (strict definition)	24.5%	25.7%	3rd quarter 2009	StatsSA Quarterly Labour Force Survey
Human Development Index	0.58	0.52	2008	Global Insight
Gini Coefficient	0.66	0.66	2008	Global Insight

Source: Community survey 2007: Statistical Release Basic Results Municipalities

Mpumalanga has a significantly higher Gross Domestic Product average of 2.8% as compared to the national average of 0.9%. This represents better economic health of Mpumalanga in comparison to South Africa's. However areas like Topiya community show low economic activity, which might be attributable to uneven development and economic activity in the Province.

In terms of the Human Development Index, Mpumalanga has an average lower than the nation's. This accounts for the low levels of literacy in the study community, which consequently may affect the degree of innovativeness in terms of development of other livelihood strategies to ensure food security.

3.3.1 Human Development Index (HDI) in Mpumalanga

In order to assess the relative level of socio-economic development in different countries, the United Nations uses the Human Development Index or HDI. According to the World Bank, 2003 HDI is a' measure of peoples' ability to live a long and healthy life, to communicate, participate in the community and to have sufficient means to be able to afford a decent living' (Worldbank, 2003). The HDI combines the three factors reflecting longevity, economic prosperity, and schooling. More specifically the variables used are:

- Life expectancy at birth;
- Per capita income; and
- Level of education based on the adult literacy rate and the average number of years of schooling of adults.

The World Bank definition explains that the index of any country is between 1 and 0, with countries that have an HDI of below 0.5 showing a low level of human development whilst countries that has a range of 0.5 to 0.79 showing a medium level of human development. Countries that score 0.8 and above have a high level of human development (Worldbank, 2003).

The index for any one country has a numerical range between 1 and 0. Countries with an HDI below 0.5 are considered to have a low level of human development, a score of 0.5 to 0.79 a medium level of development and those with values of 0.8 and above are nations considered to have a high level of human development (Worldbank, 2003).

Mpumalanga Province has an HDI below the national average; the province has an HDI of 0.52 while the country's HDI is at 0.58. The province deserves special attention as far as human development is concerned, since this has a direct impact on livelihood generation strategies and participation in the mainstream economy (Worldbank, 2003).

3.3.2 Provincial Index of multiple deprivation

The post- apartheid era has been marked by several resolutions by the South African government to improve the lives of the previously disadvantaged; one of the objectives is poverty reduction and social inequality in marginalized communities (Noble et al., 2005c). There is a need to asses and determine the areas of greatest need in terms of social deprivation at household levels so as to develop sustainable livelihood diversification strategies targeting such communities (Alderman et al., 2005).

The Provincial Index of Multiple Deprivation (PIMD) describes a ward by combining information from five categories: Income and material deprivation, Employment deprivation, Health deprivation, Education deprivation and Living Environment deprivation. Each overall ward level PIMD was then ranked in the same way as the domain measures.

The geographical distribution of deprivation can be traced using the PIMDs as an input, which is also useful for policy formulation and implementation. It is noteworthy that in reality the most deprived wards may have a few affluent people whilst the least deprived wants might also contain relatively deprived people (Provincial Indices of Multiple Deprivation for South Africa, 2001).

In Mpumalanga the most deprived wards are the former homelands of the province particularly KwaNdebele and KaNgwane. These former homelands have high incidents of deprivation. In particular, the municipalities of Albert Luthuli, Mkhondo and Seme are prominent, as well as Greater Groblersdal, Dr JS Moroka, and parts of Thembisile (Provincial Indices of Multiple Deprivation for South Africa, 2001).

3.4 Millennium Development Goals (MDG) in Mpumalanga

This entails targeted development aimed at enhancing development from seven strategic areas of focus. The Millennium Development Goals is set by the United Nations Development Programme and the African National Congress' 2004 election manifesto. The seven nuclei of development according to the MDG are:

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV, malaria and other diseases
- Ensure environmental sustainability.

The Mpumalanga Provincial Government Five year review (2004-2008), 2009

The MDG has a broad mandate part of which entails employment creation through the creation of decent employment for all with women and young people prioritized (ANC, 2004). It is imperative to examine such provincial strategies and determine how they fit at a local scale in the Topiya community.

3.4.1 Economic growth and development

Mpumalanga's economic growth is in line with the other provinces, the average growth was 2.5% for the periods of 1996 and 2001 (Provincial Growth Development Strategy (PGDS, 2001). For the 2004-2007 period the province's Gross Domestic Product (GDP) increased and in 2005 showed and economic growth rate of 4.3% and 4.4% in 2006. The highest increase was 5.4% between 2006 and 2007. The trend that the GDP for Mpumalanga is showing is that there is an upward trajectory in economic growth for the province and that its growth pattern is in line with the country's GDP growth. It is noteworthy to investigate how the province's economic growth compares with the actual household economic scenario. This is said in light of the study area's (Topiya) economic performance, which is far from showing growth despite the fact that Mpumalanga as a province is showing significant economic growth for the period under review.

Table 2: GDP Comparison: province versus country GDP

Indicator: Economic	2004	2005	2006	2007
GDP (South Africa) in R billions	1 395	1 544	1 745	1 999
GDP (SA) as % increase	4.9%	5.0%	5.1%	5.4%
GDP (MP) in R billions	92.5	99.8	118.8	140.3
GDP (MP) as % increase		4.3%	4.4%	
Gross Domestic Product real growth rate	4.2%	4.3%	4.4%	5.4%
Regional GDP contribution to the economy of SA	6.8%	6.7%	6.8	Unavailable

Source: StaSA and South Africa survey, 2004

3.4.2 Spatial Development Initiative

As part of the province's Spatial Development Initiative (SDI), the Maputo Development Corridor (MDC) is one of the 'Big Five' flagship projects. The corridor runs right into Maputo the capital of Mozambique emerging from Witbank. Opportunities have been identified in the provision of infrastructure, agriculture, mining, energy, chemicals, tourism and manufacturing. Lead time on anchor investments is about three years (The Mpumalanga Provincial Government Five year review (2004-2008), 2009). Significantly agriculture has also been identified as an investment opportunity, which would be key to eradication of poverty more specifically at a household level.

3.4.3 Local Economic Development in Emalahleni

In 2005, the value of eMalahleni Municipality was R19 billion providing about 76 733 job opportunities with an annual growth rate of 1.9%. This reflects a relatively balanced economy compared to other municipalities in Mpumalanga (Mpumalanga Local economic Development Plan, 2006).

According to economic contribution, mining is the leading sector contributing about 33.5% to the local municipality's Gross Geographical Product (GGP); coal mines are dominant in the area. The mining of coal is prevalent throughout the Local Municipality (Mpumalanga Local economic Development Plan, 2006). The second largest contributor to the local economy is the manufacturing sector. It was valued at R2.9 billion providing 9, 140 job opportunities in the area in 2005 (Mpumalanga Local economic Development Plan, 2006).

The infrastructure of eMalahleni Local Municipality is well developed with good road and railway networks. Approximately 1 537 people are employed in the transportation sector generating about R1.6 billion. The strategic location of eMalahleni Local Municipality between Gauteng and the Maputo Port in Mozambique offers great future growth prospects (Mpumalanga Local economic Development Plan, 2006).

The area had the trade sector as the fastest growing tertiary sector in the area. It reached a value of R1.89 billion in 2005. The Urban Development Zone has been newly established so as to substitute the Witbank Central Business District (CBD), which has been on the decline lately (Mpumalanga Local economic Development Plan, 2006).

The eMalahleni LED strategy has the following core objectives:

- To promote and facilitate overall economic development within the Municipality in the areas of :
    - Tourism and development
    - SMME development
    - Emerging farmer development
- To accelerate interaction between the municipality and the business community.
- To market Emalahleni Municipality as an investor friendly municipality.

- To identify poverty pockets and formulate means to address such.

Source: (Mpumalanga Local economic Development Plan, 2006).

It is quite significant that the emerging farmer development is also envisaged as one of the key dimensions to developing the local economies of the Mpumalanga Province.

3.5 Poverty and employment

Growing unemployment is one of the daunting task facing the province. The province's population is estimated at 3 606 800 people, representing less than 7 % of the total population of the country. The population has been on a steady increase. The working age group of 15-64 years is about 2.1 million and from this age group only 1.1 million are employed (2007/08) (Department of Economic Development and Planning, 2008).

Unemployment rose by 0.7% for the period of March 2001 and 2006, and a peak of 30% unemployment was in 2002 and 2003. This increase in unemployment rates continued until 2007, and over the last year there has been a tapering off with unemployment set at 20.6%. The tapering off of unemployment is not a substantial drop implying that the province is breaking even in terms of the number of jobs created offset against the number of new entrants into the labour market. This summarized in the table below:

Table 3: Rate of employment and unemployment

Indicator: Economic and demographic	**2004/2005**	**2005/2006**	**2006/2007**	**2007/2008**
Workers (employers, employees, and self-employed) aged 15-64 years				
Male	475 000	492 000	512 000	596 000

Female	369 000	345 000	390 000	543 000
Both sexes	844 000	837 000	901 000	1 139 000
Unemployment rates	19.1%	21.6%	23.9%	20.6%
Number of employed people	776 000	764 000	803 000	844 000
Number of unemployed people	269 000	288 000	303 000	302 000

Source: StatsSA, 2004

Despite the numeral interventions proposed by the Mpumalanga Provincial Government, there has been a notable increase in women within the unemployed bracket. Such high levels of unemployment underpin the significance of self-sustenance and sustainable agriculture is the key to livelihood diversification and long term sustainability given the fact that the formal employment sector can absorb so less. Overall, there has been, despite interventions made by the Mpumalanga Provincial.

The gap between high income earners and low income has been on a steady increase as shown by the province's Gini Co-efficient that has been spiraling upwards. It is noteworthy that despite the income inequality, the average income per household has been increasing over the last five years and poverty levels have been decreasing. The percentage of people living in poverty dropped from 4.7% in 2004 to 2.1% in 2007. However such statistics are not even across all the smaller communities in the districts of Mpumalanga, this call for a conceited effort to ensure that poverty eradication initiatives target all the previously disadvantaged communities with an objective of ensuring that they are self-sustaining in the long run.

Table 4: Poverty measures

Indicator: Economic	2004/2005	2005/2006	2006/2007	2007/2008
Gini co-efficient	0.64	0.65	Unavailable	0.68
Household average annual income (in rands)	60 166	65 898	72 667	80 727
Poverty levels: Number of people living on less than $ 1 per day in the province	170 874	122 267	93 824	77 527
	Proportion of people living on less than $1 per day in the province dropped from 4.7% in 2004 to 2.1% in 2007.			

Source: StatsSA, 2004

A range of initiatives aimed at addressing poverty and inequality has been developed by the Provincial Government, for instance the Expanded Public Works Programme and the Local Economic Development programmes are examples of such initiatives. Poverty levels are relatively high in Mpumalanga despite the government propelled interventions at different levels. Self-substance through encouraging and supporting sustainable agricultural activities will reduce poverty and improve the standard of living in the province and consequently in under resourced rural communities.

3.6 Access to services

Access to services is a key indicator in terms of poverty drivers. In eMalahleni, about 98 % of the total population has access to piped water and about 88% have access to electricity. About 41% have piped water inside their house or yard (eMalahleni Integrated Development Plan, 2009-2010, 2009). An estimated 90% of households in eMalahleni have access to toilets or pit latrines, of which about 71% have waterborne sewer, while 18% uses pit latrines without ventilation (eMalahleni Integrated Development Plan, 2009-2010, 2009). However the existing infrastructure is far from meeting the demands of the increasing population in eMalahleni Municipality, there is hence a need to upgrade and expand the existing infrastructure to meet the demands of the growing population. The

fringe per- urban and rural communities do not have access to piped water and electricity, which is reflective of poor communities.

3.6.1 Water and sanitation

EMalahleni Local Municipality consists of eMalahleni City, Ogies, Phola, Ga-Nala, Thubelihle and Rietspruit. Infrastructure in these districts is more than fifty years old and has thus turned in efficient in terms of service delivery (eMalahleni Integrated Development Plan, 2009-2010, 2009).

EMalahleni Dam is the major supplier of water to the eMalahleni Local Municipality and has a volume of 104 million cubic meters and an assured yield of abstraction of 75 Mega Litres per day. Water shortages might occur in other seasons since the current over abstraction is only sustainable and attainable during dry seasons, which shows the need for augmentation. As part of the augmentation scheme, the Mine Water reclamation scheme has been introduced; however this would not solve eMalahleni's water needs in isolation. This scheme already provides 20 Mega Litres per day of potable water at present (eMalahleni Integrated Development Plan, 2009-2010, 2009). In essence, supply of piped water is still a challenge in the province and the situation is worse in the rural and peri-urban communities, this exacerbates poverty conditions.

3.6.2 Electricity

Stakeholders form different sectors got together with an object to properly plan and budget on electrical distribution. The stakeholders involved mainly: the local Council, Eskom and a local professional service provider. Top of the agenda was to asses and discuss the stability and reliability of the electrical distribution network in eMalahleni. According to the results of the meeting, the Nominal Maximum Demand was exceeded by 100% and hence calling for a need to strengthen and increase the liability of supply from the source (Eskom). Initiatives to address the need follow: increase capacity at Doornpoort and KwaGuqa substations, establish a new load centre substation and establish a second feeder from Churchill to Buffer substation. The envisaged outcomes

of these initiatives includes the minimization of power supply related challenges that threaten the economic viability of eMalahleni Local Municipality (eMalahleni Integrated Development Plan, 2009-2010, 2009).

3.6.3 Housing

There is glaring housing backlog in eMalahleni Municipality this a big challenge in terms of general service delivery, which also has a bearing on the poverty levels of the municipality. The prevalence of informal settlements also attests to the service delivery challenges experienced by the Municipality, the highest number of informal settlements are in Nkangala District that has an estimated housing backlog of approximately 38 627 units (see Table 6). The western and north-western parts of eMalahleni City has the largest housing backlog.

Table 5: Housing backlog

HOUSING TYPE	NUMBER OF FAMILIES
Informal settlements	22 810
Backyard Dwellings	9 465
Multiple Family Accommodation	4 640
Hostels	811
Families on Farms	901
Total	38 627

Source: eMalahleni Municipality, August 2004

Urbanization and the movement of people in search of employment in the mines and power stations are the driving pull factors attributing to the housing backlog as the urban areas struggle to cope with the ever increasing rural to urban migration. The formation of informal settlements has been partly shaped by the eviction of farm workers (eMalahleni Integrated Development Plan, 2009-2010, 2009). Informal settlements are an essential landmark in the province; some of these settlements date back to more than forty years back and hence deserve recognition when it comes policy formulation and poverty alleviation strategies.

3.7 Tourism and development

The Mpumalanga Provincial Growth and Development Strategy has tourism as the backbone to developmental goals given that the province has rich natural and cultural resources to effectively sustain the tourism industry and capitalize on the expanding markets for international and domestic travel (Mpumalanga Tourism Growth Strategy, 2008).

3.7.1 Vision for Mpumalanga tourism 2016

In 2007, the province came up with a ten year tourism growth strategy. The pillars of Mpumalanga's cocktail of the tourism product entailed the following: wildlife and nature tourism, activity and adventure tourism, resort tourism, residential tourism, conference and meetings, leisure/ entertainment, industrial and township tourism (Mpumalanga Tourism Growth Strategy, 2008).

At the core of the development of the tourism industry, the tourism strategy saw the development of the appropriate institutional framework, destination and product marketing campaigns, human resource development and investment programmes, which all ensured that the industry strives. Essentially the tourism strategy has been key to the protection of the province's natural resource base as supported by the prevalence of some of the best managed nature and game reserves and heritage sites in Africa (Mpumalanga Tourism Growth Strategy, 2008).

Mpumalanga as a province has set aside R10 billion earmarked for the development of tourism in the next decade. The tourism product offering has to be diversified to include other economic segments such as sports events, business/ conference meetings, theme/amusement park in order to ensure the effective and value adding spend of this amount (Mpumalanga Tourism Growth Strategy, 2008). Tourism development is an essential dimension in the sustainable development rubric as it prioritizes the conservation of natural resources and cultural heritage.

3.7.2 Environmental Management, Parks and Open space

EMalahleni Municipality is faced by environmental challenges that include underground fires, gas emissions, air pollution, water pollution and general environmental degradation which is attributable mainly to open cast mining activities (Mpumalanga Tourism Growth Strategy, 2008). The space for burial has significantly constricted in the past years, According to Mpumalanga Tourism Growth Strategy, 2008 the two major cemeteries that are in current use are almost full and face imminent closure (Mpumalanga Tourism Growth Strategy, 2008).

The illegal dumping that is prevalent in the municipality will be minimized by various initiatives some of which entail the development and maintenance of public parks, which also enhances the aesthetic value of the municipality (Mpumalanga Tourism Growth Strategy, 2008).

Strategies adopted to address the identified environmental problems entail;

- Identification and purchase of suitable land for the development of a cemetery.
- Develop and maintain new parks and improve existing parks.
- Conduct preparatory investigation regarding ways and means to conduct an Air Quality Management Plan- as a joint venture with mines and industries in the municipal area.

Source: (Mpumalanga Tourism Growth Strategy, 2008).

3.8 Current state of Topiya Village

3.8.1 Location of Topiya Village

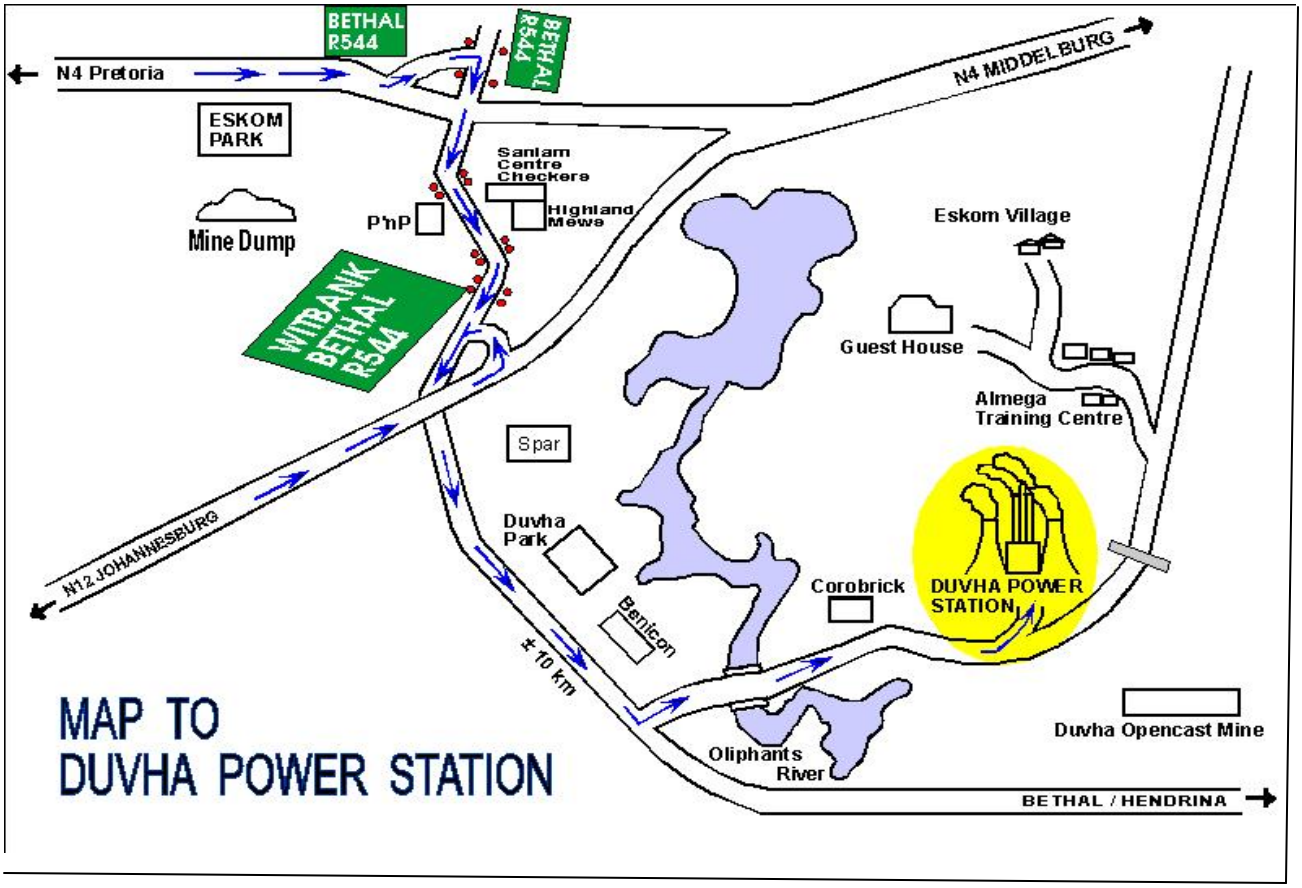


Figure 3.2: Topiya Village (marked with X)

Topiya Village is situated approximately 20 km south of Middelburg in Mpumalanga in the eMalahleni Municipality close to the Steve Tshwete Local Municipality boundary. The small community consists of approximately nineteen (19) households and has existed for the past forty years despite efforts by adjacent commercial farmers to displace the settlement. Despite the fact that the village is not under a recognized Chief, it is under Themba Khumalo, who has been residing at Topiya for the past thirty years. Topiya village is an informal name derived from Ethopia as a result of the bareness of the area and the agriculturally unfavorable soils. The small village lies less than three kilometers from the Duvha Mine which happens to be the primary source of income for Topiya

Villagers. Significantly the village lies at the foot of Olifant River which is sometimes used for resort purposes by both local and international tourists.

The topography shapes the local climate of the province. Mpumalanga is divided into two halves namely: the high-lying grassland savannah of the highveld escarpment and the subtropical Lowveld plains (SA Venues- weather 2009). Middelburg, at the centre of the highveld, experiences summer rain, and has a summer (October to February) to winter (April to August) range of around 19º C with average temperatures in the contrasting seasons, of 26º C and 8º C (SA venues- weather 2009).

Duvha Mine is the main employer, although Ben Schoeman Farm and other commercial farms also compete for the same pool of semi and unskilled human resources in Emalahleni Municipality. Formal employment is one of the livelihood strategies in Topiya; however there is a need to integrate it with other livelihood generation strategies such as subsistence agriculture. This is based on the fact that employment is temporary and only improves food security to a few households. This has forced most of the villagers in Topiya Community to resort to subsistence farming as a strategy to augment their household food supply. Various households keep goats (not more than fifteen per household) and also grow crops such as maize and vegetables for subsistence purposes. The average plot size is approximately one hundred square meters per household.

It is noteworthy that, even though subsistence agriculture has been envisaged as the secondary source of food, it plays a major role in terms of absorbing individuals that do not qualify for formal employment. Subsistence agriculture also provides for the immediate needs in terms of food security. In this poverty stricken community, various livelihood generation strategies have been postulated at both local and provincial levels such as Masibuyele Emasimini programme, which aims to ensure food security and combat hunger in rural communities. Sustainable agriculture which entails mainly scientific methods of improving crop yield has been adopted by the Topiya community as a strategy to alleviate poverty. However there has been generally a poor uptake of the initiative and instead of delivering on its good premises, sustainable agriculture has led to increased environmental degradation, more conflicts and more poverty. This has increased the tendency towards areas that are more adjacent to the Olifant River culminating into increased probability of conflict in some instances.

3.8.2 Sustainable agriculture in Topiya

The twentieth century has seen a dramatic change in agriculture that is crop production and livestock rearing as a result of a combination of factors notably demographic changes which have consequently increased the demand for food globally. Sustainable agriculture entails 'the production of food and fibre crops and animal products using new farming technologies, including new high yield variety crops, mechanisation, and the increased application of pesticides and fertilisers' (Sustainable Agriculture Group, University of Carlifornia, 2006 pg 18.).

Albeit the positive effects on farming, sustainable agriculture also come at significant costs. This includes negative environmental consequences such as; soil erosion, clearing of native vegetation, the decline in soil fertility, contamination of ground water, sky rocketing agricultural production costs and decreased farm yields per household. All this has resulted in the migration of small farmers to adjacent built up and urban areas. Notably in many cases these changes have forced small farmers to leave the land and move to urban areas (UNESCO, 2008).

3.8.3 Agricultural practices in Topiya

The unfavorable climatic conditions to agriculture in Topiya have resulted in massive stream bank cultivation. The majority of households cultivate maize along the river banks of the Olifant River. This has also contributed to the siltation of the river as a result of soil erosion. Such agricultural practices are unsustainable and tend to lead to further environmental degradation. The relationship between population growth and environmental degradation is further investigated by Madulu et al, 1993. They contend that environmental degradation and poverty has been a consequence of population pressure on agricultural land that has aided land fragmentation, invasion of marginal lands and unsustainable land use practices (Madulu et al. 1993; Mung' ong'o and Mwamfupe 2003).

3.8.4 Food Security in Topiya

The Topiya community can hardly meet its growing food demands as a result of increased number of individuals per household (Steve Tshwete Municipality LED Plan, 2006). The increase has been partly brought about by the increase in population and as a result of lack of employment in urban areas which has resulted in urban to rural migration. However the rural to urban migration has also played a positive role to improve food security in some households in the form of remittances (Bryceson 2006).

The Topiya community is food insecure and there is a dire need to improve food security. Sustainable agriculture has failed to deliver on its premise to improve food security as a result of poor uptake of the policy by the community (Mpumalanga Economic Profile, 2008). The older generation which solely depended on subsistence farming is gradually being replaced by the younger generation which concentrates more on formal employment (Bryceson 2006). Some of the younger generation is employed in the adjacent Duvha Mine while some provide farm labour to the adjacent Ben Schoeman Farm.

Most households are clustering closer to the fertile banks of the Olifants River, which has put immense pressure on the banks of the river. Scarcity of land has created a conducive atmosphere for conflict to thrive (Homer-Dixon 1999). The damp swampy areas which have soil with high moisture and mineral content at the foot of the Olifant River have attracted more households. Consequently this has also resulted in unsustainable stream bank cultivation and environmental degradation.

3.8.5 Conclusion

Climate and soil varieties of the Highveld and Lowveld regions within Mpumalanga provides for a diverse agricultural landscape. Emalahleni Municipality is predominantly rural; the majority of households in Topiya cultivate maize along the river banks of the Olifant River. The Topiya community is food insecure and there is a dire need to improve food security.

CHAPTER 4
RESEARCH METHODOLOGY

4.1 Introduction

The methodology is divided into the following sections; research design, research questions, participant, instruments, data analysis, ethical considerations and methodological reflections. The design section discusses the nature of the study. The research questions focuses and guides the substance of the research. The participant section accounts for who took part in the study and the selection criteria. The procedure describes in detail how the study was actually done. The data analysis section provides details on the statistical analysis that was followed, informing the reader about the technical, theoretical and methodological issues related to statistical analysis. Ethical considerations relate to the manner of practice in conducting research that is acceptable when dealing with human subjects. The section on methodological reflections discusses what worked well and what didn't work during the whole research process.

4.2 Research design

The study is both qualitative and quantitative in nature permitting the researcher to ensure objectivity and reliability. These techniques cover the ways research participants are selected. In this study, the research participants entailed all the households of Topiya village. A preliminary site visit was conducted to meet the chief of the area (Themba Khumalo). The objective was to ensure recognition of the community local structures and set the tone for data gathering. The researcher is considered external to the actual research, and results are expected to be replicable no matter who conducts the research (Weinreich, 2005).

The strengths of the quantitative paradigm are that its methods produce quantifiable, reliable data that are usually generalizable to some larger population. However, this paradigm breaks down when the phenomenon under study is difficult to measure or quantify (Weinreich). According to Sinha (2005) the greatest weakness of the quantitative approach is that it decontextualizes human behavior in a way that removes the event from its real world setting and ignores the effects of variables that have not been included in the model (Sihna, 2005). It is quite significant that the research used both qualitative and quantitative research methods to achieve the objectives of the research.

4.3 Participants

In terms of demographics, Topiya community is fairly small in size. The community consists of about nineteen households with an average of four heads per household. All the nineteen households of Topiya village participated in this study as the researcher felt this would deliver the best information in order to satisfy the research objectives. The nineteen households were represented mainly by the bread winners of each household and the majority were man although women also participated in the study.

4.4 Research Instrument

A closed-ended questionnaire was designed for purposes of data collection. The questionnaire was divided into five sections that were aimed to ascertain the following factors in the study area: Food security status and perception, different ways of acquiring food, livelihood strategies in Topiya village, various ways of farming and economic factors. The research instrument began by informing the participants about why the research was carried out; it gave a clear outline of the objectives of the research. Participants were given examples of how to respond to specific items. The questionnaire was self-administered although the researcher had to interpret the questions in vernacular (Zulu) so as to ensure proper understanding and relevant answers. This instrument was suitable for the study and enabled the presentation and analysis of findings.

4.5 Procedure

According to the Chief of Topiya community who has been resident at Topiya village for more than forty years, the name Topiya was derived from ‘Ethiopia’. This name was a result of the barrenness of the village despite its proximity to the foot of Oliphants River. The village is dry most of the times and this has necessitated the need to develop and adopt sustainable agricultural practices meant to improve food security and alleviate poverty in Topiya village.

A preliminary investigation was conducted. Prior to conducting the research, the researcher visited the study area and introduced himself to the chief (Themba Khumalo). The chief was given a brief on the aims and objectives of the research. The intention

was to ensure that this information is filtered down to other households. A follow up date to conduct the actual research was arranged with the Chief.

Engaging the Chief was a significant process to information gathering exercise. Observing local traditional structures ensured community buy in and effective cooperation and participation by the households of Topiya village. The Chief also assisted in terms of ensuring that each household was represented on the day of the data gathering exercise. This was quite important given the fact that some household members are working in the adjacent Duvha Power Station and their contribution is quite significant in terms of achieving the objectives of the study. The data gathering exercise was conducted on a weekend (Saturday), this also ensured a good turn around in terms of each household representative.

The Chief assisted to set a date for a common place (chief's place) where all the households of Topiya attended the data 04-02-2012. This worked well for the research given the undulating topography of Topiya; hence some areas were quite inaccessible. The fact that the respondents were gathered at the chief's place, assisted in terms of willingness to participate. The respondents were free to divulge information given the fact that the local community structures were observed in the process of engaging them.

Participation was guided by a prior introductory discussion that weighed whether or not the concerned individual was willing to participate. This was confirmed by acceptance of signing the informed consent form. The researcher provided an information sheet on the research for participants to read before signing the consent form.

A closed ended administered questionnaire was used to gather data. The questionnaires were physically presented to each household member, completed and collected. Each household member was assisted throughout all the sections of the questionnaire. The translation of the questions from English to Zulu assisted immensely in terms of ensuring that the respondents understood the requirements of the questions and gave answers best to their knowledge.

Before the administration of the questionnaires each respondent's attention was drawn to the fact there was a need for honesty and that this was not a test. Respondents were also requested to avoid giving socially desirable responses. It was indicated to them that their responses would be treated in the strictest of confidence and that their responses

would also be used for research purposes only. The respondents were requested to ask when a question or item was not understood.

4.6 Data analysis

Descriptive statistics was used to analyse the closed- ended items of the questionnaire. According to Cooper and Schindler (2003, p.474)

"The characteristics of location, spread and shape are helpful initial tools for cleaning the date, discovering problems and summerising distributions. Their definitions, applications and formulas fall under the heading descriptive statistics".

Items in the research instrument were grouped under a common theme. The themes as summarized in the data analysis section follow:

Food security status, this subsection focused mainly on the respondents' perception of food security in terms of meals per day, the dominant diet in the respondents' meals, and the general perception of food security. These were regarded as the key factors in terms of determining one's perception and position regarding food security.

Means of acquiring food was also discussed in this subsection and this looked mainly at the primary sources of food, secondary sources of food and income spent on food in the study area. This section ascertained the sustainability of strategies to acquire food in Topiya village; this would hence informed the necessity of other community participation policy interventions meant to ensure the long term sustainability of means of acquiring food in Topiya village. Sources of livelihood were also discussed; the objective was to establish whether the current livelihood strategies in Topiya are adequate to ensure food security per household.

This section also looked at other salient factors that have a profound bearing on food security and these include: different crop production methods used in Topiya, main type of agricultural produce in the community, farm sizes, duration of farming, land degradation and consequently reduced farm production, number of dependents per household in relation to food production, other sources of income that should augment agricultural produce. All the above subsections assisted to investigate in detail Topiya's position in terms of food security and this also laid the foundation for policy formulation

to improve food security and consequent poverty alleviation in peripheral communities like Topiya village.

4.7 Ethical considerations

The researcher endeavored to comply with the ethical requirements of dealing with human subjects expected of him by any academic institution in pursuance of research. Serious consideration to protect the rights of human subjects and the standards of this scientific enquiry were considered. Ethical clearance was obtained from University of the Witwatersrand Johannesburg Human Research Ethics Committee. Participants were informed of the aims, the voluntary and anonymous nature of their participation and their right to withdraw at any time without prejudice. It was made clear to the participants that the raw data would be kept separately in a locked facility and that it will be made available to the researcher and supervisor only.

4.8 Methodological reflections

It is noteworthy that the research was qualitative and quantitative in nature. This worked well to achieve the objectives of the research. Both qualitative and quantitative research designs are descriptive designs because they enable the researcher to describe the occurrence of variables, the underlying dimensions in a set of variables, or the relationship between or among variables (Heppner et al, 1992). Quantitative research designs assume that the major components of research deal with the internal mental events of the individual. The quantitative researcher observes the physical world, whereas the qualitative researcher actively constructs knowledge and does not passively receive the knowledge (Heppner et al, 1992). Both types of designs focus on different type of questions, where quantitative researchers seek to explain the cause effect relationships, the qualitative researcher seeks to explain the way people give meaning to their own and others' behavior (Heppner et al, 1992).

The use of both qualitative and quantitative research designs were also key in that; reliability, internal and external validity are important in quantitative research designs, whereas authenticity, stability and trustworthiness apply to qualitative research designs (Heppner et al, 1992).

The use of a questionnaire enabled the research in various ways. Close ended questionnaire offered the following advantages:

- It is easier and quicker for respondents to answer
- Easier to compare answers from different respondents
- Answers are easier to code and statistically analyse
- The response choices can clarify question meaning for respondents
- There are fewer irrelevant or confused answers to questions
- Less articulate or less literate respondents are not at a disadvantage
- Replication is easier

However the use of questionnaires also offered disadvantages such as: respondents that did not have an opinion on some issues answered anyway, misinterpretation of questions by some respondents; respondents could be frustrated by lack of their preferred answers in the list of options. This being said, close ended questions had a positive impact on the information gathering for data analysis and interpretation of results.

All the households of Topiya community were interviewed no sampling was done. This worked well for the research since Topiya is made up of about nineteen villages, sampling from such a small population was hardly going to achieve the research objectives and answer the research questions.

Involving the Chief and following the proper community structures was key to ensuring community buy in and honest response to questions. Data gathering exercise was bound to be futile had the researcher approached the respondents in their respective households. It was quite significant to preliminarily approach the chief, schedule a date for each household representative to present themselves for completing the questionnaire.

Ethical considerations were key to ensure that the respondents give answers without fear or prejudice. The participant consent forms were key to give confidence to respondents in terms of confidentiality and anonymity. The study area was quite suitable for the research: Topiya village is more than forty years old, food security is an incessant challenge; the current agricultural practices seem not sustainable to meet the burgeoning population. Topiya village represents a number of rural peripheral

communities that are food insecure as a result of unsustainable livelihood strategies. This necessitates community based target policy initiatives that should look at improving current agricultural practices so as to ensure food security and consequent poverty alleviation in rural peripheral communities like Topiya village.

4.9 Conclusion

This section of the thesis focused on the methodology that was used in conducting the research. The section spelt out the research design, research questions, instruments, procedure, data analysis ethical considerations and the methodological reflections that were fundamental to the methodological framework.

The research is both qualitative and quantitative and the research questions focused on the implementation of sustainable agriculture to alleviate poverty. A close ended questionnaire was administered to Topiya community households. This chapter is key and serves to facilitate and ensure the correct interpretation of the research results presented in the next chapter.

CHAPTER 5
RESEARCH FINDINGS, DATA ANALYSIS AND DISCUSSION

5.1 Introduction

This section of the thesis focuses on the research findings as well as analysis of the findings. This section will also show the graphical presentation of results and also discuss the implication of the findings in relation to the objectives of the research.

5.2 General particulars of respondents

A total population of nineteen (19) households (respondents) participated in this survey. The survey consisted of all age groups as well as the elderly who are not able to read or write but have been residing in Topiya Village for the past forty years.

5.3. Findings

5.3.1 Food security status

This section looks at food security status in Topiya community. It focuses mainly on the respondents' perception of food security in terms of meals per day, the dominant diet in the respondents' meals, and the general perception of food security. These are envisaged to be salient factors in terms of determining one's perception and position regarding food security.

Perception of food security in terms of meals per day

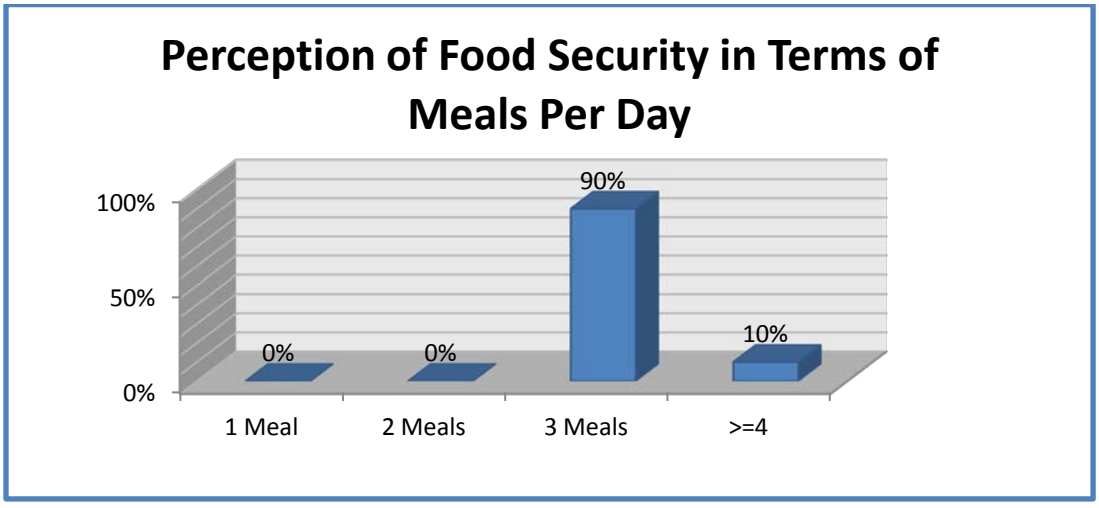


Figure 5.1: Perception of Food Security in Terms of Meals per Day

Figure 4.1 above show that most respondents (90%) perceive three meals per day as a sign of food security. However there is a 10% who perceive food security reflected by four or more meals per day.

Dominant diet in meals

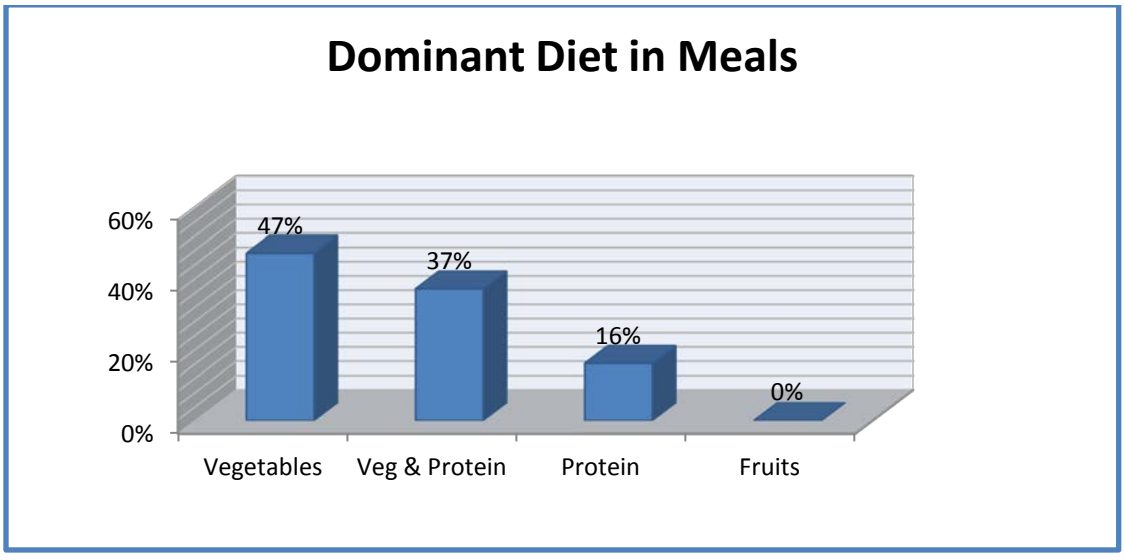


Figure 5.2: Dominant Diet in Meals

The survey results in figure 5.2 demonstrate that 47% of the respondents have diets dominated by vegetables only and 16% by protein only. However there is a 37% said

their diet is dominated by both vegetables and proteins, these represent a percentage of respondents that practice intensive agriculture and also buy from the adjacent shops.

Food security

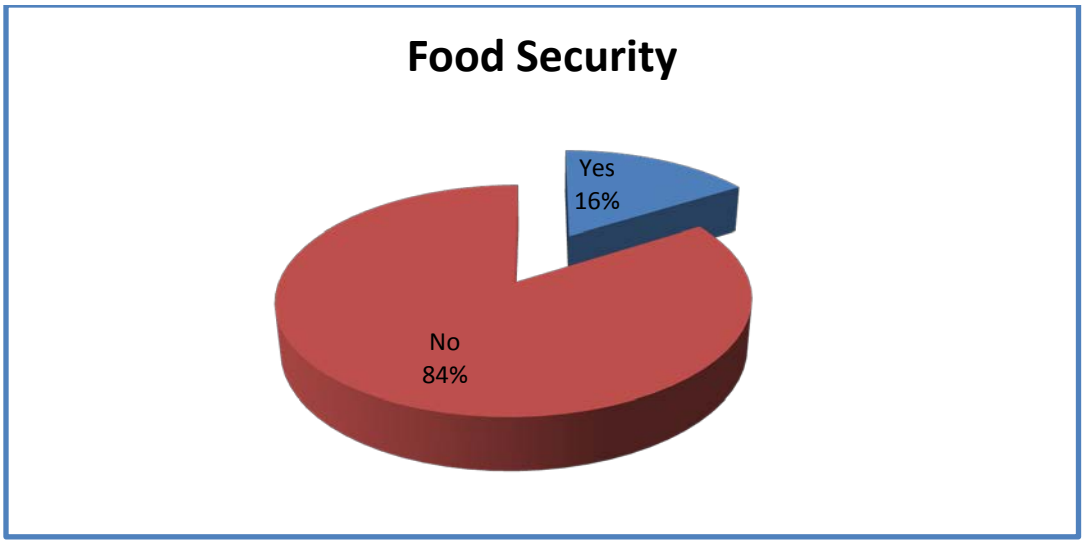


Figure 5.3: Food Security

The survey results contained in figure 4.3 above indicate that 84% of the respondents do not consider themselves as being food secure while only 16% think otherwise.

5.3.2 Means of acquiring food

The following section discusses the primary sources of food, the secondary sources of food and income spent on food in the study area. Sustainable ways of acquiring food are critical in a community like Topiya whereby dependency on one strategy for acquiring food can hardly meet the dependents per household.

Primary sources of food

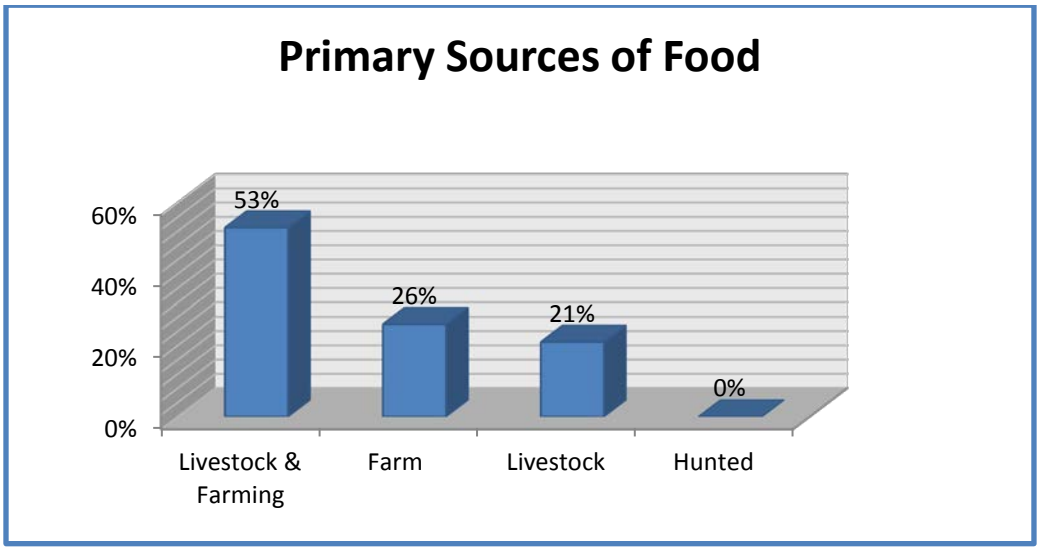


Figure: 5.4. Primary Sources of Food

The results show that for the majority of respondents (53%) the primary source of food is both farm products and livestock. However there is a 26% who primarily depend on farm products only for food whilst 21% depend on livestock only. Despite the rural set of the study area where normally hunting contributes as a source of livelihood, there are no respondents who depend on hunting as their primary source of food.

Secondary sources of food

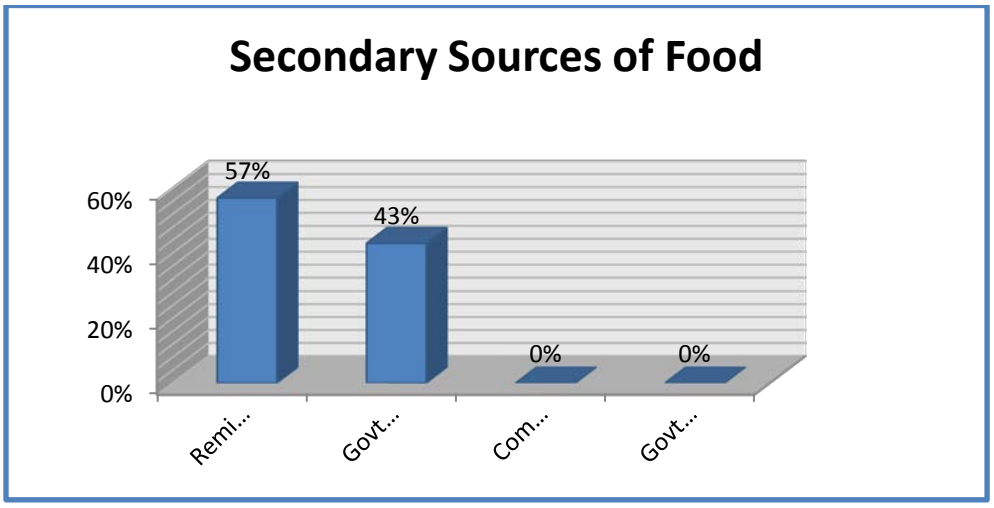


Figure: 5.5. Secondary Sources of Food

The survey results show that for all respondents the secondary source of food is either remittances or government grants and pensions. However there are more respondents (57%) who dependent on remittances than on Government Grants & Pensions (47%). Despite the dominance of agricultural workforce in the province, there are no households that depend on commercial farm labour and government food parcel.

Income spent on food

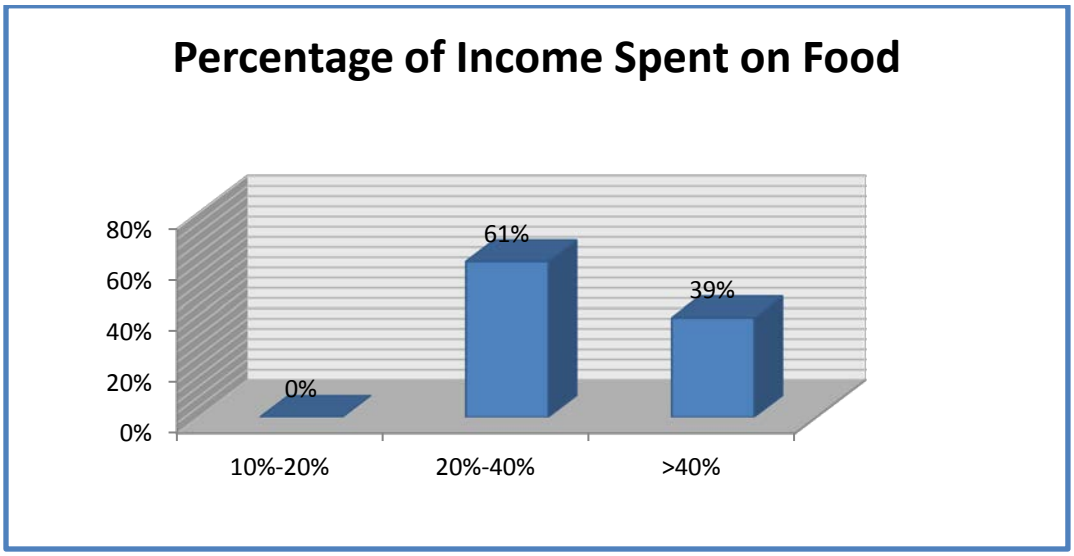


Figure: 5.6. Percentage Income Spent on Food

The results of the survey reveal that more than half of the respondents (61%) spend between 20% and 40% of their income on food whilst 39% spent more than 40%.

Internationally 'food security is defined as the ability of people to secure adequate food. More especially it has been defined by researchers as the access by all people at all times to enough food for an active healthy life (Anderson ,1990 pg 22)'. However definition of food security at a household scale is also critical, which looks at not only food availability but also investigates food accessibility as an essential paradigm to the food security discourse (Anderson, 1990).

According to Statistics South Africa LCM 2008/2009 report (2008), the average meal per day per household is three in South Africa for both rural and urban areas. The majority of respondents more than 90 % perceive food security to be at least three meals per day in Topiya Village. The consensus by the majority of the respondents is that they are food insecure. In essence, they are getting less than three meals per day that means that the current livelihood strategies are not sustainable; they fall short of providing the three meals per day per household. This further cements the need for improving the productivity of the small farms at the same time controlling the number of heads per household as this has a profound effect on the food security status of a household.

Vegetables and protein are the dominant diet; vegetables are derived mainly from subsistence garden farming whilst protein is taken to be derived from bought products like meat and eggs. Vegetables are grown mainly by the younger generation that has been cultivating the same piece of land for less than five years. These also represent the better informed generation, which integrate modern farming practices with traditional. This implies that encouraging the production of vegetables will contribute towards improving the productivity of the small farms, this will entail intensive agricultural methods including using water from the adjacent Olifants river for irrigation. The emergency of vegetables as a dominant diet in meals means there is a need for diversification by households so as to ensure sustainability and long term food security.

The realization of sustainable agriculture and rural development has been marred by an unprecedented constriction of agricultural land coupled with the deteriorating environmental conditions that are key to the production of food (Food and Agriculture Organisation, 1994). There is a relationship between food insecurity and number of depends. The bigger the number of depends the more vulnerable to food insecurity. Respondents with more than three dependents felt food insecure. This means that bigger families put a strain on agricultural output. For some households, the number of heads per household can hardly be sustained by the same piece of land in terms of size and agricultural potential. This in turn calls for a conceited effort to increase the agricultural productivity of the land by using intensive farming methods that should integrate both modern and traditional methods for long-term sustainability. Access to land is also the key to ensure providing enough food for each household.

The flip side of a larger number of depends is that; the large number of dependents can provide labour and thus serve as 'technological solution' to some subsistence farmers. This ensures long term sustenance to food production and overall improvement of agricultural out (Oppong, 1988;Youssef, 1988; Palmer, 1991; FAO, 1984, 1992; Rodda, 1991,Jacobson, 1992; Cleaver and Schreiber, 1992).

According to the findings, there is a relationship between the duration of farming and food security. Respondents that had practiced subsistence crop production for 1-2 years (11%) felt more food secure (16%) whilst the majority that represents respondents who had cultivated the same piece of land for more than two years felt food insecure. Unsustainable cultivation of the same pieces of land has reduced the agricultural potential of most fields in Topiya Village, this justifies the implementation of sustainable agricultural strategies so as to improve food security and consequently eradicate poverty.

5.3.3 Sources of livelihood

The rural economy is reliant on only agriculture but it is supported by a broad spectrum of activities and enterprises. Underlying this notion is the contemporary theory of 'livelihood diversification as key strategy to the long term sustainability of rural households in developing countries' (Ellis, 1999). The following section investigates the adequacy of Topiya's livelihood strategies to sustain households and alleviate poverty. Adequacy of livelihood strategies in terms of the study community's perception is also investigated in this section.

Main sources of livelihood

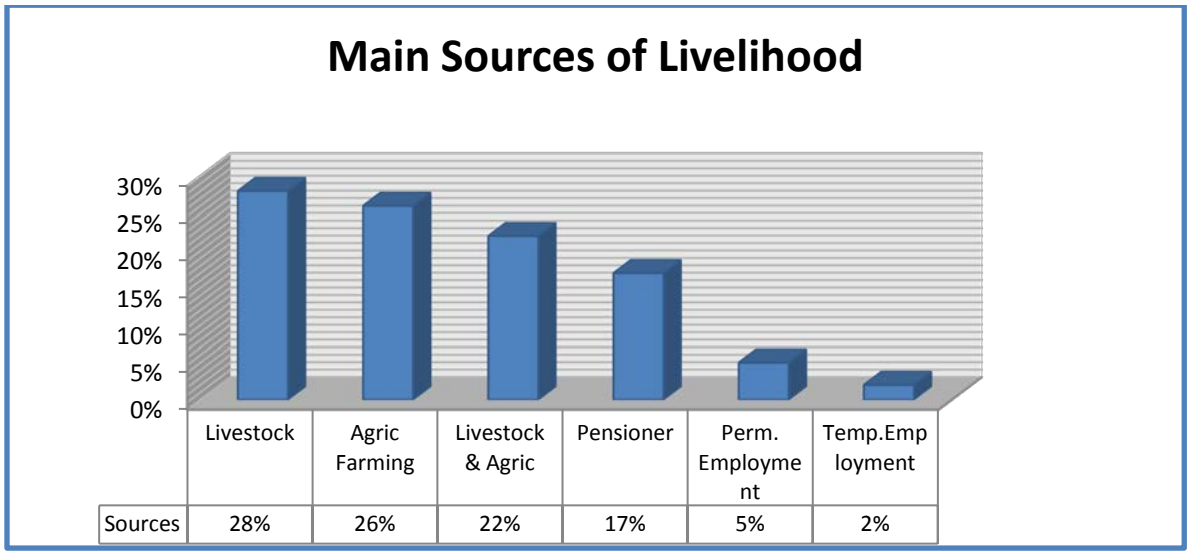


Figure: 5.7. Main sources of Livelihood

The above results show that 28% of the respondents depend on livestock only as a source of livelihood while 26% depend on Agriculture. There is a 22% who depend on both Livestock and Agriculture. The rest 7% depend on either permanent employment (5%) or temporary employment (2%).

Adequacy of livelihood strategies

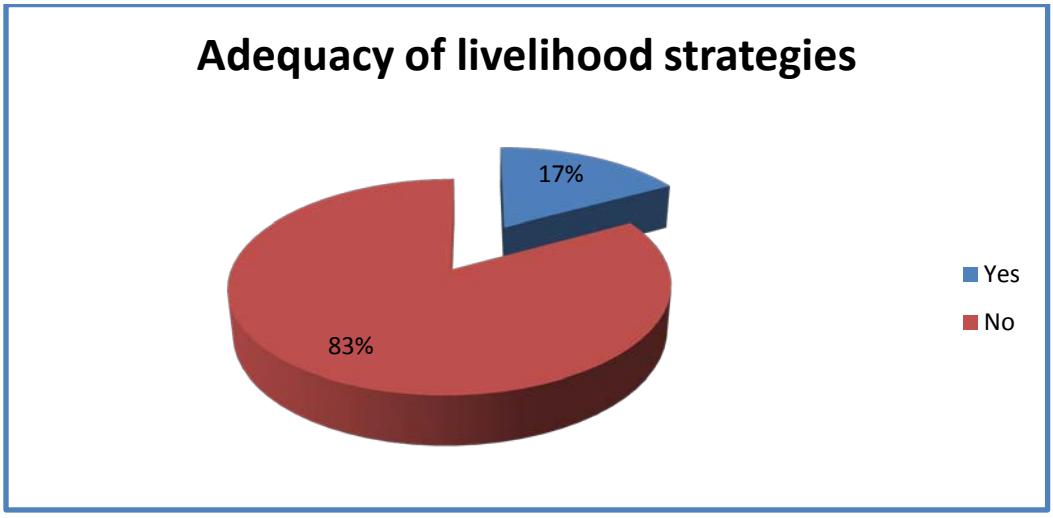


Figure: 5.8. Adequacy of Sources of Food

The results show that for most respondents their sources of livelihood do not provide enough to meet household food demand. This is further supported by the observation that there are a great number of respondents who depend on remittances (57%).

5.3.4 Subsistence crop production

In a more general sense, household food security is vastly improved by subsistence production and/or smallholder production, which tends to lessen the impacts from food price shocks (Baiphethi, 2009). In light of this, the following section looks at the main farming practices in Topiya community, their adequacy in terms of providing enough food per household and their sustainability in terms of the environmental footprint. The section also interrogates the main farming produce, the farm sizes and the net impact on food security and poverty alleviation in the study area.

Main farming practice

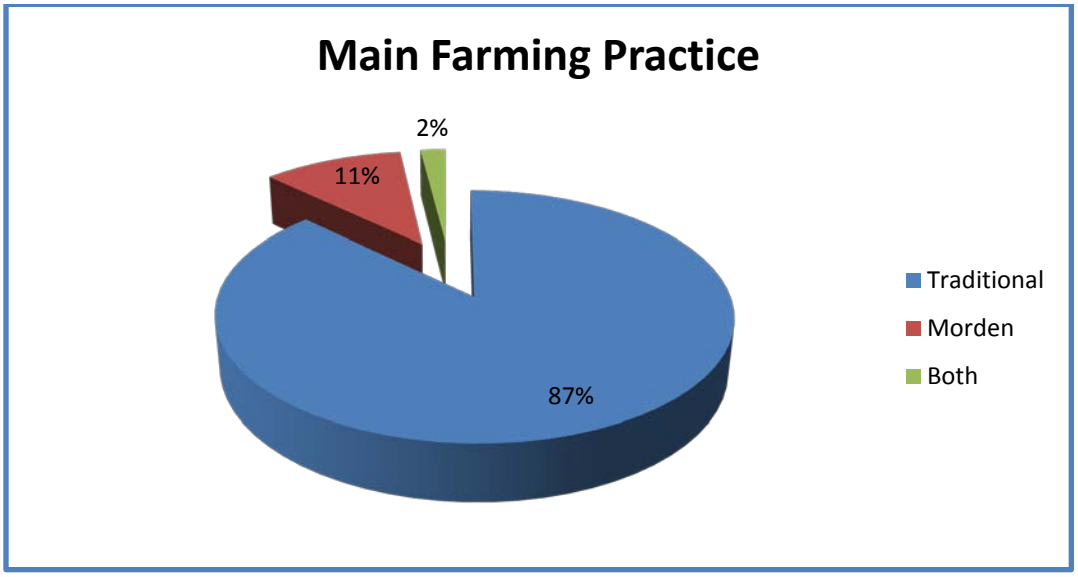


Figure: 5.9. Main Farming Methods

The results of the survey show that most of the respondents (87%) are still using traditional crop production methods, which involves the use of sustainable agricultural processes involving crop rotation, natural ways of augmenting farms' agricultural output potential through; composting, certified environmentally friendly pest control and homeopathic remedies to produce food that is free of all artificial additives (Department

of Agriculture, Forestry and Fisheries of South Africa, 2008). Only 11% of the agricultural households are using modern methods. However, only 2% of the respondents are using both traditional and modern methods. The 11% represents the younger generation that use mainly high output yield seeds and practice intensive farming whilst the 87 % majority represent mainly the older generation of households who have been farming the same pieces of land for the past five years. These have also noted a decrease in farm yield and interventions aimed at improving farm yield should seek to motivate the benefits of sustainable agricultural strategies to ensure long-term farm sustainability.

Main agricultural produce

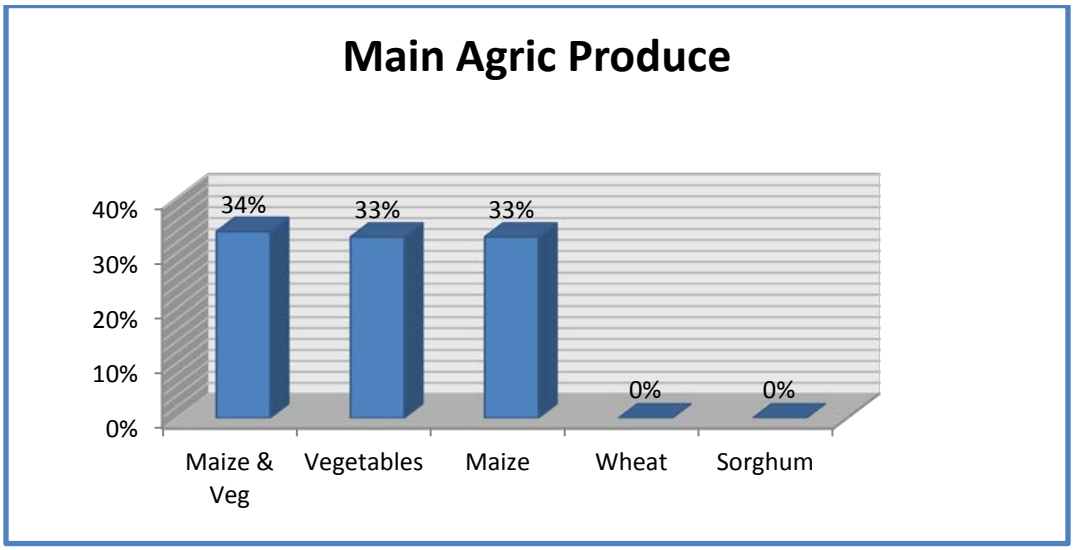


Figure: 5.10. Main Agricultural Produce

The results show that the main produce among the respondents is either maize or vegetables or both. Thirty four percent of the respondents produce maize, vegetables while 33% produce vegetables only, and the other 33% produce maize only.

Farm sizes

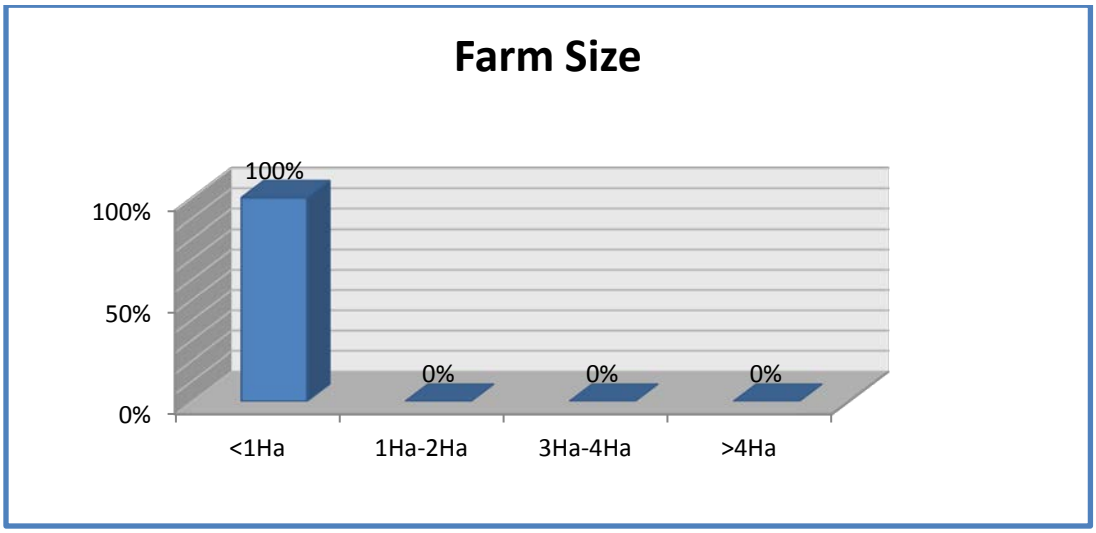


Figure: 5.11. Main Agricultural Produce

According to the results of the survey all respondents are occupying less than 1Ha farms.

Duration of farming

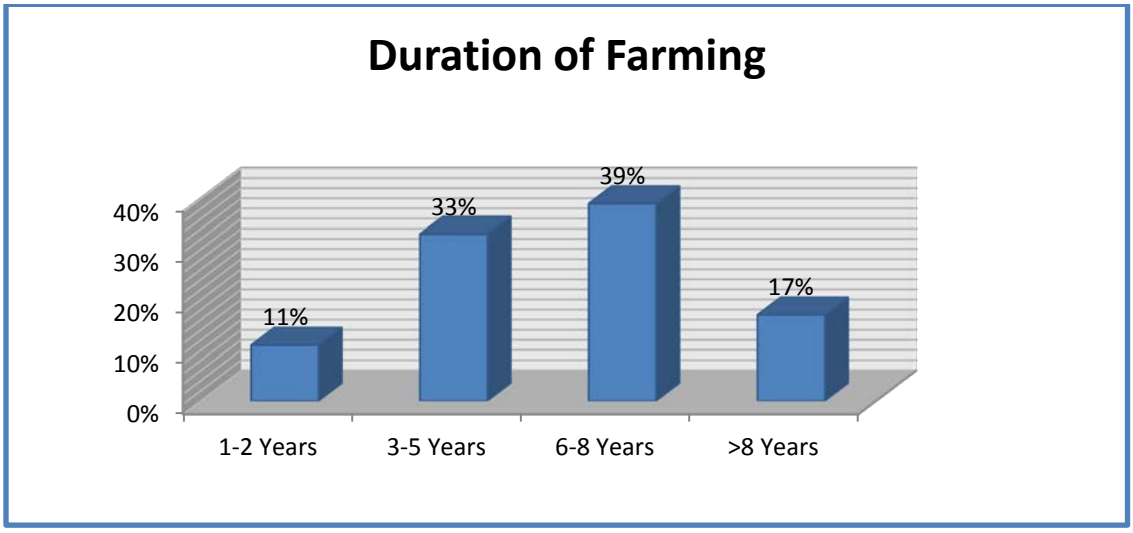


Figure: 5.12. Duration of Farming

The results show that the majority of respondents (89%) have been occupying their current farm for at least two years.

Effects of soil erosion

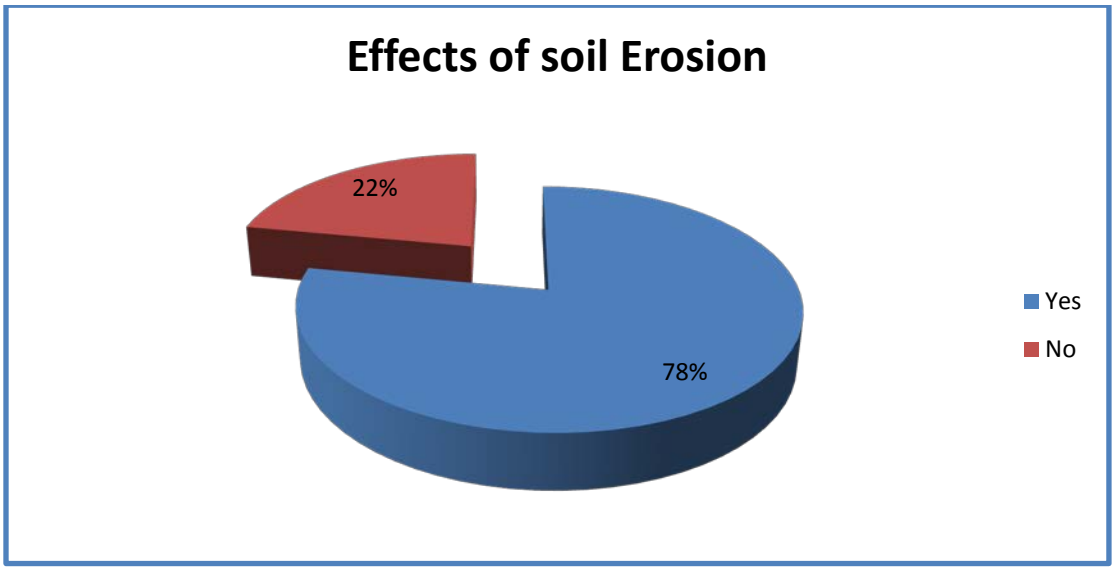


Figure: 5.13. Effects of Soil Erosion

Seventy eighty percentage (78%) agree that soil erosion is one of their major concerns.

5.3.4.1 Agriculture

The backbone to survival for Topiya community is agriculture and it has to be sustainable to feed households, minimize vulnerability to hunger and reduce poverty. For the majority of respondents the main source of livelihood is livestock production and subsistence crop production. The more dominant of the two is subsistence crop production. It is thus imperative to develop strategies that are set to ensure sustainable crop production for the community. This is also said in light of the number of households deriving their livelihood from subsistence crop production. The strategies proposed should capture the values of the Topiya community for successful implementation.

It is also noteworthy that in the context of rising food prices, Smale et al. (2009) envisage and advocate for targeted subsidies where appropriate as the foundation to improving agriculture for instance in places with good soils and water retention characteristics and market infrastructure. The delivery of improved varieties of seed, fertilizers and other farm inputs combined with targeted subsides could significantly improve farm yields and

ensure food security (Smale et al. 2009). All this will go a long way towards improving food security and consequent poverty alleviation in Topiya Village.

Livestock reared is mainly goats, sheep and pigs and it is also observed that the average number of livestock per household is about 10 heads. The small number of herd per household is attributed to shrinking of the grazing land. The adjacent farm belongs to Eskom and households always clash and quarrel over pasture. Grazing land has also affected the availability of land earmarked for subsistence crop production purposes. The net impact of this on households is chronic poverty, environmental degradation and concomitant 'eco wars' as a result of environmental scarcity.

5.3.4.2 Remittances and grants

Social grants have been envisaged to be the panacea to poverty reduction and food insecurity to most vulnerable and impoverished households in South Africa (Van der Berg, 2006). In Topiya Village, remittances from working household families also improved food security status of respondents; however the inconsistency of the remittances also resulted in respondents feeling more food insecure.

Respondents that are receiving government grants and pensions have a bigger number of dependents in the form of extended family. This also contributes to food insecurity, the dependents are not old enough to augment the household income but instead put a strain on the minimal agricultural produce and pension fund.

Most respondents depend on hand outs for income (remittances or government and pensions) but because their main source of food is either farming or domesticated livestock the community can afford to spend less than 40% of their income on food. Sixty percent (60%) is diverted to other uses that are not food. The fact that the majority of respondents spend such a high percentage (40%) of their income on food implies that the agricultural and farm produce does not sustain the majority of the households. This also justifies the need for implementation of sustainable agricultural strategies to improve food security.

The higher percentage spent on food also implies that the majority of households are earning low, the majority of which are getting grants from the government and some in the form of remittance from extended working family members. The net impact is that, more income spent on food implies food insecurity and that there is a need to develop crop production practices that are meant to sustain households and result in lesser income being spent on food.

5.3.4.3 Temporary employment

It is noteworthy that some individuals have neglected crop production and resorted to the new wave of temporary employment in the adjacent mines (Duvha) and contract employment. This has proven unsustainable in the long run; temporary employment throws back individuals into poverty after every contract lapse period. This has also increased the number of households that are food insecure. The farm produce only can hardly sustain households; also temporary employment is not adequate as a safety net for households to fall on during dry spells. An integrated livelihood strategy that does not only depend on one source of livelihood with sustainable agriculture as the backbone will go a long way towards poverty eradication in Topiya community. This resonates with what other renowned scholars like Ellis (1999) who contend that, the rural economy should not be based solely on agriculture but rather on a diverse array of activities and enterprises. Much recent thinking on this subject is based on the concept of 'livelihood diversification as a survival strategy of rural households in developing countries' (Ellis, 1999).

Increase in the asset portfolio can ensure sustainable subsistence crop production since it has been observed that in the absence of farm assets, farmers can hardly participate in agricultural production and markets (World Bank, 2007). Evidently in Topiya, some households are seeking temporary and permanent employment so as to buy tools and equipment to improve crop production, which will consequently improve food security. This point to the fact that lack of assets such as farm implements contributes to food insecurity in some households of Topiya Village.

In the Sub-Saharan Africa, lack of farm assets for crop production has consequently resulted in the prevalence of unsustainably small and falling farm sizes and poor-quality

land, the situation is exacerbated by low investor confidence in irrigation (World Bank, 2007).

Despite the fact that the majority of respondents (83%) feel their livelihood strategies does not meet their food demand, there are some respondents that are permanently employed (contractors and in the adjacent mines) and it is quite clear that income from their employment meets their food demand. They felt that declaring this, would compromise the community any intervention that would improve food security and alleviate poverty.

5.3.4.4 Subsistence crop production strategies practiced

The majority of respondents (87%) are still using traditional subsistence crop production methods, it is imperative to ensure the sustainability of the traditional crop production methods to ensure food security. Sustainable traditional crop production would mean the use of mainly manual tillage methods, use of natural manure like cow dung and crop rotation strategies. From the 87% of the respondents who are using traditional subsistence crop production methods, there is a concern that lack of equipment affects the implementation of better farming methods. This further highlights the significance of assets in improving crop production and ensuring that households produce enough food for the household members.

The majority of respondents are either producing maize or maize and vegetables. This underlies the importance of vegetables as a contributor to household subsistence agricultural produce.

Subsistence production has been proven to be an essential element to household food security, poor performance in terms of farm productivity in this sector adversely affects the net food supply per household (Rockefeller Foundation 2006). The incessant poor farm productivity has been one of the reasons behind the abandonment of farming as a source of livelihood, which has consequently catalyzed the rural to urban migration wave. This means that in Topiya, there is also a need to grow high yield variety of vegetables that mature faster so as to sustain the different household needs of the Topiya community. Topiya is not growing any drought resistant crops; the dry natural climatic condition of the region contributes to the low yields in crops like maize. Growing

crops like sorghum will also improve the food security status of the community and lead to the eradication of poverty in the long run.

All of the respondents have farms less than 1 hectare. On average the farm sizes are small compared to the average number of individuals per household which is about four. The small farm size implies that the food output per farm is less and can hardly sustain each household demand. The small farm sizes also mean that the quality of the yield is compromised because of the deteriorating soil nutrients through unsustainable cultivation of the same piece of land. The net impact of all this is that more individuals become vulnerable and susceptible to hunger, hence food insecure.

Overall, most of the farms occupied are small and favor intensive farming that require modern methods of farming. However the respondents are still using the traditional methods hence the poor yields. Crop rotation is hard to practice on the small pieces of land. Only stable food (maize) is grown. Failure to practice crop rotation is unsustainable agriculture, land degradation and concomitant environmental conflict has been the result. There is a natural increase in the number of individuals per household which is not matched by a consequent increase in the size of farms to ensure sustainability. This has put immense pressure on the little farms per household and there is no empty land. Households have quarreled in trying to demarcate farm sizes and grazing pasture is also scarce. Al this undermines the objectives of sustainable agriculture, food security and poverty alleviation.

The small farm sizes have also resulted in stream bank cultivation, which has also resulted in the partial siltation of the adjacent Olifants River. Competing land uses (grazing land and agricultural land) has also resulted in the majority of households becoming more food insecure, the land available can hardly meet the livestock needs and also achieve crop growing objectives.

There is a need to practice intensive agricultural strategies given the small farm sizes so as to increase output per square meter. The adjacent Olifants River can also provide an important source of water for irrigation to supplement the low rainfall. Respondents who have cultivated the same piece of land for more than three years have noted and

conceded to decreased farm yields hence food insecure. The land is notable exhausted and not much has been done to improve its productivity.

Households that have cultivated the same piece of land for more than eight years also depend on remittances and pension from the government. These represent the older generation that has been resident in Topiya for more than twenty years. Sustainable agricultural strategies should also target this generation since remittances and grants have proven to be inadequate to ensure food security.

Soil erosion is an issue to the majority of the respondents. The majority of respondents are using traditional crop production methods. This implies that the traditional crop production methods are not sustainably implemented, which has resulted in massive soil erosion. However part of the problem is attributed to the fact that the farm sizes are small and the households continue to extend putting more pressure on the small pieces of land. This resonates with FAO's (1994) observations that the realization of sustainable agriculture and rural development is a myth, stemming from the reduction of land for farming purposes and reduction in the environmental quality for food production (FAO, 1994).

5.3.5 Economic factors

This section seeks to understand the economic position of the community according to their projected monthly income, number of dependents, average disposable income and their access to water and electricity. These factors are key indicators for measuring poverty amongst others such as human development index and education.

Projected income

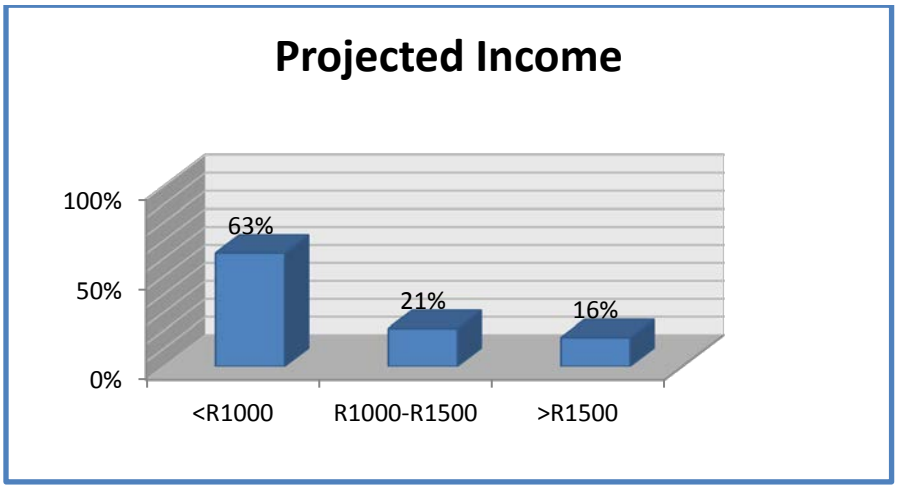


Figure: 5.14. Projected Income

The above results show that for majority of respondents (63%), the projected monthly income is below R1000 while only 16% have a projected income of above R1500.

Size of dependents

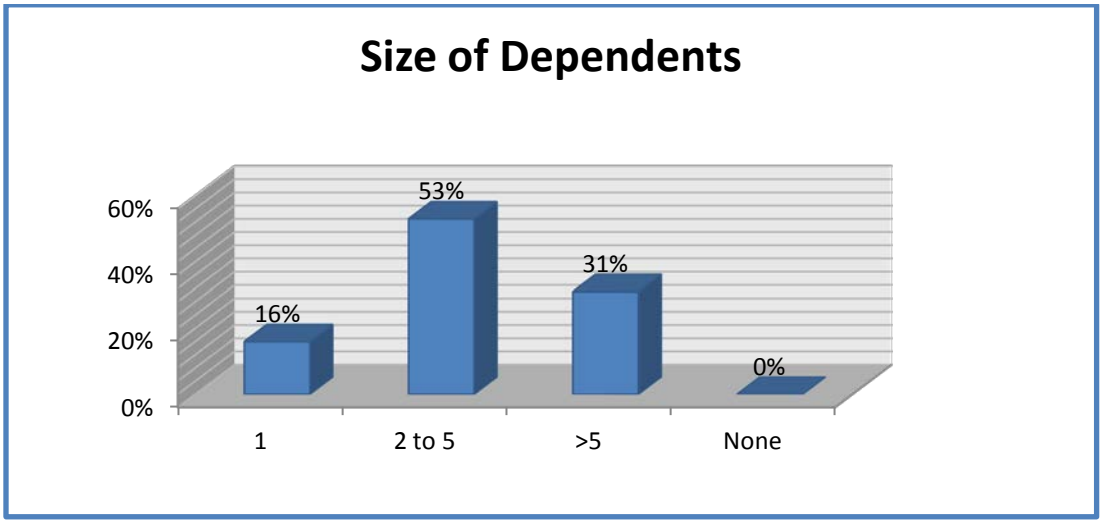


Figure: 5.15. Size of Dependents

The results show that all respondents have dependents. Sixteen percent (16%) have less than two dependents, 53% with 2-5 respondents inclusive while 31% have more than five dependents.

Average disposable income

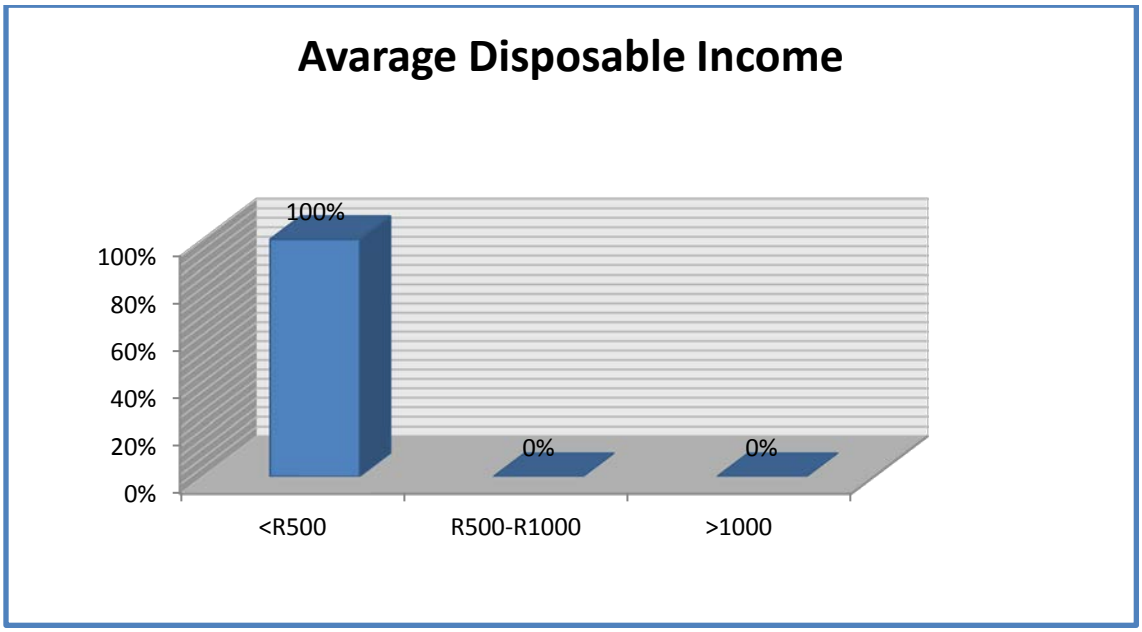


Figure: 5.16. Average Disposable Income

The respondents were further asked to disclose their disposable income and the results show that for all respondents the disposable income is less than R500.

Food security status of most households has been greatly shaped by factors such as the socio-economic characteristics and resources of individual (Sanusi et al., 2006). According to Davids (2001), after 10 years of democracy lack of income to meet household basic needs has been a continuing challenge, the findings of the, according to the findings Topiya Village is also included here.

The majority of respondents 63% have a projected monthly income of less than R1000 and almost all the respondents have an average disposable income of less than R500. This implies that in situations of poor yields, households are not able to meet food demand through buying from adjacent shops. Notably, respondents with an income exceeding R1500 (16%) also constituted the percentage of respondents that felt food secure (16%). The majority of these consist of temporary mine workers and contract labourers. Temporary employment has been used to diversify income streams, improve food security and alleviate poverty.

Most of the respondents have a projected monthly income of less than R1000 and a disposable income of less than R500. This paltry income is supplemented by farming and livestock. However outdated farming methods coupled with no access to water and electricity reflects a very poor community. The size of the households is big and reflects a poor and traditional society.

5.3.6 Conclusion

The response from the entire (nineteen) households of Topiya village has given a good insight in terms of achieving the research objectives. This is said from multiple angles, the current agricultural practices in Topiya are quite unsustainable, and they hardly meet the household food demands. This again talks to the fact that there is a wide range of agricultural improvement initiatives proposed at remote macro levels but they are not mutual embraced at Topiya village. Such trends are noteworthy as they highlight the significance and essence of community participation in policy formulation so as to ensure effective implementation.

The research findings further point to the fact that lack of other livelihood strategies that do not rely on crop production also affect the vulnerability of rural communities in terms of food security. This resonates with the assertion by other renowned Food security research institutions like Food and Agricultural Organisation of the United Nations (FAO), 2005 who also had research in various rural communities with more similar findings.

Looking at the factors such as food security status, means of acquiring food, sources of livelihood, effects of remittance and grants on food security, subsistence crop production strategies practiced and other economic factors like other sources of income in Topiya village all assisted to get a detailed understanding of the nexus between a broad spectrum of factors in determining food security. The findings have also shown that food security does not only mean lack of access to food, but it also talks to other salient pre conditions like entitlement and the ability and capacity to produce.

The research findings in Topiya village show and cement the fact that scientific initiatives may fail to deliver on their mandate not as a result of lack of understanding by rural communities but mainly as a result of failure to embrace and uptake the initiatives. This may be attributed to the fact that these initiatives are considered foreign and do not

reflect the values of the concerned communities meant to implement them. This highlights the need of micro-community level involvement in policy formulation so as to ensure effective implementation.

Topiya community is food insecure and there is a need not only to implement sustainable agricultural strategies but also implement other livelihood diversification strategies to ensure poverty alleviation. Agriculture is envisaged as the major means of acquiring food, its long term sustainability is of paramount importance. This could be achieved through active community participation in developing sustainable agricultural strategies, public and private sector support through various agricultural research and training initiatives. Traditional subsistence farming is the main crop production method, this should be integrated with other modern agricultural strategies such as use organic fertilizers to ensure long term sustainability.

CHAPTER 6
RECOMMENDATIONS AND CONCLUSIONS

6.1 Introduction

This chapter discusses various recommendations meant to improve food security and consequently alleviate poverty in Topiya village. The chapter borrows from international discourse on how to improve food security in impoverished rural communities. These include implementing sustainable agriculture, improving access to land, human capital development, livelihood diversification into mainly nonfarm activities, improving the asset base of rural farmers, agricultural research and development. Challenges and lessons learnt are also discussed.

6.2 Sustainable agriculture as a panacea to food insecurity

The majority of households in Topiya feel food insecure. This hence calls for the development of sustainable agricultural strategies that prioritizes technological innovations and a culture of environmental friendliness, these strategies should be easily and cost effectively available to subsistence farmers. The input of the farmers in the formulation of these strategies is important for long term sustainability and to ensure that they deliver on the mandate to improve food security and consequently eradicate poverty (Food and Agriculture Organisation, 2005).

New sustainable agricultural approaches are needed in Topiya. The most ideal strategies in this regard should ensure the combination of the following factors: introduce and implement sustainable biological and ecological processes into the food production web, limit the use of non-renewable inputs that has adverse environmental and health effects, tap into the indigenous knowledge and skills of farmers, ensure the involvement of people so as to consultatively address agricultural and natural resource challenges that include pest control, wetland management, irrigation forest and credit management (Scherr & McNeely, 2008). Agricultural systems can be boosted through improvements in capital assets such as; social; human; physical; and financial capital. The main objective is to improve natural capital for long term sustainability, combined with the use of a variety of genotypes crops and animals can be a foundation to improving food

production and consequently ensuring a food secure economy at household level (Kesavan & Swaminathan, 2008)

Genotype improvements via a diverse modern biological initiatives and the general understanding of the environmental, ecological and agronomic tradeoffs is the prime concept of sustainable agriculture (Food and Agriculture Organisation, 2005).

According to Food and Agriculture Organisation (2005) the key principles for sustainability are to:

- Integrate biological and ecological processes such as nutrient cycling, nitrogen fixation, soil regeneration, allelopathy, competition, predation and parasitism into food production processes,
- Minimize the use of those non-renewable inputs that cause harm to the environment or to the health of farmers and consumers,
- Make productive use of the knowledge and skills of farmers, thus improving their self-reliance and substituting human capital for costly external inputs, and
- Make productive use of people's collective capacities to work together to solve common agricultural and natural resource problems, such as for pest, watershed, irrigation, forest and credit management.

(Food and Agriculture Organisation, 2005)

These principles could also be adopted in Topiya community through effective community participation and ongoing consultation so as to ensure that the policies also reflect the true values of the Topiya community.

It is of paramount importance that the sustainable agricultural strategies in Topiya always take cognizance and need to develop agricultural technologies and practices that:

- Do not have adverse effects on the environment (partly because the environment is an important asset for farming),
- Are accessible to and effective for farmers, and

- Lead to both improvements in food productivity and have positive side effects on environmental goods and services. Sustainability in agricultural systems incorporates concepts of both resilience (the capacity of systems to buffer shocks and stresses) and persistence (the capacity of systems to continue over long periods), and addresses many wider economic, social and environmental outcomes.

(Dobbs & Pretty 2004; MEA 2005).

Agricultural sustainability does not imply the exclusion of technologies or practices on ideological grounds. Sustainability benefits could be justified in instances whereby technology is harnessed to improve productivity for farmers with minimal negative environmental consequences (Dobbs & Pretty 2004; MEA 2005). Farmers' access to technology and better variety of seeds, food shortage risks may be ameliorated however farmers should be assisted and supported in terms of how to sustainably integrate technology and better variety of seeds into their farming systems with minimal environmental harm (Rockefeller Foundation, 2006). In this light, Topiya community should integrate sustainable technocentric agricultural production systems with indigenous knowledge systems that borrow from traditional crop production methods. In this way household farm productivity could be improved and consequently food security.

The use of improved inputs is another proposed solution to improving farm yields. This is said against a backdrop of the poor agricultural potential of the land meant for crop production purposes; hence in order to boost and sustainably improve yields there is a need for intensification of production by using improved inputs (Gill, 2002; Reardon et al., 1996; Rockefeller Foundation, 2006; Smale et al., 2009, Southgate & Graham, 2006). Essential components of improved inputs encompass intensification of the use of fertilizers, organic inputs and conservation investments. Increasing productivity in this way in Topiya village will reduce pressure on marginal lands, as the intensification of cultivated land will reduce the need to expand production into fragile marginal lands.

Engaging in high- input agricultural productivity requires financial support for sustainable implementation. Given the fact that the majority of subsistence farmers are low income earners, the effective implementation of high-input agriculture remains a daunting task,

household constraints remain a salient factor in for the effective implementation of high-input agriculture to improve food security (Reardon et al., 1996: 4).

6.3 Access to productive land to improve food security

The research findings show that all of the respondents have farms less than 1 hectare. On average the farm sizes are small compared to the average number of individuals per household which is about four. The effective participation of people in agriculture is immensely affected by access to land resource (Aliber & Hart, 2009).

The Sub Saharan Africa's agricultural landscape is dominated by the lack of assets for production, this is supported by deteriorating land quality, unsustainably small farm sizes, and investment in irrigation is general low (World Bank, 2007). Increase of farm sizes for the Topiya households will not solve food security challenges in isolation but will go a long way towards alleviating pressure on the current small farm sizes given that Seventy eighty percentage (78%) concede to the fact that soil erosion is one of their major concerns.

6.4 Human capital development

Household food insecurity is quite alarming in rural South Africa, policy formulation aimed at improving security and ensuring poverty reduction has to be developed. Human development is one of the critical aspects of development that ensures creativity and the adoption of a broad spectrum of livelihood strategies (Sen, 2009).

According to Sen (2009), macro level interventions cannot address development challenges alone. Full potential of individual members of a nation is required through emancipation and effective participation in policy formulation and implementation for long term sustainability. Improving human capital lies central to this together with better governance, less corruption and improved democratic systems (Sen, 2009). Human capital development will go a long way towards ensuring innovativeness and development of other livelihood strategies in Topiya Community.

6.5 Livelihood diversification into mainly nonfarm activities

The research findings show that the majority (28 % depend on livestock, 26% crop production and 22 % practice both) of respondents are relying on agriculture as the primary source of food. There is a need to diversify to other off farm livelihood strategies so as to argument the household farm produce, which hardly meets the demand for food per household.

Agricultural production and the exchange of produce for other products is a essential source of livelihood. Essentially remittances including social grants and migrant labour contributions form a significant income stream. The vending of goods particularly consumables such as food, beverages and paraffin, renting of animals for traction also help diversify income streams and ensure long term sustainability of rural communities in South Africa (Aliber and Hart, 2009). Temporary employment on permanent and seasonal basis on the adjacent mines and commercial farms also form a critical landscape of livelihood diversification especially in non-cropping seasons and in poor rainfall seasons that do not favor subsistence agriculture (Aliber & Hart, 2009).

In light of this, rural livelihoods in Topiya village should not over reliant on agriculture but on a diverse array of activities and enterprises, non-farm wage employment, self-employment and remittances (Chapman & Tripp, 2004). Nonfarm activities together with household agricultural production are key to food security; hence off farm activities are a critical dimension to food security.

6.6 Improving the asset base of rural farmers

Access to implements and other agricultural resources is key to the effective and sustainable crop production. Access to land but lack of farm implements and other resources has forced farmers to concentrate on homemade gardens so as to provide some measure of food supplementation as supported by some study in the Eastern Cape (Fraser et al., 2003). A strong asset base can enable farmers to hire out assets and improve cashflow; consequently the purchasing power is improved that is key to accessing food (Webb et al., 2006; Devereux, 2009).

Households' access to food is greatly shaped by access to assets (Maxwell, 2003), either through production, purchase or transfers. Assets range from personal, socio-political, infrastructural, economic and ecological assets (Drimie & Casale, 2009). Household food security is highly dependent on the strength and ability of livelihood strategies to ensure that assets are available. An improvement in assets in asset base in Topiya community is essential for the consequent improvement of crop production.

Lack of assets to till the land was raised as one of the obstacles that hinder subsistence crop production in Topiya Village. This includes lack of farm implements such as the basic tools for tilling the land. Government intervention through the provision of basic farm assets for tilling land can also help reduce vulnerability of households to food insecurity. Therefore, access to assets is not simply a household or local level debate, but other intricate societal factors are at play (Wisner, 2001) and is greatly shaped by individuals' historical, social, economic and geographical position in society at large (Mgquba & Vogel, 2004).

6.7 Agricultural research and development

Support from the private and public sectors through agricultural research and development could play a pivotal role towards improving food security in Topiya Village. Households should be encouraged to grow high-input cash crops such as spinach, cabbage, onions, beetroot, carrots, green peppers, tomatoes and green beans for local output markets. Production and food security can be boosted through input support targeting smallholder farmers as seen elsewhere in Africa (Baiphethi & Jacobs, 2009). Agricultural Input Support Programme (AISP) vastly improved yields on a number of staple foods produced by smallholder farmers in Malawi (Baiphethi & Jacobs, 2009). The core focus of the programme was mainly to raise the agricultural productivity of small holder farms, improve food and cash crop production, and reduce exposure to food insecurity and hunger. Such an input based support programme could also help improve yields in Topiya village and ensure long term sustainability of agricultural initiatives.

Diversification of crops will help Topiya community improve diet requirements and address the incessant nutritional challenges. This is in line with international

recommendations that call for the increase of the variety of foods in diets and within food groups (Food and Agriculture Organisation/World Health Organisation, 1998) and in the South African food-based dietary guidelines (Maunder et al., 2001).

In the context of escalating food prices, Smale et al. (2009) suggests the use of targeted subsidies in suitable environments that has good soils and moisture and market infrastructure as means of improving agricultural production propose improving agricultural production. Improved input packages could be increased through some "smart or targeted" input subsidies (Bryceson, 2002; Smale et al., 2009). Such subsidies could be effectively used to empower and equip households in Topiya village with resources and farm assets so as to ensure the implementation of sustainable agricultural strategies.

Subsistence smallholder farming in Topiya can be made more productive and sustainable by, among other measures:

- improving price incentives and increasing the quality and quantity of public investment;
- making product markets work better;
- improving access to financial services and reducing risks;
- enhancing the performance of producer organisations;
- promoting innovation through science and technology.

(World Bank, 2007)

6.8 Challenges

The road network to Topiya village is quite poor; Inaccessibility of the some areas was a challenge. There were great expectations by some households that the interviews would consequently result in them getting free food parcels. In accurate information supplied by some households was also a major challenge. A few households were evidently surviving better than their declaration. These were mainly contract laborers in the adjacent farms and contractors that were doing mainly civil engineering.

Some households were quite suspicious that giving out information would result in evictions; this affected the information gathering exercise. Some critical official statistical information about Topiya Village for instance demographics is hard to find. Topiya Village has been in existence for more than forty years but still such official data is missing.

Other households from adjacent communities would disturb during the open discussion. One to one interview with the elderly needed an interpreter, which compromised the free divulging of information.

6.9 Conclusion

Providing adequate food for the world's impoverished communities is indeed a continuing challenge, perceptions and reality clearly show that Topiya community is a food insecure community. A plethora of initiatives need to be dovetailed together to address the situation in Topiya village. There is a need not only to implement sustainable agricultural strategies but also implement other livelihood diversification strategies to ensure poverty alleviation. These include off farm activities like contract employment in the adjacent mines of Duvha during non-farming seasons, other income generating projects like small scale brick making projects. Agriculture is envisaged as the major means of acquiring food, its long term sustainability is of paramount importance. This could be achieved through active community participation in developing sustainable agricultural strategies, public and private sector support through various agricultural research and training initiatives.

Crop yield per household farm needs to be increased so as to sustain the ever increasing number of individuals per household in Topiya village. This could be achieved through a combination of traditional farming methods and intensive agricultural strategies to achieve a holistic sustainable agriculture goal. Active community participation in policy formulation and implementation is pertinent to achieving the goals of sustainable agriculture, which entail providing enough food per household and achieving this within the realms of environmental integrity.

It is noteworthy that chronic food crisis is triggered by the interplay of ‘multiple stressors’, which consequently undermine household livelihood strategies (Drimie & Casale, 2009). In light of this, a plethora of initiatives need to be at play so as to improve agricultural performances and consequently food security in Topiya community.

Context is important to resolving food insecurity, programmes and development actions cannot be regional in application, given the different national and local contexts and circumstances in which chronic and transitory food insecurity occur. Context specific interventions are a necessity so as to strengthen own production of food and ensure long term sustainability.

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