TOWARDS PROMOTING FOOD SECURITY AMONGST POOR URBAN HOUSEHOLDS: THE CASE OF PHOMOLONG IN MAMELODI

by

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DECLARATION

I the undersigned, hereby declare that this dissertation, “Towards promoting food security in Africa’s poor urban households: The case of Phomolong Informal Settlement (PIS) in Mamelodi-South Africa”, is my own work, and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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Signature

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SUMMARY

Promoting household food security for many poor people globally and more so in Sub-Saharan Africa continues to be a challenge today. Ever rising poverty levels, an influx in the prevalence of the HIV/ AIDS pandemic, reduced rainfall accompanied by changing climatic patterns, environmental bankruptcy, the complexities associated with urbanization, globalisation as well as technology shift in the agricultural sector and capitalistic market economies all play a role in the food security debate.

This research has highlighted some of the factors that influence the food economy and related these to the household food security of poor informal settlement dwellers.

Achieving household food security for poor urban households requires an integrated approach in terms of poverty eradication as well as deliberate efforts with regards to food production and distribution within a framework of ecological integrity, with an aim of empowering the poor and ensuring that their household food security is guaranteed.

KEY TERMS

Food security; food insecurity; informal settlements; poor households; women empowerment; poverty eradication; climate change; environmental degradation; Sub-Saharan Africa; sustainable livelihoods.

DEDICATION

This thesis is dedicated to my parents Mr. Wycliffe Gimoi and Mrs Florence Nekesa Gimoi who worked hard and sacrificed a lot to ensure we their children got descent education. May the good Lord allow them to reap the fruits of their labour during their lifetime.

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
FAO	United Nation's Food and Agriculture Organization
HDI	Human Development Index
HIV	Human Immuno-deficiency Virus
IDS	Institute of Development Studies at the University of Sussex
IPCC	Intergovernmental Panel on Climate Change
MDG's	Millennium Development Goals
OECD	Organization for Economic Co-operation and Development
PRA	Participatory Rural Appraisal
PAR	Participatory Action Research
RRA	Rapid Rural Appraisal
TB	Tuberculosis
UN	United Nations
UNDP	United Nations Development Programme
UNDPI	United Nations Department of Public Information
UN Habitat	United Nations Human Settlements Programme
UNISA	University of South Africa
WCED	World Commission on Environment and Development
WCS	World Conservation Strategy
WHO	World Health Organization

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Chapter 1

Introduction

"At the beginning of the new millennium, close to 800 million people in developing countries, about 17% of their population, lack sufficient food to live healthy and active lives…. The forecast for the future continues to be a cause for serious concern"
(FAO: 2002).

1.1 Introduction

The purpose of this chapter is to:

- Discuss the background to this study
- Discuss the motivation for the study
- Discuss the formulation of the problem
- Outline the research methodology used in this study
- Discuss the chapter layout.

One of the most urgent and challenging issues facing the African continent is achieving food security for its people. The first formal definition of food security was provided by the United Nations (UN) World Food Summit in 1974. The Summit concluded that food security is the "availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices" (UN Report of the World Food Conference, 1974). A more recent definition by the World Food Summit held in Rome in 1996 states that " Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life".

This study focuses on understanding the key issues impeding the promotion of food security amongst households in informal settlements such as Phomolong in Mamelodi, South Africa. It therefore seeks to

contribute towards the identification of better options to enhance sustainable livelihoods in poor urban households and improve equitable economic growth in South Africa and other Sub-Saharan African countries. It is, however, important to note that the problem of food insecurity among poor urban households in most developing countries has its origin partly in the migration of people from rural to urban settlements in search of what they perceive to be better jobs and a good life. For instance, Ellis and Freeman suggest that migration is one of the strategies used by the rural poor to improve their livelihoods (Ellis and Freeman, 2005: 1-15).

The limitation in terms of job opportunities in the urban areas of South Africa, as in many other developing countries, decreases the chances of rural-urban migrants finding employment. Scholars such as Jerve (2001:89-120) and Rakodi and Lloyd-Jones (2002) argue that when people move from rural to urban areas, they carry poverty with them, hence the establishment of informal settlements in urban and peri-urban areas. A study conducted by Okuneye on the socio-economic life of rural-urban migrants in Lagos revealed that among other things, there was an uncoordinated growth in shanties, characterised by poor services in terms of urban infrastructures such as roads, health centres, police stations, electricity, water, drainage systems, waste management, etc, resulting in the loss of biodiversity and other forms of environmental degradation. Similarly, food and water consumed in the informal settlements were more contaminated than those in high-income settlements. The contamination of food and water, according to the study, were similar to those in places of migrants' origins, while a lot of waste, as well as infrastructure decay, were observed in many localities (Okuneye, 2000: 10-12).

At the heart of the debate on levels of food security in various cities is the realisation that every city's poor households have their own peculiarities, which differ from those in other cities. This depends on people's access to resources. For instance, the UN-Habitat notes that while Johannesburg had only one sixth (2.5 million) of the population of Lagos (15 million) in 2000, it operated on an annual budget of US$1.2 billion, which was four

times that of the US$300 million for Lagos. In relative terms, therefore, the poor in Johannesburg may not be as poor as those in Lagos (UN-Habitat, 2005: 3).

Among other peculiarities across the spectrum are the historical background and composition of informal settlements. For example, informal settlements such as Phomolong in the urban areas of South Africa are largely inhabited by poor black people (Martin and Meadows, 2000: 45). This study was conducted in the Phomolong informal settlement in Mamelodi with the aim of achieving the identified objectives.

The UN Habitat (2004:103) defines urban slums as 'residential areas that lack adequate access to water and sanitation, security of tenure, poor structural quality of housing and insufficient living area." In this regard, Momsen posits that "…in many of these cities urbanization has not been accompanied by industrialization, but by migration. Urban wards have increased as rural life becomes more impoverished, and modernization and opportunities are seen as concentrated in cities" (Momsen, 2004:171). The UN Habitat (2004:113) estimated that "urban slum populations are likely to double on average, every 15 years, while the total population doubles every 26 years. In 2015, the urban slum population in Africa is likely to reach 332 million." If this is the trend, there is an urgent need to ensure that population growth does not overwhelm the available resources, as this would culminate in a catastrophe.

The weight of the matter was summed up by the UN-Habitat (2004:104) statement that "available data suggests that the proportion of urban poor is increasing faster than the overall rate of urban population growth in a larger number of countries, and especially in the poorer countries."

1.2 Background to the study

Achieving food security is a major concern for many households and governments in Africa today. This situation has been exacerbated by key issues such as the impact of environmental degradation and climate change on food production, rising food prices as a result of reduced production, a shift of focus from growing food crops for food to providing bio-fuels, the global economic recession being faced by the global market, and the traditional challenges of inequitable access to factors of production by men and women. Breman (2004:1) states that "food security is one of the most urgent issues facing Africa today", and agrees with Rupiya (2004:83), who observes that "the African continent is the only region in the world that has not been able to feed itself since the mid – 1970s and is unlikely to do so in the near future unless radical policy changes are made to current practice."

Most African governments have put fairly good policies aimed at curbing the problem of food security in place. However, various factors (discussed later in the study), including insufficient political will, continue to hamper progress. In order for food security to be assured, the issues of access to food and its guaranteed availability at all times are of crucial importance (Stevens et al., 2002:2). In Africa, the challenge remains to ensure adequate and sustainable production of food, proper distribution to ensure equitable access, as well as knowledge to ensure a balanced diet in terms of nutritive value. In summary, therefore, the concept of food security can be seen in terms of four major components, as outlined by the World Food Programme (WFP). These components are:

- Availability of food
- Access to food by individuals and households
- Utilisation, which has to do with a person's ability to select the food that they prefer, as well as absorb the nutrients in the food
- Vulnerability of the individual to future shocks

(WFP, 2002, 2006; Webb and Rodgers, 2003)

Food security may also be viewed from macro and micro perspectives. The macro level refers to large players such as governments and regional bodies, while the micro level refers to households. Haan et al. (2001) highlight this viewpoint when they state that “household food security is a function of inter-related processes that happen at different geographic scales: international, national, regional/district, community, and intra-household.”

The opposite of food security is food insecurity. This can also be viewed from different perspectives. Maxwell (in Sijm, 1997:9) emphasises this distinction when he points out that “An additional distinction between mild, severe or acute food insecurity is made to indicate the gravity of the situation.” According to the WHO (2006: 21), “Food insecurity, or the absence of food security, is a state that implies either hunger (due to problems with availability, access and use) or vulnerability to hunger in the future”. Food insecurity therefore implies a lack of access to sufficient food or a lack of adequate food in terms of nutritional value, resulting in under-nutrition or malnutrition. The diagram below, adapted from the WHO (2006:21), illustrates the relationship between food insecurity, hunger and under nutrition.

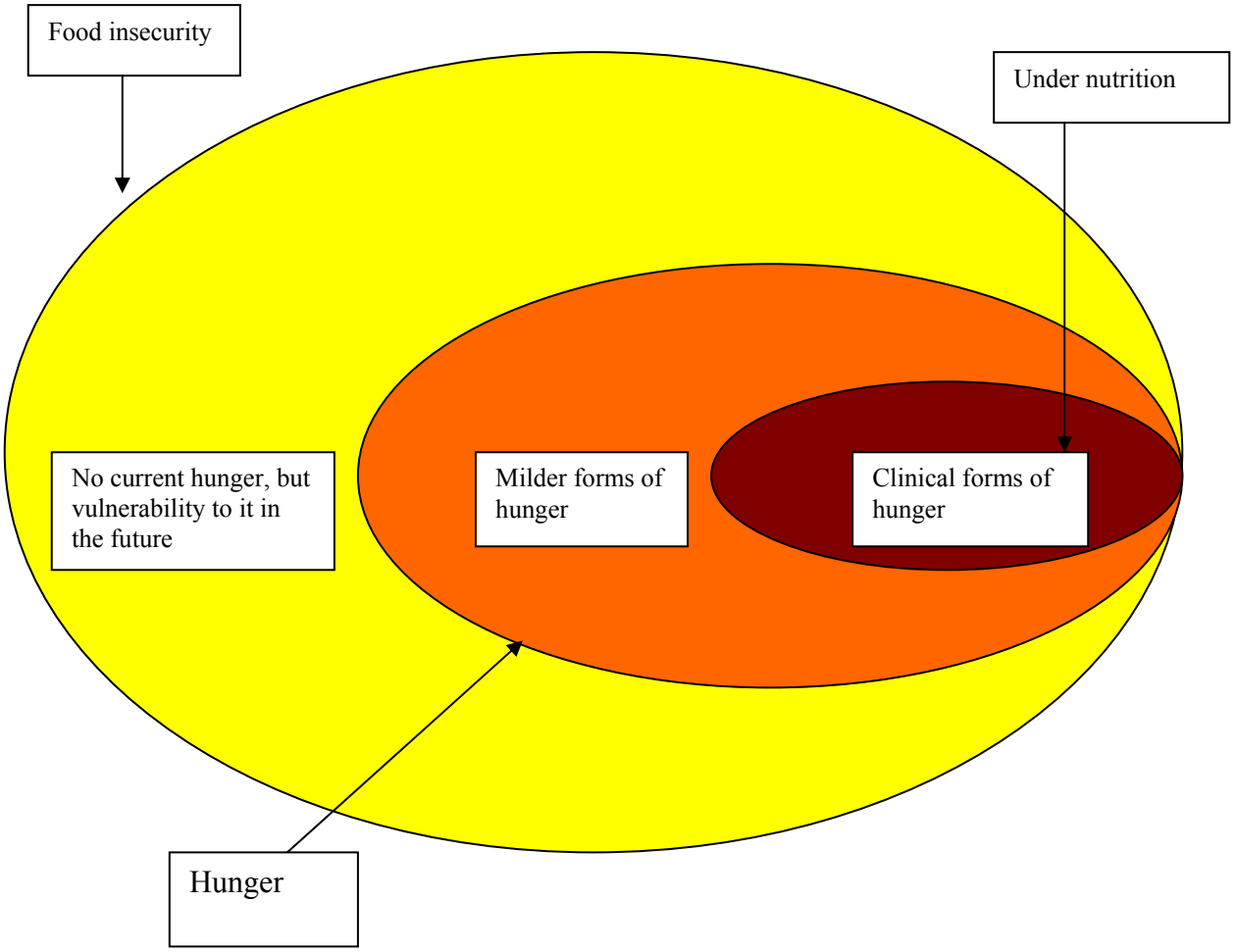

Figure 1: The relationship between hunger, food insecurity and under nutrition

The diagram above depicts three levels of hunger, all of which are interrelated. The severity of the situation progresses from the outer, bigger oval where, despite the fact that there is no hunger, people remain vulnerable because of the uncertainty of future access to food. In the context of African climates, this oval could represent a season of good harvests in which rainfall was in abundance and timely.

The second oval represents the commencement of a precarious state of food insecurity in which a given community/family is either on the verge of exhaustion or has just exhausted its reserve stocks, without assured replenishment. This uncertainty could be as a result of a bad harvest due to abnormal weather patterns, leading to either excessive (hence destructive) rainfall, as was the case with the El Nino phenomenon in 2001/2002, or an insufficient and unpredictable rainfall pattern, leading to drought and hunger.

For example, in 2002, WFP and FAO experts expressed fears that being the third consecutive year of food shortages in Southern Africa, 12.8 million people were living on the brink of starvation and needed immediate food aid, as they had even exhausted coping mechanisms such as selling livestock to pay for food. The situation had been worsened by successive years of poor harvests caused by droughts, economic crises, disruption of farming activities and high prices of maize due to El Nino, a periodic warming of part of the Pacific Ocean, which caused droughts in some countries and floods in others (WFP, 2002: http://www.wfp.org/newsroom/in_depth/Africa/sa).

At the clinical level of hunger (represented by the smallest oval in the above diagram, the family/community has exhausted all sources of available food, including all coping mechanisms, and is therefore vulnerable to malnutrition if external intervention does not occur. This is the stage of desperation, and is likely to lead to death.

1.3 The nexus between poverty and food insecurity

In most parts of Africa, achieving adequate food supplies for the whole year is increasingly becoming a tremendous challenge. The problem of food insecurity is indiscriminate, affecting both rural and urban dwellers. Eldridge (2002:79) indicates that "even in 'normal' years, most smallholders do not harvest enough to last them 12 months, for several reasons, including; insufficient and/ or poorly distributed rainfall, poor soils, shortages of draught power, insufficient labour and, in some areas, a lack of money for fertilizer." The situation is worse among poor urban dwellers because of their low-income status. The urban setup often leaves the informal settlement dweller (often without specialised skills) with no land for even small-scale food production.

At the centre of these challenges is the issue of poverty. The United Nations (in Sweetman, 2002: 3) describes poverty as having "various manifestations, including lack of income and productive resources sufficient to ensure a sustainable livelihood; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increasing morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments; and social discrimination and exclusion. It is also characterized by lack of participation in decision-making and in civil, social and cultural life. It occurs in all countries - as mass poverty in many developing countries and as pockets of poverty amidst wealth in developed countries." This description captures the different facets of poverty and its relative degrees in rich and poor countries.

There is no doubt that the struggle to eradicate poverty throughout the world is one of the most important challenges for policy makers today. In their discourse on economic freedom and world poverty, Norton and Gwartney provide three reasons for why this drive to eradicate poverty has grown significantly all over the world. The first is the fact that because most of the world is poor, poverty reduction has become a central issue, especially in the field of economics. The second is the effect of

globalisation (increased trade and capital flows in recent decades), which has increasingly drawn attention to cross-country differences in income, living standards and the plight of the poor, particularly those living in impoverished countries. The third reason is that modern communication and transportation systems have enhanced the visibility of global poverty, thereby attracting the attention of celebrities and prominent global individuals (Norton and Gwartney, 2008: 24). While the authors' argument is sustainable, it is also true that these accelerated efforts have not yet yielded substantial results, especially in developing countries.

Contrary to the foregoing arguments, some researchers have projected a critical view of the global efforts aimed at poverty eradication. For example, Easterly and Collier argue that the Millennium Development Goals (MDGs) are unrealistic, wasteful and even counter-productive. They criticise the approach used, terming it a "top-down" approach, and thereby generating considerable doubt regarding the ability of the MDGs to achieve the desired objectives (Easterly and Collier, quoted in Norton and Gwartney, 2008: 24).

Amidst various efforts to curb poverty and promote development, Sub-Saharan Africa continues to be one of the regions that is adversely affected by both poverty and diminishing levels of food security.

In South Africa, the end of apartheid rule paved the way for an increase in rural-urban migration, particularly by black people, who apartheid legislation had restricted to living in designated rural homelands. This new wave of migration, said to have been the most intense between 1991 and 2001 (Boraine, 2004: 198), was not in direct proportion to the Human Development Index (HDI) for the country.

The HDI is a composite measure of the average achievement in three basic areas of human development, namely a long and healthy life, education and a decent standard of living. The disparity between

increased rural-urban migration and the diminishing HDI was shown in the United Nations (UN) 2003 Human Development Report, which noted that while absolute poverty had declined, with the percentage of people living below the national poverty line falling from 51.1 percent in 1995 to 48.5 percent in 2002, close to 22 million South Africans were still considered to be poor, with the HDI for the country decreasing from 0.73 in 1995 to 0.67 in 2003 (UNDP, 2004: 295). De Klerk further analyses the South African situation by pointing out that "despite its own national 'food secure' status, more than 14 million people, or about 35% of the population in South Africa, are estimated to be vulnerable to food insecurity, while the development of as many as 1.5 million, or about one quarter, of children under the age of 6 is reckoned to have been stunted by malnutrition" (De Klerk et al., 2004: 3). It was further estimated that approximately 1.5 million South African children suffered from malnutrition, 14 million people were vulnerable to food insecurity, and 43% of households suffered from food poverty (National Treasury, 2003; Charlton and Rose, 2002).

Persistent food insecurity hinders the achievement of sustainable growth and development in all their aspects. This happens because when a society is in the grips of food insecurity, which always manifests itself through hunger, it is more preoccupied with the struggle to survive than with other development matters. The United Nations Development Programme (UNDP) (2003:5), with regard to South Africa, argued that "the real prospect for sustainable development in South Africa depends on confronting political challenges: that is, strategic political interventions that focus policies and support measures on achieving the goals of sustainable development." The implication here is that without adequate sustainable development, human security, of which food security is part, becomes compromised.

As food security continues to elude millions of poor people, especially in the developing world, the severity of threats to human security intensifies. The Africa Non-Aggression and Common Defence Pact defines human security as "…the security of the individual with respect to the satisfaction

of the basic needs of life; it also encompasses the creation of the social, political, economic, military, environmental and cultural conditions necessary for the survival, livelihood and dignity of the individual including the protection of fundamental rights, good governance, access to education, healthcare, and ensuring that each individual has opportunities and choices to fulfil his/her own potential" (Cilliers, 2004:8). The issue of human security cannot be properly dealt with in international affairs today without taking environmental issues into consideration. The World Bank (1991:209), in noting this concern, especially in relation to urban environments, states that "The emerging environmental crisis in towns and cities is a problem receiving far less attention than it should." This concern, which will be elaborated on later in this study, is not limited to urban areas, as it affects all aspects of biodiversity throughout the world. This demonstrates the intricate relationship that exists between food security and human security.

1.4. Motivation for the Study

This research could not have been undertaken at a more appropriate time, when the world is dealing with issues of rising food prices, global environmental pollution, a crumbling global economy and a general increase in human insecurity. The increase in the rate of rural-urban migration, rapid urbanisation and the number of poor people in developing countries indicates the need for practical poverty alleviation measures to be adopted. For instance, seven of the ten largest metropolitan areas in 2000, such as Mexico City, Sao Paulo and Lagos, are in countries of the South (World Bank, 2001). As the number of poor urban dwellers increases, so does the challenge to provide adequate housing and other social amenities to meet the demand. In addition, there is also a need to provide adequate food, shelter, education and health care for these people. The influx of this group has led to an increase in slum dwellings in many of the world's cities today.

First and foremost, therefore, this study aims to provide a critical assessment of the challenges faced by inhabitants of informal urban settlements in their effort to attain food security. The choice of Phomolong informal settlement for this study was based on various factors. Firstly, the researcher was relatively familiar with this location, and had a network of acquaintances living in Phomolong. Secondly, the researcher was familiar with the difficulties experienced by inhabitants of informal settlements such as Kibera in Kenya, where she had previously worked, and Phomolong inspired her to want to understand the situation there better and come up with recommendations that policy makers could adopt, not just as a remedy for the Phomolong situation, but also for other informal settlements in South Africa.

Thirdly, the researcher was motivated by the South African Constitution (Chapter 2, Section 27.1b), which states that every citizen has the right to have access to sufficient food and water, and that the state must take reasonable legislative and other measures, according to its available resources, to achieve the progressive realisation of this right to sufficient food. In addition to the abovementioned three factors, the researcher was also motivated by:

The geographical location of Phomolong informal settlement - Phomolong is situated in the Mamelodi West Township in the east of Tshwane (Pretoria). This suited the researcher who, at the time of the research, was based in a neighbouring suburb. Daily trips to and from Phomolong by taxi and bus gave the researcher invaluable interaction with the population there. Phomolong is situated quite close to the main road leading into Mamelodi, and is therefore easily accessible.

In order to conduct this study effectively, the researcher had to make use of interpreters. Due to the researcher's lack of familiarity with most ethnic languages in South Africa, it was essential for her to have a reliable interpreter, and one who was familiar with Phomolong. In this regard, the researcher had the assistance of two well-versed acquaintances living in

Phomolong, who assisted with interpretation during focus group discussions, interviews and the circulation of questionnaires. The choice of a female and male interpreter was convenient in that, depending on the situation and nature of the questions, the female interpreter dealt with the female population, while the male interpreter dealt with the male population.

Therefore, in view of these factors, the researcher chose Phomolong as the focus of her research.

1.5 Justification for the research topic

At the centre of today's development debate is the issue of sustainable livelihoods, of which the achievement of food security is a basic component. The realisation that society's poor remain at the forefront of food insecurity is the reason why this research focused on understanding the situation of vulnerable households in the Phomolong informal settlement.

The fact that Phomolong is only a microcosm of many other 'phomolongs' around the world, it was necessary that the study first rooted itself in the global factors affecting food security, such as climate change, population growth and urbanisation, before looking at the general factors affecting food production in Sub-Saharan Africa and thus informal urban settlements such as Phomolong. In this regard, therefore, the study was structured as per the chapter layout provided at the end of this chapter.

The choice of this topic was further motivated by another set of factors, among them the fact that:

- Insufficient research had been done in relation to the situation of informal settlement dwellers in urban areas such as Phomolong. Most of the research has tended to concentrate on key global issues at the policy maker level, without much due consideration (except for political purposes such as general elections) for how the common citizen in an informal settlement ekes out a living.

- Although infectious diseases such as HIV/AIDS tend to affect all people, the poor are most susceptible to diseases, due to their limited access to resources, which results in them struggling daily to make ends meet. The relationship between HIV/AIDS and food security in Sub-Saharan Africa is discussed at length in chapter four of this study. Although a lot has been written about the effects on various populations, there is insufficient focus on the link between food security of individual households and infectious diseases, as this study will reveal.

- South Africa, being the richest and most developed country in Sub-Saharan Africa, has made great efforts to ensure adequate food security for its citizens. Although these efforts have not been all-encompassing and there is room for further improvement, this study thought it best to document such successes and give due credit to South Africa's policy makers, while at the same time making recommendations regarding areas needing improvement.

- The status of women in informal settlements needs to be focused on. It was noted that "in Africa, women contribute 70 per cent of food production. They also account for nearly half of all farm labour, and 80-90 per cent of food storage and transport, as well as hoeing and weeding" (UNDPI: 2008). Furthermore, "To improve the status of women in society requires that women have access to land and property rights which are vital to sexual equality and food security".

This study also aims at contributing to knowledge with regard to the debate about food security, especially as far as the situation of less fortunate and marginalised people is concerned. This study, however, acknowledges that it is not an end in itself, and therefore recommends that further research in the field of food security for poor urban households be conducted with a view to identifying other issues that need to be

addressed in order to improve the general livelihood of more vulnerable members of society.

1.6 Statement of the Problem

The purpose of this research was to investigate factors affecting sustainable food security in the Phomolong informal settlement. In order to achieve this goal, the following objectives were identified:

1.7 Objectives of the study

This study seeks to:

a) Review the global concerns and trends underlying the threat to food security.
b) Assess and document the major challenges hindering Sub-Saharan African countries from achieving self-sufficiency in food production.
c) Identify the main factors preventing inhabitants of informal urban settlements in South Africa from achieving sustainable food security, and make policy recommendations aimed at alleviating this problem. In order to achieve this objective, this study analyses the situation in the Phomolong informal settlement as a case study.

1.8 Research methodology

This study used a literature review as well as fieldwork in an attempt to understand how households in informal settlements such as Phomolong endeavour to achieve food security in their daily lives. In order to achieve this and the identified objectives, different techniques were employed.

A detailed literature review was conducted, in which various published and unpublished materials formed part of the secondary data. This was useful in terms of gaining knowledge on different views people have regarding food security among poor people in both urban and rural settings. The UNISA library was a major resource in this regard. Specific sources included published books, journal articles and workshop proceedings,

amongst others. The researcher analysed reports by development agencies dealing with food security issues, such as the World Food Programme (WFP), The Food and Agricultural Organisation (FAO), as well as other international research institutions, including the Institute of Development Studies (IDS) at Sussex University and the International Institute for Environment and Development (IIED).

Primary data was gathered from interviews conducted with key informants, who included officials from the Tshwane Metropolitan Council such as health workers at the Phahameng clinic in Mamelodi, civil society workers, as well as members of local church groups. The author made several visits to different households in the Phomolong informal settlement, where she was able to meet community members and discuss their food security situations with them. This was done through several focus group discussions in the form of structured interviews with individual respondents. This brought to light issues of primary concern, which were then built into the data presented in the case study chapter, and the researcher gained a lot of experience from these interactions.

1.9 Chapter layout

This study is divided into eight chapters, and the various arguments are linked to each other where applicable.

Chapter one begins with a descriptive definition of the two main concepts in this study, namely food security and poverty, in the context of the world, Sub-Saharan Africa and South Africa. The chapter follows this with a discussion regarding the background to the study, its motivation, the research problem and the research methodology.

The main purpose of chapter two is to discuss the concept of sustainable development within the context of food security, as well as factors affecting its achievement, such as global warming and the greenhouse effect.

Chapter three builds onto the discussion in chapter two, albeit with a particular focus on the specifics of how human activities, including population growth, impact on ecology and biodiversity, thereby affecting the production of food.

The fourth chapter sets the stage for the case study by conducting an analysis of the factors influencing the attainment of food security in Sub-Saharan Africa. This chapter links the arguments projected in the foregoing three chapters with those in the subsequent chapters. It provides a detailed discussion of factors exacerbating food insecurity in Sub-Saharan Africa, such as chronic poverty, poor governance, demographic pressure, limited market access and over-reliance on traditional agricultural practices.

Chapter five is also the first part of the case study. It presents the methodological issues relating to the case study, and starts by exalting the virtues of adapting participatory action research (PAR) to all levels of a project, in order to improve its overall success. The chapter then describes the physical location of the Phomolong informal settlement, before dealing with the methods used to collect data in this regard.

Chapter six comprises an analysis of the findings of the research conducted in the Phomolong informal settlement in the Mamelodi township of Tshwane. The chapter presents a qualitative analysis of the collected data and presents the findings as per the objectives of the study identified in chapter one.

The seventh chapter presents the policy recommendations emerging from the study. In so doing, the chapter draws from all the previous six chapters.

The final chapter, chapter eight, presents the conclusions of the study, as well as recommendations for further research.

1.10 Conclusion

This chapter has provided the background to the study. It discussed the motivation for selecting this research topic, and went on to discuss the statement of the problem and research methodology, as well as presenting the outline of the study. It also provided a justification for the selection of the Phomolong informal settlement as the case study. It has therefore set the stage for the in-depth discussion of the chapters that follow, in which the issues mentioned in this chapter are dealt with in more detail and recommendations made accordingly.

Chapter 2

Promoting Sustainable Development within the context of food security

> *"umlilo umuntu ewotha kawushisi mbala= izinto ezimbi umuntu azenzayo kuyenza ukuba zingasheshi zibonakale;kodwa isigcino ziyovela. The heat of a fire does not scald immediately when one warms himself up=the damaging things that one does are not always immediately evident, but will accumulate and eventually emerge."*

Masuku-Van Damme and Donoghue (2000:32)

2.1 Introduction

Chapter one provided a general introduction to the various issues that are related to global food security. Among these issues is the concern as to whether or not the world can implement development policies without harming the environment on which human life and that of all other organisms thrives, thus promoting sustainable development. This chapter will do the following:

- Give a brief introduction to the concept of sustainable development
- Discuss some challenges posed by climate change, such as global warming, the greenhouse effect and pollution, in terms of promoting sustainable development.

2.2 Towards an Understanding of Sustainable Development

Sustainable development deals with economic, environmental and social justice issues amongst others. Sustainable development thus emphasizes a balance between ecological sustainability and development. This is a challenge that becomes more complex by the day.

A combination of concerns raised by academics and those involved in the debate between economic growth and economic development yielded a more balanced approach to the theory and practice of sustainable development. Although the term "sustainable development" was not popularised until the 1980s, its origin goes back to the 18th century, when it was used to indicate concern with regard to logging practices (Dwivedi et al., 2001: 220). The term was first introduced to the international arena at the 1972 Stockholm Conference (Engfeldt, UN Chronicle, 2002). In 1983, the United Nations established the World Commission on Environment and Development, led by Gro Harlem Brundtland. At the end of its mandate, the Commission issued a report suggesting that the solution to the then problems surrounding economic development and environmental conservation lay in sustainable development – the idea that human activity should "meet the needs of the present without compromising the ability of future generations to meet their own needs."

This definition of sustainable development implied that development might be desirable if it occurred within a holistic framework. This reflected an increased awareness of and interest in the long-term view of development and the necessity to preserve environmental integrity during a time of increasing development. Goodman and Redclift summed up the virtues of sustainable development by stating that it includes an intergenerational component, "a pattern of social and structural economic transformations (i.e., development) which optimises the economic and other social benefits available in the present without jeopardizing the likely potential for similar benefits in the future" (Goodman and Redclift, 1991:36).

Figure 2 below illustrates the interrelationship that exists between factors comprising sustainable development, as mentioned by Goodman and Redclift.

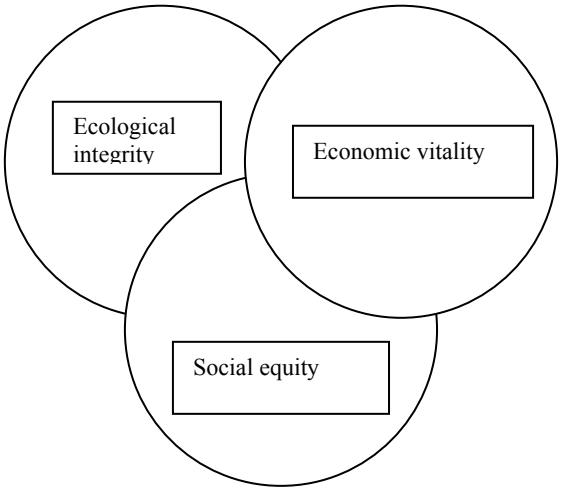

Figure 2: Interrelationship between factors comprising sustainable development

Promoting sustainable development requires a multifaceted approach. It involves economic development to facilitate the equitable distribution of resources and social justice within a framework of environmental justice, which ensures the survival and sustainability of all ecosystems for the benefit of future generations.

A conference held in 1999 at the University of Colorado on sustainable development defined it in the following two ways:

1. "Environmentally sustainable development, which means development that does not cause degradation of the environment and uses renewable resources to the maximum extent possible.
2. Development that is internally sustainable by village residents after the external stimulus is removed. Movement out of poverty generally requires an external force, person or system that causes action toward development to take place. Internally sustainable development is development that will continue undiminished after this external influence has been removed." (http://www.sil.org/anthro/articles/sustain.htm)

The above definition takes into account the fact that sustainable development comprises different targets that have to be achieved at the same time in order to ensure its existence.

As illustrated in Figure 2 above, there has to be a balanced mix of environmental stability (ecological integrity), economic growth (economic vitality) and shared benefits within a community (social equity).

Falconer (2003:3) states that “the concept of sustainable development therefore hangs on vague and opportunistically flexible notions -if they are not altogether illusions -of “time” and “resources”.

After considering the Brundtland Report, the UN General Assembly called for a United Nations Conference on Environment and Development in 1992. The summit, also known as the Rio Earth Summit, generated a sense of urgency about the need to alter human behaviour in order to reduce environmental degradation. Sustainability emerged as the way forward. The theme of the Rio Summit was the broader issue of the relationship between environment and development at national and international levels. The Rio Summit set a new agenda for sustainable development. Another similar conference, entitled the World Summit on Sustainable Development, took place in 2002 in Johannesburg. This conference resulted in a common declaration known as the Johannesburg Declaration on Sustainable Development. This declaration, besides identifying global challenges to environmental sustainability, also stipulated guidelines for member states’ commitment to sustainable development (UN Department of Economic and Social Affairs: Division for Sustainable Development, 2002 Report).

The pillars of the Brundtland Commission, as well as the outcomes of the Rio Summit and the Johannesburg conference, formed the basis for the approach that characterises today’s global development policies. A major handicap, however, has been in terms of the implementation of

sustainable development policies. A study conducted among the member states of the European Union (EU) revealed this profound challenge. Quantitative data collected from EU states' sustainable development indicators showed that the process of promoting sustainable development goals increased candidate countries' GDP growth, which also increased their capacity to meet the MDGs and, therefore, to implement sustainable development. However, while the economic and social standards of candidate countries were shown to be increasing, their environmental conservation was shown to be decreasing. The significance of this outcome is that when the economic and social standards of masses improve, the environmental pillar of sustainable development becomes neglected, or that an increase in the capacity to implement sustainable development does not necessarily lead to the implementation of sustainable development (Friedaricka, 2008:1-2).

It should be noted that at present, most people in sub-Saharan Africa have not yet attained the level at which their basic needs of access to food, clean water and decent shelter have been met (Mwaniki, 2008). In light of this, the question remains as to whether or not sustainable development can be achieved in situations where the basic conditions for survival of some of the people are threatened. The answer to this question, however, is beyond the scope of this study.

In exploring the tenets of sustainable development, this chapter focuses on one element of basic human needs, namely access to food. In order to achieve this goal, this study explores the intractable connection between food security and human security. It contends that while food is a basic necessity in terms of human security, access to it is still a problem for many people in parts of Sub-Saharan Africa. It is due to a concern about the consequences of protracted food insecurity that this chapter seeks to determine how food security can be promoted within the framework of sustainable development.

2.3 Conceptualising sustainable development

Sustainable development is widely defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WECD, 1987). This definition represents an ideal view of what sustainable development should be. The reality, however, is that an interplay of various factors within any given environment has an enormous bearing on the realisation of sustainable development in its ideal form. This makes meeting the needs of both current and future generations a priority.

Mainstream sustainable development is based on various benchmarks, the basic ones being economic goals, environmental goals and social goals. The sustainable development agenda revolves around issues of economic growth, sustainability of available resources and resilience of the environment, in order to give future generations the same benefits that the current generation gets from the environment. A balanced inter-relationship of this kind would yield a degree of intergenerational equity.

The concept of sustainable development is essentially an interdisciplinary one (Rao, 2000:67), as indicated in the above. It was introduced in 1980 by the International Union for the Conservation of Nature and Natural Resources (IUCN) at the announcement of the World Conservation Strategy (WCS), with the overall aim of achieving sustainable development through conservation of living resources (IUCN, 1980). This strategy emphasised the need to conserve living resources in order to promote sustainable development.

After this, more proponents of sustainable development came to the fore. One of them was the World Commission on Environment and Development (WCED), which defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987:43). The Commission went on to explain what the operational

objectives of sustainable development are. These include: reviving growth, changing the quality of growth, meeting essential needs for jobs, food, energy, water and sanitation, ensuring a sustainable level of population, conserving and enhancing the resource base, reorienting technology and managing risk, merging environment and economics in decision making, and reorienting international economic relations (WCED, 1987:49).

The Organization for Economic Co-operation and Development (OECD) provides another definition of development, in which it considers human generations and their well-being to be central, by stating that development is a path along which the maximisation of human well-being for today's generations does not lead to declines in future well-being (OECD, 2008).

From the foregoing observations, it is clear that human survival is at the centre of development, or rather that every approach to development must consider the survival of the human species to be a central objective. This argument has generated debate in various disciplines, and despite attempts to clarify the key issues, decades of practice and theory building have not helped to explain the concept of sustainable development, leaving it to undergo a dynamic process (Lele 1991, Stedton et al., 2006). Indeed, almost every discipline in the social sciences today discusses sustainable development. This includes economics, politics, sociology, anthropology, history, geography and development studies. However, the underlying factor is the wider concern for human survival, together with that for the well-being of the environment as a system.

The multiplicity of disciplines that integrate sustainable development into their spheres has led to the emergence of various proponents, who have attempted to operationalise the concept of sustainable development. These proponents, according to Rao (2000:70), can be divided into the following two categories:

I. **Ecocentric proponents:**

These include environmental philosophers, who view human activities in terms of their implications for ecological ingredients, their relative effects and balances. Those who hold this view seek to promote the environmental sustainability of an ecosystem.

II. **Anthrocentric proponents:**

This group includes those who hold the view that any and all human activities must be in the primary interest of humans, and should strive to achieve the desired goals and objectives of the society, regardless of whether or not some of the elements of the environment and ecology are kept intact. They promote the enhancement of human life through exploration and use of the earth's resources.

In order for the entire ecosystem to thrive, a balance in all areas of development has to be maintained. This balance has to be achieved in order for humans and the rest of the ecosystem to survive and thrive.

The sanctity of human life is intrinsically linked to that of the rest of the environment in general, as suggested by the late Pope John Paul II when he observed that:

"Respect for life and for the dignity of the human person
extends also to the rest of creation, which is called to join man
in praising God."

The relationship between human life and the rest of the ecosystem, including the interdependencies amongst living organisms, calls for a need to investigate how development, if not carried out in a sustainable manner, can affect the stability of the environment.

2.4 Debating sustainable development: realities and challenges

In analysing sustainable development, it is of utmost importance to discuss both economic and environmental development. The World Bank defines the environment as "the natural and social conditions surrounding all mankind, and including future generations" (World Bank, 1991:2). The environment thus comprises not only natural resources but also other physical elements that are man-made and which affect the life of man on earth. Environmental sustainability therefore refers to the ability of the environment to maintain its present level of balance at all times.

i) Internationalisation of the sustainable development debate

A populist approach to sustainable development argues that human beings should only utilise the environment and its natural resources to such an extent that the environment is able to naturally renew itself. Sustainable development requires that, as much as economic growth is sought through processes such as the industrialisation and mechanisation of agricultural techniques (as discussed later in this study), it should be achieved within the framework of environmental sustainability.

The point here is that the objective of sustainable development is to ensure the survival of future generations, without undermining the existence of present generations, and this cannot be overemphasised. However, in order for this to be achieved, it is important that current available resources are utilised in a manner that will ensure their continued availability for meeting the demands of future generations. Basiago (1995:109) contends that "far from being a mere doctrine of development science, 'sustainability' has emerged as a universal methodology for evaluating whether human options will yield social and environmental vitality."

Basiago views sustainability as being central to the evaluation of whether human activities have a negative or positive impact on the environment in terms of achieving sustainability of the ecosystem. In other words, Basiago is concerned with evaluating what man gives back to the environment (what he refers to as “environmental vitality”) as he (man) exploits the environment for his survival.

Those who clearly support the call for sustainable development are in the race to ensure that biodiversity and social cohesion are not destroyed at the expense of the present generation’s selfish short-term objective of meeting their immediate needs. Other sustainable development scholars, such as Cousteau (1980), emphasised the fact that future generations also have a right to the current available resources that the present generation is enjoying. He expressed this concern in his “Bill of rights for future generations,” in which he said that “Future generations have a right to an uncontaminated and undamaged earth…each generation.... has a duty as trustee for future generations to prevent irreversible and irreparable harm to life on earth….”

In this above statement, Cousteau echoes the sentiments expressed by Basiago, by emphasising the need to ensure the continuity of future generations through a balanced exploitation of available (natural) resources.

Although the debate on sustainable development was initially largely the concern of individuals in various domains of study, the fact that the subject has a universal implication for human survival has encouraged the involvement of other stakeholders, including policy makers such as governments, non-governmental organisations (NGOs), as well as regional and international organisations such as the UN and the World Bank. These stakeholders, especially NGOs and international organisations concerned with environmental policy implementation, have taken a step forward to ensure sustainability by emphasising that the development projects they undertake clearly support and enhance the

move towards sustainable development. They call for not only the promotion of sustainability of the human population, but also of biodiversity in its totality (UN-Habitat, 2007:8). This is done through policy formulation and agreements that embrace the cause of sustainable development.

The approach is multifaceted, and includes a variety of procedures that range from bilateral to multilateral funding arrangements that ensure improved food security, health care, provision of infrastructure and environmental conservation, amongst others. Such funding arrangements are made between economically poorer countries of the south and economically richer countries of the north, and the requirements include conditions such as proper legislation. Such agreements include the Paris Declaration and the Millennium Development Goals. For instance, in some cases laws have been passed to regulate the amount of pollution released into the atmosphere, and these laws include a prohibition against the use of leaded fuel in motor vehicles if unleaded fuel is available.

ii) Sustaining the environment

Proponents of sustainable development suggest that it is possible for the human population to maintain a balance between what it takes from the environment and what it gives back in terms of conserving it. Those who hold this view argue that it is possible for mankind to co-exist in harmony with other natural organisms in the ecosystem, without impacting negatively on environmental resources. Rees refers to this phenomenon in his discussion on the concept of human carrying capacity, which he describes as being “the maximum rate of resource consumption and waste discharge that can be sustained indefinitely in a defined planning region without progressively impairing ecological productivity and integrity” (Rees, 1990: 20; UN-Habitat, 2007).

The concern raised with regard to aggravating human activities that continue to deplete the environment has lead to a search for intervention measures, with the aim of regulating these activities and promoting environmental conservation. Some of these measures include the Tokyo

Convention on Environmental Pollution, which was convened in order to discuss ways and means of regulating the amount of pollution being released into the atmosphere. These are some of the initiatives that are commended by proponents of sustainable development. At the core of these principles is the belief that with an increase in awareness, international agreements such as these will make it possible for a compromise to be reached in terms of the need to enhance sustainable development.

At the opposing end of the debate on sustainable development are those who hold the view that the concept is too ideal and hence unrealistic. This group argues that the environment has already been polluted and massive environmental degradation has taken place, to the extent that no matter what kinds of interventions man introduces, the damage has already been done. This group maintains that things such as the depletion of the ozone layer, global warming and the greenhouse effect are processes that have gradually been taking place over a long period of time, thus making it impossible for the situation to be reversed.

It is, however, true that while environmental degradation has been steadily occurring, human exploitation of the environment for survival has intensified, thereby exerting excessive pressure on the ecosystem. The end result has been twofold, in that on the one hand, the environment has been polluted by man's activities, and on the other hand, man has physically encroached on the environment as he seeks to achieve food security amidst a growing population and changing weather patterns.

The fact that the world is building consensus through international legal instruments such as the Kyoto Protocol and the Bali 'roadmap', a consensus is bound to develop in which basic universal approaches to environmental protection can be observed.

"*The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions .These amount to an average of five per cent against 1990 levels over the five-year period 2008-2012." (http://unfccc.int/kyoto_protocol/items/2830.php)*

However, one must acknowledge the challenge that industrialised countries will continue to pose to such regulatory regimes.

iii) Promoting sustainable development

In order for sustainable development to be promoted, the issue of stakeholder participation is fundamental, because it is central to determining whether or not resources are equitably distributed and how they are distributed (whether they are distributed to groups or individuals, and the criteria used in selecting beneficiaries) (Mutebi, 2004;Ramachandran, 2008).

Participation in this sense refers to the ability of stakeholders to participate in an activity. In order for sustainable development to be achieved, all stakeholders have to be equitably represented, with a corresponding share of the resources. The issue of participation has been central to the discourse on sustainable development right from the beginning. For example, principles of eco-development, which is the term used before sustainable development, emphasised the need for equity and social justice as prerequisites for achieving sustainable development.

The term that was used at that time was sustainable equitable development, although this fell by the wayside when the terms equity, participation and decentralisation were adopted, as they carried the same meaning.

However, sustainable development scholars such as Lele (1991:615) criticised the grouping of the three terminologies, declaring it to be an ambiguous use of terminologies. Lele, in challenging this move, stated that

“by using the terms, equity, participation and decentralization interchangeably, it is suggested that participation and decentralization are equivalent, and that they can somehow substitute for equity and social justice.” Lele’s argument is reasonable, because all the ideals are important and necessary to the achievement of sustainable development. Grouping them together and giving them a similar meaning only served to diminish the seriousness of the issue.

The reality is that in today’s world, where competition thrives, it is difficult for such ideals to be met without any challenges. This is particularly true for those who hold pessimistic views about the possibility of achieving sustainable development. It is important to note, however, that when striving to promote food security, it is essential that whatever efforts are made include all stakeholders, with the view to achieving inclusiveness. A participatory approach to development helps to reduce the feeling of “them against us” amongst stakeholders, especially between locals and foreigners. This is because the more the beneficiaries feel part and parcel of the process, the less resistance they will show towards the project, and hence the greater the chances will be of it succeeding. Proper participation should therefore be a requirement for all sustainable development endeavors including food production processes. This would ensure maximum benefits from food production processes, thereby ensuring that food security is achieved in a sustainable manner.

Despite the confidence expressed by some proponents of sustainable development, there are others who renounce the practicability of sustainable development. This group holds the view that the damage already done to the environment is too extensive to repair. They argue that there is a lack of sincerity on the part of many richer countries and that the balance in terms of implementation of agreements is one-sided - it is biased against developing countries. For example, the United States of America, which is amongst the highest polluters of the environment, has not ratified the Tokyo agreement for fear of losing employment for its

citizens. Based on such facts, the group contends that sustainable development is an elusive ideal whose attainment is virtually impossible.

iv) Policy-making and conflict as factors affecting sustainable development

The sustainable development paradigm has led to the formulation of many policies at both national and international levels.

In some cases, however, the policies that are formulated have raised concern among various scholars, who have questioned the extent to which such policies could be implemented in order to achieve a realistic degree of sustainable development. For instance, Lele, in his critique of the numerous terminologies and concepts that underlie sustainable development, comments that " given this confusion in terms, perceptions and concepts, the policies being suggested by the mainstream of sustainable development thinking cannot and do not conform to the basic idea of ecologically sound and socially equitable development. They are often seriously flawed, and reflect personal, organizational and political preferences" (Lele, 1991: 616). In this regard, he highlights the baggage and biases which guide or influence policy formulation, referring to factors such as a country's national security, employment opportunities and fear of the dumping of goods, among other issues.

Lele, in his discourse on policies, goes on to suggest that there are three main dimensions in which failure has occurred in terms of sustainable development policies in international trade, namely in the fields of economic relations, sustainable agriculture and the survival of tropical forests. He argues that developed countries, which are also the financial centres of most of the international funding organisations, have made it impossible for equitable distribution of resources to occur in this area, adding that most of the policies that are formulated, especially in terms of trade, have tended to favor developed countries at the expense of developing countries. This poses a challenge to sustainable development.

Consequently, countries that experience conflict, especially armed conflict, or those that are emerging from such a situation, are usually faced with the risk of their national resources being looted and/or plundered by those who intervene under the guise of preventing the situation from degenerating further. Against the background of such interventions is often the illegal exploitation of natural resources such as gold, diamonds, oil, etc. Feeney and Kenny (2005: 350-51) provided a good example of the looting of natural resources in the Democratic Republic of the Congo (DRC) when they wrote that:

> *"During the DRC conflict, for example, the DRC Expert Panel reported that the richest and most readily exploitable of the publicly owned mineral assets of the Democratic Republic of the Congo are being moved into joint ventures that are controlled by the elite network's private companies. These transactions, which are controlled through secret contracts and offshore private companies, amount to a multi-billion-dollar corporate theft of the country's mineral assets…The elite network has been trying to legitimize such corporate and market these assets to legitimize international mining companies."*

In the excerpt above, the authors expose the typical manner in which many countries in conflict, especially those in sub-Saharan Africa, lose their riches in terms of natural resources to intervening countries. In most cases, due to the clandestine nature of the exploitation, proper standards are not observed, leading to wastage of natural resources and/or under-valuation of the prices of exploited resources, to the detriment of the victim country.

When a war ends, post-conflict society retains the horrendous wartime experience, and this often lingers for several generations. Usually, the attitude of a post-conflict society towards life is changed through the experiences of war. For example, if mining was the specialty of a few individuals recruited by the government, the lawlessness that

characterizes conflict may have attracted them to illegal mining which, even when the war ends, might continue to exist, at the expense of, for example, crop farming. This has a direct impact on the sustainability of such a community. In such instances, achieving food security and sustainable development is often a far-fetched ideal.

2.5 Climate change as a factor influencing food security within the framework of sustainable development

From the above discussion, it is clear that the importance of promoting sustainable development cannot be overemphasised. However, it is of utmost importance to note that with current climate change conditions, achieving food security within acceptable sustainable development targets is a definite challenge.

This section discusses climate change and how it impacts negatively on the lives of living organisms, especially humans. In order to bring the underlying issues to the fore, this section analyses phenomena such as global warming and the greenhouse effect, and then relates them to emerging challenges to the ecosystem, particularly for human survival.

2.5.1 A brief introduction to current global climate change patterns

Climate change has been referred to as “an alteration of long standing weather patterns- as opposed to daily fluctuations-above and beyond natural climate viability observed over comparable time periods; climate changes are changes in composition of the global atmosphere that can be attributed directly or indirectly to human activity” (Falconer and Foresman, 2002:34). Controversies surrounding climate change are slowly dissipating, as man gradually comes to terms with the reality that weather patterns are no longer as predictable as they were in the past. Pachauri (2006), Clark (2006), McCaffrey (2006), and Sanchez (2000) among others, confirmed this view, emphasising that the

existence of an environmental crisis is not an arguable subject any longer, as shown by the myriad scenes of climatic change that continue to occur globally. However, the effects of changing climatic conditions vary from place to place, and these changes impact differently on human life. It is against this background that Hollander (2003:1) points out that:

> "For an American, claims that last year's hot summer was a precursor of catastrophic global warming, but in any case you perceive such environmental scenarios as somewhat esoteric and remote from your daily life. If you are a welder in a Chinese bicycle factory, in contrast, you are fully aware of the serious water and air pollution that China's rapid industrialization has brought to your region, but you probably accept the pollution with forbearance because the bicycle factory provides a steady job that enables you to support your family. Yet if you are a subsistence farmer in Sub-Saharan Africa living on the brink of starvation, you probably think of the environment as nature's fickle preserve- the land and animals that in good years barely keep you and your family alive and in bad years bring starvation and disease. The environment of the rich and the environment of the poor are indeed a world apart."

Hollander (2003) reflects on the realities of environmental change and how it affects different people, depending on their location and status in society. Due to differences in livelihoods, economic capabilities and physical environments, the impact of environmental change is experienced differently by different people. However, changes in the environment resulting from excessive human activity have led to a myriad of undesirable consequences for life on earth, with the most conspicuous effect being global warming

Global warming has led to a number of environmental imbalances, such as a rise in temperatures, which has resulted in the melting of glaciers,

something that has led to unpredictable rainfall patterns, flooding and unprecedented drought in certain instances. These developments continue to impact negatively on traditional patterns of food production. If these conditions persist; it is becoming apparent that man will no longer be able to co-exist in harmony with other organisms, as it should be.

Most scholars in the field of environmental studies, such as Maarten (2005), Brown (2004), Per-Pinstrup-Andersen and Rajul Pandya-Lorch (1998), Mawhinney (2002), Sanchez (2000), Jones and Nelson (1999), as well as organisations such as UNEP and IFPRI, among others, agree that global warming is negatively affecting the global climate pattern, and this, in retrospect, affects food production, especially where crop production is rain-fed rather than by means of irrigation.

Economic limitations experienced by developing countries prevent them from venturing into large-scale irrigation practices when rains become unreliable, hence exposing these countries to elements of climate change, however minimal they may be.

Since global commons such as atmospheric air and water bodies are universal, their effect is not restricted to a specific geographical location.

2.5.2 How industrialisation and environmental pollution affect food security

The quest for human development through industrialisation, backed by the capitalistic nature of world trade in which environmental ethics come after monetary profits, has led to massive overexploitation of the earth's resources, of which some are non-renewable. Although human life has generally been made relatively easy and more comfortable, technological advancement has brought with it an imbalance in the ecosystem, which manifests itself through environmental degradation.

Scientists such as Kay warn that current trends of resource exploitation are no longer sustainable, and that the crisis that is facing mankind and

other species on earth today will become more real by the day (Kay, 2004, in McCaffrey, 2006:96). Climate change embodies a global concern that is no longer a subject for scientists alone, but is also of great interest to those in the political sphere.

After years of ignoring the fact that industrialisation affects the quality of the environment, British politicians eventually accepted it in the early 1990s in a statement made by Sir Geoffrey Howe, a former chancellor and Foreign Secretary of the United Kingdom, when he stated during the United Nations General Assembly that:

> "*We are totally dependent on climate. Damage to it beyond repair and the earth becomes a lifeless desert, spinning in space. We cannot leave a problem of this magnitude to technical bodies*" (Brown, 1996:21).

The global nature of environmental pollution, as explained by Howe, affects both the polluter and the non-polluter. For example, when harmful gases such as carbon are emitted into the atmosphere from industries in the industrialised North, they easily affect the rest of globe by depleting the ozone layer. In other cases, the concentration of such gases creates the greenhouse effect, raising the earth's temperatures with negative consequences for the ecosystem (this phenomenon will be discussed in detail in the next section).

In its annual index of greenhouse gas emissions, the National Oceanic and Atmospheric Administration (NOAA) found that atmospheric carbon dioxide, the primary driver of global climate change, rose by 0.6 percent, or 19 billion tons, in 2007. The study, which was based on data from 60 sites around the world, showed that in 2007, the increase in carbon dioxide added 2.4 molecules to every million molecules of air, a measurement known as parts per million or ppm.

The NOAA highlights the looming danger of pollution when it states that comparatively, carbon dioxide levels were about 270 ppm in the mid-18th century, before the widespread use of fossil fuels, which began with the Industrial Revolution. In 2007, these levels were near 390 ppm, and they have been rising more steeply over the last three decades (Zabarenko, 2008)[1]

In the case of Sub-Saharan Africa, where most countries rely on annual rainfall patterns for food production, a change in the pattern of rainfall impacts directly on the pattern of food production. In this context, therefore, one can conclude that the current crisis caused by environmental degradation is likely to increase, and if food security is to be promoted, then factors such as environmental sustainability, restoration and conservation have to be considered. It is only when a balance is achieved in ecosystems that all living organisms can thrive. Sustainable development is therefore a prerequisite in this regard.

Ayensu (1992:120) reinforces this argument when he says that “several studies have concluded that rapid population growth, coupled with the careless handling of the biosphere, have contributed significantly to the rising levels of environmental degradation in Africa today.” He goes on to state that this is coupled with the fact that “Forty-four percent of the land surface is arid, semiarid and desert, 18 percent is of extremely low fertility, and 22 percent is waterlogged and of shallow depth. Only 16 percent can be considered satisfactory.” This proves that Africa is facing a challenge in achieving sustainable food production in response to the continent’s growing population.

Furthermore, population growth creates a high demand for goods, hence intensifying industrialisation, which is a major source of environmental pollution of natural resources such as rivers and lakes, as well as underground water.

Pollution, whatever the source and location, has a global domino effect. This effect, however, is more prevalent in the immediate environment in which the pollution takes place, such as the more developed and populated countries/regions of the world, for example China, India and the United States. In commenting on India and its environmental challenges, Lat et al (2003:194) state that "A second major problem is the progressive pollution of the Indian environment, soils, water and air, with agricultural chemicals and liquid, solid and gaseous emissions from automobiles and industrial operations. The rapid increases in agricultural production have been largely based on heavy use of agrochemicals, and the rapid industrialization in India has led to production of effluents and gaseous emissions in very large quantities… and may take many years for some ecological compartments of the environment to recover from this pollution."

According to the NOAA, the primary source of carbon dioxide is the burning of fossil fuels, something which is increasing, with China being now the world's biggest emitter, followed by the United States.[2] Acid rain, which occurs as a result of acidification of the air due to industrial fumes, has also severely impacted on global water resources. A case in point is that of lakes classified as dead lakes, such as the Adirondack Lake in New York. According to Esch (2008), the Brooktrout Lake was teemed with trout before air pollution from faraway cities began to change the chemistry of lakes and soils in the 6-million-acre Adirondack Park. In 1984, biologists found that Brooktrout Lake and hundreds of others in the rugged region were completely devoid of fish.[3]

Others, however, continue to dispute the notion of a looming environmental crisis resulting from environmental degradation. Leroux (2005:16), for example, disputes the existence of a pending disaster when he says that "the 'greenhouse effect' or 'global warming' scenario is a myth. Climatology has better things to do rather than waste its time and resources, and ultimately lose its credibility, in this way. It does not exist to give ideas for the plots of disaster movies. Its priority should be to minimize real weather risks, now, and not to gaze into the future trying to

imagine the improbable dangers to come." In his discourse, Leroux cautions that climatology has misled humanity into believing that there is a pending disaster that will befall the earth as a result of environmental degradation. He refers to the notion of a pending disaster as a result of global warming as being pure sensation. He bases his argument on the fact that there have been so many predictions made in the past regarding doomsday due to global warming, but this has not yet come to pass. The notion that global warming is a myth is not well founded, as all the signs indicate that the effect is real (Sanchez, 2000), and unless mitigated, the world will be faced with extreme weather conditions. Chasek (2000:65) clearly illustrates this in the table below, which categorises the various environmental problems that the world currently faces.

Table 1: The effect of pollution on human populations

Environmental problem	**Main Source of Problem**	**Main social group affected**
Urban air pollution	Energy (industry and transportation)	Urban population
Indoor air pollution	Energy (cooking)	Rural poor
Acid rain	Energy (Fossil fuel burning)	All
Ozone depletion	Industry	All
Greenhouse warming and climate change	Energy (fossil fuel burning)	All
Availability and quality of fresh water	Population increase and agriculture	All
Coastal and Marine degradation	Transportation and energy	All
Deforestation and desertification	Population increase, agriculture and energy	Rural poor
Toxic chemicals and hazardous wastes	Industry and nuclear energy	All

Taken from Chasek (2000:65)

The above table highlights the fact that pollution in whatever form or type eventually affects human life. Thus, it is of critical importance that everyone protects the environment, since destructive practices eventually affect all living organisms. Such levels of environmental degradation are not in line with sustainable development practices.

2.5.3 The impact of Millennium Development Goal (MDG) 7 on food security

The need to curb the current pace of environmental destruction in the hope of reducing environmental degradation, as well as reversing the negative effects that accrue from it, led world leaders and conservationists to agree to a number of issues that would ensure environmental sustainability. The MDGs are aimed at ensuring environmental stability by the year 2015. The objectives of Millennium Development Goal 7 were to:

- "Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources
- Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation
- Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers." (UN Millennium Project, 2005:xix).

While the above mentioned objectives are plausible, it should be remembered that countries continue to lag behind in terms of meeting these targets. According to the United Nations Report of 2009 on African Trends for achieving Sustainable Development, "Therefore, whether it is realistic to base the expected developmental process on these goals is a matter for further discussion".

2.5.4 The impact of global warming and the greenhouse gas effect on food security

Global warming occurs whenever there is a rise in atmospheric temperatures. An excess of this causes an imbalance in nature, as it depletes the ozone layer responsible for protecting living organisms against the adverse effects of ultra-violet (UV) rays. Global warming has increased over thousands of years, despite the fact that it is only in the last few decades that rapid global warming has been witnessed and continues to be more evident, especially with the melting of polar glaciers, an occurrence that has resulted in rising sea levels and unpredictable weather patterns.

Global warming occurs when there is an excessive concentration of greenhouse gases in the atmosphere. These comprise mainly of carbon dioxide (CO_2), water vapour, chlorofluorocarbons (CFCs) and methane (CH4). According to data released in 2008 by the NOAA, and entitled "New Data: Global Warming Gas Build-up Accelerating," the NOAA observes that not only did carbon dioxide (CO2) emissions increase by 0.6% –19 billion tons – but methane, an even more powerful but less common greenhouse gas, increased by 27 million tons after nearly a decade of no increases.

The amount of carbon added to the atmosphere in 2007 was 20% higher than the average annual increase in recent years (2.4 ppm versus 2 ppm), 60% more than the increase witnessed during the 1980s, and more than double the increase recorded during the 1960s (NOAA, 2008)[4].

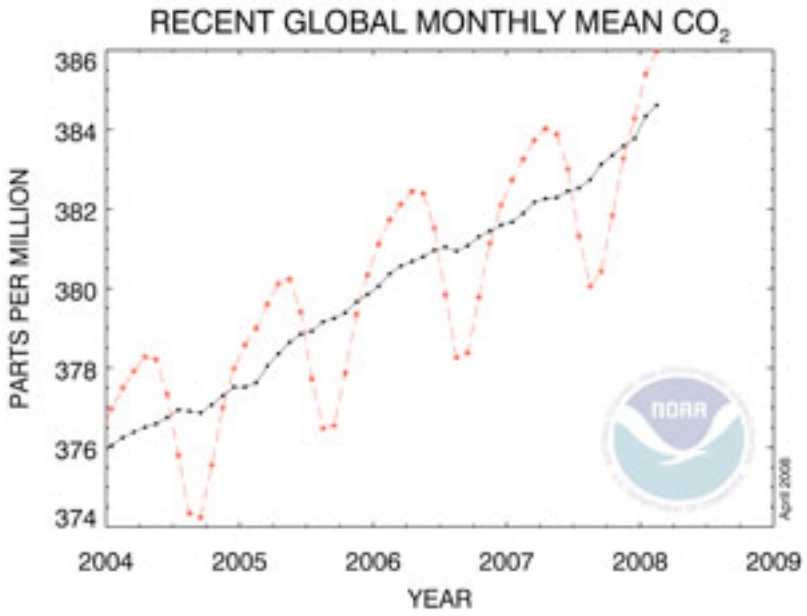

Figure 3: Global trends in CO2 emissions according to NOAA

According to the NOAA, the 2007 increase in global carbon dioxide (CO2) concentrations was the third highest since atmospheric measurements began in 1958.

*The red line shows the trend together with seasonal variations.

*The black line indicates the trend that emerges when the seasonal cycle has been removed.

Source: NOAA, published in *The Daily Green. Available at: http://www.thedailygreen.com/environmental-news/latest/greenhouse-gas-emissions-47042306. (9 August 2008).*

From the foregoing, it is clear that the concentration of CO2 in the atmosphere is continuing unabated, thus making global warming a real danger.

According to Hill (2006: 156), global warming occurs when radiation from the sun reaches and warms the earth's surface. In turn, the earth emits radiant heat (Infrared radiation) back towards space, and water vapour and greenhouse gases capture part of this radiant heat. Hill goes on to illustrate that without this so-called "greenhouse effect" to trap the warmth, the earth would be 35^0C colder than it actually is, and would not be able to

support life. However, lately there has been a high concentration of greenhouse gases in the atmosphere, and the amount of warmth that is trapped is too high, thus causing an increase in the earth's temperatures. This increase in the earth's temperatures then results in the melting of polar glaciers.

The NOAA posits that whether or not this sudden spike indicates that the permafrost in the Arctic is melting remains to be determined. However, it emphasises that "when permafrost melts, it releases a massive dose of greenhouse gases that will fuel more warming, which will melt more permafrost, which will... It's one of the most feared 'positive feedback loops' that scientists predict will accelerate the global warming that is initiated by pollution from burning fossil fuels like coal and oil."[5]

Not only are glaciers in polar regions melting, but also those on mountain peaks. Hill (2006:160) observes that Alaska's permafrost (permanently frozen subsoil) is beginning to thaw, as witnessed by sagging roads, sinking pipelines and the rapid multiplication of insects that feed on the state's spruce forests. Some trees are even showing their roots as the permafrost melts. In Africa, the continent's highest mountain, Mt. Kilimanjaro, has also been affected. 82% of its famous icecap 'snows of Kilimanjaro' has melted.

Brown (2004:118) concludes that global warming is thus responsible for the rise in atmospheric temperatures in different parts of the world, as well as the melting of glaciers in the polar region, an occurrence that is responsible for food shortages, when he writes that "In 2003, Europe was hit by high temperatures. The record-breaking late summer heat wave that claimed 35,000 lives in eight nations shrank harvests in every country from France eastward through the Ukraine. It contributed to a world harvest shortfall of 94 million tons-5 percent of world consumption."

An assessment by climatologists at the National Astronautics Space Association (NASA)'s Goddard Institute for Space Studies (GISS)

indicates that the highest global annual average surface temperature in more than a century was recorded in 2005. According to climatologists, ice sheets and glaciers have been melting away at unprecedented rates since record-keeping began. Changes in the surface area and volume of the two polar ice sheets in Antarctica and Greenland are intricately connected to changes in global climate, and could result in changes in levels that would severely affect the densely populated coastal regions of the world.

An analysis by the Intergovernmental Panel on Climate Change indicates that a 1 metre (3 feet) rise in sea-level has the potential to affect 6 million people in Egypt, with 12 % to 15% of agricultural land being lost, 13 million people in Bangladesh, with 16% of national rice production being lost, and 72 million in China and 'tens of thousands' of hectares (1 hectare = 2.47 acres) of agricultural land being lost.

From the foregoing discussion, the implication is that a continuing rise in global temperatures is likely to trigger a rise in sea level that would result in the massive displacement of people and destabilisation of the ecosystem. Such an occurrence would, according to the World Watch Institute, lead to the displacement of human populations, and the resulting problem of refugees (World Watch Institute, 2005).

Since these displaced people will seek resettlement, issues such as congestion, competition for resources and increased pressure on social amenities will culminate in vices such as crime and disease, while poverty will continue to be a common problem.

The amount of capital that will be lost in the form of the destruction of buildings and infrastructure will have an adverse effect on the global economy. When people lose their livelihoods like it happened as a result of the Asian Tsunami in 2005, the reconstruction process often takes a long time. Apart from a loss of human capital, survivors are often traumatised, and it takes generations for communities to stabilise.

According to studies on the effect of increased temperatures on food security, a rise of 1 degree Celsius during the growing season of many grains would translate into a loss of about 10% of the crop yield. Brown (2004:121) indicates that “crops suffered the most in Eastern Europe, which harvested its smallest wheat crop in 30 years. The wheat crop in Ukraine, already severely damaged by winterkill, was reduced further by the heat, plummeting from 21 million tons the year before to a mere 5 million tons. As a result, Ukraine a leading wheat exporter in 2002 was forced to import wheat in late 2003 and early 2004 as bread prices threatened to spiral out of control. Similarly, during the same period, Romania, which was particularly hard hit by heat and drought, harvested the smallest wheat crop on record, while the Czech Republic had its poorest grain harvest in 25 years” (Brown, 2004:121).

Global warming is set to eventually lead to a change in the climatic conditions in different parts of the world. Purvis (2004: 250) emphasises that “Climate change, in particular could derail economic growth and exacerbate existing concerns about matters such as food supplies, livelihoods and vulnerability to natural hazards. The potential costs of damage to socio-economic and environmental systems are huge and seem set to be borne disproportionately by the poor.” Such changes simultaneously impact on food production, both locally and globally. Other factors such as diminishing underground water resources (the main source for irrigated agriculture), degraded land and availability of arable land contribute to inferior food production, and in the long run exacerbate food insecurity.

Chapter 3

THE IMPACT OF POPULATION GROWTH ON ECOLOGY AND FOOD SECURITY

3.1 Introduction

This chapter is linked to the previous one in that it discusses other factors that have perpetrated environmental degradation, and examines how these factors influence food security. The key issues discussed in this chapter are:

- the role played by population growth and carrying capacity in influencing household food security
- The role of the mechanisation of agriculture and its impact on food security.

3.2 Population growth and the concept of the carrying capacity

Rev. Thomas Robert Malthus (1766-1834), in his debate on the danger that rapid population growth posed for future generations in terms of meeting their needs, from the environment earned him the title of the prophet of doom. He warned against heightened levels of population growth at that time. Malthus argued that if the population growth patterns of that time were not checked, then the earth's resources would not be able to accommodate the growing human population in a sustainable manner. He argued that too many people would outrun the earth's ability to produce enough food to meet people's food needs (that is, the earth's carrying capacity would be exceeded). This means that the human population would overstretch the earth's ability to sustain itself and renew its resources, in order to maintain a healthy ecosystem. This view erroneously presupposes that mankind is superior to other living organisms in the ecosystem, and that his survival therefore comes before that of other living organisms.

Authors such as Rees and Smith (1998:43) have challenged Malthus' argument by positing that "If the Malthusian argument is followed, and the earth's population is assumed to increase by say 1.5 percent, it means the world would double its population in a mere 48 years. While this average is on the lower side, many developing countries especially in Sub-Saharan Africa experience a growth rate that is definitely more than 1.5 per cent. Unless, something astonishing happens which even Malthus could never have predicted-as astonishing as, for instance, the creation of human settlements on Mars! – It is physically, economically and logically impossible for current population growth rates to continue. Predictions concerning the years 2000 were startling enough, but if we were to project to year 3000 we could envisage a world where every inhabitant has a square meter of land to stand on, or where the weight of the people and the buildings they live in exceed the weight of the earth itself." It is also important to note that Malthus himself did not anticipate the high rate of technological development that would later occur, such as the green revolution and improved food production, both of which to some extent help to meet the demand for food that comes with population growth.

Despite controversies that exist regarding population growth and environmental degradation, the general consensus is that population growth places excessive pressure on the environment. This leads to an increase in water and food consumption and waste generation, the latter of which adds to environmental pollution. Gradually, the environment becomes unable to cope with the demands of people, leading to abnormalities such as pollution and global warming (McKee J et al, 2003; UNESCO, 2000).

Not only have the demands of the global population increased, but also the amount of pressure exerted on the environment by an individual. Today, an individual needs more fresh water due to changes in diet and lifestyle, while at the same time polluting the environment more as a result of using more fossil fuels to facilitate his/ her daily life. Thus, the higher the

population, the more pressure on the environment's resources, hence the higher the likelihood of increased environmental degradation.

While the foregoing discussion portrays a bleak future, some scholars hold an optimistic view with regard to the future of the environment. They argue that the earth has its own way of renewing itself, and that it would react to negative pressures in ways not yet known to man, so as to stabilise itself and ensure its survival. Proponents of this view, such as Lovelock and Margulis (in Luczkovich and Knowles, 1998:2), contend that mankind is only a part of the universe, and that other forms of life also contribute towards the earth's survival. They express this view in terms of what they call the Gaia Hypothesis.

On the other hand, the Earth's Charter stipulates that "humanity is part of a vast evolving earth. The forces of nature make existence a demanding and uncertain adventure, but earth has provided the conditions essential to life's evolution". It goes on to say that " the resilience of the community of life and the well-being of humanity depend upon preserving a healthy biosphere with all its ecological systems, a rich variety of plants and animals, fertile soils, pure waters, and clean air" (Falconer and Foresman, 2002:9).

Lovelock and Margulis go on to posit that according to the principles of the Gaia Hypothesis, environmental conditions found on earth (such as the oxygen-dominated atmosphere that is produced by plant photosynthesis and is absent from other planets in the solar system) are caused by the symbiotic interaction of organisms on earth, and are self-regulating. The authors further express their view by stating that, increasingly, the 'Gaia Hypothesis' worldview of global interactions suggests that solutions to environmental problems are global in scale, comprised of many local ecological disruptions that accumulate globally. Thus, both local and global issues are related, and solutions must be sought across all spatial scales.

Whatever argument is proposed, it is clear that, “Once the demands of a growing population surpass the sustainable yield threshold of an ecosystem, any growth in human numbers is a matter of concern” (Brown, 2004:23).

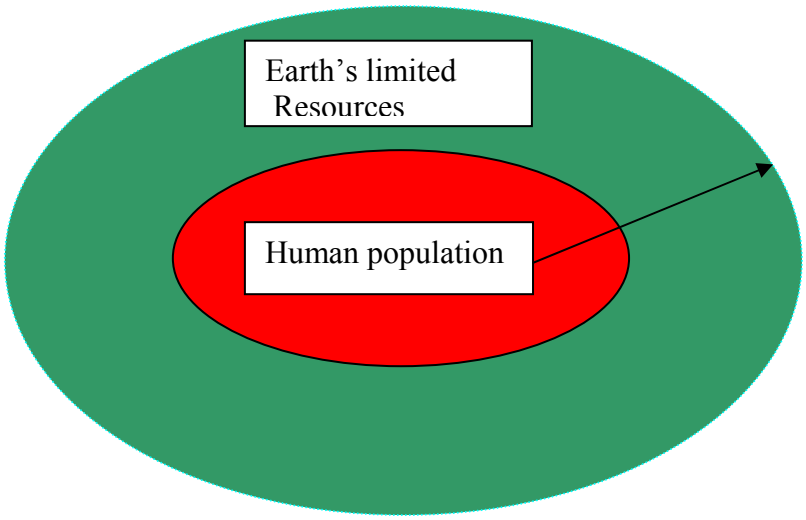

Figure 4: Relationship between human population and the earth’s resources

The diagram above illustrates the relationship between a growing human population and the earth’s limited resources. While the population (represented by the smaller oval) is dynamic in terms of growth, the earth’s resources (represented by the bigger oval) are limited, and their ability to be renewed (for those that are renewable) is compromised by man’s continuous dependence on them.

The arrow in the above figure indicates the potential growth of the human population, hence the expansion of the small oval. If this occurs while resources remain constant or decrease, the potential danger is that natural resources will be exhausted, and this would adversely affect human life.

Of particular concern to this study is the apparent inability of the earth to meet the growing food needs of the increasing human population. Clover

(2003:10) cautions that while population pressure may be viewed as a cause of world hunger, it may actually be only an aggravating factor, not a cause. The author goes on to absolve weather and climate from blame, arguing that they have also been a convenient scapegoat for explaining the current regional food shortages, although an abundance of food can and does exist alongside famine, even in the case of natural disasters.

On the other hand, Pinstrup-Andersen et al. express a different view, by emphasising that an increase in population has a corresponding effect on food security. They base their argument on the premise that "Meeting the increasing and changing food needs resulting from population growth, rising incomes, and changing lifestyles will be a fundamental challenge to the realization of the 2020 vision" (Pinstrup-Andersen et al, 1998:3). Their vision stipulates that the number of hungry people globally should be halved by the year 2020. This argument paves the way for an analysis of how the pressure being exerted on the environment by the growing human population affects the ecosystem, and how this culminates in food insecurity. The growing human population has necessitated an increase in food production, and one of the strategies used to increase this production has been the green revolution.

3.2.1 The green revolution: a discussion of key issues

The need to improve food production in order to meet the demands of a growing population led to the establishment of various initiatives, one of which was the green revolution. An increase in population is equated with an increase in demand for food. In order to meet this growing demand, new techniques in food production had to be introduced. The 'green revolution' strategy was formulated in the 1940s, and was mostly funded by the Ford Foundation, which sought to improve the quality and quantity of agricultural production in an effort to meet the demands associated with a growth in human population. In order to achieve this objective, the green revolution strategy prioritised the use of advanced agricultural technology, which included the use of farmer extension services, fertilizers and

pesticides. The green revolution also promoted the use of hybrid seeds to ensure maximum yields.

Other than rural development and economic development policies, green revolution policies were also introduced in African states. The Organization for Economic Cooperation and Development (OECD) defines the green revolution as the increase in crop yields based on cultivation of high response varieties of wheat, rice, maize and millet, and intensive use of fertilizers, pesticides, irrigation and machinery (http://stats.oecd.org/glossary/detail.asp?ID=1155). On the other hand, Wikipedia defines it as the increase in food production stemming from the improved strains of wheat, rice, maize and other cereals. It involves the extensive use of chemical fertilizers, irrigation, use of heavy machinery, pesticides and herbicides (http://en.wikipedia.org/wiki/Sustainability). Clarke (2006:207) describes the green revolution as "the sharp rise in grain yields brought on by the dissemination of new water-seed-fertiliser technologies introduced in the 1950s and 1960s".

In the above definitions, the most notable aspect is the emphasis on increased crop yields through the use of machinery, fertilizers, pesticides and herbicides. The advent of the green revolution was marked by an introduction of new varieties of hybrid crops and modern technology in terms of farm equipment and machinery. This new approach yielded positive results in the agricultural sphere, and the new varieties increased crop yields.

The most remarkable aspect of the green revolution is that while yields increased per given unit, the future of the large majority of poor households still hung in the balance, with most of them unable to afford basic foods and commodities, hence limiting their access to food. This was because the implementation of the green revolution policy meant that small-scale farmers, who formed the majority in developing countries, could not actively participate. The reason for this was that this category of farmers did not posses the necessary capital to purchase inputs and

machinery needed for capital-intensive agriculture. The green revolution has been responsible for things such as an increased loss of biodiversity, compromised food quality, increased pollution from the use of chemical fertilizers, loss of jobs due to mechanisation, and land degradation.

The expansion of the green revolution led to the depletion of forest land, as this was converted into plantations (Pingali and Heisey, 2001). The looming problem now is that after years of green revolution technology and the exhaustion of land through repeated large-scale cultivation, food production does still not meet the demand, neither is more virgin land available for further agricultural exploitation, while the human population continues to grow. The future in this case will end up as depicted in Figure 3, where population growth, which is elastic in nature, gradually exerts more and more pressure on the earth's inelastic resources, resulting in ecological stress and strain.

Thus, despite years of a successful green revolution, household food security has not yet been achieved in Sub-Saharan Africa. This is partly because women, who are usually at the forefront in terms of household food production, have not had access to the factors of production, especially land. The importance of women's participation in household food production was first noted by the FAO in 1996, when it said that:

"*Given women's role in food production and provision, any set of strategies for sustainable food security must address their limited access to productive resources. Women's' limited access to resources and their insufficient purchasing power are products of a series of inter-related social, economic and cultural factors that force them into a subordinate role, to the detriment of their own development and that of society as a whole".*

The above statement therefore implies that new and more radical initiatives that involve women's active participation still have to be put in

place to ensure food security for the poor, vulnerable and marginalised (Singh,2003; Un-Habitat, 2005,Ramachandran, 2008:5; UNDPI, 2008).

3.2.2 The impact of deforestation on the environment and food security

The interdependence among factors that impact on food security and the environment, such as population growth, global warming and the depletion of natural resources, cannot be disputed. Each of these factors, either directly or indirectly, affects the others. For instance, forests play a fundamental role in balancing atmospheric gases (absorbing carbon dioxide and generating oxygen) that support human life, as well as that of other organisms. However, the growth in human population inevitably leads to encroachment on forests, which results in their depletion. The human quest for land extends beyond land for settlement to include land for cultivation and other forms of agriculture, such as livestock-keeping and aquaculture.

A study by the Food and Agricultural Organisation (FAO) (2006) revealed that "Expansion of grazing land for livestock is a key factor in deforestation, especially in Latin America: some 70 percent of previously forested land in the Amazon is used as pasture, and feed crops cover a large part of the reminder. About 70 percent of all grazing land in dry areas is considered degraded, mostly because of overgrazing, compaction and erosion attributable to livestock activity."

The impact on the environment is such that as more deforestation occurs, water catchment areas dry up, resulting in loss of biodiversity, while at the same time the top soil becomes exposed to agents of erosion. Such occurrences negatively affect the ecosystems that support life, and reduce the chances of achieving food security (Krebs, 1978; Tischler, 1979; Dudley and Stolton, 2003; UNESCO, 2006).

3.2.3 The impact of demographic pressure on water availability

> "Water is non-negotiable. If you are poor, you don't stop drinking water" (Adil Najam, 2006).

It is an indisputable fact, as Najam confirms, that water is the single most important natural resource needed for the survival of any living organism on earth. The importance of water for both human consumption and agricultural production cannot be overemphasised. Despite this, there are millions of people today, more than ever before, who do not have access to clean drinking water, let alone access to sufficient water for agriculture. An analysis by Unklesbay (1992:51) revealed that" although water covers about three-fourths of the earth's surface, only 3 percent of the world's water is fresh, and 75 percent of that is contained in glaciers and the polar ice caps." The implication of this is that as the world population continues to grow, so does the potential for water supply. This is because the human population is increasing at a rate faster than that at which sufficient clean water can become available. This scenario affects global food security as follows.

a) Constraints regarding access to clean drinking water

Access to clean drinking water is a challenge for many people in Sub-Saharan Africa. Scholes and Biggs (2004:39) write that "An unsafe and an unreliable water supply is the reality for millions of people in Africa south of the equator: close to half of the region's population has no access to safe water and sanitation services." By and large, the provision of clean water for human consumption is an ideal that remains a priority in terms of the policies and strategies of most governments, but whose achievement remains elusive for various reasons. The FAO, in its endeavour to meet the Millennium Development Goals (MDGs), stipulates the following as its targets for meeting goal number 7, which calls for the need to ensure environmental sustainability:

- “Target 9: Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources;
- Target 10: Reduce by half the proportion of people without sustainable access to safe drinking water;
- Target 11: Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020”

The above three targets come from the FAO’s strategy, and are relevant to the organisation’s mission to achieve the MDGs. Countries across the globe aspire to meet the MDGs by the stipulated deadline of the year 2020. Current trends indicate that most countries, especially in Sub-Saharan Africa, continue to lag behind in terms of meeting these targets, and that the feasibility of meeting the targets continues to pose a big challenge.

A case in point is the challenge that most countries in Sub-Saharan Africa face - access to clean (piped) water. Increasing population growth and harmful environmental practices such as deforestation and pollution have lead to the destruction of many water catchment areas, thereby denying rural families easy access to water. Today, women in most African rural areas have to walk long distances in search of fresh water. Fetching water for these communities is a time and energy consuming exercise, and one which leaves people with very little time for other economic activities to help improve their livelihoods.

The above situation (in African rural communities) is applicable to many urban environments in Africa, especially among informal settlement dwellers. According to the Department of Water Affairs in South Africa, out of a population of about 48.9 million people, only 17.43 million people have access to clean water and sanitation. The majority of those with access to clean water are in urban areas, leaving over 31 million people without guaranteed access to water.[6]

In the case of South Africa, various approaches are being explored in an effort to mitigate the threat of water shortage. One such effort has been made by the City of Cape Town, which has conducted studies to determine the feasibility of installing a desalination plant that would purify ocean water for human consumption, thereby increasing the water supply by half the amount that is currently available in Cape Town. This strategy emulates a similar approach that is being followed on Robben Island.[7]

While this strategy is plausible, the potential disadvantage of it is that most of the operational and maintenance costs of the plant will eventually be shifted to consumers, a fact that is likely to limit consumers' access to water due to the cost. In this event, the poor are likely to be forced into further poverty traps. While rich people can afford to pay extra for services, the poor, who are often the majority, are usually the most affected by price hikes. As long as a price is associated with water supply, informal settlement dwellers will be hindered from accessing it, due to their low income levels.

The argument that, were it not for the disproportionate and inequitable distribution of resources, there would be sufficient water for all people, is largely true. The uneven distribution of resources, especially in developing countries, is directly linked to the scarcity of resources and widening gap between rich and poor. This gap is often shown in the way essential resources such as water are distributed and used. An indication of the difference in standard of living between the rich and the poor is in terms of their lifestyles. For example, the rich, due to their lifestyles, tend to consume water and other commodities such as electricity in larger amounts than necessary, in order to cater for their luxurious lifestyles. This is evidenced by people using water to fill their swimming pools, irrigate their flower gardens, and maintain water features and fishponds, among others, while the poor attempt to obtain access to the same commodity for their basic survival.

In some urban areas, water supply has been privatised, making it unaffordable for poor people (http://www.cbc.ca/news/features/water/). When the cost of water becomes prohibitive, food security is also compromised. For vulnerable communities and households, the amount of time and money spent on accessing water leaves them with very limited ability (both in terms of time and money) to conveniently access food.

More often than not, families caught up in such a situation typically resort to using contaminated water sourced from unhealthy surroundings (gullies, leaking sewerage, stagnant water in open places, dams, etc). As a result of this, many poor people contract diseases such as cholera, which is currently affecting Zimbabwe, and typhoid. Malaria is also mostly (in the case of Sub-Saharan Africa) contracted due to the vulnerable situation in which the poor find themselves.

b) The effect of reducing water supplies on food production.

Food production is often a water-intensive activity. When talking about food security, water as a resource has to be considered. Successful agricultural practices, whether in the form of crop farming or livestock keeping, can only be sustained if the water supply remains constant. Sustainable agriculture, in most parts of the world, depends heavily on underground water sources for irrigation. Wells are sunk and water drawn from aquifers, some of which are renewable.

The fact that water tables are falling at unprecedented levels, and that wells and rivers are drying up and rainfall patterns are no longer constant is reason enough for food security practitioners to be concerned. Similarly, stakeholders in food production have reason to be concerned, and there is a need for urgent measures in proper management of available water resources to be introduced if the looming crisis is to be averted. The evidence that there is indeed less water available for agriculture lies in the fact that underground water,

which is mostly used in commercial farming, is reducing. The table below, adopted from Lester Brown's book *Outgrowing the Earth* (2005:101), helps to illustrate the extent to which underground water is being depleted in various countries.

Table 2: Underground Water Depletion in selected countries

Country	Description
Mexico	In Mexico, where a third of all water comes from underground, aquifers are being depleted throughout the northern arid and semiarid regions. In a country where irrigated land is more than three times as productive rain-fed lands, the loss of irrigation water from aquifer depletion will be costly.
United States	Over pumping is widespread, and the over pumping of the vast Ogallala or High Plains aquifer-essentially a fossil aquifer that extends from Southern Dakota through Nebraska, Kansas, eastern Colorado, Oklahoma, and Texas-is a matter of national concern. In the Southern Great Plains, irrigated area has shrunk by 24 percent since 1980 as wells have gone dry.
Saudi Arabia	When the Saudis turned to their large fossil aquifer for irrigation, wheat production climbed from 140,000 tons in 1980 to 4.1 million tons in 19992. But with rapid depletion of the aquifer, production dropped to 1.6 million tons in 2004. It is only a matter of time until irrigated wheat production ends.
Iran	The over pumping of aquifers is estimated at 5 billion tons per year. When aquifers are depleted, Iran's grain harvest could drop by 5 million tons, or one third of the current harvest.
Yemen	This country of 21 million people is unique in that it has both one of the world's fastest growing populations and the fastest falling water tables. The World Bank reports that the water table is falling by 2 meters or more a year in most of Yemen.
Israel	Both the coastal aquifer and the mountain aquifer Israel shares with Palestinians are being depleted. With severe water shortages leading to a ban on irrigated wheat, the continuous tightening of water supplies is likely to further raise tensions in the region.

India	Water tables are falling in most states in India, including the Punjab and Haryana, the leading grain- surplus states. With thousands of irrigation wells going dry each year, India's farmers are finding it increasingly difficult to feed the 18 million people added each year.
China	Water tables are falling throughout northern China, including under the north China Plain. China's harvest of wheat has fallen in recent years as irrigation wells have dried up. From 2002-2004, China went from being essentially self-sufficient in wheat to being the world's largest importer.

While one may assume that the effect of a decrease in water tables and insufficient food production in remote countries has no impact on Africa's food security, the opposite is true for a variety of reasons.

Firstly, many countries in Sub-Saharan Africa depend on food imports and food aid to supplement their food requirements. For countries affected by drought, civil strife, or both, food aid and food imports are commonly applied to supplement the country's food production before it can restore its stability. When the countries mentioned in the above table turn to the world market to import food in order to meet their dietary requirements, it means that the demand for commodities will increase. The ripple effect resulting from this translates into a price hike for basic food commodities in the global market. An increase in the price of commodities will mean that low-income countries (most of which are found in Sub-Saharan Africa) will be operating at a loss. They will have to purchase grain at the same market-exit price as richer countries, or else suffer the consequences. While "the price of wheat on the world markets had risen by 130 per cent between March 2007 and March 2008, rice had increased by nearly 90 per cent and maize by nearly a third" (United Nations, 2008). Consequently, donor agencies would need more money to purchase food for aid

purposes, and countries with surplus produce would prefer to sell it rather than offer it as donations. This is already a problem whose trickledown effect will mean an increase in food insecurity amongst the poor people of Sub-Saharan Africa.

In Sub-Saharan Africa, farming is largely dependent on the availability of rainfall. Lately, rainfall patterns have not been as consistent as in the past, and this has led to crop failure in many parts of the region. The changes in climatic conditions are not only based on environmental degradation, but also on the geographical positioning of Africa as a continent. Commenting on this, Harrison (1987:28) says that "A glance at any globe shows Africa's peculiar geographical predicament. The Equator neatly bisects the continent, which is squarely exposed to the glare of the sun like no other region. In the tropics the sun's rays operate at full power. The year-round high temperatures and high humidity in the rainy season provide ideal conditions for pests and diseases - of humans, of crops, and of livestock. These not only affect the quality of life, but depress the productivity of labour, of land, and of animals."

Although Harrison may be correct in his observations, the geographical positioning of Africa is a natural phenomenon that is beyond the control of countries or human beings. While this may appear to be a disadvantage to a certain extent, the fact that most African countries have traditionally experienced sunny conditions and sufficient rainfall throughout the year means that the continent has the best opportunity to produce food naturally throughout the year, without the use of greenhouses, as is the case in polar regions that experience extremely cold (winter) conditions.

It is, however, important to acknowledge the fact that Africa experiences a setback in terms of food production due to an over-reliance on rain-fed agriculture. With regard to Southern Africa, De Wit and Stankiewicz (2006), from the University of Cape Town, suggest that even a small decrease in the levels of continental rainfall would cause a drastic reduction in river water, which would ultimately impact negatively on food

production. They argue that “With a 10 percent drop in rainfall, parts of Botswana would be left with just 23 percent of the surface-water flow it has now. With a 20 percent decrease, Cape Town would be left with just 42 percent of its river water, and Botswana would completely dry up. In Parts of northern Africa, river water levels would drop below 50 percent. Less river water would have serious implications not just for people but for the many animal species whose habits rely on regular water supplies.”

If this above situation were to occur, tourism, which is a major income earner for a number of Sub-Saharan African countries, would be one of the sectors that would be worst affected, as vegetation would dry up, leading to the loss of wildlife.

As Africa faces a looming water crisis, food production is also at stake. Many riverine communities have for ages thrived on riverbanks as the backbone of their livelihoods. With decreasing rainfall and increasing populations, riverine communities have no choice but to explore river water as a means to enhance food production. In so doing, many communities have quarrelled over natural resources such as grazing land and water. Many international boundaries separating countries in Sub-Saharan Africa are linked to relief features such as mountains, rivers and lakes, while many others transcend national borders. The sharing of these resources easily results in resource-based conflicts as their use becomes competitive due to climatic changes.

Commenting on the Nile Basin conflict, Brown (2004:105) states that:

> “The Nile, for instance, which originates largely in Ethiopia and flows through Sudan and Egypt, is reduced to a trickle by the time it reaches the Mediterranean Sea. Since it rarely rains in Egypt, the country’s entire existence depends entirely on the Nile…Egypt now gets the lion’s share of the Nile’s water because it developed much sooner than Ethiopia. But, as Ethiopia begins to develop, it is planning to build dams on the Upper (Blue) Nile that will reduce the

> flow on the lower reaches of the Nile river basin… With virtually all the water in the basin now spoken for and with the combined population of three countries (Egypt, Ethiopia and Sudan) projected to grow from 179 million to 358 million by 2050, the potential for the basin's population to outgrow its water resources - setting the stage for conflict-is clear."

In order to avoid a catastrophic future, Africa needs to explore avenues for sustainable livelihoods. For instance, one of the alternatives would entail investing in proper soil management techniques that make use of water conservation, so as to maximise the use of available water resources and ensure food security for communities in this region. Africa could explore this, bearing in mind that a reduction in water supply is not the only sign of environmental crisis, but that there is also a decrease in the number of living organisms in the world today as a result of changes in global weather patterns.

3.2.4 Loss of biodiversity and its impact on food security

Fowler and Mooney, the Right Livelihood Award winners, once stated that:

> "If enough diversity is lost, the ability of crops to adapt and evolve will have been destroyed. We will not have to wait for the last wheat plant to shrivel up and die before wheat can be considered extinct. It will become extinct when the ability to evolve and when neither its genetic defences nor our chemicals are able to protect it. And that day might come even as millions of acres of wheat blanket the earth".

The above statement warns us of the impending danger that a loss of a plant species could have on food security. With the world population figures expected to soon surpass the 6 billion mark, caution has to be observed in terms of food production systems, ranging from crop growing to livestock keeping, among others. Biodiversity plays a critical role in

achieving global food security. Despite the positive contribution that biodiversity has made in the field of sustainable food production, several shortcomings continue to challenge this practice. Two such challenges are easily identifiable, as discussed below.

a) Impact of monocultures on biodiversity and the environment

Monoculture is defined as the cultivation of only one variety of a particular crop on a specific piece of land. This practice is made necessary by modern trends in the international market that result in the large-scale production of a particular crop in response to a rising demand. This approach was highlighted by Norberg-Hodge et al (2002:36) when they posited that "Production for the global market… Effectively precludes diversity. What a farm produces is not determined by local conditions but by the requirements of a global marketing system that prizes standardized products, extended shelf life, and the capacity to withstand long-distance transport."

Monoculture precludes diversification in favour of specialisation. While it has a number of advantages such as the ease of controlling diseases, high yields and leverage in determining market prices due to large quantities of the produce, it overshadows traditional farming practices that support the notion of diversity, whereby different species thrived together in an ecosystem. Monoculture is about maximising profits, thereby prioritising output (quantity). To ensure high quantities, farmers have to apply extensive land management practices in order to maximise production. Maitima et al have described this phenomenon in their comment that in monoculture farming, extensive land management is required in order to ensure optimum harvests (Maitima et al., 2004:12).

In most cases, monoculture is characterised by genetic modification of a particular species of crop, the basic aim being to optimise the positive features of the crop and maximise its production. This results in the neglect of other species of a similar crop, or even of other types

of crops. Commenting on this fact, some authors have pointed out that in the United States, almost three quarters of potato production comes from just four closely related varieties, while the corn industry is so dependent on inbred lines that one seed company official admitted that the industry is probably working from the narrowest base in history.

From the foregoing observations, it is clear that the practice of monoculture has a significant negative impact on the ecosystem in terms of the survival of certain species, especially endangered ones. In the same vein, in monoculture farming, there is the chance of an entire species of a crop being wiped out due to a persistent disease that may affect just that specific crop type.

In addition to the threat posed by infectious diseases, monoculture crops are also at risk of extinction. Due to the fact that in monoculture, only a certain species is grown or reared, it is more vulnerable to extinction or destruction when attacked by a virus or pest. Indigenous species are usually more resistant to pests and diseases, since they are adapted to their indigenous locations, as opposed to exotic breeds. In expressing this concern, Pimentel and Hall (1989:53) cautioned that "A major threat lies with the trend for subsistence farming to give way to commercial agriculture, whereupon food plants that during centuries have evolved adaptations to their local ecological conditions are supplanted by more productive varieties, often from foreign sources." The basis of Pimentel and Hall's observation is that while the practice of monoculture may indeed lead to increased food production, it may also have disastrous consequences for local (indigenous) genetic diversity.

In monoculture, particularly in the case of large-scale (commercial) farming, the greatest emphasis is on quantity, as opposed to quality. Because large-scale farming is often propelled by demand, the need to maintain high production levels forces farmers to use artificial fertilizers and pesticides in order to achieve the set targets. The danger of such

practices is that plants do not use up all the chemicals that are applied. In addition, broad-based pesticides usually affect a large number of pests, beyond those that were targeted by farmers, and which may be necessary in other parts of the ecosystem. Due to leaching, the residue from fertilizers applied to crops drains into water sources and pollutes not only the soil but also other water systems. Residues of nitrogen-based fertilizers that find their way into water bodies usually result in eutrophication, which in turn leads to an increase in algae and the poisoning of fish and other marine organisms. The cyclic effect of this situation means that in the long term, the original plant species in the area being cultivated will be destroyed, while the use of artificial chemical fertilizers and pesticides will render plant and animal species extinct, thereby modifying the ecosystem.

Cognisant of the danger that the use of pesticides and fertilizers poses to human health, biotechnologists have been working out a compromise that would enable farmers to grow strains of crops that are pest-resistant, while at the same time producing high yields and being able to have longer shelve lives. One of the shortcomings of biotechnology, however, is that the domain is dominated by chains of corporate players, thus leaving very little room for small-scale farmers engaged in traditional crop production that involves practices such as intercropping, and that recognises the diversification of crops as a way to control diseases and maintain biodiversity.

Despite knowledge of the dangers associated with monoculture, the practice continues to appeal to many farmers, of whom the majority are agribusiness stakeholders with the capacity to influence the production, processing and distribution of food in global markets. Agribusiness, as is the case with most business ventures, is driven by profit maximisation that, as discussed above, tends to disregard the ethics of food quality and its accessibility and affordability, especially for the poor. This creates inconsistencies, considering the fact that access to food is a human right.

In a bid to reverse the negative effects of monoculture, the United Nations (UN) declared 2008 to be the International Year of the Potato. In Peru, where it is believed that the potato was first grown, many traditional varieties are now being grown in a 'potato park' to celebrate the diversity of the potato. This is intended to sensitise the world to the danger of losing biological diversity in the quest for profit maximisation.

Another challenge, like monoculture, to biodiversity and hence to the environment, is the effect that animal-based protein diets have on the environment, as discussed below.

b) The impact of changing human diets on food security

The fact that human health is inextricably linked to animal health and production creates a very close relationship between the two. This relationship between human and animal populations and with the surrounding environment is particularly close where animals provide things such as transportation and clothing, as well as protein (meat, eggs and milk).

The lifestyle of humans is often directly influenced by their social status. The general trend is that the more affluent a society becomes, the greater the tendency of its people to consume more animal proteins and their by-products (meat, poultry, cheese, butter, etc). In other words, the more people who are economically richer in a society, the more they will consume animal proteins. A corresponding trend is also discernible in the consumption of processed (manufactured) products. The rich, because of their higher purchasing power, will be able to afford more sophisticated (mostly imported) products than the poor. The problem is not, however, so much the difference in social status (between the rich and the poor) as the impact that such trends in consumption have on the environment, and hence on food security.

In nature, a gradual shift in diet turns into a shift in the environment. Industrialisation comes with modernity, and therefore new trends that are embraced by all people throughout the world. Basic benchmarks of a modern life are the ability to afford sophisticated manufactured products as well as animal-based portentous foods such as meat and poultry. As a result of population growth and globalisation, the demand for these food products has increased significantly. Given that these products undergo mechanised processes before they reach consumers, the environmental impact of producing such products is correspondingly high. The price paid in such a practice (in terms of environmental damage) is equally high, as industries depend on water, fuel, etc. to process these products, thereby depleting such natural resources, while at the same time, industries emit harmful gases into the atmosphere, which contributes to the greenhouse effect that leads to global warming.

This relationship was summed up by the United Nations Commission on Sustainable Development with reference to a report by the International Water Management Institute, which stipulated that 840 million of the world's population remain undernourished, hence the need to find ways to produce more food using less water. The report notes that it takes 550 litres of water to produce enough flour for one loaf of bread in developing countries, but up to 7,000 litres of water to produce 100 grams of beef.[8]

The effects shown in the practice of monoculture are also evident in the practice of animal husbandry. In the latter case, however, the impact on the environment stems from man’s increasing consumption of animal proteins. The growing demand for meat products in response to the expansion in the hospitality industry has led to a global demand for meat products, which has in turn necessitated a corresponding growth in livestock keeping. The need to rare livestock on a large scale has seen the increase in expansive farms that specialise in animal husbandry.

According to Dr Malik, more than 75 percent of all infectious diseases emerging in the last 50 years have been zootomic diseases. These are diseases that move from animals to people. Malik goes on to comment that:

> "The reasons for the global increase in food-borne diseases are complex, and have revealed weaknesses in how modern agriculture is organised. Industrialised agriculture tends to encourage economies of scale to keep prices down, and large groups of animals are often gathered into one place. Since the conditions which promote epidemics are a function of the size of the susceptible population and the probability of adequate contact – itself a function of the agents and the methods of spread-these large populations of animals are vulnerable to epidemic diseases."[9]

Malik elaborates by adding that the biological effects of these economies of scale have been exacerbated by the economic pressure to become more efficient, hence animal "wastes" (organs and parts of animals not considered fit for human consumption) have been reprocessed (rendered) into protein supplements (meat and bone meal or MBM) through various heat and chemical processes.[10] The product is fed to animals in order to make them grow faster or produce more milk. While this seems to make sense economically, ecologically, however, it creates an ideal condition for the spread and increase of food-borne illnesses.

Malik's argument echoes that of Steinfeld, who states that "Livestock are one of the most significant contributors to today's most serious environmental problems. Urgent action is required to remedy the situation" (http:www.fao.org, 2006). The FAO, in one of its reports on food production, using a methodology that considers the entire commodity chain, estimates that livestock are responsible for 18 percent of greenhouse gas emissions, a bigger share than that of transport. The pollution by animals accounts for 9 percent of

> anthropogenic carbon dioxide emissions, most of which is due to expansion of pastures and arable land for feed crops. Livestock, according to the FAO, generates even bigger shares of emissions of other gases with greater potential to warm the atmosphere, with as much as 37 percent of anthropogenic methane, mostly from enteric fermentation by ruminants, and 65 percent of anthropogenic nitrous oxide, mostly from manure. (http://www.fao.org/ag/magazine/0612sp1.htm).

In an attempt to respond to deteriorating climatic conditions, scientists at the University of New South Wales in Australia have discovered that farming kangaroos instead of sheep and cattle in Australia could cut by almost a quarter the greenhouse gases produced by grazing livestock, which account for 11 percent of the nation's annual emissions. The study, according to Perry, indicates that removing 7 million cattle and 36 million sheep by 2020 and replacing them with 175 million kangaroos to produce the same amount of meat could lower national greenhouse gases by 3 percent a year, since kangaroos produce negligible amounts of methane. Another way in which industrial (commercial) livestock keeping impacts negatively on the environment is through the land being set aside for the animals to graze while such land would otherwise be under forests. In addition, large-scale animal husbandry exacerbates soil erosion. Thus, not only does livestock farming affect biodiversity in ecosystems, but it also leads to land degradation, as more land has to be converted into pastures.

Chapter 4

Some other factors affecting food security in Sub-Saharan Africa

4.1 Introduction

The previous chapter discussed the potential challenges that uncontrolled human activity creates for ecological sustainability. This chapter analyses how some of these factors (both natural and man-made) have impacted on food production in Sub-Saharan Africa. In discussing challenges facing the achievement of food security in Sub-Saharan Africa, it is important to note that the fight against hunger remains a priority for all governments in Africa, and will remain this way until it is tackled effectively. As a prelude to the discussion of contemporary factors affecting food production in Sub-Saharan Africa, it is useful to re-examine the background to this situation.

Sub-Saharan Africa continues to carry the burden of hunger, even as other parts of the world strive to tackle the problem with some (relative) success in their sub-regions. For example, the European Union has a common agricultural policy (CAP) in place to protect the interests of its farmers, both at the production and trade levels. Africa, however, especially the Sub-Saharan region, continues to suffer. All African countries are well aware of the potential threat and have, at national levels (and sometimes regional levels), formulated policies geared towards alleviating the threat of food insecurity, albeit with limited success.

This chapter starts with an attempt to trace both historical and contemporary causes of persistent food insecurity in Sub-Saharan Africa, despite the fact that (some) governments have put policies in place to tackle this problem. The analysis here is motivated by the question as to whether the flaw lies within the policies themselves or in the manner in which they are implemented. The chapter then ends with an assessment

of the challenges hindering Sub-Saharan Africa from achieving sustainable food production.

4.2 The impact of modernisation on food insecurity in Sub-Saharan Africa

The challenges related to food insecurity in Sub-Saharan Africa go back to historical times. However, this study only looks at these challenges from the post- World War II (WW II) era onwards. The end of WW II was marked by one main agenda: reconstruction and development. Along with this was the complex issue of modernisation in all its aspects (technological, agricultural, political and even cultural). The International Bank for Reconstruction and Development (IBRD) (the current World Bank) was established at this time. According to Clark, the principal claim was that development was a process which 'societies' - defined as nation states - passed through on the road to becoming an end state. The end state, which all states aspired to reach, according to Clark, was a mass consumer society (Clark, 2006:207).

Coming just after World War II, policies during the 1950s promoted rapid industrialisation and infrastructure development. In Sub-Saharan Africa, development was characteristically linear in nature, due to the fact that it was concentrated within national boundaries, since many of the states were still under colonial rule, and this was exacerbated by the East/West divide of the Cold War era. Urbanisation became a central phenomenon in most African countries, as was the case in the rest of the world. Urbanisation was supposed to promote national development by creating jobs (wealth) and thereby reducing poverty. In describing this approach, Jenkins writes that most government policies at that time assumed that increased development in terms of modern industries and infrastructure projects would lead to the creation of jobs, which would in turn result in increased income for citizens, and eventually raise their living standards, reduce poverty and lead to improved household food security (Jenkins, 1991). To achieve the dual goal of modernisation and wealth creation,

many African states provided Western countries with unfettered access to natural resources.

Economic growth and economic development

In general, the two terms of 'economic growth' and 'economic development' were used interchangeably, as they were understood to be synonymous with each other. However, in economics, as well as in the area of development studies, economic growth is defined as the increase in the value of goods and services produced by every sector of the economy. It is usually expressed in terms of the gross domestic product (GDP) of the country. On the other hand, economic development implies an increase in the per capita income of every citizen. It also leads to the creation of more opportunities in the sectors of education, healthcare, employment and environmental conservation (http://www.blurtit.com/q352972.html).

The advent of modernisation in Africa triggered a wave of policies in African countries, whose central objective was to promote economic growth through technological advancement. This coincided with the era of independence in most African countries during the 1960s. Most African countries embraced the desire for economic advancement, and those that were rich in natural resources (especially extractive resources such as diamonds, gold and oil) became a focal point for the West, which was in dire need of such resources for their industrialisation. To most Sub-Saharan Africa countries, this meant more foreign income for rapid development. Defined by Grainger (2004:10) as "an increase in an economy's output of goods and services, and the overall amount of income that it generates", economic growth became the lingo of most developing countries.

In many respects, the desire by newly independent African countries to improve their countries' gross domestic product (GDP) as an indicator of economic growth appeared to surpass other related issues such as the environmental impact. Exploitation of natural resources in Sub-Saharan

Africa was undertaken by multinational corporations (MNCs) from these countries' former colonial powers. Having coincided with both the Cold War and independence eras in most African countries, Western modernisation and post-WW II reconstruction was characterised by the trends of the bi-polar world (East and West alignment). Large concessions were signed between African countries and their former colonial powers. For instance, Belgium retained its grip over the Congo, while Britain retained its dominance in East Africa.

The outcome of the East-West realignment was intensified by the exploitation of African countries' natural resources, to a degree that has been referred to variably as the 'plundering of Africa's natural resources.' In many respects, this exploitation did not heed the ethics of sustainable development. The dangers associated with environmental degradation grew, and alternative policies and measures had to be sought in order to curb the extent of the supposed damage. Proponents of environmental consciousness at the time, such as Mishan (1967), stated that "Maximizing consumption requires using up the planet's resources and the processes by which these are extracted and transformed into commercial products generate pollution and other forms of environmental degradation." The impact of environmental degradation and how this affects food security has been dealt with in detail in the previous chapter.

Following in the footsteps of economic growth during the 1960s and 1970s was the realisation of the need to protect the environment in the process of development. During this time, a wave of policies emerged among developing countries aimed at enhancing economic development which, unlike its forerunner (economic growth policies), emphasised the need for policymakers to include in their policies measures geared towards ensuring the survival of the ecosystem while improving the standard of living.

Simpson captures the essence of this approach in his definition of economic development as "a rise in the well-being of society as a whole,

as reflected in the expanded set of opportunities available to the present generation. It requires not just a rise in mean income, but that this income be distributed as equitably as possible among the population to increase the welfare of the whole of society - for example, by increasing access to food, clean water and housing, and improving standards of health and education" (Simpson,1987).

In his definition, Simpson raises some of the fundamental issues of developmental concern which were not central to the concept of economic growth, such as the need to ensure that development promotes the welfare of society. Simpson's shortcoming, however, is that he does not emphasise the central role of the environment in which the factors of production are present.

After economic development came sustainable development, a concept which was discussed in chapter 2 of this study.

Out of the processes of the 1990s the Millennium Development Goals (MDGs) evolved during a summit held in 2000 (Millennium Summit), which was hailed as the largest gathering of world leaders in history. The Summit adopted the UN Millennium Declaration, which committed nations to a new global partnership to reduce extreme poverty, and laid down a series of time-bound targets with the deadline of 2015.[11] The MDGs are the world's time-bound and quantified targets for addressing extreme poverty in its many dimensions, such as poverty, hunger, disease, lack of adequate shelter, gender issues, education and environmental sustainability.

Like its predecessors (economic growth, economic development and sustainable development), the MDGs are faced with critical challenges in their implementation, especially in Sub-Saharan Africa. Contrary to the situation existing in developed countries (of which most have a sustainable welfare system for their citizens), developing countries continue to grapple with the most basic human needs. However, it is important to note that the

inability of most developing countries to keep up with MDG goals stems from the inability of these countries to coordinate resources in order to implement these goals.

Many developing countries responded to the call by world leaders to embrace MDGs by incorporating them into their national strategies. As of today, many developing nations still fall short of achieving the MDGs.

The reason why Sub-Saharan Africa countries are grappling with the implementation of MDGs, with very limited success, is embedded in a spiral of factors, the primary of which is the realisation that Sub-Saharan Africa countries lack sufficient capacity in their national budgets to meet the MDG goals, since in most cases, national budgets are overstretched by most of the basic priorities. This inability was highlighted in a statement by the former Nigerian President, Olusegun Obasanjo, when he said that "most African countries may not meet most of the targets of the UN Millennium Development Goals in spite of the prospects for continental development. The targets can only be attained if the efforts of African leaders are complemented by foreign development aid…" (The Tide Online, 2008). Obasanjo added that in education and industrialisation, Africa has used borrowed experiences and funds and engaged borrowed hands, and not much, if any, of the continent's development programmes and strategies is African.

Obasanjo's comments draw attention to a concern that African countries continue to face and which impacts on the continent's food security. With the advent of globalisation, theories and policies used to intervene in African situations are often formulated externally, and are therefore not suitably adapted to indigenous African development processes. This implies that in order for policies to work effectively, they need to be adapted to suit the aspirations of their beneficiaries. In order to achieve this, the intended beneficiaries need to be involved in the project from its inception. This echoes the idea of participatory rural appraisal (PRA). PRA principles promote the essence of ownership by beneficiaries of a project.

Furthermore, PRA ensures that the indigenous knowledge and practices of the people are taken into consideration, thereby creating a solid feeling of ownership among beneficiaries and enabling realisable positive changes to be effected in a society.

In situations where the PRA approach is neglected, the outcome is often wastage of resources and abandoned projects (the phenomenon of 'white elephant' projects). This is the risk that goes with the implementation of MDGs, as their formulation, from the above discussion, does not appear to have been all-inclusive.

4.3 The Impact of globalisation on household food security

Globalisation has played a large role in influencing food security, both at global and local levels. According to McGrew (1998:7), "Globalization reflects a widespread perception that, in the late twentieth century, the world is rapidly being compressed, as a consequence of economic and technological change, into a shared social space, that developments in one region of the world do have profound consequences for life chances of individuals or communities on the other side of the globe". The implication of this for food security is that best practices in food production in one area are usually replicated in the other, just as occurrences in one region have spill-over effects in the rest of the world.

Szentes (2003:403) defines globalisation as:

> "*a process which had started long time ago but has been accelerating in the last decades, that tends to bring the members of humankind closer to each other and makes the countries increasingly interdependent. In economic sense globalisation means the development of the world economy into an 'organic system' with lasting relations between more and more countries, i.e. a horizontal extension of international economic relations and a vertical deepening of economic interdependencies*."

While globalisation has had a considerable positive impact on developing countries (for example, in the field of communication, it has also had adverse results in some areas, such as the economies of developing countries which, in many respects, are too weak economically to compete with the developed world in global markets. Bigg sums up these effects by stating that globalisation is partly to blame for the inequitable distribution of resources in African states, due to the fact that a few rich individuals benefit at the expense of the majority, simply because they are positioned in such a way that they can influence decisions (Bigg, 2004: 173).

4.4 The impact of trade imbalances and market restrictions on food security

Imbalances in trade requirements between developing countries and the West have had a relatively significant effect on food security in developing countries. The West has placed restrictions on importing of agricultural produce from developing countries, while they (West) have continued to flood Third World markets with their goods, resulting in dumping. Zambia's late President Levy Mwanawasa highlighted these concerns in a speech he made at the European Union (EU) – Africa Trade and Development Summit in Lisbon in 2007.

He declared that "Zambia was losing at least US$150 million per year on meat exports as a result of trade restrictions from European countries…the amount is close to what the EU gives us in aid per year… it was obvious that Africa was being denied the opportunity to earn itself a living through agricultural exports to Europe." President Mwanawasa stressed the fact that Africa's competitiveness would continue to rely on agriculture for a long time, but in order for Africa to exploit the external market, there was a need to eliminate agricultural subsidies for farmers in the industrialised world, in order to level the playing field in this area (Lusaka Times, December 9, 2007).

The economies of most African countries are agriculture-based and in most cases, the trend is towards subsistence farming as opposed to large-scale farming, which is often capital-intensive. The traditional trend is that whenever harvests are bountiful, a family disposes of excess produce in local markets. The advent of mechanised agriculture helped to expand production to levels at which the produce would be so plentiful as to make the search for bigger markets necessary.

Several African countries, such as Kenya, Uganda and Malawi, among others, are well known for their high quality production of agricultural products such as tea, coffee and tobacco, among others, which compete favourably in global markets. However, these products are often auctioned in international markets in a semi-processed form to be used for blending (due to their superior quality) similar products, but ones which are of a lower quality than those from other countries. Once the blending is done and the end product refined, the product is packaged and (re) exported to developing countries, including those that produced the high quality product used in blending and sold at exorbitant prices. The context is therefore such that while developing countries strive to produce primary products, their developed counterparts have diversified their markets to include the processing, packaging and reselling of the end product, while at the same time imposing restrictions on developing countries for directly accessing Western markets to sell end products from developing countries. It is also important to note that the West dictates the prices at which they buy the semi-processed material from developing countries.

The skewed trade relationship between Africa and the West contravenes the law of comparative advantage. Currently, this skewed relationship, according to Harrison, has conditioned developing countries to agree to the status quo. Harrison (1987:336) comments that “to the developing countries the great world market place must often seem like a casino where all the wheels, dice and decks are rigged, loaded and marked so that the bankers of the West always win.”

When the above restrictions are added to the high costs of mechanising agriculture, most farmers in Africa are left out of the equation because of limited capital. However, because the traditional farming techniques used in subsistence farming are no longer competitive, farmers in many parts of Africa are succumbing to a new type of technique in which they lease out their land to multinational companies (MNCs) operating locally for a number of years (often renewable). However, the relationship between the farmer and company has hardly been symbiotic, as one farmer (Wycliffe Gimoi) indicated in the case of sugar cane farmers in the western part of Kenya in the story below:

The Case of Sugarcane Farming in Western Kenya

Western Kenya has been producing sugar cane for a long time since Kenya's independence. The local sugar factory has signed contracts with several farmers, which require them to grow sugar cane for at least three cuttings. Since each harvest takes place after 18 months, it means that the farmer is obliged to grow the cane for at least 5 years before the contract can be renegotiated.

However, due to bureaucracy and cronyism within the company's structure, the harvesting is seldom done on time, at times stretching up to 24 months. The contract, often skewed in favour of the contracting company, is, however, binding, and the farmer cannot get rid of the sugar cane prior to the expiry date of the contract (this is usually after the third batch of sugarcane has been cut, obviously extending beyond the five years).

However, most farmers are unable, due to lack of capital, to independently engage in commercial farming. Rather than leave their land to lie in a state of disuse, they are lured into leasing it out to MNCs. The harsh reality of the pain of living in extreme poverty has played a large role in convincing many farmers to move to cash crop farming. They are at least then assured of a lump sum payout, which would not be received if they didn't plant sugarcane. The fact that this money is paid out once every two or three years does not affect the farmers' decision not to plant the sugarcane, even if it means having less land available for planting

subsistence crops. Some farmers are constantly faced with food insecurity as a result of using all their available land to grow cash crops. At the same time, the fluctuation of global sugar prices and irregular importation of sugar into Kenya has added to the plight of sugar cane farmers. Kenyan traders importing cheaper sugar from countries like Brazil have saturated the market, making companies that operate locally lose part of the domestic market. The effect trickles down to the farmer, who has to content himself with low prices despite inflation, while sugar processing companies downsize in order to cut down on expenses.

Source: Mr. Wycliffe Gimoi, Farmer in Kabras Location, Kenya

From the above case, it is no wonder that most sugar cane farmers in Western Kenya are still poor and suffer from food insecurity (having committed vast acres of their land to sugar cane plantations), despite the fact that they engage in cash crop farming. Similar situations abound in many other parts of Sub-Saharan Africa.

4.5 Other factors affecting food production in Sub-Saharan Africa

In 2005, the Famine Early Warning Systems Network (FEWS-NET) warned that Southern Africa was experiencing a food crisis in Malawi, Zimbabwe, Zambia, parts of Mozambique, Swaziland and Lesotho. According to the report, this crisis was as a result of drought and poor agricultural production during the 2004/05 season, but had been worsened by chronic food insecurity and poverty in the region. The report specified that the situation was further exacerbated by the effects of HIV/AIDS and, in Zimbabwe, a failure of governance (Fewsnet, 2005: 1).

The above mentioned findings of FEWS-NET's analysis of the situation in Southern Africa are a replica of the situation pertaining to most Sub-Saharan African countries. The causes of food insecurity in Sub-Saharan Africa are common to most countries, as indicated below.

a) Poverty as a contributing factor to food insecurity

There is no single, universally accepted or standard definition of poverty. The definitions have moved away from conceptions based on a lack of physical necessities towards a more social and relative understanding. For instance, the European Union (EU) adopted its working definition of poverty as:

> "Persons, families and groups of persons whose resources (material, cultural and social) are so limited as to exclude them from the minimum acceptable way of life in the Member State to which they belong" (Maxwell, 1999:3).

This definition is the most commonly used one in the industrialised world, and it recognises that poverty is not just about income, but also the effective exclusion of people living in poverty from ordinary living patterns, customs and activities.

However, scholars such as Bjorn (2002: 2) have identified five categories of poverty, based on the extent and nature of the specific situation. According to Bjorn, there is absolute poverty, which occurs when human beings live in a state of deprivation due to meager income or lack of access to basic human needs, including food, safe drinking water, sanitation, health, shelter, education and information. The second category is relative poverty, derived from a comparative point of view. Here, poverty is not absolute but relative, in a sense that if three countries, A, B and C, with an estimated wealth of 70 per cent, 25 per cent and 5 per cent respectively, are assessed in a situation where poverty is pegged at 30 percent and below, both B and C would be poverty-stricken, but C would be poorer relative to B.

The third type of poverty, according to Bjorn, is administrative poverty, and this involves individuals who are eligible for state welfare because they are either temporarily unemployed and/or unable to earn an income. The fourth type of poverty is consensual poverty, and this depends on what the

public deems to be below a basic subsistence level. The last type of poverty is what Bjorn calls contextual poverty, and this is based on a comparison of poverty with the socio-cultural and economic levels of a particular society. This definition is helpful in comparing the poor and non-poor in a particular society. The debate concerning the wider issues and meaning of poverty and social exclusion is an ongoing one, and this lies beyond the scope of this study.

The historical context of poverty in Africa can be attributed to various factors, ranging from colonial marginalisation of indigenous communities to situations of chronically poor resource endowments at both household and regional levels, vagaries of harsh climatic conditions such as endemic droughts and floods, and the extreme remoteness of some communities.

Poverty in Africa is also directly related to the continent's instability due to political, ethnic and armed conflicts, things which result in a cycle of chronic poverty and food insecurity. Poverty in Africa has also been historically affected by unfavourable trade policies and the external debt burdens of many African nations.

On the other hand, economic development in Africa continues to be hindered due to lack of government investments in infrastructure and social services. This has a direct impact on food production, as many African farmers are economically excluded from modern inputs such as fertilizers, pesticides and improved seeds, which would result in increased production. The knock-on effect of this situation is the weak purchasing power of consumers, often too poor to purchase the food required to maintain a healthy and productive life. According to the World Bank, the situation continues to worsen, as the per capita consumption of food has decreased in recent years in some African regions (World Bank, 2003b).

Despite other parts of the world recording significant progress towards poverty alleviation, Africa, in particular Sub-Saharan Africa, continues to

lag behind. The likelihood of this tendency increasing is good if preventive measures are taken in time.

b) How the HIV/Aids pandemic perpetuates food insecurity

In general, diseases, particularly HIV/AIDS, are intrinsically related to poverty. Africa, particularly the Sub-Saharan region, continues to bear the brunt of the HIV/AIDS epidemic, as the disease continues to be the leading cause of adult deaths. The 2008 report on the global Aids epidemic showed that although the global percentage of people living with HIV has stabilised since 2000, the overall number of people living with HIV had increased as a result of the increasing number of new infections each year and the beneficial effects of more widely available antiretroviral therapy. Sub-Saharan Africa, according to the report, remained most heavily affected by HIV, accounting for 67% of all people living with HIV, and for 72% of AIDS deaths in 2007 (UNAIDS Summary Report, 2008: 5).

People with insufficient access to food, income and land, especially women and girls, are more likely to be forced into situations that place them at risk of HIV infection. Strickland (2004) gives the reasons for such high-risk situations as including migration and mobility for work, transactional or commercial sex, and staying in high-risk or abusive sexual relationships due to economic or social dependency. All these factors are linked to inadequate access to resources, of which the primary one is food.

In addition to its impact on health, economic and social aspects of life, the disease seriously affects food security and nutrition, since the epidemic is most common among the most productive age group (15-50-year-olds). When families lose their breadwinners to the virus, households are often deprived of their normal source of income, while assets are used for medical or funeral costs. More often than not, both parents succumb to the disease, leaving behind orphans.

Edström and Samuels (2007: 8-9) emphasise the fact that lack of food security and poor nutritional status may hasten progression to Aids-related illnesses, undermine adherence and response to antiretroviral therapy, and exacerbate the socioeconomic impacts of the virus. They add that HIV infection in itself undermines food security and nutrition by reducing work capacity and productivity, thus jeopardising household livelihoods. This concern was also highlighted by the UN General Assembly Resolution 60/262 (2006), which noted that food security and nutrition in all settings is vital to achieving the goal of universal access to HIV prevention, treatment, care and support by 2010, to which all Member States of the UN committed themselves. The link between HIV/AIDS and food security is therefore quite apparent, and continues to pose tremendous challenges to the already impoverished economies of Sub-Saharan Africa.

Most skills are also lost when (young) professionals get infected and die before they can pass on crucial farming knowledge and expertise to the next generation, a situation that has lasting effects not only on agricultural production but also on other aspects of production. The Food and Agriculture Organization of the United Nations' (FAO) annual report for 2008 states that Aids has killed around 7 million agricultural workers since 1985 in the 25 hardest-hit countries, mostly in east and southern Africa, where AIDS-related illnesses could kill 16 million more before 2020, and up to 26 percent of their agricultural labour force within two decades.[12]

The analysis, based on a study commissioned by the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) on the impact of HIV and AIDS in the seven most affected countries in Southern Africa, namely Botswana, Lesotho, Namibia, South Africa, Swaziland, Zambia and Zimbabwe, notes that HIV-induced famine, commonly referred to as "new variant famine," kills the most productive family members first, unlike traditional drought-related famines that kill dependents first (children and elderly). A closer look at the impact of HIV/AIDS on agricultural production was taken in the Zimbabwe Agricultural Sector Strategy on HIV/Aids: 2006-2010. This strategy does an analysis, which is provided in

the table below:

Impact of HIV and AIDS on the agricultural sector
The impact of HIV and AIDS has been felt by both the farming community as well as the institutions servicing the agricultural sector. The Ministry of Agriculture and its departments, parastatals and commercial farms have experienced an increase in absenteeism of staff due to illness and attendance of funerals and the need to care for the sick. HIV and AIDS-related deaths have resulted in a loss of experienced staff of various grades as well as financial losses through assisting staff members with funeral expenses. The general impact of HIV and AIDS on the subsistence farming households has resulted in the reduction of the area under cultivation; a decline in yields as a result of delays in, or poor timing of, essential farming operations and reduced soil fertility; a decline in crop varieties and changes in cropping patterns as high labour demanding cash crops may be abandoned; a decline in livestock production; loss of agricultural skills and biodiversity; diversion of resources from agriculture and sale of productive assets such as livestock in order to meet care and treatment expenses.
Excerpt from: *Zimbabwe Agricultural Sector Strategy on HIV and Aids: 2006-2010. Zimbabwe Ministry of Agriculture (Produced by the Ministry of Agriculture with technical assistance from the Food and Agriculture Organization of the United Nations), Zimbabwe, 2006.*

c) How poor governance affects household food security

The problem of poor governance can be found throughout the African continent, and is often the cause of most post-Cold War conflicts. When structures of governance such as official (public) positions are enshrouded in corruption, collusion and nepotism, they have the strong potential to negatively impact on the ability of governments to promote development efforts. Many African countries are perceived to be corrupt. According to the Corruption Perception Index (CPI) of 2008, a global survey conducted

in 2007 revealed that while only a very small proportion of respondents from North America and EU regional groupings reported having paid a bribe to the police and judiciary, about half of the respondents in Africa who had contact with the police in 2007 had paid them a bribe (Transparency International, 2008: 303).

The Global Corruption Report of 2008 focuses specifically on corruption in the water sector. It cautions that the water crisis ensues from bad governance, with corruption as one of its root causes. The report argues that corruption in the water sector is widespread and makes water undrinkable, inaccessible and unaffordable, as evident in the drilling of rural wells in sub-Saharan Africa, the construction of water treatment facilities in Asia's urban areas, the building of hydroelectric dams in Latin America, and the daily abuse and misuse of water resources around the world (Transparency International, 2008: xxiv). Among the reasons given by the report for why water is a high risk sector for corruption is that corruption in this area most affects those with the weakest voice, such as marginalised communities, the poor or – in the case of its impact on the environment – future generations. These are all stakeholders with a weak voice and limited ability to demand more accountability. Yet, without adequate access to clean water, household food security is adversely affected.

d) The effect of demographic pressure on food security

The rapid population growth in Africa increases the pressure on food supplies, including fisheries, fuel wood and grazing land for wildlife and livestock. In order for the population to sustain itself, people have to either encroach on other biodiversity such as forested areas, or intensify food production through irrigation, leading to increased pressure on water resources. In the case of Sub-Saharan Africa, the easiest option has been encroachment on forest reserves to increase land for food production.

According to the Washington-based Working Group on Population Growth and Economic Development (1986: 18), because biotic resources such as

forests, fisheries and agricultural land can be renewed by natural processes, resources are potentially capable of providing economic services in perpetuity, as long as their regenerative ability is not compromised. The Working Group concludes that when a population is larger, a member of the population will have, on average, fewer renewable resources to use in production and consumption. Rapid population growth therefore necessitates that food production be accelerated in order to match population growth. In the case of Sub-Saharan Africa, population growth has superseded food production, leading to encroachment on forest resources and sometimes food aid. Although food aid continues to be a mitigating measure, in the long term, each African state needs to develop a sustainable strategy to ensure food availability through local production and trade, while at the same time preventing encroachment on biotic resources.

e) Limited market access

Due to poor or lack of infrastructure such as roads, low capital base, limited access to information, and poor and sometimes misplaced government policies, many small-scale farmers in Sub-Saharan Africa are unable to market their produce away from their immediate neighbourhood. For example, poor road networks prevent farmers from accessing target markets in time and in a cost-effective way, which would enable them to make a profit. While a small-scale farmer may have the ambition to advance to specialised production, the hurdles are often overwhelming, thus inhibiting their ambitions.

f) Over-reliance on less mechanised (traditional) methods of food production

Agricultural practices in most Sub-Saharan countries are largely subsistence and cultural, with very little added value. Most farmlands are ancestral and characterised by monoculture subsistence farming due to limited access to agriculture-related technical assistance and limited modern knowledge about advantageous soil fertility management practices. Such limitations pose a major challenge to food security,

because they lead to a loss of soil fertility, as well as environmental degradation. The lack of such knowledge sometimes leads to farmers expanding into less-favourable lands, hence wasting their meager resources.

Over-reliance on traditional food harvesting and storage practices leads to a significant loss of food. Furthermore, the tropical climate makes foods produced in these regions prone to pests and diseases, unless the food is properly stored. Consequently, most farmers in Sub-Saharan Africa lack the capacity to add value to their produce, something that would otherwise enhance the competitiveness of their produce in international markets.

The fact that the majority of agricultural production in Africa is rain-fed means that food and crops are often predisposed to adverse weather conditions and other vagrancies of climatic change.

4.6 Conclusion

This chapter has provided an analysis of the historical and contemporary causes of food insecurity, both globally and then in Sub-Saharan Africa in particular. In order to do this, the chapter started by highlighting the relationship between development (modernisation) and food insecurity, and then went on to distinguish between economic growth and economic development. Sustainable development formed a major theme of the chapter, and its effectiveness has assessed with regard to global efforts made to mitigate the effects of unsustainable development on biodiversity and food security.

Noting that food insecurity is a concern for all countries in sub-Saharan Africa, this chapter argued that while new technological innovations are doing their best to try to increase overall food production, access to food for the majority of people remains a challenge. This chapter has therefore attempted to provide the background to food security and explain the reasons behind the persistence of hunger for some of the most vulnerable people in society, especially those living in poverty.

Chapter 5

Methodological issues relating to this study

5.1 Introduction

Chapter four dealt with both the global nature of the challenge facing food security and the specific challenges relating to developing countries, with specific reference to countries in Sub-Saharan Africa. This chapter builds on the previous chapter by discussing the methodological approaches that the researcher followed in the course of collecting data in the Phomolong informal settlement in order to achieve the results documented in Chapter six.

The purpose of this chapter is twofold. Firstly, it seeks to provide an account of the background to the formulation of the research strategy used as a tool in data collection, namely participatory action research (PAR), and secondly, to provide a background to the Phomolong informal settlement, including its situation in terms of food security.

5.2 The background to the research strategy

The University of Greenwich defines research simply as an original investigation undertaken in order to gain knowledge and understanding. [13] In recent years, however, developmental research has evolved from a top-down approach to a more participatory one (Clark, 2006: 428).

Hollard and Bell (2007:4) view participatory research as "research that tends to employ more contextual methods and elicit more qualitative and interpretive information, but brings with it an important additional philosophical commitment to respect local (emic) knowledge and facilitate local ownership and control of data generation and analysis".

Thus, it can be said that the key issue involved in participatory research is the direct involvement of local people in the research and development

process. Such involvement entails allowing the community to engage with a project from its inception, through to the planning and data gathering stages, by encouraging their participation in focus group discussions in order to benefit from their interpretation. In this way, the participants (beneficiaries of the outcome of the research) get the feeling that they are 'challenging development from above' (Mukherjee, 1995:27; Chambers, 1994 a & b, 1997). In other words, they feel that they have ownership of the process.

In exploring the best possible approach to use in gathering data in this study, the various approaches followed in past food security studies were analysed. An important finding of this assessment was the appropriateness of qualitative approaches in urban informal settlements whose dwellers often lack the specialised analytical ability required by quantitative research. It is for this reason that the researcher opted to use PRA techniques in gathering the data. For instance, in order to understand the nature of food security in urban households living in an informal settlement such as Phomolong, the data would be collected using a participatory approach.

In designing the methodology used to conduct this research, a feasibility study was carried out to enable the research team to familiarise themselves with the Phomolong informal settlement. The research team held, at random, casual discussions with a few residents of the settlement, including the local authorities from whom permission to conduct the research was sought. The fact that most residents interacted with the researchers and demonstrated enthusiasm in responding to questions asked contributed to the decision to use the participatory approach in the data gathering process. In this way, the research would benefit from the input of all stakeholders. This is in line with the recommendation of Greenwood and Levin (2007:33) that research be conducted with people and not on people.

Maxwell (1984:47) concurs with Greenwood and Levin when he states that "The basic aim of inquiry, let it be remembered, is to promote human welfare, help people realize what is of value to them in life…But in order to realize what is of value to use in life, the primary problems we need to solve are problems of action - personal and social problems of action as encountered in life". This implies that developmental research should focus on understanding the people for whose benefit the study is conducted. An understanding of the social, cultural and physical circumstances of the people in the study, especially before the research begins, is fundamental to limiting potential biases that could hinder the research from achieving its objectives (Chambers, 1997).

In conducting this research, six focus group discussions were held in six localities within Phomolong. Each group comprised between 25 and 50 participants, chosen randomly and of both genders. Children who could not be sent away watched from the sidelines. Discussions were spontaneous and issues covered ranged from occupational activities of residents to home gardening and types of dwellings. The advantage of an open-ended approach to discussions was that it yielded many other questions that elicited relevant findings, as discussed in Chapter six.

The fact that most people sacrificed their time in order to participate demonstrates the readiness of Phomolong inhabitants to be involved in matters concerning their welfare. The basic recommendation from all of them was the need for consultation between the community and government when designing mitigation projects. This suggestion seems to support Sowman and Gawith's observation that in the past in South Africa "planning decisions were the exclusive domain of professionals and decision-making authorities, including politicians, lawyers and administrators, who held that those who were best qualified and technically most knowledgeable possessed the requisite expertise to make judgments and reach decisions on environmental matters" (Sowman and Gawith, 1994:1). The willingness of Phomolong residents to share their experiences gives credence to development practice, which emphasises

the participation of people in whatever activity they are involved in (Chambers, 2002; Holmes, 2001; Food Ethics Council, 2004), while at the same time endeavouring to have a positive impact on a person's livelihood. Similarly, the value of indigenous knowledge in this study was appreciated. Although most of the residents were not formally literate, they possessed valuable indigenous knowledge in various ways and practices. Indigenous knowledge in this case refers to the knowledge of a specific people, learned over time and suited to their culture and environment. It has usually stood the test of time and is unique to that specific group of people (Sillitoe, Dixon and Barr, 2005; Grenier, 1998; IIRR, 1996).

By incorporating values gathered from indigenous knowledge and cultural norms of most Phomolong residents into the data collection process, the researcher was able to learn about and appreciate the richness of the residents' way of life and coping mechanisms. This understanding played a vital role in minimising potential misunderstandings between the researcher and the community.

The failure to be sensitive enough to recognise and appreciate people's indigenous beliefs and knowledge may lead to misunderstanding and the imposition of a researcher's ideas on the community or the asking of questions that may be taboo. This may result in antagonism between the two parties, thereby jeopardising the outcome of the research.

McGee and Norton (2000:27) echo the usefulness of participatory approach, especially in terms of poverty assessment and policy research, when they posit that 'two distinct but compatible cases have been made for them (referring to participatory approaches): one stressing the benefits of participatory poverty research in terms of more and better information, the other stressing the right of the poor to participate in defining and analysing the phenomenon and processes of poverty as these affect them…A third advantage, - also compatible - has developed, which stresses the opportunities inherent in the Participatory Poverty Assessments process itself to open up spaces in which poor people's

perspectives can influence policymakers' perspectives and practices." It was therefore vital that the participation of the Phomolong community was sought in this study.

5.3 Challenges relating to the research process

The foregoing observations notwithstanding, this research learnt several lessons and encountered a number of challenges, the most important ones being that:

i) Gathering primary data among poor people requires tact and wisdom, the most important element of which is the need to steer clear from making any promises or commitments with regard to the delivery of anything (including even what one is sure to do). This helps to not raise the hopes of the people, who in most cases consider an outsider interacting with them to be an almoner. Unfulfilled promises have the potential to harm expectations and may prevent the participation of those communities in future research.

ii) The researcher had to fund the research with her own resources, and this limited the size of the research sample, the basic principle being that the researcher had to cater for research assistants' daily subsistence allowance, as well as transport costs.

iii) Although the interpreter was of commendable ability, the chances still existed that some facts may not have been transmitted with the intended accuracy. Furthermore, the language factor to some extent distanced the researcher from the community, due to the fact that the hoped-for communal bonding was not achievable. This, however, is a relative issue, and is not easy to authenticate.

iv) In order for this research to be conducted, the researcher had to seek permission from the Tshwane Municipal Council, which in turn transmitted the request to the respective Ward Councillor in

Mamelodi. This process took about three weeks, as it entailed several visits to the offices of respective authorities in an effort to get authorisation for the research.

v) In an environment where residents strive to make ends meet, as is the case with poor urban informal settlement dwellers, it is always a struggle to mobilise people, least of all adults, who are pre-occupied most of the time with worries about where the next meal will come from. Such was the challenge experienced in this research. The fact that caution was exercised to ensure that no handouts were given and no future promises/commitments made meant that the research group requested the residents of Phomolong to choose a time that suited them best for the focus group discussions. The majority of them favoured Saturday afternoons, a time when most of them had finished with their week's engagements and household chores.

5.4 Triangulation of data collection approaches

In collecting the data used in this study, the research team used a variety of qualitative research tools that included focus group discussions, structured and unstructured in-depth interviews, questionnaires, participatory observation, and analysis of both past and present documentation and research on the topic.

Triangulation was then used in analysing and relating the findings of the methodologies used, in order to reduce possible biases. Miller and Brewer (2003:326) define triangulation as the combination of different methods, methodological perspectives or theoretical viewpoints in order to achieve a net gain where the strength of each contrasting approach more than cancels out the weaknesses of their counterparts.

This research adopted the triangulation method used by Laws et al (2003:280) to correlate the data gathered through the various methods (focus group discussions, interviews, observations, questionnaires).

The triangulation approach involves testing responses to related questions asked under different circumstances - for instance, how different a response to a question posed to a group was from the response to the same question posed to an individual in a structured interview. The straight lines criss-crossing in the diagram below indicate the linkage (triangulation) of the findings of one method with a corresponding one. The middle square box “household food security” is to remind the reader that the central objective of the research was to review the status of household food security in the Phomolong informal settlement.

The diagram below depicts triangulation.

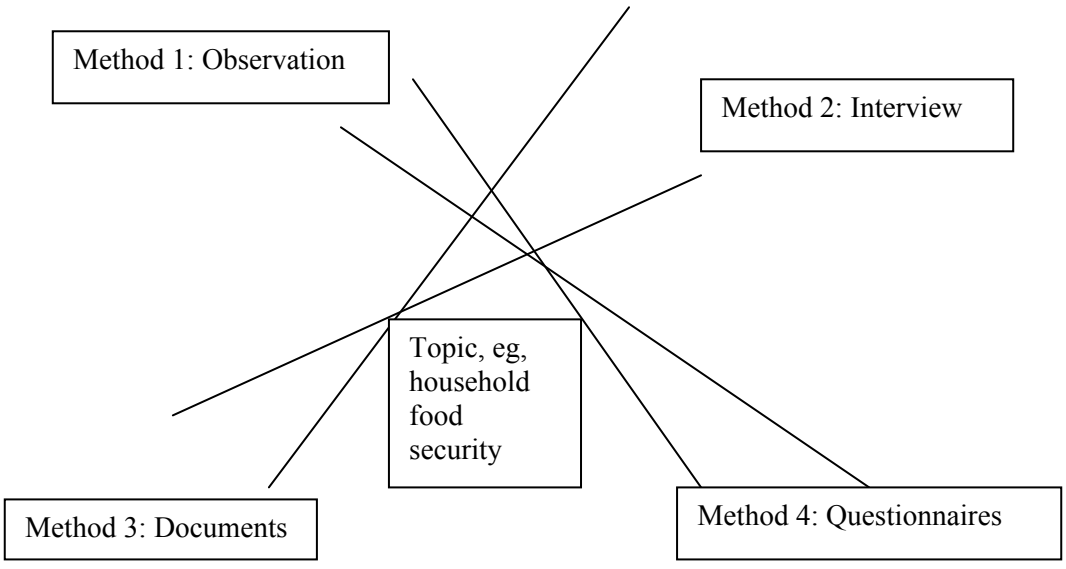

Figure 5: Taken from Laws et al (2003:280)

5.5 Introducing the Tshwane Metropolitan Municipality: The statutory authority to which the research area belongs

The Tshwane Metropolitan Municipality is the local government district that hosts the City of Tshwane (Pretoria), the administrative capital of the Republic of South Africa. The metropolis covers an area of about 3200 $km^{2,}$ stretching for almost 60 km east/west and 70 km north/south. The municipal area includes Pretoria, Centurion, Akasia, Soshanguve, Mabopane, Atteridgeville, Ga-Rankuwa, Winterveld, Hammanskraal, Temba, Pienaarsrivier, Crocodile River and Mamelodi (http://www.tshwane.gov.za).

Apart from being the administrative capital of South Africa, Tshwane is home to more than 100 diplomatic missions, international organisations and academic and research institutions, all of which contribute to its population of close to 2.2 million people (http://www.tshwane.gov.za).

Like many other capital cities in the world, the Tshwane Metropolitan Municipality experiences a wide range of challenges relating to the social, political and economic activities of its inhabitants. Being the most developed capital city in Sub-Saharan Africa, Tshwane continues to attract a large number of people from both South Africa and neighbouring countries, who come there in search of better opportunities. The population of Tshwane, just like in any other city, is diametrically divided into two tones of resource allocation between the rich and the poor. Certain suburbs such as Waterkloof, Groenkloof, Menlyn, and Silverlakes are inhabited by the affluent, while parts of townships such as Mamelodi, Soshanguve, Attridgeville and Hammanskraal are home to the majority of poorer people. In Mamelodi, for instance, where Phomolong is situated, clear disparities amongst the residents also exist. For example, while residents of Phomolong lack water and electricity, other parts of Mamelodi are well serviced in this regard.

i) Origins of Mamelodi Township

Mamelodi was established in June 1953 by the former apartheid government as a township for black South Africans, with the aim of maintaining a workforce for the apartheid regime. This was in accordance with the terms of the Group Areas Act of 1950. The Group Areas Act No 41 of 1950 forced the physical separation of the races by creating different residential areas for different races. It was an act of parliament created by the apartheid government that assigned races to different residential and business regions in urban areas. The implementation of this act began in 1954, and it led to forced removals of people living in what was considered to be the "wrong" areas. In the process, communities (mainly Africans, Coloureds and Indians) were torn apart and restricted to their respective designated areas14.

Mamelodi is a township near Pretoria in the Gauteng province (formerly PWV - Pretoria-Witwatersrand-Vereniging), which was established in order to maintain a workforce in the city, and at the same time exclude black people from the “white” city.[15]

Despite South Africa gaining independence from white domination in 1994, Mamelodi, like all other previous townships, still remains a black-dominated area. However, there is a stratum of various social classes of people developing in Mamelodi today. This is apparent because there are certain sections of Mamelodi that represent an average standard of living, with social amenities such as piped water and electricity, while others, such as Phomolong, still suffer in abject poverty.

The vast economy of South Africa in relation to its neighbours has created a nucleus around which immigrant labour from neighbouring countries coalesce. Like locals inhabiting the informal settlements,

most immigrants (until the political upheaval in Zimbabwe pushed professionals out of Zimbabwe) are semi-illiterate, with limited specialised skills, and are thus not highly competitive in the South African labour market. As such, most immigrants entering South Africa usually end up in informal settlements as they embark on seeking employment, which in many cases is restricted to manual labour.

Mamelodi thus thrives as a haven for local citizens as well as foreign illegal immigrants from countries like Zimbabwe, Malawi and even Angola (Gauteng province, 2005:34). With such a huge population, problems associated with poverty such as overcrowding, over stretching of available resources, crime and disease prevail in the township.

The vices associated with unemployment, poverty and illiteracy have characterised the life of informal settlements such as Phomolong, and by extension the wider Mamelodi, such that the shear disclosure that one lives in Mamelodi, or worse still Phomolong, makes the listener uncomfortable. This is because residents of informal settlements are viewed as being criminals as well as pervasive.

b) Background to Phomolong informal settlement

Phomolong was established in 1990 alongside four other informal urban settlements of Jefsville, Concern, Vergenoeg, and Brazzaville. All the five settlements are located in the southeastern part of Pretoria, approximately 19 km from the city center. These informal settlements were established on land previously owned by the South African Defense Force (Theron, 2000). These informal settlements were located on state land in a transitional manner to provide residents with a locality on which to built temporary shelter pending construction of permanent housing under government's low-cost housing project.[16]

During the establishment of these settlements, the provision of infrastructure was largely ignored, partly because the settlements were of a transitional nature. The situation however remained precarious as residents continue to await government's intervention.

c) Surveying Phomolong households

Originally urban life was associated with only good things. At independence towns and cities in the African context were regarded as places of fortune and good life, where every rural dweller dreamed of visiting or working. Little was poverty associated with life in towns and cities. Poverty and food insecurity were perceived to be a problem of the rural areas. As such most countries adopted rural development models in an attempt to food production in rural areas, and multilateral institutions such as the World Bank supported this approach.

For instance the World Bank (1975:3) justified the focus on the rural situation by stating that, "rural development is a strategy designed to improve the economic and social life of a specific group of people - the rural poor. It involves extending the benefits of development to the poorest among those who seek a livelihood in the rural areas…" This declaration by the World Bank demonstrates how the focus was mainly on rural areas as the most vulnerable compared to urban areas. For a while therefore the plight of the poor urban dweller slipped unnoticed.

When massive rural-urban migration started occurring, and congestion emerged in urban centres, policy makers became concerned. Commenting on this fact, Musoke (1990:3) writes that, as the situations of economic dependency and underdevelopment deepened, it triggered rural poverty thereby leading to starvation and partly contributing to an increase in rural-urban migration.

> For purposes of this study a household was defined as consisting of not only persons who usually ate and in the same dwelling, but also who fall within the same category of income. Ironmonger (1989:3) describes households as comprising those families or individuals who live alone or together as a domestic unit for the general purpose of everyday activities. He adds that a household can consist of a single household person living alone although the general usage does not regard that person as a family. Ironmonger concludes that several unrelated individuals, not regarded as a family, can live together as a household. So can two or more families.

In the informal settlements, one is most likely to find households that comprise of people from different backgrounds unlike in formal settlements where households usually or more often comprise of members of the same family. This situation is propagated by the difficulties of making ends meet, especially in paying rental fees in an environment where one is not on an assured employment, as is the case with most residents of informal urban settlements. Overcrowding is therefore a common feature in such environments, also prone to unhygienic conditions, leading to ease of epidemic outbreaks (Maxwell 1999:1941).

5.6 Data collection methods used in this study

As mentioned earlier in this chapter, the collection of data for this research included both primary data and secondary methods, in which various tools and approaches were used, as discussed below.

a) Primary data collection methods

In order to compile evidence for an assessment, research requires data. Such data, especially primary data from the case being studied, provides first-hand information for an assessment. In the case of this study, the researcher made several visits to the Phomolong informal settlement. The following methods were used to collect primary data.

i) Observation as a tool for data collection

Observation was a major component of the field research, and was used in all stages of data collection. This technique involved observing the way of life of the people in Phomolong in terms of their livelihood approaches, for example, what was commonly grown in house gardens, the types of housing and infrastructure, as well as the composition of the community and their attitude towards the research.

In social science research, an observer can gather data in four major ways, by playing the role of s:

- *A complete participant*: the researcher here attempts to participate fully in the activities of the group or organisation under investigation. In this regard, the researcher's intentions are covert (hidden). This method is best applied in sensitive types of research, where the researcher's life may be endangered if his/her identity is revealed. One of its advantages is that the information gathered is usually accurate, with very little bias.
- *A participant as observer*: this is the opposite of a complete participant, in that the researcher adopts an overt (open) role, making his/her presence and intentions known to the respondents. Despite traditional concerns with 'establishing rapport' or 'going native' for many researchers, this method of scientific inquiry has been subjected to scrutiny and criticism. The researcher often becomes a 'fan' or supporter, although this does not mean attempting to act as a member of the group – for example, in studying prostitution, it does not mean that the researcher must become a prostitute.
- *An observer as participant*: in this case, the researcher moves away from the idea of participation. This usually involves one-visit interviews, and calls for relatively more formal observation

(e.g. ownership and structure of a firm, rather than its internal practices and norms) than either informal observation or participation. The limitation of this approach is that there is the possibility of misunderstanding the issue being studied, as it is more of an encounter between strangers, and therefore does not have the advantage of time in the field, thereby running the risk of missing out on an understanding of the rules, roles and relationships involved.

- *A complete observer*: here, the researcher is uninvolved and detached, and merely passively records behaviour from a distance (e.g. a researcher sitting in a classroom, making observations about pupils and their teacher).[17]

In this study, the researcher adopted the role of participant as observer in order not to jeopardise the research, given that the interpreter and two research assistants (all inhabitants of Phomolong) were already acquainted with the researcher. Although this had the advantage of establishing a level of rapport between the researcher and the Phomolong households, it meant that the households could intentionally overstate certain facts or conceal others from the researcher. However, given the researcher's prior knowledge of the general living conditions in informal settlements and her past involvement in similar exercises, possible biases and errors were reduced during the data analysis stage.

In the process of observing, composure was a fundamental factor that the researcher identified. Coming face-to-face with situations that are not common to the researcher's way of life, such as a whole household sharing one small room, would surprise many researchers who are new to such a situation. The researcher had to be careful not to openly express surprise to the residents of Phomolong, in order to not inhibit their openness in responding to questions. As Gray cautions, during observation, the observer's past experiences or assumptions directly influence the way in which

he/she interprets what is observed, hence the need for the researcher to maintain objectivity.

With regard to the challenges of observation as a method of data collection, Gray adds that "The interpretation of 'meaning' is one of the benefits but also potentially one of the drawbacks of the observation method. On the positive side, observation provides an opportunity to get beyond people's opinions and self-interpretations of their attitudes and behaviours towards an evaluation of their actions in practice…One of the drawbacks of observation is that the interpretation of what is observed may be influenced by the mental constructs of the researcher (including their values, motivations, prejudices and emotions)." The physical expressions and reactions of the researcher in the course of data collection may also affect the behaviour of respondents.

Systematic observation proved to be very useful in the course of this study. The researcher took a tour of households, the local shopping centre, health centre and school, and in all these places, the researcher was given an opportunity to interact with the respective occupants. This experience enhanced the researcher's understanding of the physical challenges experienced by respondents.

ii) Individual Interviewing

This is another technique used in gathering qualitative data. Laws et al (2003:289) describe it as a qualitative interview that is essentially a conversation in which the interviewer establishes a general direction for the conversation and pursues specific topics raised by the respondent. In this form of interview, it is the respondent that does most of the talking.

The researcher used this technique in one-to-one interviews with heads of various households in Phomolong, especially when asking

relatively sensitive questions such as those that related to gender and the number of households sharing the same dwelling, as well as estimates of their monthly earnings.

However, the use of this technique posed a challenge in cases where respondents could not clearly express themselves in English, given that the researcher lacked fluency in the South African local languages. In such situations, the researcher used the services of two research assistants, namely Mr. Francis and Ms. Glenda, both of whom were native speakers of the local languages, and who also lived in Phomolong. Both of them had a fairly good understanding of the dynamics existing in the area. From the point of view of the researcher, individual interviewing was very successful when it came to her interaction with medical staff at the local clinic, as well as the schoolteachers and religious representatives, all of whom were very fluent in the English language.

iii) Focus group discussions

Six focus group discussions were conducted randomly in the Phomolong informal settlement, and the gender composition of respondents was equally distributed, with their ages ranging between 25 and 45 years old. The researcher directed the course of the discussions and guided participants in order to ensure that all important aspects of the research were covered, as per the set objectives.

In highlighting the advantages of focus groups, Gray (2004:217) notes that one of the advantages of using focused interviews is the opportunity they give the interviewer to re-focus the respondents if they move away from the objectives of the study. This actually happened in the course of this study, making it necessary for the researcher to direct the discussions.

iv) Questionnaires

The use of questionnaires in this research was very important for documenting responses. 60 questionnaires were used during this study. Given that the questionnaires all contained the same questions, it was easier for the researcher to analyse responses systematically and triangulate them with answers during interviews and focus group discussions.

In instances where respondents could not interpret the questionnaire effectively, the research assistants translated the questions in the respondents' own language. The research assistants then filled in the questionnaires in an interview format. Sometimes, questionnaires were administered concurrently with individualised interviews. This happened whenever respondents required some help in filling in the questionnaires.

b) Secondary data sources used

Secondary data gathered from previous research on the subject being studied helps the researcher to understand the research area better, thus assisting the researcher in shaping the research approach, as well as the gaps that need to be filled in by the research. In this research, information was gathered by reviewing government reports, news items and research findings from previous studies in the area of food security. More secondary data was obtained from the UNISA library, as well as the Internet, especially from the websites of various development institutions, such as the IDS, IDRC, WFP and FAO.

5.7 Conclusion

This chapter focused on the methodologies used in collecting data for this research. It started by emphasizing the advantages of using PRA as a method of research, because of the opportunity it gives respondents to participate actively in the research, hence increasing the validity of the data. The fact that this chapter has discussed the various methods used in collecting data during the research establishes a link between it and

Chapter four, which dealt with factors affecting food security in Sub-Saharan Africa, as well as with Chapter six, which documents the findings of the case study. This chapter concluded with a discussion of the two main methods of data collection, namely primary and secondary data collection methods. A combination of the two methods was very useful in this study, due to the fact that the two methods are complementary, as discussed above.

Chapter 6
Findings with regard to household food security in the Phomolong Informal Settlement

6.1 Introduction

This chapter discusses the findings that emerged from this study in terms of household food security in the Phomolong informal settlement. These findings are presented in a qualitative manner by linking data collected by primary and secondary sources.

The chapter begins by providing a descriptive analysis of the methodology used during the research, followed by a presentation of the findings. It concludes by looking at strategies that Phomolong residents use to cope with situations of food insecurity.

6.2 Results obtained from data collected

This section provides a qualitative analysis of the data collected from all sources and according to all the methods used in data collection.

i) Analysis of responses

Observation, interaction and participatory approaches complemented the information gathered by means of questionnaires. Questionnaires were administered to 60 households that were randomly selected in the Phomolong informal settlement. Of these, only 48 households agreed to participate, comprising only 80% of the selected sample. The remaining 20% declined to participate, citing various reasons that ranged from lack of time to read and respond to the questionnaire, lack of motivation (lack of a reward), the inability to properly read and understand English , as the questionnaire was

only available in English, and uneasiness about providing personal information that was viewed as being confidential.

However, the majority of those who declined to participate in the research claimed that if there had been a reward or financial gain, they would have gladly participated in the exercise. This is a clear indication of the gullible nature of poor people. Objecting to providing a free service, residents who turned down the request to participate used the term, '*nothing for mahala,*' a phrase commonly used in South Africa to mean '*nothing for free.'*

The general deduction that the researcher made from the attitude of those who did not want to participate by responding to the questionnaire was that they might not have clearly understood the objective of the exercise, hence mistaking it for a kind of temporary employment. On the contrary, over 90% of the respondents asked to participate in focus group discussions did not object. The 25% of respondents who insisted on being paid for responding to the questionnaires may have done so simply due to the fear of battling through an academic exercise. The researcher concluded that in a largely semi-illiterate environment such as Phomolong, an oral approach (interviews and discussions) is best suited to data collection.

Since the study focused on food security, most of the participants anticipated some form of reward towards meeting their daily food requirements. The absence of such an incentive might have dissuaded some participants from being involved in the research process, instead of using that time to obtain food for their households. The general level of engagement by respondents, however, was very encouraging.

ii. Analysis of research findings

The findings of this research highlighted the reality of food security in the Phomolong informal settlement, by linking the situation to various sources of livelihood, such as farming, employment and government support. The following were the main findings of the research:

a) *Composition and occupational characteristics of Phomolong residents:* The average size of the households studied was approximately five members (4.5 people). Of the 48 households interviewed, 40 (83%) of them had between 1 - 5 members sharing the same one-room dwelling, while 16% of the households had between 6 – 10 members. No household comprised more than 10 members. This data is tabulated below.

Table 4: Number of persons per household

Category	Number	Percentage of the whole
1-5	40	83.3%
6-10	8	16.7%
Over 10	0	0%
Total	48	100%

On average, a household in Phomolong comprises a husband, wife and three children. However, single parenthood was found to be a relatively common occurrence. There were families comprising just a father and his sons or a mother and her children fending for themselves. However, many residents disclosed the fact that they had other family members living in rural areas of provinces such as Mpumalanga and Polokwane, whom they usually visited at the end of each month.

Thus, there was some form of rural-urban linkages. The urban people could get some food resources from their village counterparts in order to subsidise their meals, even though it was only once a month when urban people visited rural areas. Some households only consisted of friends living together. This was common among young households, for example, men working together on construction projects in the city. They would share rental costs and other daily household expenses.

b) Housing:

Phomolong houses are best described as shacks because of the nature of the material with which they were built, namely wood and corrugated iron (locally referred to as zinc), plastic sheets and cardboard. Each shack consisted of only one room, while a "bedroom" was improvised in some cases by hanging a curtain across the room to conceal the bed. In most cases, there were public water points (taps) located strategically in an open area for all to use, a walking distance from these shacks. There was no electricity supply and all households used pit latrines located at the edges of the shacks. The shacks were located on a regularly demarcated space of between 100 and 400 square metres.

There were some differences among the shacks, depending on efforts made by individual households to improve their living space. For instance, while some of the shacks had solid walls, zinc roofs and plastered (cemented) floors, others were dilapidated. In most cases, the small space left in front of the shack acted as a home garden.

It was, however, noticeable that the shacks were numbered, and this helped the research team to avoid repetitive distribution of questionnaires, as well as conducting of interviews. The plots

on which shacks stood were also clearly demarcated. Of the total households surveyed, 91.6% owned the shacks they lived in, while the rest (8.3%) were renting them from landlords who also lived in Phomolong. This indicated that some individuals owned more than one shack, whereas some did not own any, as illustrated in Table 5 below.

Table 5: Ownership of shacks

Nature of ownership	**No. of households**	**Percentage of total households surveyed**
Rented	4	8.3%
Owned	44	91.6%
Total	48	100%

On average, the shack per occupant ratio was around 1:6, making it a really big challenge to live comfortably. Cortemiglia (2006:61) regards this type of congestion as being common in informal settlements, when he writes that "one can safely affirm that, on average, informally housed families are relatively large in size, thus resulting in many residents of informal settlements being compelled to live life packed like sardines in a small shelter."

This way of life increases the chances of the spreading of diseases, including communicable diseases. Harris (1992:176) highlights the relationship between congestion and productivity at work when he affirms that "the link between poor or nonexistent infrastructure and the health status of the poor is also well attested. Housing no doubt influences the capacity of workers to work at given levels of productivity and affects the capacity of the poor both to work and to maintain their households."

The entire Phomolong was without electricity, and residents therefore depended on paraffin for lighting. As a result, several shacks were said to have caught fire in the past, thus further impoverishing residents.

c) *Agricultural practice:* Most residents of Phomolong were on average younger than forty-five years of age. Home gardening was the most common form of urban farming. These gardens measured on average 12 square metres, and were located mainly in front of the dwelling. Of the 48 households surveyed, 38 (79%) of them were, at the time of this research, actively engaged in home gardening, while the remaining 10 households had avoided farming at that time, either because they were too busy elsewhere or due to low yields which did not justify inputs such as frequent watering.

d) *Employment:*

An understanding of the trend in employment was important in this research because it allowed the researcher to predict the sustainability of livelihoods in Phomolong. Ruel et al (1999); ILO (1995) and Yamada (1996) agree that the ability to earn a cash-income is an especially important determinant of urban food security, and Ruel et al (1999:1918) add that “Because urban-dwellers must rely on income in order to survive, urban poverty tends not to be primarily the result of lack of work but the lack of well-paying, steady jobs”.

This research attempted to understand the ratio between those regarding themselves as being employed and those who were unemployed. Out of the study sample of 48 households, the following findings emerged, as illustrated in the table below:.

Table 6: Rate of Employment amongst Respondents

	Number.
Number of people employed	23
Number of people unemployed	25
Total	48

From the above data, the study deduced that 52% of the households interviewed considered themselves to be unemployed, in comparison with 48% who stated that they were employed, either formally or in their own businesses.

Illiteracy and a lack of specialised skills render residents of informal settlements more prone to unsustainable employment. At the time of this research, the unemployment rate in Phomolong (extrapolated from the findings of the households surveyed) stood at 52%, in comparison with the national unemployment rate of 26.7% (Statistics SA). A similar study by Frayne (2004:490), conducted in Windhoek, showed a high incidence of unemployment amongst informal settlement dwellers. Like Phomolong, the Katutura informal settlement is a previously designated African township in the Windhoek Municipality.

Questions regarding salaries and wages proved to be difficult to get open answers to, and most respondents felt freer to respond to this in the questionnaire, due to its anonymous nature, than to respond directly. Even so, only 22 out of the 48 respondents provided useful answers in this regard. Of these 22, only 5 (22%) respondents disclosed their pay, whose gross monthly average was R2, 500. Interestingly, these 5 respondents were self-employed. Of the remaining 26, 5 were casual labourers and 12 were employed on a permanent basis. Of these 12, 3 had an income of above R3000.00 per month, 1 below R.1000.00, and the remaining 8 had a gross monthly income of between

R2000.00 and R3000.00 per month. Only those with a gross income of above R3000 had any formal training. The rest were casual labourers whose jobs did not require any formal training.

From observations and controlled interviews, it became evident that an individual's income was directly proportional to their level of training. Those who were formally trained had access to better paying jobs than those who were not formally trained. It was therefore concluded that illiteracy contributes to poverty and hence to food insecurity.

In order for poverty eradication to be achieved and food insecurity to be reduced amongst informal settlement dwellers, one of the major factors that need to be considered is the promotion of both formal and non-formal education. Both adult and primary education should be promoted, as well as skills development at the informal level. This is necessary in order to empower people with skills that can assist them to make better livelihood choices, both in terms of getting jobs and setting up small-scale businesses.

The dangers that befall unemployed families in urban areas can be as tormenting as they are destructive. The excerpt below, in which a mother laments her loss of employment, as well as that of her husband, emphasises this reality.

"My husband lost his job about five months ago…. then two months ago I lost my job. We were desperate. There was no money coming in now. Now they've cut off the electricity and we're two months in arrears with rent. They're going to evict us, I'm sure, we just can't pay though. My husband decided to go to Jo'burg…. I don't know where he is…Sometimes (the children) lie awake at night crying. I know they are crying because they are hungry. I feel like feeding them Rattex. When your children are hunger-crying, your heart wants to break. It will be better if they were dead. When, I think things like that I feel worse…I'm sick….I can't take my children to the doctor when they're sick because there's no money…What can one do? You must start looking. You can also pray to God that he will keep you from killing your children."
(Reconstruction and Development Programme, 1995:3)

Cases similar to the above are preventable if the emphasis is placed on better education and skills training, especially in areas that would enhance an individual's ability to establish their own business.

e) *Women as a source of livelihood:*

Although men were generally the household heads, the contribution of women to the survival of households was found to be significant. Generally, the women were more responsive and more active in discussions and interviews, as well as being more willing to participate. The composition of respondents to the questionnaire is indicated in Table 7 below:

Table 7: Gender composition of respondents

	Male	Female	Total
	21	27	48

Women appeared to be better versed in household matters than their male counterparts. This was attributed to the fact that women were usually responsible for the day-to-day running of the household and

even in cases where they were not the breadwinners, they were still responsible for ensuring that all members of the household had their basic needs met. It emerged that in desperate situations such as when their husbands lost their jobs or during transition from one casual job to another, the overall well-being of the family was trusted to women. Women were, as a result of this, motivated to engage in home gardening as a precautionary coping mechanism.

It was also a natural trend for women to consider the production of food for their families as being one of their primary household roles. Asked where the motivation to garden originated, almost all respondents said that they had acquired their knowledge while they were in rural areas, and when they moved to Phomolong, they deemed it necessary to engage in farming as a way of supplementing their wages.

The most commonly grown crops were of exotic types such as maize, beans, spinach, kale (mostly by immigrants), sweet potatoes, tomatoes, onions, Irish potatoes and carrots. A few others grew beetroot and *bambara*. Farming was mainly practiced during summer when it also rained, although all households interviewed grew crops in the garden even during winter. During the growth period, the leaves of beans were harvested and used to cook a relish locally referred to as *morogo,* in seSotho meaning 'fresh vegetable.' Water for irrigation was obtained from public water points supplied by the Tshwane Metropolitan Municipality. In most cases, younger family members (mainly children) and women did the watering of gardens by fetching water from public taps.

It was a common practice in male-headed households for the men to provide their wives or partners with a specific amount of money at the end of every week to constitute their spouses' household budget. It emerged from the interviews that most casual labourers were paid weekly wages, usually on Fridays. However, a concern was raised by the women throughout the research about the relatively high level of alcoholism amongst men. Most of the men were said to drink a local brew nicknamed

paparazzi. These drinking binges occurred mainly on weekends, starting on Friday evenings and sometimes only ending on Monday mornings. This kind of social mischief, although lying beyond the scope of this research, has the potential to impact negatively on household food security, as some men were said to drink away their whole wages at the expense of their households' basic needs, including food.

The concept of group gardening came out of discussions in two of the six focus groups. In both instances, only women were involved. In one group, there were six women and in the other eight. All but three of the women had part-time jobs as domestics in the richer suburbs of Pretoria. They would go to these jobs on alternate days of the week. Such part-time, casual jobs were commonly referred to as *piece-jobs* by respondents.

On days when they did not go to their piece jobs, they joined others in tending their group gardens, which were mainly located on public land in the neighbourhood of a school and a local clinic. A major constraint with regard to group farming was limited access to water for irrigation.

It was noted during the discussions that in the past, the City Council had restricted women from using public water to irrigate their farms. Another challenge was the uncertainty regarding the land on which they farmed. The fact that it was public land meant that at any time, the government could reclaim the land, without a second thought for the group farming activities. The respondents recalled several cases in the past where they had been barred from farming in particular locations that were meant for future projects belonging to the local authority.

Upon harvesting their produce, the women sold it (especially maize, potatoes and beans) at the local shopping centre, and some produce was taken to Pretoria city centre for sale along the streets. The dividends were then split amongst the members. The average monthly income from group gardening in summer ranged between R800 and R1500 per member. In the opinion of the members of these groups, this income provided an

immense relief to households, many of which earned on average R900 per month per household head from casual labour and/or piece jobs.

The structure and composition of group farming mirrors traditional African society, in which the male heads of the family have the seemingly prestigious and unrealistic attitude of not wanting to engage in domestic farming. Hemson supports this argument by stating that women's roles still revolve around nurturing the household (Hemson, 2002: 2), while men tend to take on the role of provider. The research revealed that although men were aware of the food situation in their households, they often regarded it as women's territory.

vi) Government support available to participants

This study established that only 23 out of 48 respondents received some government support. This translates into 47.9%. Of the 47%, 15 received child support grants, while 8 received disability grants. The percentage of those who did not receive government support in the form of social security grants was 52.1% of the total.

The research concluded that the government support grant does not benefit all residents in informal settlements, despite some being in situations of abject poverty. There are several reasons why deserving people are unable to qualify for such grants, the most common being a lack of identity documents.

The most accessible grant was that for child support, amounting to R190 per child per month as at the time of this research. With the increase in living costs, it was apparent that this grant's impact on the livelihoods of beneficiaries was very minimal.

For some households, the child grant was the only source of direct income at any time. There were cases where teenage mothers used the child grant to finance other personal projects, such as buying clothes and jewellery. In this regard, government needs to develop a more informed

approach that would ensure the sustainable use of this grant. Critics such as Otto Lambsdorff have argued that while the intention of social welfare is noble, such a policy would result in overburdening the country's economy, being counterproductive on issues of unemployment, and in the long run, decreasing sustainable development in South Africa (Otto Lambsdorff, 2006).

vii) Additional survival techniques

Besides the coping mechanisms discussed above, this research also identified other mechanisms that Phomolong residents used whenever appropriate in order to sustain themselves. The old adage that "necessity is the mother of invention" revealed its true nature in this research, when a number of respondents acknowledged that in dire situations of need, some of their members would succumb to temporary (coping) strategies that ranged from begging, mainly from neighbours and friends or on the streets, to engaging in prostitution and theft. These practices were most prevalent during times of food shortage, such as when a breadwinner was sick (and thus unable to work), had died or lost a job, and was thus unable to fend for the household.

Given that most residents of informal settlements are casual workers, the incidence of job losses is a common occurrence, and this partly explains the pervasive behaviour, including theft, which is associated with informal settlement dwellers. According to residents of Phomolong, incidents of joblessness contribute to a high level of insecurity, and nights were the most dangerous time. Prostitution was also a common phenomenon, and was said to be a major factor contributing to the spread of HIV/AIDS.

In the course of this research, the case of immigrants from neighbouring countries was raised by respondents on numerous occasions. Respondents mentioned that the influx of foreigners into their neighbourhood had sometimes led to a scarcity of food and escalation of food prices and rent, while on the other hand, the desperation of the immigrants reduced the level of casual wages, as they were ready to offer

their services at reduced costs. The link between immigrants and food security requires more in-depth research, and this lay beyond the scope of this study, although it is important to note the potential impact that it may have on food security in an informal settlement such as Phomolong.

From the findings of this research, it became obvious that household food security in Phomolong depends on access to a source of income, as is the case in all societies. Without adequate income, a household can succumb to the lowest levels of deprivation, and even engage in morally unacceptable activities in order to survive.

6.3 General comments

At the end of the questionnaire, respondents were asked to list their immediate needs in order to live a decent life. Most of them gave similar responses in terms of their immediate and future needs. They prioritised them as: an adequate supply of water, toilet facilities, electricity, better houses, permanent jobs, stands (plots of lands) and identity documents, so that they would qualify for government grants.
All participants expressed a desire to obtain stable or permanent jobs, and for the government to build low-cost houses for them.

6.4 Conclusion

This chapter discussed the findings of the study. The basic finding, and one which impacts directly on the household food security of residents of the Phomolong informal settlement, is that the majority of them consisted largely of households that depended on casual employment, and were therefore classified as poor. However, as a survival mechanism, some households that had gained experience in agriculture from rural areas initiated home gardens, as well as group gardens.

A key concern emanating from this study is the need for government to intervene with policies to enhance food security among households in Phomolong. Above all, an integrated approach to sustainable livelihoods and development should be adopted by the government at all levels of

service provision, in the spirit of ‘Batho Pele’, meaning “people first’, in order to empower the poor and thereby promote poverty eradication and improve self-reliance.

Chapter 7

POLICY RECOMMENDATIONS FOR IMPROVING HOUSEHOLD FOOD SECURITY

7.1 Introduction

This study has noted that economic development is a major challenge facing developing countries, and more specifically Africa, and that solutions to sub-Saharan Africa's challenge of hunger and poverty are intrinsically embedded in global policies. It follows therefore that in order for African countries to mitigate some of the adverse effects of globalisation, the continent has to pursue policies and strategies that promote long-term growth, while at the same time offering short-term security options for the poorest of the poor, such as residents of the Phomolong informal settlement, which formed the case study for this research. It is for this reason that the following recommendations, emerging from this study, can be made.

7.2 The need for more effective policies

At the continental level, Africa needs to establish a mechanism charged with the responsibility of coordinating information in every member state regarding the location, severity and causes of food insecurity, so as to enable mitigation measures to be put in place before the situation becomes severe. Such information would also be useful for humanitarian agencies that are willing to intervene.

This research explored various coping mechanisms that inhabitants of informal settlements use in order to sustain their livelihoods. It is recommended that policy makers, through further research, develop policies aimed at improving the knowledge and abilities of urban informal settlement dwellers with regard to the best principles of and approaches to urban farming. Consequently, government should put aside sections of

urban areas for farming by residents of informal settlements.

7.3 Implementation of suitable national agricultural policies

Adequate food production requires suitable factors of production, such as land, technology and knowledge, as well as storage facilities, in addition to political stability. Land remains a contentious issue in many African countries, and South Africa is no exception. The end of apartheid marked a new beginning in all aspects of the lives of South Africans, including land ownership.

The post-apartheid government has been involved in land reform processes aimed at land redistribution. According to the Department of Land Affairs in South Africa (2007), “Under colonialism, and later under apartheid, South Africa was divided into racial zones. Most of the country, including most of the best agricultural land, was reserved for the minority white settler population, with the African majority confined to just 13% of the territory (the native reserves, later known as African ‘homelands' or ‘Bantustans'). At the end of apartheid, approximately 82 million hectares of commercial farmland (86% of all farmland, or 68% of the total surface area) were in the hands of the white minority, concentrated in the hands of approximately 60 000 owners. Over 13 million black people, the majority of them poverty-stricken, remained crowded into the former homelands, where rights to land were generally unclear or contested and the system of land administration was in disarray. These areas were characterised by extremely low incomes and high rates of infant mortality, malnutrition and illiteracy when compared to the rest of the country. On private farms, millions of workers, former workers and their families faced severe tenure insecurity and lack of basic facilities. In the cities and rural towns, informal settlements continued to expand, beset by poverty, crime and a lack of basic services.”

As this process is taking place, it is advisable that the parties involved exercise due diligence, in order to avoid pitfalls that could lead to a

national calamity, as has occurred elsewhere on the continent. At the same time, it is highly recommended that due consideration be given to the situation of residents of informal urban settlements such as Phomolong, with a view to according them education, land, shelter and job opportunities. This need was implied by Kennedy (2007), when he noted that access to food in urban areas is dependent on cash exchange, with a few exceptions in cases where urban food production contributes directly to household income. Others who emphasised this fact include Rogerson (1996) and van Averbeke (2007), who observed that the majority of urban farmers in South Africa only produce food as part of their survival strategy, and not really as an enterprise.

7.4 Short-term interventions to improve the food security of poor households

The over-reliance on purchased food is a leading factor in household food insecurity of poor urban populations.

A concerted effort by government, civil society and the community could assist in this regard by offering training and demonstrations (garden workshops, retail trade, etc) to inhabitants of informal urban settlements. This awareness would improve the knowledge and abilities of the unskilled residents of such areas, thereby empowering them. This kind of intervention would lead to the creation of more job opportunities for small-scale entrepreneurs in urban areas, and increase their income base to relieve those who are unemployed. The ripple effect of such an intervention would be self-sustaining middle and tertiary level training institutions for children of poor households in these settlements. Skills such as tailoring, catering, carpentry and basic mechanics, learnt at such institutions, could help to ease the problem of unemployment.

7.5 Focus on rural development

As noted in this study, rural-urban migration is a major contributor to congestion in urban centres, and more importantly, is the reason behind the increase in informal urban settlements. This is because people move

to cities in search of employment and a better life. In this respect, it is advisable that governments decentralise national operations by setting up industries and agricultural projects in rural areas, in order to provide the would-be migrants with better chances of obtaining jobs, instead of having to move to cities.

To achieve this goal, a country's growth and development strategy needs to have at its core the objective of elevating the levels of public sector investment in agriculture, as well as rural development, while at the same time prioritising the need to commercialise small-scale agriculture in order to enhance productivity and competitiveness. As pointed out in this study, the question of household food security is ultimately an issue of availability and access - therefore, governments need to develop food security policies that would increase the probability of access to food for vulnerable households.

7.6 Dietary concerns

The fact that most residents of informal settlements are semi-literate implies that they may not be well informed about what a balanced diet involves, or even if they are aware, budgetary constraints are likely to hinder their ability to prioritise a balanced diet. For this reason, this study proposes:

a) The inclusion in primary school curricula of the importance of a balanced diet. This could be further promoted at major public forums such as community meetings, public gatherings, school meetings and adult education forums, among others.

b) Antenatal and postnatal clinics should continue to teach nutrition to mothers, in order to ensure that both mother and child are healthy. The use of supplements for pregnant mothers should also be promoted, in order to ensure that adequate vitamins and minerals are available for the development of the unborn child. Maternal health is very important and should thus be constantly promoted. According to the WHO,

"under- nutrition during pregnancy and infancy causes the most harm to the long-term learning capacity of individuals…" (WHO, 2006:37). Since traditional norms have placed women in a position where they are responsible for household food requirements, it means that an informed mother will make better decisions regarding food consumption for her household.

c) The training and deployment of more nurses, health workers and social workers should be promoted. This process should involve the upgrading of training facilities, as well as the improvement of service conditions of those working in the medical fraternity. Medical specialists have an enormous impact on the community in term of building the capacity of community members through the provision of primary health care. Home-based caregivers should also be empowered with the knowledge of the benefits of proper nutrition. This is important in ensuring that the emphasis is placed on the quality of food, as well as the quantity, while at the same time helping to ensure that food security is achieved amongst the population, especially today, where opportunistic infections such as HIV/AIDS and tuberculosis (TB) affect a large percentage of the population.

d) Similarly, the link between education and hunger cannot be overemphasised. The hungrier an individual is, the less likely the chances are of that individual being able to learn. The WHO (2006:2) noted this by stating that "understanding the relationship between hunger and learning requires a long-term perspective: what happens at one stage of life affects later stages, and what happens in one generation affects the next." Therefore, hunger impacts directly on all spheres of human development.

7.7 Tackling HIV/AIDS in order to improve household food security

The HIV/AIDS pandemic continues to affect the ability of people to produce food in most developing countries to a large extent. In 2005, the South African National Survey estimated that 10.8% of all South Africans over the age of 2 years were living with HIV. Amongst people aged

between 15 and 49 years old, the estimated HIV prevalence was 16.2% (South African National Survey, 2005).

With such a high infection rate, the impact on national food security is very clear. An integrated approach would be most appropriate in terms of mitigating the impacts of this scourge. This study proposes an approach that promotes voluntary counselling and testing, as well as support for HIV/AIDS sufferers and capacity building of health professionals, so that they are able to cater for patients who need care and support.

Furthermore, the government needs to accelerate the roll-out of anti-retroviral medication to those with AIDS, in order to reduce the incidence of mother-child transmissions and lengthen the lifespan of those affected, especially in cases where patients are breadwinners in their households. Cohen (2007:6) suggests "that treatment strategies should include nutrition support as well as drugs. Design of agricultural development programmes needs to incorporate a HIV/Aids element".

7.8 Promoting good governance

Sub-Saharan Africa is widely affected by conflict, corruption and bad governance. A combination of these factors engenders poverty and worsens the spread of diseases. No meaningful development can thrive under such circumstances. Instead, this situation makes it more difficult for ordinary people to access the basic commodities needed for their survival, ranging from food to health care and agricultural inputs. Food sustainability becomes impossible under such circumstances.

Governments in Sub-Saharan Africa, after damaging their social systems through bad governance, often call upon humanitarian agencies for food aid in order to feed their citizens. This practice is increasingly becoming an endemic part of governance in these countries, and if not stemmed, Africa will for a long time lag behind the rest of the world. Devereux (2003:9) highlights this in a succinct way by stating that "Social protection interventions can be designed to address one or more of three broad

objectives: risk reduction, risk mitigation, and risk coping. In the aftermath of a food crisis, it is all too easy to focus on 'coping' interventions, designed to assist affected households and communities first, to survive and second, to rebuild their livelihoods. These are important ameliorative measures, but they do nothing to reduce vulnerability to future shocks that will require more post coping interventions."

This clearly shows that there has to be a political environment that is peaceful and ensures the equitable distribution of resources to all citizens. The cornerstone of realising this objective is a government's political will to implement the right policies in the right way and at the right time.

7.9 Conclusion

This chapter has proposed some of the major recommendations that emanated from the study. If these recommendations are implemented, they will go a long way towards contributing to the improvement of food security, not only for the urban poor, but for everyone.

Chapter 8

Conclusions

8.1 Introduction

This chapter presents a conclusion to this study. After careful analysis, this study was able to:

a) Discuss the concept of food security
b) Analyse the different factors affecting food security
c) Carry out an in-depth household survey regarding the food security situation of poor households in the Phomolong informal settlement in Mamelodi
d) Provide some recommendations on how to improve household food security on a policy level

This study has demonstrated the need for policy makers to focus on the situation of informal settlement dwellers in urban areas, with the hope of making a contribution to the improvement of individuals' access to food. However, the study opened with a general discussion on global challenges facing food security, such as global warming, pollution, trade and the mechanisation of agriculture. It was believed that such a discussion would help to place the research in its proper context, based on the interrelatedness of global affairs in today's world.

This study contends that when poor rural people migrate to the city, they often become poor urban people, at least initially, and that their experience of poverty in the city differs from that in the rural areas from where they came due, for example, to limited access to land for farming.

The study also notes that social mischief and disintegration of families are features of poverty that are largely associated with migration from rural to urban environments. It argue that the technique of urban farming is usually imported from the rural environment (at least initially), and this helps rural-urban migrants to restart their lives by reliving elements of rural life such as farming. It also helps women, in particular, to come to terms with the

social challenges facing them, and this farming allows them to provide food for their households.

In order to systematically discuss issues contributing to food insecurity in Africa's poor urban households, this study bases its analysis on the case of the Phomolong informal settlement, which provides the basis for some of the major arguments and conclusions made in the study.

It is in this respect that the first chapter, besides providing the background to the study, as well as its objectives and motivation, also sets the stage for subsequent chapters by highlighting the relationship between food security and human security. The chapter argues that poverty and diseases such as HIV/AIDS are intricately related.

The fact that human survival is central to all forms of development emerges clearly in the findings of this research. This argument is reinforced by the second chapter of the study, which discusses the merits of sustainable development in detail. The crux of the debate is that in order for the ecosystem to thrive, a balance in all aspects of development needs to be observed, and the correct measures must be put in place in order to safeguard the environment for the benefit of future generations.

The link between the growth in human population and the pressure this exerts on the environment is discussed in the third chapter of this study. The basic argument is that were it not for the inequitable distribution of resources (natural or artificial), there would be enough for the entire ecosystem. The endemic inequality in the distribution of resources (especially in developing countries) has a direct relationship to disparities between the rich and the poor, leading to relative deprivation, which in turn leads to crime (human insecurity). Ultimately, an insecure community is less productive and hence has less food security.

Sub-Saharan Africa is the most affected region globally in terms of food insecurity. Several factors contribute to this occurrence, and these include

chronic poverty, diseases, poor governance, demographic pressure, limited market access and over-reliance on less mechanised agricultural methods. To a certain extent, north-south trade imbalances also continue to impact negatively on the food security of the developing south. These issues are discussed in the fourth chapter.

The Phomolong informal settlement (PIS) represents a typical poor urban settlement, in which inhabitants thrive on the 'good will' of the urban poor to provide jobs (often unskilled labour). In rare circumstances (as revealed through focus group discussions conducted in PIS), inhabitants involve themselves in informal, small-scale farming, mainly of a kitchen gardening nature. Various methodological issues emerged during the researcher's field visits to PIS. For instance, it was realised that gathering primary data among poor people calls for tact and wisdom. While it is important for the researcher not to raise the expectations of the target population, it is equally important that the population's willingness to participate frankly in discussions is sustained.

The main findings of the research conducted in PIS are presented in the sixth chapter. The reality of food insecurity in PIS is such that on average, a household in PIS consists of 4.5 people. Of the total families interviewed, 83% of them had between 1 and 5 members sharing one room, while 16% comprised between 6 and 10 members. This is a strong indicator of the typical way of life of families in poor urban settlements across Sub-Saharan Africa.

From the PIS case study, various policy recommendations emerged (as contained in Chapter 7). What is important, however, is the need for more effective agricultural policies that are pro-poor in focus. Issues such as good governance and access to health care are also vital.

This study contends that no single approach is sufficient to ensure the sustainable existence of poor urban informal settlement dwellers. Rather,

it is highly recommended that a multi-faceted approach that brings together the various recommendations outlined in this study be followed.

8.2 Areas for further research

Based on the findings of this research, it is apparent that there are several issues related to those discussed that need to be investigated further and recommendations made. The six specific issues for further research with regard to the Phomolong informal settlement are:

1. The role of street vending in promoting household food security.

2. How to use innovative technologies such as rainwater harvesting and small-scale bio-intensive gardening, among others, to improve household food security and alleviate poverty.

3. The social impact of the child support grant on society, with direct reference to behavioural change and the spread of HIV/AIDS.

4. The impact of climate change on household food security in South Africa.

5. How to promote ecological integrity in the urban biosphere

6. Interdisciplinary research on food security within the fields of anthropology, geography, agriculture and sociology

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QUESTIONNAIRE

This questionnaire is aimed at obtaining information regarding the current food security situation of people living in the Phomolong informal settlement, with the objective of finding out how the overall food security of households in informal settlements can be improved.

1. **Identity of respondent** (Please tick one)

Gender: Male: □ Female:□

Age:

Nationality (optional):

Number of people in the household: 1-5 □ 6-10 □ Over 10 □

Relation to the respondent: Spouse □

Child □

Other family member □

2. **Type of Housing/ Shelter** (Please tick one)

a) What type of house do you live in?

   a. Permanent house (Brick) □
   b. Temporary structure (shack) □

b) Who owns the house?

   a. Self □
   b. Rented □

3. **Source of livelihood** (Please tick one)

Are you employed? Yes: □ (If yes go to 4)

No: □ (If no go to 5)

4. **Nature of employment** (Please tick one)

Are you self-employed? Yes □ No □

What sort of work do you do? Formal (Which requires training) □

Informal (requiring manual labour) □

What are your terms of employment?

Permanently □ Casual □

What is your average monthly income? Below R.1000 □

R.1000 –2000 □

R. 2000-3000 □

Above R.3000 □

5. Source of Livelihood (Please tick where applicable)

What is your source of livelihood (how do you get money for your day to day activities)?

Government support/ grant □

Other (mention)

……

6. External support (Please tick one)

a) Do you receive any government subsidy?

Yes.□ (Go to b) No □

b) Which one? (Please tick one)

Child Support Grant □

Disability Grant □

Pension □

Welfare □

Is your income sufficient to meet your daily needs?

Food □

Shelter □

Education □

Medical attention □

7. **Food security situation** (Please tick where appropriate)

a. How do you get your daily food for consumption?

Own production □

From family members in the rural areas □

Purchase □

Borrow □

Food parcels from civil society or churches □

Other ……..

b. How many meals do you eat in a day?

One □ Two □ Three □

Breakfast □

Lunch □

Supper □

c. What food do you normally eat / common type of food? (Tick all that applies to you)

Pap/Bread/Rice/Chips □

Beef/chicken/Fish □

Vegetables/ Fruits □

d. In your opinion is your household's food intake sufficient?

Yes □ No □

e. Do you ever experience a problem in accessing food?

Yes □ (go to f.)

No □

f. What are the constraints you face in accessing food?

Financial □

Availability of food □

Availability if culturally acceptable food □

Not a problem □

g. When is it most difficult to access food?

All year round □

During winter □

During summer □

Not a problem □

h. In your opinion, what can you do to improve your food security situation?

Get a job □

Get a small plot for small-scale farming □

Government to give food stamps □

i. Who else do you think should do something to assist you in meeting your food needs?

Central government □

Local government □

Church □

Civil society (NGOs) □

j. What other problems/constraint do you face in trying to live a comfortable life?

……

……

8. Dependency on head of the household

a) Who is the head of your household?

Father□ Mother□ Grandfather□ Grandmother□

Child □ Other (specify) □…….

b) Do you have any dependants? Yes □ No □

c) How many? 0-5 □ 6-10 □ More than 10 □

d) What are their ages? 0-5 □ 5-16 □ Over 16 □

e) Where do they live?

With you □

Elsewhere □ (Explain)

……

……

…… ……

9. Government Intervention

Are you aware of anything the government is doing to assist poor people to achieve food security?

Yes □ No □

Do you think the government, both local and national, should have a responsibility towards your life with regard to food security?

Yes □ No □

Why?

……

……

10. Other pressing issues

What would you say are your biggest impediments to living a comfortable and decent life in terms of priority/urgency?

……

……

……

11. Final comments

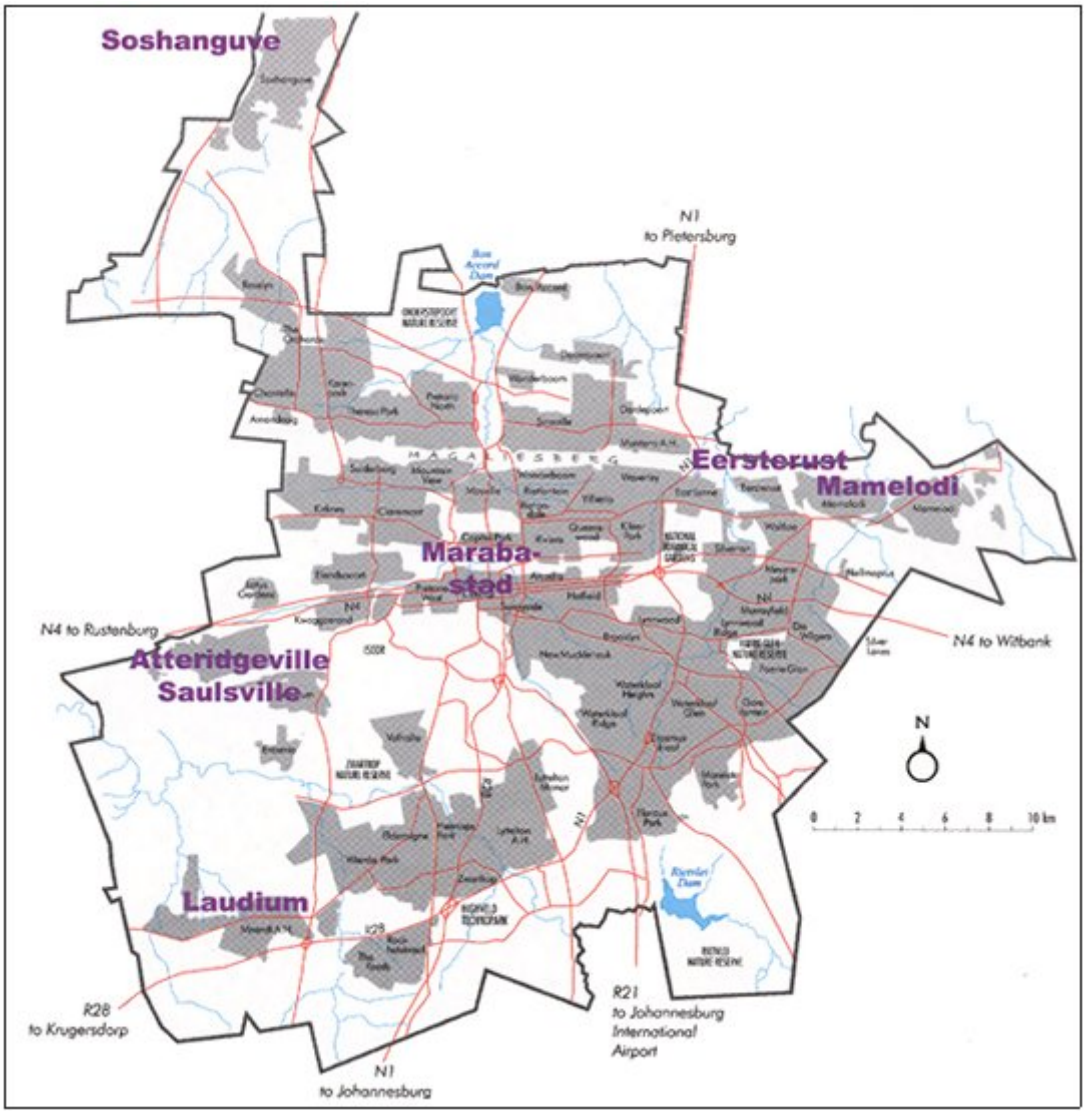
Do you have anything else to say regarding promoting your food security needs as an individual on behalf of your household?

……

……

Thank you for your support

TSHWANE MAP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International
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