A CASE STUDY APPROACH TO THE ASSESSMENT OF URBAN AGRICULTURE IN THE GREATER EDENDALE AREA, PIETERMARITZBURG, KWAZULU- NATAL, SOUTH AFRICA

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BY

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Plate 1 Urban agriculture: Fairview, California: the Western landscape contrasts strongly with that of the Edendale Valley, Plate 6, page 43

Source: Ableman (1998:14)

ABSTRACT

Migration from rural to urban areas has characterized the South African population in the last quarter of the 20th century. More recently, internal urban growth itself has contributed to the rapid growth of cities. This rapid population increase in towns and cities has resulted in a range of social and environmental problems. Food insecurity is one such problem, it is contended, that could be addressed by the more wide spread development of urban agriculture (UA).

The literature review helped the researcher to understand the problems and potential of UA. For the purposes of this study, UA is defined as the growing of plants, tree crops and raising of livestock within and at peri-urban areas. It focuses specifically on the 'community' type ventures rather than that associated with individual households. UA is an effective and efficient way of converting urban waste land and underutilized resources into food products, generate income and create jobs. The literature review and the case studies underlined the importance of UA to supplement household income and address issue of food security. However, the activity has been largely overlooked by local government, policy makers and non-governmental organizations (NGOs). It was also realized that UA is not a widespread or common practice in the cities of South Africa although the majority of the urban populations are poor due to past apartheid policy, rapid urbanization and the relatively slow growth of the economy as a whole.

Against the above background, this study focused on socio-economic analysis of vegetable production in the study area by identifying and examining the role played and potential socio-economic and environmental importance of UA in the Greater Edendale Area (GEA). The study was conducted in the GEA particularly in three vegetable gardens, namely, the African Tree Centre (ATC), the Edendale Lay Ecumenical Centre (ELEC) and the Willow Fountain Centre (WFC). Primary data were collected through using structured interviews, key informant interviews, personal observation and through a literature review and the consultation of documents and records from the organizations surveyed.

Agricultural activities in general and UA in particular in the study area were limited. Production at present is also low. However, the production of vegetables and fruits and the raising of poultry do relatively well when compared to other UA activities. Very few people in the study area were practising UA because of the lack of suitable land set aside for the purpose, lack of equipment and lack of financial and technical support.

The initial cost of starting community based UA was found to be high. This situation has limited the number of urban farmers. If people are able to meet the start up costs, they can provide the urban poor with fresh and affordable produce.In addition, the lack of information and awareness, in relation to the actual and potential benefit of UA, has limited its spread in the study area.

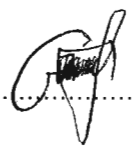
It is also possible to optimize the capacity of UA with limited inputs. High production per hectare is possible and is well suited to low-income families and it allows women, who constitute the majority of urban farmers, to participate. The young, the old and the unemployed are other potential beneficiaries. However, lack of recognition, and cultural biases (i.e, many urban managers and policy makers think that allowing UA in cities 'ruralises' them of its activities hinder the realization of the potential role of UA.

Therefore, integration of UA in the plans, policies and activities of stakeholders, particularly urban planners, city administrations, NGOs, local universities, extension and credit organizations, and community based organizations (CBOs) should be a priority issue. Strategies to ensure a higher priority for UA need to be carefully articulated.

PREFACE

The field work was carried out in the Pietermaritzburg (PMB), Greater Edendale Area (GEA), in collaboration with members of the Greater Edendale Environmental Network (GREEN) particularly with Sandile Ndawonde, the co-ordinator of GREEN. My supervisor, Professor Robert Fincham, played a role in putting me in touch with GREEN and the research assistants. He was also constantly consulted during the field work.

The work presented in this thesis is the original work of the author and has not otherwise in its entirety nor in part been submitted in any form at any university for any degree or diploma. Wherever use is made of other's work, it is acknowledged in the text.

Signature .....  .....

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LIST OF ABBREVIATIONS AND ACRONYMS

ANC	African National Congress
ATC	African Tree Centre
ELEC	Edendale Lay Ecumenical Centre
CBO's	Community Based Organizations
FAO	Food and Agricultural Organization of the United Nations
GEA	Greater Edendale Area
GREEN	Greater Edendale Environmental Net-work
KZN	KwaZulu-Natal
LIFE	Local Initiative Facility for the Urban Environment
NGOs	Non Governmental Organizations
PMB	Pietermaritzburg
PMB-TLC	Pietermaritzburg-Transitional Local Government
SA	South Africa
UASG	Urban Agriculture Support Group
TLC	Transitional Local Council
UA	Urban Agriculture
UNICEF	The United Nations Children's Fund
UNDP	United Nations Development Programme
WFC	Willow Fountain Centre
WFG	Willow Fountain Garden

CHAPTER ONE: INTRODUCTION

1.1 PREAMBLE

The current world population is anticipated to increase at a faster rate than food production. Today, the world population is approximately six billion and increases at a rate of three people per second or 100 million per year and is expected to rise to 10 billion by the year 2050 (Vos 1999).

Table 1.1 highlights the exponential nature of the increase and the burden of numbers that will be allocated to the developing world in the first quarter of the 21st century.

Table 1.1 World population trends

Population (In billions)				% Increase of Pop^{n} (1990-2020)		% of Urban pop^{n}	% of Rural pop^{n}
1990	1995	2000	2025	Developing world	Developed world	2000	
1.6	5.8	6.0	10.0	90	10	40	60

Source: Devas and Rakodi (1993); Anonymous (2000) and Vos (1999)

According to these sources, approximately 40 percent of the world's population lives in urban areas of which 73 percent are in developed and the remaining are in developing countries. Roughly a third of city dwellers in the developing world's urban population fall below the poverty line (Devas and Rakodi 1993). The number of the world's urban poor in 1995 was 1 640 million and is expected to rise to 3 050 million by the year 2025 (Anonymous 2000).

The population of Africa was estimated at 224 million in 1950 and expected to rise to more than 1 441 million persons in 2020. This means that by the year 2020, the population of the continent is expected to be almost 18 percent of the total population of the world, whereas it was only nine percent in 1950 and 11 percent in 1985

(Development Information Business Unit 1998).The annual population growth rate of Sub-Saharan Africa from 1992-2000, has also been estimated at three percent which is the highest in the world (United Nations Development programmes 1995). In similar manner, the population growth in SA is high and is a contributing factor towards the under development in the country. The population of the country in 1970 and 1995 were 22.5 and 41.5 million respectively. The last number is forecasted to rise to 61.8 million by the year of 2015 and will be doubled by the year 2026 (United Nations Development programme 1998). SA's population growth rate is higher than the Third World countries (Development Information Business Unit 1998). The population of KwaZulu-Natal (KZN) according to the census of 1994 was 8.8 million. This means KZN is the province with the largest population. In this province, the average annual increase in population between 1980 and 1994 was 2.9 which was higher than the average for the country (Development Information Business Unit 1998).The estimated population of Pietermaritzburg (PMB-TLC) and GEA were also 485 282 and 238 524 respectively (Integrated Planning services (PTY) LTD 1998; and Data World Consultant to the Masakane Project 1998).

Migration from rural to urban areas has characterised SA's population in the past. More recently, urban population growth itself has contributed to the rapid growth of cities. According to the United Nations Development programme (1998), the urban population of the country in 1970 and 1995 was 48 percent and 49 percent of the total respectively. These numbers are also forecasted to rise to 56 percent by the year 2015 and the annual growth rate of urban populations (1970-1995) and (1995-2015) are also 2.6 and 2.7 percent respectively. Population growth, poverty and shortages of food supplies become the primary constituents of social problems in many poor developing countries and in SA, it is an issue of equal concern.

As a result of the rapid population growth, many SA rural poor experience a variety of problems in relation to land and production. Social dislocation, inequalities in income between the poor and the rich, limited access to education, to health care, to clean water, to energy and environmental degradation are some of the problems they face. The past apartheid policy also reinforced these inequalities along racial

lines. The rural people's solution to the above problems was to go to cities and, as a result, thousands of people have moved from rural areas to cities and towns in SA and many live in slum-like conditions.

Although the population in cities is growing fast, the economic activities in cities can not accommodate every unemployed citizen. The ever-growing population in cities has resulted in high competition for limited job opportunities as the economy is not expanding fast enough to accommodate all job seekers and many of the people have been forced to settle informally with a minimum standard of living. For example, it was found that only 25 percent of the population of PMB live in formal housing (Personal communication, Fincham 1999).

The unemployment rate in 1995 was 29 percent in South Africa and 33 percent in KZN and the dependency ratio in 1994 was 2.0 in South Africa and 2.2 in KZN (Development Information Business Unit 1998). In this case, the urban poor are the ones who suffer the most. The problems such as food insecurity and unemployment in urban areas have been experienced throughout the world as well as in SA. Many people in PMB and GEA are unemployed, very poor, have poor social services and most of them stay in informal settlements. Morever, access to resources are difficult and people are living in great poverty. Food insecurity is just one of the problems they face (May and Peters 1984; Integrated Planning service 1998; and Development Information Business Unit 1998). In the past, concerns have been about National Food Security. This is still the case where war and famine occur. The situation in the horn of Africa is a good example for this. However, there is now a focus on household food security. This is where this study concerned itself.

In South Africa, the major employment areas are economic activities (such as industries, manufacturing and banking). However, the fast in-migration and natural growth of the population of the cities of the country could not be accommodated with only these economic activities. Therefore, other sectors or alternatives such as UA can help reduce the problem of food insecurity in urban areas or cities. UA provides and has a potential to provide significant advantages to the city dwellers in general

and to the urban poor in particular. 'The overwhelming majority of urban farmers in third world countries are low-income small farmers. Some of these farmers are able to eat and live only through growing their own food' (Smit and Ratta 1992:9). UA in towns, cities and metropolitan areas can convert urban wastes (waste water, solid waste etc) into resources; put vacant and under utilized areas to productive uses; and can improve the environment for urban living (Smit and Nasr 1992; and May and Rogerson 1994). However, the activity is not as widespread as one would expect and does not achieve the potential it could in many countries of the world and in SA.

The aim of this study is therefore to make a socio-economic analysis of urban agriculture using three case studies in the GEA.

1.2 SCOPE OF THE STUDY

UA is a broad term which includes growing crops, fruits, vegetables, plantations, and keeping livestock. There are nine vegetable gardens in the GEA. Because of the time (only six months) and financial constraints, the study dealt with the socio- economic analysis of vegetable production in three gardens selected from the GEA namely, WFC, ATC and ELEC. They were selected for study because they were actively involved in vegetable production relative to other similar gardens in the study area (Appendix 2, Table1). Furthermore, the selection was made as a result of discussions with the co-ordinator of the Greater Edendale Environmental Network (GREEN), Mr. Sandile Ndawonde and his colleagues. ATC and WFC are community gardens and the aim of production is for consumption and generating income. The ELEC is a training centre. However, it is also involved in vegetable production and selling activities. Therefore, the study is mainly concerned with the common activities of the three organizations, namely vegetable production.

1.3 THE STRUCTURE OF THE DISSERTATION

The dissertation comprises seven chapters:

- *Chapter one* is the introduction,
- *Chapter two* deals with the nature of UA,
- *Chapter three* outlines the nature of the study area,
- *Chapter four* identifies the research methods and research limitations of the study,
- *Chapter five* presents the results of the field work,
- *Chapter six* discusses and analysis the implications of the results, and
- *Chapter seven* then draws conclusions and provides recommendations that need to be considered in terms of future research and policy formulation.

A key focus of the study was to explore the issues of cost of inputs (seeds, fertilizer and so on) and the actual quantity and price of outputs. No similar study of these gardens has been attempted to date. What became important in the work was to identify problems to greater production and the more widespread adoption of community based vegetable production.

CHAPTER TWO: THE NATURE OF URBAN AGRICULTURE

2.1 INTRODUCTION

This chapter deals with the literature review which aims to examine the nature of UA. It focuses on UA and this topic is developed using experiences in SA as well as around the world.

UA is an activity of growing plants and keeping livestock. It is important that UA should expand with the growth of urban population. Rapid growth of population has resulted in problems such as food shortages, unemployment and competition for resources. Hunger and malnutrition are increasing world wide as the global food system fails to satisfy the growing demand of the urban poor (Kurnicki 1999). The rise of UA could create sets of both positive and negative impacts for the population and the urban environments. The positive effects include adding to household incomes, improving food security, creating job opportunities, improving environment, and enriching the sense of identity and belonging of individuals. This must be balanced against such negative aspects as chemical contamination of water and noxious pollution from livestock.

2.2 WHAT IS UA ?

2.2.1 Definitions of UA

A new global facility for UA was created in March 1996 at an international consultation held by the Urban Agriculture Support Group (UASG). This group examined the issues related to food security and UA, especially for developing countries. A recent study by the United Nations Development Programme (UNDP), estimates that 800 million urban farmers produce over 14 percent of all the food consumed on the planet and more than 50 percent of the vegetables, poultry, and pork eaten in towns and cities (Anonymous 1996).

Different people interpret UA differently. Mougeot (1994) and Tinker (1992) defined UA as the growing of plants, tree crops and raising of livestock within and on peri-urban areas. Urban planner Irene Tinker (1994), believes that it is possible to define agriculture, but not easy to define UA with regard to food production. UA is any activity that produces food within an urban area which includes activities of growing food whether it be fruit, vegetable, protein (fish or livestock) in the city environment (Kurnicky 1999). Plate 1 (P : ii) shows some types of UA, such as vegetable and fruit production.

UA is food production occurring within the confines of cities whether in backyards, community vegetable and fruit gardens, public spaces or on rooftops. It includes commercial operations producing food in green houses and other spaces, but is more often small-scale and scattered around the city. In this case, the most important crops of urban farmers are believed to be perishable fruits and vegetables grown in or near the city by small or large farmers for home consumption or sale in the urban market (Nugent 1997).

2.2.2 Who Are Urban Farmers?

Many people consider that urban farming is for the urban poor and men only. However, urban farming involves a complex mix of operators from low, middle and high income people and women as well. Generally, most of the urban farmers are women. For example, of the urban farmers in Kenya, Colombia and Zaire, 56 percent, 67 percent and 64 percent respectively are women.

2.2.3 Growth of UA

Urban population is growing fast. The possible reasons for this are: natural growth and in-migration to escape rural poverty, unemployment, famine, war, land losses and land degradation (Sawio 1994). Since the late 1970s, UA has been growing in many parts of the Third World. Expansion of cities is driven by economic growth and /or by migration from rural to urban and peri-urban areas as agricultural and rural employment opportunities decline along with the rural population. Social unrest, lack

of educational opportunities and medical facilities in rural area are also other factors in urban growth.

Today, UA is part of a world-wide trend. For example, United Nations statistics show that some form of agriculture is practised by 65 percent of Muscovites, 67 percent of Nairobi residents and 80 percent of the people in Kinshasa (Musa 1996; and Appendix 2). Currently, more and more people in the cities of the developing countries are trying to grow some of the food they need, although it is not much. World-wide, approximately 200 million urban dwellers are now urban farmers, providing food and income to approximately 700 million people (Mougeot 1994).

2.2.4 Types of UA and Their Importance

The main constraint facing UA is the availability of land. There is shortage of open spaces or land for UA in cities and towns. Here, urban agricultural land is associated with many problems. Some of these problems are security problems, that is, land used for UA is more likely to be rented or borrowed than owned and city authorities in many countries do not take pride in having their towns appear rural (Sachs and Silk 1990).There are different types of UA. Some of them are discussed below.

2.2.4.1 *Gardening*

At the international level, household and community gardens in urban areas were widely supported in the 1950s and 1960s by the Food and Agricultural Organization of United Nations(FAO), the United Nations Children's Fund (UNICEF) and other agencies (Oliver 1994). Some researchers suggest that in view of escalating urban food prices, an expansion of the practice of self-food cultivation in city gardens is important for the urban poor, not least in terms of improving their standards of nutrition. Urban gardening is thus seen not as a pleasant subsidiary activity but as a vital means for developing more productive and viable urban habitats (Rogerson 1989). This activity can play an important role in the health of families and the country could reduce its food expenditures (Asian Vegetable Research and Development Centre 1985). Although vegetables are important for health and generating income, they are expensive to buy. Therefore, it is advisable to grow them

in a home or community garden. In growing vegetables the most important things are: land, fencing, water and tools. Gardening may be a community or home type activity.

Home gardening:- home gardening is the garden of a household or family. Home gardening is important for improving nutrition or household food supplies and is mostly for consumption and some times for selling. The home garden can be used to raise fruit, vegetables, staple food crops, medicinal plants, and sometimes farm animals and fish. In most cases, there is a difference between wanting to home garden and actual practice by households. The reason for this is said to be lack of garden space and lack of time, particularly for urban dwellers. However, to increase the supply of fruits and vegetables by developing methods of producing and utilizing them in the easiest, most economic and effective way in backyard/ home gardens, research concerning garden pest control, planting systems, and inadequate urban space has to be done (Asian Vegetable Research and Development Centre 1988).This UA is particularly important in the developing countries where the food budget accounts for a much higher proportion of total family expenditures as high yields could have been obtained from small gardening areas (Sachs and Silk 1990).

Community gardening:- community gardening is the farming system which is associated with an open space that a group of citizens voluntarily manage for horticulture and other activities. Here, groups of people work together intensively to produce food for themselves and their community. The importance of the community gardens is to develop a sense of community through the development of individuals. Skill sharing, cooperation among members the production of food and raising of income are all important outcomes. Involvement in gardening may be important in providing points of common interest among members of the community, encouraging social interactions, increasing community cohesiveness and sharing resources.

2.2.4.2 Urban trees and forests

Social forestry is a broad term which comprises subjects such as agroforestry, farm forestry, community forestry, and general tree planting programmes. Some of the main points of importance of urban trees include shade, beauty, food, windbreaks, medicine, fodder, fuel wood, timber and soil fertility (Gouws and Zeyl 1994). Historically, urban forestry has not been widely supported. However, according to the Danish Forest and Landscape Research Institute (1999), a study of 439 Chinese cities in 1991 put their overall green space, including trees at 380 000 ha or 20 percent of their urban areas.

2.2.4.3 *Livestock production*

Livestock has served as a means of survival for millions of city poor (Cohen 1999). Livestock production is important in many towns and cities for economic and traditional reasons. Particularly, small livestock can be produced cheaply. For example, raising some chickens in Dar es Salaam and pork and poultry in major Asian cities are reported to be common and important. Hong Kong is also found to produce a majority of its poultry needs within the city. Nugent(1997) has shown that in the 1990's, livestock holdings in urban households has increased by about 17 percent. Paris and Rome on the other hand are known for their bee hives and sheep grazing as urban agricultural practices respectively. Many countries in Europe are also committed to UA. Rabbits are also raised in urban and suburban areas of Cuba and Hungary. Nearly 98 percent of Hungary's rabbit production is achieved in small scale enterprises (Bob 1998). Thus the rural tradition of householders keeping livestock is becoming common in urban areas all over the world.

2.2.5 Potential Benefits of UA

Currently, the understanding of the potential of UA to provide benefits to cities and towns is greater than the past. Many governments, NGO's and other agencies are beginning to support the activity. The problems facing the urban farmers tend to be resolved and the efficiency and yield increase. Smit and Nasr (1992) highlight the following benefits of UA:

Economic potential:- UA can play a role particularly in Third World countries by providing food and income to the urban poor.

Food security or nutritional potential:- UA could help the urban poor to produce food by themselves.

Potential of environmental quality:- sustainable waste management and improvement of environmental quality could be achieved through the activity of UA, that is, by proper use of waste and unused resources.

Potential of land management:- increasing biodiversity, green spaces and improving degraded lands play a role in improving quality of the environment and land management. In this case, land that can not be used for construction can be used for productive UA.

Potential for waste management:-as mentioned earlier, UA can play a great role in recycling solid waste and waste water and use them for the production of food which in turn improves the quality of the environment.

2.3 URBAN GROWTH AND ITS IMPACT ON UA

2.3.1 Growth of the World Population and Poverty

2.3.1.1 Population growth

The world's urban population is growing rapidly. In some cities more than 250 000 people are added to the total each year. As a result, the planners and managers of the cities of the developing world face an enormous task (Devas and Rakodi 1993). By the year 2000, over half of the world's population will be living in the urban areas. The current world's population of 5.9 billion is divided about equally between urban and rural areas. However, urban areas are expected to be greater in population around the year 2005. For example, currently, 57 percent of South Africans live in towns and cities and it is projected that by the year 2010, 73 percent

of the population will be urbanized (Dlamini 1998). It is explained that 75 percent of the total population of North America, Latin America, and Europe live in urban areas, while only slightly more than 33 percent of the population of Asia and Africa live in urban areas (FAO 1999). The rapid urbanization of many developing countries resulted in a large class of urban poor. There is an expectation that the global urban population will double in 30 years' time. However, the number of urban poor is expected to increase at a greater rate. The World Bank estimated an increase from 400 million to one billion urban people living in absolute poverty in the 1990's (FAO 1999).

Figure 2.1 compares the growth rate of developing with that of the developed countries. The problem with population increase is food supply.

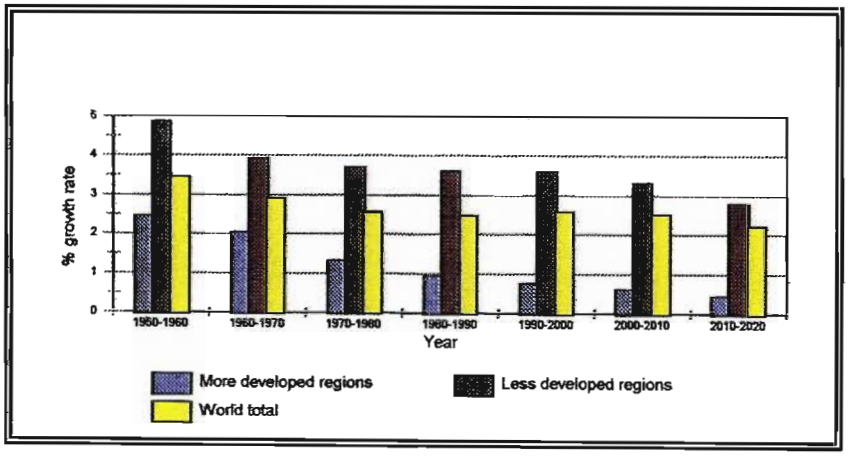

Figure 2.1 Average percentage growth rate of urban population (1950-2020)
Source: Devas and Rakodi (1993:3)

2.3.1.2 *Poverty / Hunger*

Poverty can be defined as the inability of a household or an individual to command enough resources to fulfill minimum standards of living and an inability to meet higher-order needs for personal fulfilment, recreation and freedom (Development Information Business Unit 1998). For example, in KZN, about 62 percent of people live in rural areas and approximately 40 percent of the households live in poverty. Hunger on the other hand is the result of economic incapacity of the poor to

purchase food rather than the absence of food in the market (Smit and Ratta 1992). The greatest challenges that Third World countries faced at the beginning of the 1990's was to end the poverty which affected over a quarter of their population. This is also true in SA, that is, poverty is one of the most widely experienced problems facing post-apartheid SA.There is a widespread and great degree of inequality even within black societies in SA. Rising poverty and unemployment have increased pressure on environmental resources as more people have been forced to rely more directly upon them. This is partly the result of unequal distribution of resources. FAO study explained that by the year 2000 there will be 117 countries capable of producing enough food for one and half times their expected population. However, 64 countries with 1.1 billion people will not be able to satisfy their own food requirement (Janeiro 1992).

2.3.2 Role of UA in Food Security, Health and Nutrition

2.3.2.1 What is Food Security ?

Household food security can be defined as access by all people at all times to the food needed for a healthy life. In order to meet these needs, adequate food supplies both at the national and household level are required. A city that produces its own food is more nutritionally self- reliant than others that do not. To attain food security, rapid growth of food production is important. However, since 1970, African food production has been estimated to grow at roughly only half the rate of growth of population and it is said that a large share of the urban poor households' income is already used on food and fuel, and household food insecurity has been worsening in recent years in the region (Dubbeling 1999). Food security unlike food self-sufficiency, involves both the availability (supply of food) and access to food.

2.3.2.2 Role of UA in food security

To address food security, it is reasonable to examine the existing food systems and ways to improve the availability and accessibility of food for city dwellers. According to UN, and FAO, UA can help solve the problem of hunger, especially for the urban poor who spend a great percentage of their income on food (Musa 1996).There is a

growing consensus that home gardening combined with nutritional education can be a viable strategy for improving household food security (Drescher1997).

When UA and peri-urban agriculture is effectively undertaken, it can significantly reduce food insecurity. This means, it could increase the quantity and quality of food available. Poor urban dwellers often have no capacity to buy enough food. Therefore, UA can play a role in reducing food insecurity by providing direct access to home-produced food to households and to the informal markets. In this case, although most produce of growers of UA is for their own consumption, some also sell and get additional income. Morever, it could also enhance the freshness of perishable foods reaching urban consumers, increasing over all variety and nutritional value of food available. UA food production takes a variety of forms making ingenious use of space, closeness to equipment, facilities and markets, water, soil and waste resources. It also provides a means whereby poor city residents can improve their food security or living standards. This means that it will not serve well as the exclusive food supply for urban families in most instances.

UA makes a significant contribution to food self- reliance in many main cities and towns. With a little support, it provides a significant share for the needs of the city dwellers and the quality foods they depend upon. These days, UA is recognized as an important part of the urban informal sector. This is because it provides income, or income-substituting food to a significant number of urban residents (Tinker1994). For example, six large Chinese cities, produce more than 85 percent of the vegetables consumed within their municipalities; Hong Kong uses 10 percent of its total land to produce 45 percent of its fresh vegetable demand, 68 percent of live chickens consumed, and 15 percent of the pigs; Singapore grows 25 percent of the vegetables consumed by its population and 80 percent of its poultry demand; Uganda produces 70 percent of its chicken products and eggs (Appendix 2).

The above statistics suggest an important and expanding role for UA is food security: approximately 25 to 67 percent of the urban and peri-urban households in the world are involved in UA. One of its advantages is that it can be done part- time and by women, children and the old (Urban and peri-urban agriculture 'No date').

2.3.2.3 Role of UA in health and nutrition

In UA, home produced food can improve the quality of the family's diet and may provide the more expensive components of the meal such as meat and vegetables which in turn play an important role for the health of the urban poor.

Generally, the urban poor particularly, pre-school children and pregnant and lactating women, are the most affected by food scarcity and are the most disadvantaged of all the groups with serious nutritional deficiencies. In the world, nearly 800 million people do not get enough food, and about 500 million people are chronically malnourished (United Nations Development programme 1995). In this case, UA, if carefully planned and supported by government policy, can play an important role in reducing the above mentioned problems (Oliver 1994).

2.4 ENVIRONMENTAL ASPECTS

2.4.1 UA, Environment and Sustainability

Third World countries are faced with severe environmental problems rooted in rapid urbanization and the lack of local resources and the ability to manage the urban environment. Local Initiative Facility for the urban Environment (LIFE) recognises the critical role that Transitional Local councils (TLCs), NGOs and CBOs play in establishing development programmes to tackle the problems of the urban environment. It assists Third World countries to generate replaceable models of improving the living conditions of the residents in low-income urban settlements (Arrossi *et al.*1994).

UA has the potential to improve the environment of the cities or towns through greening, reduced temperatures and air pollution and increased bio-diversity. In other words, it can help cities and towns develop a sustainable ecosystem by recycling waste. The use of organic fertiliser in UA can help to decrease costs of buying artificial fertilizers, improve environment and in the development of a sense of community, as neighbours cooperate in the establishment, management and supervision of community owned garden plots. Urban nutrient recycling programmes may also lower

input costs and the costs of food processes which could decrease costs of producers and consumers and improve the environment. UA could also enhance bio-diversity as urban crops and crop lands could attract a greater variety of birds and animal life. It is also important in sustaining a range of new industries and employment opportunities in and near cities. This includes compost production, seed supply, marketing and distribution, farm consumer cooperatives, exchange trading systems and farm work itself. For the above reasons, UA makes sense on environmental, social and economic grounds (Ress 1997). Some issues which could play an important role in environmental quality are explained below.

2.4.1.1 Urban greening

The quality of the urban environment is an important factor. Urban greening can play a very important role in supplying the urban poor with employment, food and income and in protecting the environment. According to Addo and Jaganyi (1999), greening means an integrated city- wide approach to the planting, care and management of all vegetation in a city to secure multiple environment and socio-economic benefits for urban dwellers. The urban poor are the ones who are often faced with the greatest exposure to urban environmental hazards. Urban greening programmes support community gardens in the city and help neighbourhoods develop and carry out open space plans (Open Land Project 1999).

2.4.1.2 Compost

Quality of soil is a very important ingredient for the success of urban agricultural projects. Hence, convincing city people to turn scraps of food and garden waste into soil nourishing compost is a good and efficient project. Turning all urban organic waste back into crop nourishing humus helps to enrich the soil for growing good crops and to hold more water. It is advisable to use compost for vegetable gardens. Compost can be made from kitchen waste, grass and weeds, leaves and manure and is the best fertilizer for vegetables (City farmer, Urban home composting 1999). Community composting is where a group of people in a local community pool organic materials to recycle large amounts of waste in order to make large amounts of compost. Community compost has environmental benefits (decreases pollution),

social benefits (involves people) and economic benefits (marketing compost for selling) (Community Composting Network 1999).

2.4.1.3 Waste and its role in UA

Traditionally, waste was viewed as just that but not as a resource. However, recycling wastes can play a significant role in UA and in the quality of the environment. In many cities and towns water shortages and the contamination of water sources are common. If waste is managed and used properly, this waste can have great importance in producing vegetables and in increasing the availability of fresh water for other purposes such as drinking, and cooking. Solid waste could also serve as a source of soil nutrients, that is a significant input into sustainable agriculture. Many cities in developing countries have already used this resource. It is said that about 10 percent of the world's population currently eats food that is produced using waste water (Smit and Nasr 1992).

2.5 ECONOMIC ASPECTS

As is seen earlier, UA has a potential to play a role in increasing income. It becomes a means of survival and makes an important economic contribution to the household budget particularly where there is extreme poverty and critical shortages of food.

2.5.1 Income Generation, Saving and Employment

Income generation:- UA can increase household cash income. For example, in Bolivia, urban food projects supply women producers with 25 percent of their total income. In Dar es Salaam, UA generated incomes were larger than regular salaries for 67% of respondents. In Addis Ababa, all urban cooperative farmers showed incomes well above those of half the city's employed population. In Nairobi, Kenya, 47 percent of the city farmers had no visible means of support other than their UA (Mougeot 1994).

Saving:- UA helps in saving income for some urban farmers at present. In Addis Ababa, the capital city of Ethiopia, the household consumption of vegetables by co-operatives was said to be 10 percent greater than the urban average which enabled them to save 10-20 percent of their income. In Dar es Salaam, the lower income

group spent 77 percent of its income on purchasing food and the home- cultivation supplied the equivalent of 37 percent of their income and saved them 50 percent of their expenditure in food. In Maseru, Lesotho, on the other hand, high income producers were found to save 29 percent of their expenditure (Mougeot 1994 and Webb 1998).

Lower income households in many large urban areas spend more than half of their incomes on food. As a result, any saving on food expenditure translates into a significant portion of the income available for other non food expenditure. It can also have energy saving implications as it can cut travel distance significantly (Smit and Nasr 1992).

Employment:- the activity of UA is labour intensive. Since it does not require special skills, experience and training, it could create job opportunities for the unprivileged sections of the society. For example, the combined household and cooperate strategy of the urban producers in Addis Ababa has created full- time and part- time employment for the community, that is, full-time employment for the heads of the households and their spouses and part time employment for the children and other members of the households (Egziabher 1994).

2.5.2 Opportunities, Costs and Constraints

As is seen earlier, UA has a potential to play an important role in the lives of urban people in general and urban poor in particular if used properly. But it might cause problems to the environment if not practised wisely. Its opportunities, costs and constraints are explained below.

Opportunities:- some of the opportunities here are less need for packaging, storage and transportation of food; market access to fresh food for poor consumers; availabilities of fresh, perishable food; relatively low marketing problems; ability to contribute to community development, possibility to reduce crime levels and ground water pollution (Sachs and Silk 1990).

*Costs (Risks):-*UA is criticized for its potential negative effects. For example, it is said that malarial mosquitoes breed in maize grown in East African towns. Besides,

livestock left to wander may add to urban squalor. Similarly, increased competition for land, water, energy and other resources and pollution problems such as odour from animal wastes are also other negative factors (Tinker1994).

Constraints:- the constraints in this case can be seen at different levels. At household level they include insecure land tenure, crop theft, lack of farming knowledge, and lack of inputs (such as labour, capital tools and water).

At community, local or regional level:- competition for land use and conflicts in urban open spaces; legislative or administrative problems (lack of clear regulations) to guide UA development, environmental degradation, poor perception of the importance and role of UA in the ministry concerned; lack of support (generally, urban farming lacks support from extension services, policy makers researchers etc.); lack of access to resources (farmers lack access to land, solid waste, waste water, credit, inputs, market information and extension services); lack of developed market distribution systems, and lack of information and awareness (Oliver 1994 and Robert 1998).

2.5.3 Economic Significance and Efficiency

A 1991 survey in East Africa, indicates that two out of three families were engaged in UA activities (Smit and Ratta 1992). Furthermore, in Latin America, particularly, in Buenos Aires, about 20 percent of the nutrition needs of the city is produced by part time farmers; 18 percent of China's largest cities produce more than 90 percent of the vegetable demand and greater than 50 percent of the meat and poultry; Bamako, Mali became totally self-sufficient in horticulture products, and exports (Oliver 1994). In some countries across the world, 25 to 75 percent of urban families are engaged in food production full or part time. In contrast to rural agriculture, UA shows a higher yield per unit of space, a higher need for labour and a lower requirement for capital and it carries lower risks. It also presents farmers with the challenge and opportunity to become market-makers (ability to influence market) (Sachs and Silk 1990). The efficiency of UA can be explained by different factors. Some of these factors are the following:

Horticultural production (especially vegetable production):- this is much practised around cities in developing countries as an informal activity by poor city dwellers. The possibility of year round production, short harvesting time and high production per unit area make vegetable gardens important sources of food.

Effective use of resources:- productive use of under utilized resources, such as vacant land, treated wastewater and recycled waste, and unemployed labour is another real efficiency of UA. In addition, UA links farm cultivation with small scale enterprise, such as street food stands, fresh milk outlets and maize roasters.

2.6 EXPERIENCE OF URBAN AGRICULTURE

2.6.1 Asia

The greatest growth in production and marketing systems of the 20th century for UA are found in and around main Asian cities and towns (Egziabher *et al.* 1994). The introduction of UA in several Asian cities is an indication of government policy to include it as a basic part of the urban economy. Here, the need to plan for food production as part of the economy of Asian cities is seen as an essential aspect of creating sustainable urban development in terms of resources and ecology. However, the incorporation of UA into urban planning has been uneven across Asia. That is to say many Asian cities neglect the use of UA. On the smallest scale , home gardens are encouraged in the urban areas of several countries as part of broader national programmes which are aimed at developing food self-sufficiency (Rogerson 1989).

2.6.2 America (Cuba)

The breaking up of the Soviet Bloc in 1989 put Cuba into the worst economic crisis of its history. The cost of inputs became very high as conventional agriculture was highly dependent on imported inputs from the USSR. As a result, food production was heavily damaged in the country. The only solution was found to be to use local resources and inputs to run UA. In this case, the government committed itself to making unused urban and sub-urban land and resources available to urban farmers. By 1994, a spontaneous decentralized movement of urban residents joined a

planned government strategy to create over 8 000 city farms in Havana alone. As a result, in 1998 an estimated 541 000 tones of food were produced in Havana for local consumption which has improved food availability. This new planning, laws and regulations, placed the greatest land use priority on food production (Murphy 1998)

2.6.3 Africa

Since the late 1970s, UA has been growing in many developing countries in terms of numbers of practitioners, space used, contribution to household welfare and urban economies in general. Recent studies show that the growth of the Urban Information Sector and the growing contribution of farming to both informal and formal urban employment in Africa is great. Today, UA within African cities has become a very important activity. The advance of UA throughout Africa has occurred often in the face of negative actions by local authorities. Despite its widespread use for consumption, urban food and livestock production is usually not appreciated by urban authorities and certainly not planned for and supported. It has recently become an alternative urban food strategy that could be employed in alleviating some of the impacts on urban poor. Informal economic activities offer an opportunity for women to earn and retain autonomous control over their income (UA in Kampala, Uganda 1994). Some researchers suggest that in certain parts of Africa, the practice of UA is not merely confined to the poorest strata of households. However, it must be conceded that in most African cities, UA is overwhelmingly a survival strategy adopted by the poor to reduce their vulnerable condition in urban areas (Smith 1998).

2.6.3.1 Cameroon

In the past, environment and health officials were under the misconception that UA was useless and a breeding ground for rodents. These days, however, many Cameroonians are practising UA and spend their time after work and during week-ends working in their gardens (Cameroon UA 1996).

2.6.3.2 Uganda

Although small groups of commercially-oriented farmers are present, UA in the city is used as a source of income for household consumption. Technically, the practice of UA in Kampala is said to be illegal. Generally, in the lowest income group, farming contributes directly to household food security. However, among the high income groups indicators of food security are not significantly different, but the amount of cash spent on food is less (Maxwell 1994). UA in Kampala is largely a strategy of urban women who come from low-income households and do not have access to sufficient money to guarantee access to food for their families. Although food from farming is not a major source of food for the household, it constitutes one important additional source. UA is practised more for cultural reasons than for economic reasons. This is mostly true for non commercial urban farmers in Kampala. Although farming is a hidden activity, it is a successful food security strategy of urban women (UA in Kampala, Uganda 1994).

2.6.3.3 Kenya

Nairobi is probably one of the best examples of cities in developing countries in which the relatively detailed study of informal UA has been undertaken (Rogerson 1989). Activities of urban farmers are observed almost all over the city. It is said that 77 percent of urban farmers in Kenya produce entirely for their own consumption. UA is the most important activity for mostly the poor and unemployed women in the Kenyan capital. In short, the main reason for the adopting UA in Nairobi is to minimize hunger and malnutrition. However, urban authorities in Kenya perceive informal UA as part of the broader embarrassment of the problems of the informal sector.

Although UA is widely practised in Nairobi, there is no positive government policy toward it. Generally, cultivation of public land is illegal, however there is some tolerance to the activity. The main reason for aiding UA in Kenya are: (1) To help migrant families support themselves. (2) To help communities without formal education and without other skills and (3) To increase the supply of food and create jobs (Rogerson 1989).

2.6.3.4 *Central and Southern Africa*

Gardening and cropping activities in Lusaka, Zambia receive very little support from local authorities. Most often these activities are prohibited by the city councils. Similarly, the relationship between UA, food production and the urban environment has been greatly ignored. Here, women play an important role. They produce staple food and vegetables in the wet and dry seasons respectively. In this case, micro farming is the one activity which contributes to household food security in town directly by providing food, and indirectly by generating income. In Lusaka, as with many towns in southern Africa, UA is important to the urban poor since it provides the very basic necessity of life, that is food (Rogerson 1989).

2.6.3.5 South Africa

The situation of UA in SA is evidently closer to that in other developing African cities than to the extended metropolis of Asia and other parts of the world (Rogerson 1989). Its potential is likely to lie in assisting the country's urban poor.

UA is a new strategy for managing poverty in South African cities, and it is an environmentally friendly way of promoting sustainable development, supplementing low incomes and making more and cheaper food available to the urban poor (May and Rogerson 1994). In urban fringes of SA cities, different crops such as garden plants, vine production, lawn, fruit, specially sub-tropical fruits such as mangoes, papayas and bananas, fresh vegetables and sugar cane are reported to grow (May and Rogerson 1994). Community vegetable gardens have also been set up by organizations such as local governments and NGO's in some South African towns and peri urban areas such as ELEC, WFC and ATC (In PMB) and Botha's Hill in KwaZulu-Natal; Montagu and Ashton in the Cape. But these vegetable gardens are limited (South Africa's food gardens 1995 and the data obtained from the field work).

2.7 POLICY AND URBAN AGRICULRURE

Despite the real potential benefits of UA, its value was underestimated, disregarded and was not understood by researchers, urban planners, decision and policy makers (Egziabher *et al.* 1994). In other words, most UA still remains largely

unrecognized, unassisted, or discriminated against, even in years of food shortage, the claim being that urban farmers are unsightly and that UA promotes pollution and illness (For example, water borne diseases due to chemical contamination). Because of its fragmentation and diverse nature, UA gets little support and attention from most national governments, developers, planners and NGOs. Planners' lack of interest in UA is because it remains in the informal sector which is largely unrecorded in economic statistics.

According to Mougeot (1994) and Tinker (1994) however, governmental and NGO's around the world are creating agencies to manage UA and have started to encourage the activity. The Greater Enendale Environmental Network (GREEN) and the Institute of Natural Resources (INR) at the University of Natal, provide local examples of such support agencies.

Hunger and poverty reduction through UA is being found to be increasingly efficient, productive as well as profitable if policies and programmes from government and NGOs are in place (Ratta and Smit 1993). In the case of UA, there is competition for resources like land, water, labour, energy with other priorities. There is also a possibility of improving the city environment if food production and forestry are handled properly. Thus optimal management of urban resources requires land use planning. Quantitative and qualitative measures of UA, for example soil type ecology, slope steepness, cultivation plot length, crop type, cultivation method used, maturity of crop stand, rainfall, amount of soil erosion and level of environmental pollution are some of the vital factors in policy development for the management of urban agriculture in ways that minimize its potential negative impacts (Bowyer-Bower 1995). Recently, in many African countries ministries of local government affairs and agriculture, health and nutrition agencies, urban municipality and urban district councillors have become more tolerant although they are not particularly supportive of UA (Mougeot 1994).

In conclusion, several sources in the literature cited showed that the best policy interventions are those that permit rather than deter UA. However, the policy impacts need to be investigated (Smith1998). The relationship between government, NGOs, local people and information on UA plays an important role in determining UA policies. This situation is explained below.

2.7.1 Indigenous Knowledge

Indigenous people have practised agriculture for thousands of years. In doing so they have developed knowledge and understanding of how to survive. This knowledge and understanding is commonly not shared by developers, or researchers and planners. Relief agencies often offer communities pre-determined plans, developed without the full participation of the community. Many developers and policy makers do not attach great value to indigenous knowledge. However, equitable and sustainable development can be achieved if users of the resources are involved in the planning process (Adzobu 1995). In general, the true face of participation is the one which encourages the indigenous knowledge to be used in the process of decision-making in the project as well as to influence how resources are used and how choices are made concerning what could be done and what role external agencies can play (Arrossi *et al.*1994).

2.7.2 Urban Development Programmes

In most Third World countries, urban development programmes are helped and implemented by government and NGOs. The main aim of UNDP is to promote human development in urban areas, and urban poverty alleviation ; also to provide the poor with infrastructure, shelter, and services; to improve the urban environment; to strengthen local government and administration; and to promote the private sectors and NGOs. Third World countries are suffering from several environmental problems particularly in relation to rapid urbanization and the lack of local resources and of the ability to manage the urban environment. To solve these problems, NGOs, TLCs and CBOs in co-operation with the local people, can play an important role by establishing development programmes to tackle the problems of the urban environment. LIFE provides grants for small scale projects by NGOs, CBOs, and the TLC that deal with urban environmental problems. LIFE also helps developing countries in improving the living condition of the residents in low-income urban settlements (Arrossi *et al.*1994).

2.7.3 Information About UA

Since people have been living in cities, small but highly valued quantities of food have been grown in cities. However, information on UA has been hard to find.

Nevertheless, a number of publications have started to come out recently (City farmer (international urban agriculture) 1996; Sachs *et al.*1990; and Appendix 2). Currently, there is a growing body of data on the importance of UA (Mougeot 1994; and Sachs and Silk 1990).

Through the growing international literature, UA is viewed more as a resource than a problem and the need is realized for comprehensive land use plans which incorporate food production and socio-economic factors, for the promotion of a productive agricultural sector, which encouraged other informal activities. Nevertheless, much more site specific information and analysis on urban agricultural practice is important to inform governments and policy makers about the potential importance of UA and how to overcome and address the obstacles that hamper its growth and success.

2.8 THE STUDY AIMS AND OBJECTIVES

2.8.1 Aims

The main problems of urban agriculture in the Greater Edendale Area is that not much research has been done on the activity and its potential role has not been fully appreciated. This is the reason why not much information is available about the activity. As a result, there is no a clear policy concerning the activity. Hence, the aim of this study is:

- to conduct a case study about urban agriculture initiatives and their value to food production, income generation and employment creation in Greater Edendale Area.
- to undertake a study which stimulates interest in the potential contribution of urban agriculture to improve quality of life of the urban poor in Greater Edendale Area.

2.8.2 Objectives

Specific objectives were drawn up to achieve the overall aim of the study. These objectives are explained below:

- to examine the indigenous knowledge, management and record keeping of urban farmers,
- to examine access, ownership and availability and use of resources (factors of production),
- to assess the potential role of community gardens of the study area in food security, income generation, employment creation and environmental improvement by:

  -examining costs and income data and

  -determining the profitability and viability of the community gardens,
- to provide an initial critique of TLC policy and NGOs approvals of urban agriculture and their impacts on low income urban farmers and
- to provide and recommend suggestions for improving urban agriculture.

2.9 CONCLUSION

The chapter outlined the nature of UA. From the literature review it was realised that UA is not easy to define. It was also found that population is growing fast all over the world. This population growth has resulted in a lack of access to resources, lack of social facilities and services and has resulted in poverty and unemployment particularly in rural areas. Because of these problems, people have started to flow to towns and cities to get jobs and social facilities and services. The rapid population increase in towns and cities has also resulted in social and environmental problems (such as unemployment, resource competition, crime , poverty and hunger). In this case, UA has the potential to address these problems. However, if UA is not used properly, its negative impacts (such as chemical contamination, degradation, deforestation and pollution from livestock) might outweigh positive impacts. Despite the immense potential importance of UA, it has not been given the status which has been given to other activities by many governments, countries, developers, and policy makers. Morever, not much research has been done in this field. Nonetheless, some governments and countries have started to be tolerant although not supportive of the activity nowadays. For example, it is explained that UA is introduced in many Asian

cities which indicates the tolerance of the government to the activity. The activity (UA) is also seen all over Nairobi, and Lusaka, where it is explained to be the most important activity for urban farmers of the two cities.This means although there is no clear policy that supports the activity, it is widely experienced and practised. In South African cities many of the urban population are poor, nevertheless, UA is not widespread or common practice in the cities of that country.

The literature review helped the researcher to understand the problems and potential solutions to them of UA. Out of this, the aims and objectives of the study are drawn up to explain the potential role of UA in SA. This will be important as basic information to understand the socio-economic and environmental importance and value of urban agriculture of the area studied which could possibly help the TLC and other authorities create a good environment and formulate progressive policy on urban agriculture.

CHAPTER THREE: THE STUDY AREA

3.1 INTRODUCTION

The GEA is an integral part of the PMB -TLC in KZN province. This has not always been the case. To understand the potential for UA, there is a need to understand and identify the history, human and environmental dimensions of the area. Therefore, the aim of this chapter is to deal with these issues and hence, the background of the study area.

3.2 LOCATION AND HISTORY OF THE STUDY AREA

The GEA lies within the western section of PMB-TLC (Figure 3.1). This area includes areas such as Edendale, Willow Fountain and Mbali. It consists of approximately 8 600 hectares of land. The area lies about 10km south west of the central business district of PMB. Renaming of some areas as development units by the apartheid government played a role in making it difficult to understand the fabric of the township. For example, unit 15 is known as unit Q; unit 13 is known as unit N and unit BB; and unit 18 is also known as unit T (Butler and Harley 1993; and Maphanga 1997).

The GEA is a black township which is a predominantly residential area with few formal sector jobs. As a result, there is high competition for these few jobs. Most of the population travel daily from Edendale to the Central Business District (CBD) and its surrounding industries, which is about 10km from Edendale (Maphanga 1997). The urban agricultural projects reviewed in this dissertation occur within the GEA. Mbali is a relatively formal settlement with reasonable infrastructure. Edendale and Willow Fountain on the other hand are more informally settled and have poor infrastructure. People in the Willow Fountain area in particular, have been affected by civil and political violence due to the prevailing political tensions between Inkatha and African National Congress (ANC). Being affected by apartheid policies, the administration of this area has been difficult. It remains economically, socially and politically complicated (Butler and Harley 1993).

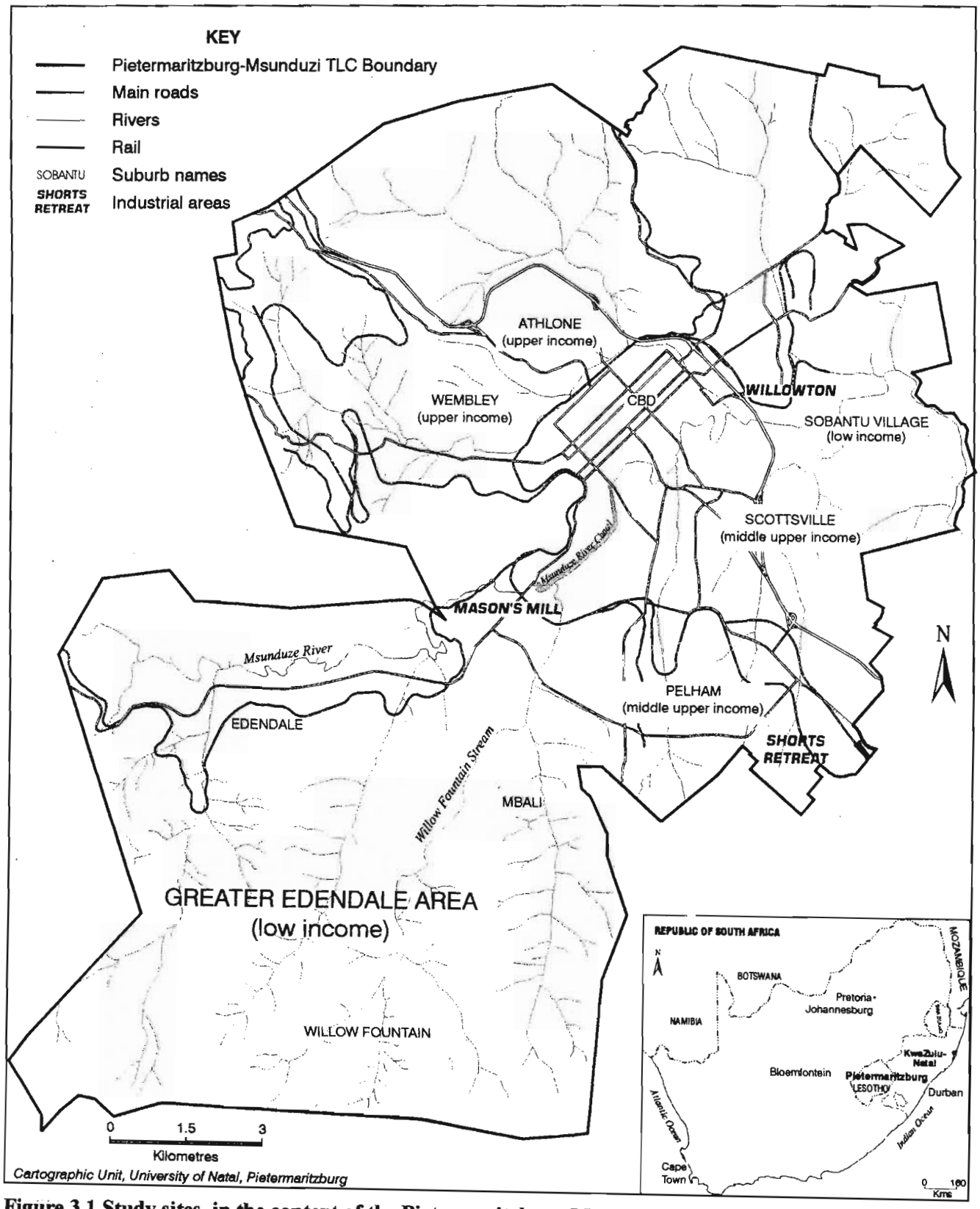

Figure 3.1 Study sites in the context of the Pietermaritzburg-Msunduzi TLC

Added to the apartheid policies which created the above problems, rivalry between political parties (ANC / Inkatha) has also created additional problems. As a result, the Willow Fountain area has experienced many problems, such as hostilities between races and parties, unemployment, resource competition, crime, poverty, and lack of land for agriculture (Maphanga 1997).

3.3 THE HUMAN SETTING

3.3.1 Population

It is difficult to obtain accurate population estimates for the PMB city in general and the GEA in particular. Estimates from different sources vary widely. For example, February 1989 report of the 'Republic of South Africa KwaZulu Development Project' estimated the population of Edendale to be 54 400. But the report by the RKDP, in April 1990, estimates only 20 000 for the same area (Butler and Harley 1993). The 1991 census also estimated the population of GEA, at 121 400 people. However, the City Planning Department estimation was 207 200 people which is over 70 percent difference. As a result, many investigations suggests that there is no source which is absolutely accurate (Integrated Planning Service (PTY) LTD (1998).

In general, the numbers of dwellings and population are much higher in the lower income areas. The majority of the population of the GEA are categorized under the lower income levels. Table 3.1 provides an overview of GEA within PMB.

Table 3.1 Dwelling units and population estimates by income levels in PMB -TLC 1998

Income classification	No. of dwelling units	Percent of Dwelling units	Population	Percent of Population
Upper	5 199	6	19 913	4
Middle	14 902	17	67 776	14
Lower	66 669	77	397 593	82
Total	86 770	100	485 282	100

Source: Integrated Planning Service (PTY) LTD (1998:13)

3.3.2 Settlement

Sixty six percent of the total dwelling-types of the GEA area are informal. Population growth, urbanization, lack of land and lack of development policies of the past are believed to be the causes for the number of informal settlers, many of whom have located on the flood plains of the Msunduzi areas of the GEA. The activities of these types of settlements can affect the environment through destroying the vegetation cover, soil erosion and through contamination of the water quality.

Table 3.2 Settlement types and population of the GEA

Total dwelling type	Formal		Informal		Population
	No.	%	No.	%	
39 754	13 439	34	26 315	66	238 524

Source: Data World, Consultant to the Masakane Project (January 1998).

There are essentially two different settlement types, that is the formally planned township (for example, Mbali) and the less planned or peri-urban areas (for example, Edendale and Willow Fountain) (Plate 2). Considerable difference is seen in the peri-urban area of Greater Edendale, between relatively planned areas such as Mbali and more spontaneous settlements such as Willow Fountain.

The specific quantitative value of the population densities of the study areas (Mbali, Willow Fountain and Edendale) was not found. However, according to Krige and Scott (1995), the population densities of some areas are as follows: KwaZulu-Natal (93 people per square kilometre), Ntuzuma and Umlazi (5 916 and 4 804 persons per square kilometre respectively) and Durban (1 674 persons per square kilometre). For PMB, including Willow Fountain, Mbali and Edendale, the population density falls within 51-500 persons per square kilometre. According to the researcher's observation, Willow Fountain has relatively lower population densities than the other study areas.

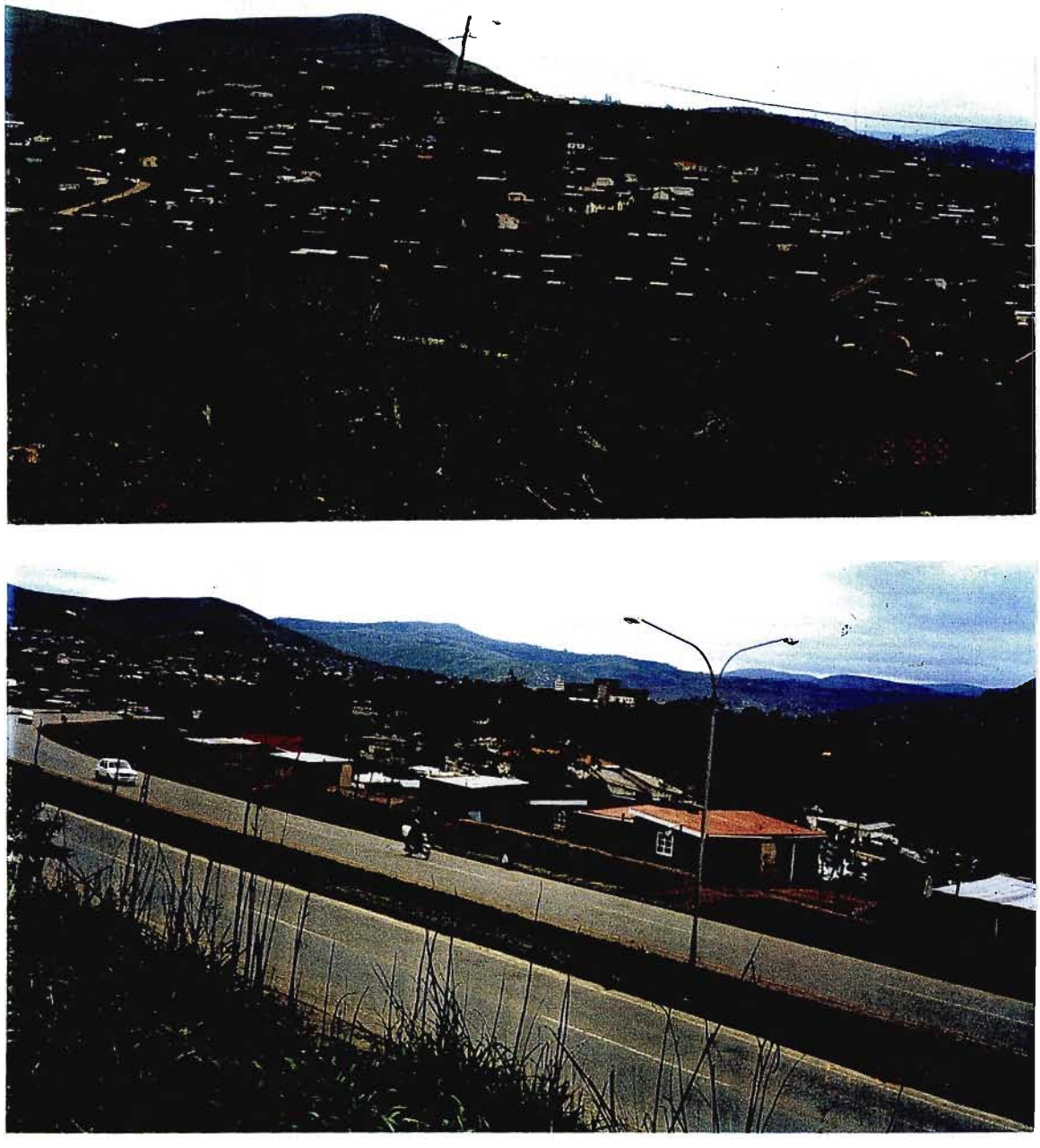

Plate 2 Different settlement pattern and housing types

Top scene: scattered settlement typical of that surrounding the Edendale Lay Ecumenical Centre and the African Tree Centre.

Bottom scene: formal housing also in close proximity to the above institutions and showing the main Edendale road in foreground.

3.3.3 Household Characteristics

According to May and Peters (1984), study of income and expenditure in urban Kwazulu -Edendale-Imbali, the average household size of the study area was 7 which was also supported by Mahpanga (1997).

3.3.4 Unemployment

According to the May and Peters (1984) study, a large percentage of the unemployed population in the GEA were women. The data also show that amongst the unemployed group, a greater proportion fell into the younger age group (15-34 years). Unemployment was more prone in the informal settlement areas than the formal ones (May and Peters 1984).

As is explained earlier, the majority of the population of the PMB area live in the GEA. However, the employment areas are situated outside of this area. In this case, the Central Business District (CBD) in 1998 provided the most jobs (25 000 or 56.8 percent) followed by Willowton industrial area (12 000 or 27.3 percent). Camps Drift/Mason's Mill and Shorts Retreat provided very few jobs (4 000 or 9.1 percent and 3 000 or 6.8 percent) respectively (Figures 3.1, and 3.2).

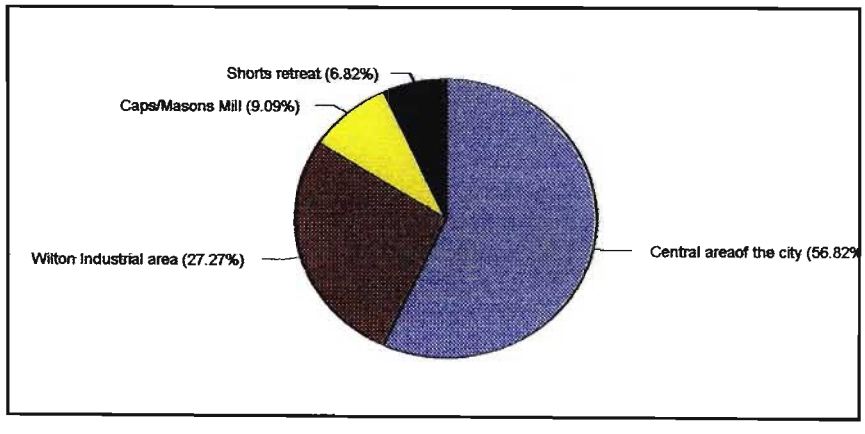

Figure 3.2 Employment areas and employment status in PMB -TLC in 1998

Source: Integrated Planning Service (PTY) LTD (1998:17)

3.3.5 Infrastructure (Transport and Housing)

The infrastructure of the study area was very poor, fragmented and poorly serviced and had not enough clinics, recreational areas, and sports fields. Morever, there was shortage of water and electricity in some areas (May and Peters1984 ;and Butler and Harley 1993).

3.4 ACCESS TO LAND AND AGRICULTURE

3.4.1 Access to Land

Land is a crucial and scarce resource in urban areas. The PMB city occupies an area of 24 846 ha, of which ± 17 821 ha is owned by the TLC and the state. The TLC has a policy that makes land available at R 200.00 per site in the case of PMB subsidized projects (Integrated Planning services (PTY) LTD (1998). The study of May and Peters (1984) shows that more than 68 percent of the people interviewed cultivated no land. But 15 percent were found to cultivate only garden plots in the township. Land plots were found ranging from 1 to 4 ha with the mean size 1.5 ha. According to the study of May and Peters (1984), most of the time land was not owned by all of the households in the study area. However, many more households were found to have more access to land than prior of the study times.

3.4.2 Agriculture

As a result of the small number of land holdings, subsistence production can be regarded as of marginal importance in comparison with wage earning activities in the GEA. According to May and Peters (1984), significant agriculture was not practised in the GEA. It was also explained that only some fruit or vegetables were sold. Generally, the agricultural activities in the study area were mostly for subsistence and did not have an important contribution to make to their cash. In the GEA, large and small stock units were found to be infrequently owned. Vegetables, fruit and poultry were doing relatively well in the area and were making an important contribution to subsistence activity (May and Peters 1984).

3.5 ENVIRONMENTAL ISSUES

In this section, climate, soils, water and flooding are dealt with and discussed as follows:

3.5.1 Climate

According to Maphanga (1997) and Laband and Haswell (1988), the climate of the study area is explained as follows.

The average annual rainfall of the study area is approximately 821 mm per annum (Laband and Haswell 1988). The area experiences extreme hot weather in summer and extreme cold and windy weather during winter times (Maphanga 1997). There is a steady increase in the mean annual rainfall total from less than 800mm in the drier South-East of PMB city to above 1100mm on the wetter North-West of the city. The reason is because of the remarkable change in altitude between the South East and the North West of the city. It has a latitude (30°S), and an altitude (658m at the City Hall). Remarkable variation of rainf all across the area have also been observed across the city (Laband and Haswell 1988). However, the mean annual rain fall (786mm) and the temperature ranges shown on Table 3.3 look moderate.

Table 3.3 Climate of PMB

Mean annual rain fall (mm)	Temperature (Degree C)			Heat units (base)			Evaporation A-pan (mm)	Sunshine (Mean annual) (Hours)
	mean	max.	mini.					
786	18.1	25	12	10 C	4.4 C	5.0 C	1 723	6.9

Source:(Anonymous, Document of KwaZulu Natal Department of Agriculture and Environmental Affairs).

3.5.2 Water

The PMB-Msunduzi TLC area is characterised by a relatively dense network of streams draining into the Msunduzi flood plain (Figure 3.3). There are 1180 km of, 19 reservoirs and 4 pump stations which serve 55 000 connections (Integrated Planning Services (PTY) LTD (1998). However, there is less water than needed in the GEA.

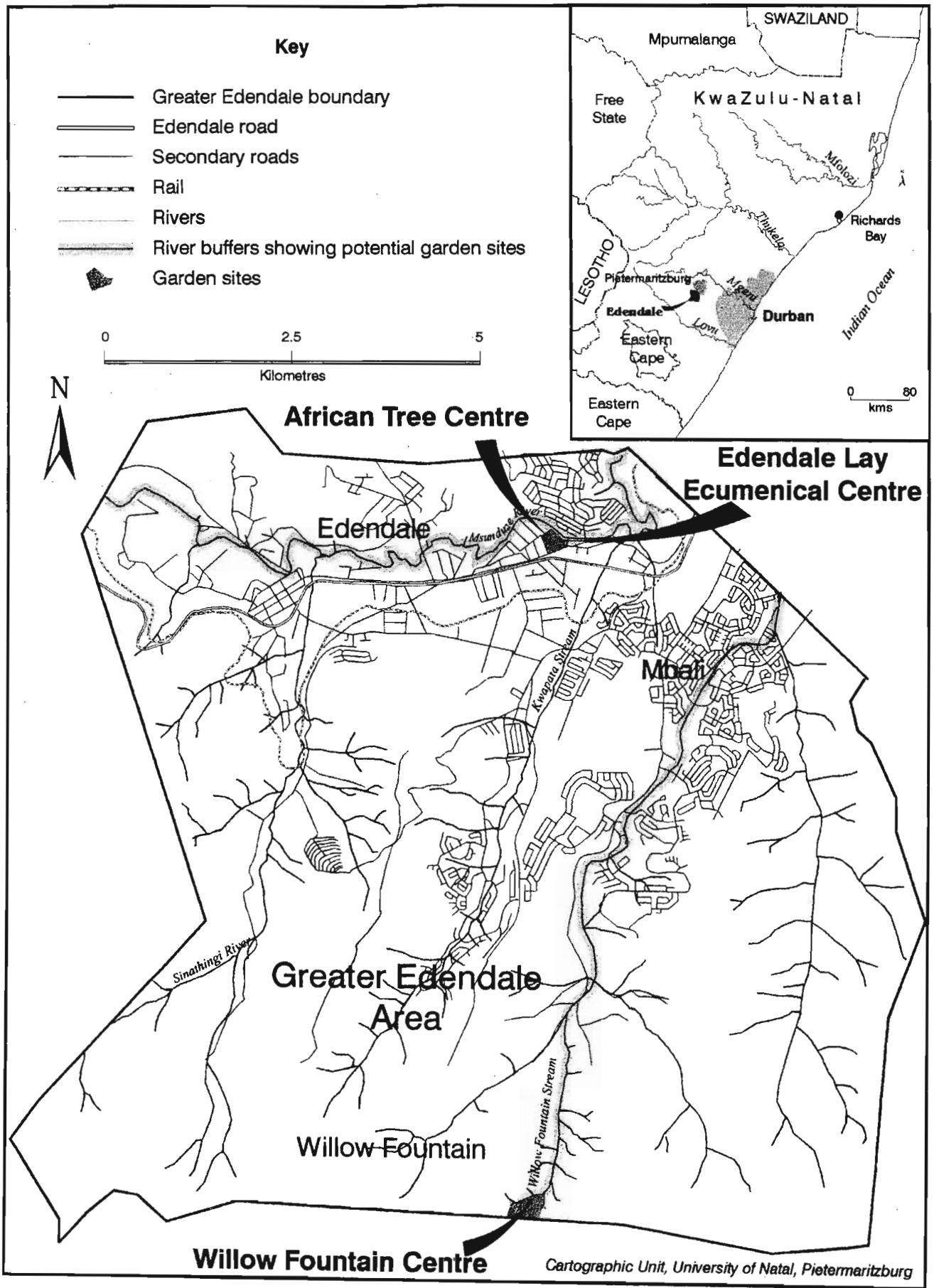

Figure 3.3 Study sites in the context of the Greater Edendale Area

Only some parts of the area have 24 hours' storage time capacity available. Residents are frustrated by the constant water cuts which always come without warning and with no temporary supplies. Umgeni water is the main supplier of major potable water which comes from Midmar dam, for this area.

Rivers and flood plains of the area have caused serious problems. Two issues of concern have emerged as constant problems: firstly, deteriorating water quality which impacts on human health and the ecological health and amenity value of this river network; secondly, repeated flooding, in the Edendale Valley. (Integrated Planning services (PTY) LTD 1998); and Butler and Harley 1993).

3.5.3 Flooding

Maphanga (1997), defines flooding as any high stream-flow which overtops natural or artificial banks of a stream. It is found that PMB has a long history of having flood problems. PMB in general and the Edendale areas in particular have experienced flooding problems in 1917, 1939, 1947, 1971, 1984, 1987 and twice in 1995 which brought devastating floods to the Msunduzi flood plain. Many of the city sport facilities which are located on the flood plain were also severely damaged.

Similarly, the flood of 1995 caused the death of nearly one hundred and sixty people, 583 people to be homeless and thousands of people to be displaced and some to be orphaned or widowed. The flood of 1995 was recorded to be the worst flood in the history of SA (Maphanga 1997). The damage due to flooding is not only to human beings, but also it causes soil erosion (Laband and Haswell 1988). The main reason for the huge human loss is believed to be because of the informal settlement of the people in the potential flood area. For example, in the 1993, between 50 000 and 100 000 South Africans have been settled within the flood plains (Maphanga 1997). Plate 3 shows that houses that are exposed to flooding problems.

Plate 3 Houses built on the flood plain within the Edendale valley

3.6 THE CASE STUDIES

There are about 9 vegetable gardens in the GEA. As it was mentioned earlier However, African Tree Centre (ATC), Edendale Lay Ecumenical Centre (ELEC) and Willow Fountain Centre (WFC) are the ones which are actively involved more in vegetable production and are doing well relative to others (Appendix 2, Table 1).

3.6.1 African Tree Centre

ATC is located outside PMB in the black free-hold settlement of Edendale (Figure 3.3). ATC as a community garden was started in August 1998. Its name is Siyaphila (ATC) which is a support group for people living with HIV / AIDS. It consists of 20 members, of which 16 are women. They started the project in July 1999. The size of the garden which was cultivated by the organization was only 20m x 18m (0.036ha). The main vegetables that were grown in the garden were: cabbage, spinach, choumoli, carrot, tomato, pepper, beetroot and turnip. Its main agricultural activities were vegetable production and keeping small livestock (poultry) for selling. But the researcher will deal only with the former activity (the vegetable production) due to the

financial and time constraints explained earlier. The specific aims of the centre are to give support and care to people living with HIV/ AIDS, to educate the communities in HIV/ AIDS and to help in capacity building for the infected and affected people (Anonymous document obtained from the ATC). Plate 4 shows the vegetable gardens at the centre.

Plate 4 The garden at ATC

3.6.2 Edendale Lay Ecumenical Center

ELEC is also located outside PMB in the black free-hold settlement of Edendale near the ATC (Figure 3.3). It is an interdenominational lay academy which was established in 1965. The total garden size for the vegetables and fruits is about 0.7 ha. The types

of vegetables grown in the garden include: spinach, beetroot, cabbage, choumoli, carrot, potato and turnip. Fruit types grown are: orange, mulberry, fig, plum, naartjies and peaches. But the study concentrated on vegetables. The center was set-up for different activities.

One of the activities is an agricultural programme. This programme was designed to train and educate people on how to utilize soil and other natural resources. The types of training given under this programme are the art of vegetable and fruit growing, fish culture and organic farming (Appendix 2). The aim of the centre concerning vegetable production is to train and educate people in agriculture so that they may be able to increase the agricultural production of their own gardens for consumption and selling and to create self- employment (Anonymous, document obtained from ELEC). Plate 5 shows the garden at ELCE.

Plate 5 The garden at ELEC

3.6.3 Willow Fountain Centre

Hadie (1998) stated that the Willow Fountain township has approximately 30 000 inhabitants and 5 000 dwellings with more than 60 percent of the people either unemployed or living from hand to mouth. It is also said that the area has been used mainly for agriculture. Fruits and vegetables are important crops in the area. Willow Fountain Garden (WFG) (Plate 6) is located in the GEA, outside the residential area of the Willow Fountain township (Figure 3.3). It was established in 1996 by 21 females and 4 men of the poor community of Willow Fountain. Its purpose was to produce vegetable crops for the purpose of consumption (to fight poverty) and for selling (to generate income). The main types of vegetables produced by this organization are cabbage, spinach, potato, carrot, beetroot, pepper and beans. The total area of the community garden is about 1.8 ha. Members are organized as an agricultural co-operative aiming to cultivate and sell vegetables communally, although it is still at an early stage. However, it had not registered as a bonafide co-operative (Anonymous, document obtained from GREEN).

3.7 CONCLUSION

This chapter discussed the background of the study area which is characterised by formal and informal settlements and some areas (such as Willow Fountain) are very scattered, which can make any development activities difficult. A significant proportion of the population of PMB, and the majority of informal settlement is found in this area which is also categorised as being a low income area with relatively large household sizes. Access to resources is difficult. Agricultural activities such as vegetables, fruits and poultry are practised in the study area although they are limited.

In conclusion, directly or indirectly, the apartheid policy together with the in-migration and natural growth of the population were the causes for the current problems of poverty, unemployment, unequal distribution of resources, poor social services and facilities as well as the flooding problems in the study area.

Plate 6 The garden at WFC and the Willow Fountain township

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 INTRODUCTION

Research design is a fundamental issue in any research project. It involves deciding on a method (s) to address the planning of the scientific inquiry, that is designing a strategy for finding out something. According to Babbie (1995), there are two major aspects of research design. These are specifying precisely what you want to find out, and determining the best way to do that. Thinking creatively in the research approaches, strategies and methods also helps to answer the research questions and objectives and helps the credibility of research findings and results (Saunders *et al.*1997). The aim of good research design and management is, therefore, to get the best results possible with the limited resources and time available.

The research field work was performed between August and October 1999. It was conducted by a student of the Centre for Environment and Development for the partial fulfilment of the requirement of the degree of Master for Environment and Development Faculty of Science and Agriculture, University of Natal.The research was paid for by the Ministry of Agriculture of the State of Eritrea via NORAD funding. Information such as the role of UA in the study area, perceptions of the people in the study sites toward UA, the role of government and NGOs on UA, the availability and use of resburces, and the strengths and weaknesses of UA was collected.

This chapter describes the research methods employed and the limitations encountered in this study for the data collection and analysis processes.

4.2 RESEARCH METHODS

Case studies of three vegetable gardens were chosen from the GEA, namely ATC, ELEC, and WFC as explained earlier. In this research project, secondary data were collected through a literature review, while primary data were collected through case study methods. These techniques or methods are discussed below.

4.2.1 Literature Review

This method focussed on reading books, journals, articles, reports and consulting records and documents, and websites. It covered wide areas related to UA. The intention here was to understand what has been written by other people about UA. This method together with initial visits to the study area played a role in defining the problem, identifying the study aims and objectives and designing the questionnaires.

4.2.2 The Case Study Approach

Robson (1993) cited by Saunders *et al.* (1997), defines case study as the development of detailed, intensive knowledge about a single case, or a small number of related cases. It is an important approach that could answer the questions,'why?' 'what?' and 'how?' It uses various data gathering methods. These include observation, analysis of documents and records, interviews, and questionnaires (Saunders *et al.* 1997).

A case study may be of one person, one group, one family, one classroom, one town or one nation (Bouma and Atkinson 1995). To collect the primary data, case study methods were used because it enabled an in-depth study of the selected vegetable gardens. The components of the case studies to collect the data, are explained below.

Personal observation, and informal interviews:- personal observation helped in gathering information and it is an important way of doing qualitative research. Its major advantage is that it remains flexible and the details of the approach are generally modified as the research proceeds (Bouma and Atkinson 1995). According to Nicholls (1995), observation is a highly effective method of in-depth study in a small community. In gathering the data, the researcher travelled into the study area on a daily basis as the study area was not far from the researcher's dwelling area.

A reconnaissance visit was made to the study area prior to conducting the structured interviews. During this visit, the aim was to make personal observations and conduct pilot interviews with some of the vegetable garden members (those who work in the garden) and officers (those who usually perform administrative or office work). These personal observations and pilot interviews provided a general view and idea of the

study area. This was important to restructure, reorder and make necessary changes to the draft questionnaire to reflect the issues of the study area.

Meetings and informal interviews with key informants:- key informants are individuals who can provide the required information, or ideas on a specific study better than the majority of the population under review. It is possible to collect useful information from only a few members of the community but who nevertheless have a good knowledge of the issues that need further examination. These people are called key informants (such as community leaders, school teachers, extension workers) and their opinions and evaluations are important (Nicholls 1995).

In this study, the key informants were drawn from the three organizations or centres. In the WFC, the chair-person and in the ATC and ELEC, the co-ordinators of the organizations were regarded as the key informants. The researcher was introduced to the three organizations and the key informants by the co-ordinator of GREEN, Mr. Sandile Ndawonde. Interviewing of these key informants was done before and after the formal interviews. Before the formal interviews, they were asked about the general situations of the vegetable gardens such as activity, type, and scope of the vegetable gardens; use and availability of resources, technical and financial sources; strength, and problems of the organizations.They were also consulted many times for clarification of some information after the formal interviews. The aim of the informal interviews with the key informants was to gain a general picture of the study area. The key informants could give a good deal of information within a short period of time and this was important in identifying problems, and reformatting the questionnaire.

Records and documents:- documents and records were consulted concerning the aims and objectives, cost of production, sales, price of produce, use of resources and other general information. However, the three organizations were found to be weak in documenting and recording their activities.

Structured interviews :-. two types of questionnaires were administered, that is one to the three officials (key informants) of the organizations and the other to members of the community gardens (members of the three organizations) (Appendix 1).

The questionnaires prepared for the organizations, ATC and WFC, were similar as they had similar aims and objectives, that is for consumption and generating income. Morever, both were community gardens and operated under similar conditions. However, the questionnaire for the ELEC was not the same as the aim of the centre is to use the garden as a demonstration field for training purposes. Due to the above differences, some questions were added to the questionnaire developed for ELEC. In similar manner, there were also some questions asked of the other two centres which were not included in the ELEC questionnaire. However, the difference between the questionnaires is not significant (Appendix 1).

The researcher planned to interview 50 percent of the members of each organization. In the WFC, it was done as planned (13 out of 25). In the ATC 8 out of 20 were interviewed as the researcher could not meet the members because of other commitments. Similarly, in the case of ELEC, 7 rather than 10 interviews were conducted. Nevertheless, the homogeneity of the members of these organizations means that those interviewed were likely to be representative of organizations.

In all cases, structured interviews were conducted face-to-face during this information gathering process. This was found to be valuable as the researcher and the assistants clarified the meaning on the spot of any unclear questions to the interviewees. It also allowed the researcher to clarify issues further whenever interviewees gave inadequate answers.

4.2.3 Processing and Analysis of Data

According to Babbie (1995), data processing is a process which involves the classification (coding) and the transformation of information to some computer format, or it is a process in which data are processed and transformed for quantitative analysis.

Data were collected, stored, presented, analyzed and discussed from which conclusions were drawn up and suggestions were made. After collecting the data, the quality of the raw data was checked for whether something important was missing or not, although checking was a continuous process during the field work. When found

necessary, missing responses and information were again collected by going into the field or through telephone conversations. The responses obtained from the structured and unstructured interviews and information obtained from observations were presented, described and analyzed qualitatively and quantitatively. In this case, manual and computer data analyses methods were used to analysis the quantitative and qualitative data as the data was collected through qualitative and quantitative methods. The full coding system was developed manually with the help of counting sheets, and by keeping count of how many times each answer type was repeated. Based on this, tables were generated, while findings that did not require tables and charts were presented in the form of explanation.

Some quantitative data in the form of tables was also processed using computer packages (Quattro pro). This soft-ware was used because it is possible to generate charts and graphs in full labeled forms and is relatively easy to use. Raw data was entered into the computer (Spreadsheet) (for example, Figures 5.1- 5.7), from which fully labeled forms of charts were produced for discussion and for drawing conclusions. Tables, percentages, averages and graphs were some of the simple tools used for describing information (Babbie 1995; and Nicholls 1995).

4.3 LIMITATIONS OF THE STUDY

This section deals with problems and short-comings encountered prior to and /or during the data collection process. The problems encountered or experienced are described below.

Respondents in the study area :- the people of the study area explained that they are tired of answering questions from different research workers almost on a regular basis. As a result, they do not show interest in answering questions. Had not the researcher been introduced to the community by the GREEN co-ordinator, it would have been impossible to conduct the field work. Respondents were also expecting something from a researcher when interviewed. Some of them also asked the researcher what benefit they would derive from the research work. The researcher was also dependent on assistants as he does not speak the local language (Zulu).

Research assistant:- research assistants were taken from the study area. They were chosen because they spoke the local language as well as English. They were also known and accepted by the people in the study area. They were trained for a short time on how to conduct the interviews as they had had experience in similar research assistant work in Sobantu and GEA. However, owing to many other commitments, the research assistants were erratic in keeping appointments and schedules. However, via careful assessments of questionnaires with them and going over all questionnaires at the end of a day with them ensured consistency in the way issues were raised with interviewees.

Documentation and records:- although one of the main objectives of the research was to undertake a cost benefit analysis (calculating the total cost and revenue so as to find the net benefit or cost, by subtracting the total cost from the total revenue), it was not possible to get reliable cost of production, production and sale records from the three organizations because they do not keep good records. The information on cost of inputs, price of out-puts, and revenue presented in chapter 5 as results are only estimations. Therefore, it was not possible to conduct a full and reliable cost benefit analysis.

4.4 CONCLUSION

The chapter outlined the methods and methodologies used in the study. In this case, it was explained that secondary data were collected through literature review while primary data were collected through the three case studies.The literature review was important in identifying the constraints and strengths of UA around the world and in SA.

The initial visits to the study area together with the literature review were important to define the problem and formulate and develop aims and objectives of the study. The structured and unstructured interviews and records and documents helped the researcher to understand the perception of the community members of the three organizations toward UA and government and NGOs. Observation on the other hand helped to gain a general idea of the areas.

In spite of the constraints imposed by time and the difficulties of keeping to the schedule of interviews, the researcher believes that the case study approach outlined provided a satisfactory basis for data collection.

CHAPTER FIVE: RESULTS

5.1 INTRODUCTION

The aim of this chapter is to describe and present the data obtained from the field work. It describes and presents the socio-economic characteristics of respondents; the role of UA; the access, use and cost of resources and the production and marketing of the case study areas.

5.2 SOCIO-ECONOMIC CHARACTERISTICS OF THE HOUSEHOLDS INTERVIEWED

The household head and household size, gender, age, work status, level of education and income level of people all play a role in determining their living standards. It is for this reason that information gathering on the socio-economic aspects of the people was found to be important.

5.2.1 Household, Age and Gender Situations of Those Involved in the Interview

Most respondents at ATC were females and they were household heads. On the other hand, all the heads of the households at ELEC were males and almost half of the respondents of WFC were headed by females. In ELEC and WFC, number of males of the total members of the household interviewed was bigger than females, but less in ATC. The mean and largest household sizes of the three organizations were 5 and 8 respectively. The majority of the household members in the three organization were found in the age range of 16 - 60 years (Table 5.1).

Table 5.1 Characteristics of household heads and sizes, age and gender of the households interviewed *

Organization	R N	TNHHM	Age distribution (age range)			Gender		Household heads		Mean size of H.H. members
			≤15	16-60	> 60	M	F	% of M H.H.H	% of F H.H. H	
WFC	13	72	13	53	6	38	34	46.2	53.8	5
ATC	8	38	16	19	3	12	26	25	75	4.8
ELEC	7	32	5	26	1	19	13	100	-	4.6
Total / Ave.	28	142	34	98	10	23	24	54.6	45.5	5

*M = male, F = female, H.H.H = household head, TNHHM = Total Number of house hold members

RN = Respondent number

source: Field work questionnaire case study data

5.2.2 Work Status

All the respondents in the three gardens explained that to find a job in the area is very difficult. Some people in the study area were self-employed and growing vegetables in their back-yards, keeping livestock such as chicken, cattle, and others. The ATC and the ELEC have employed labourers for their garden activities. However, the WFC was found to use family or its own labour (Figure 5.1). The number of unemployed people in the three organizations is high, that is higher than the employed people.

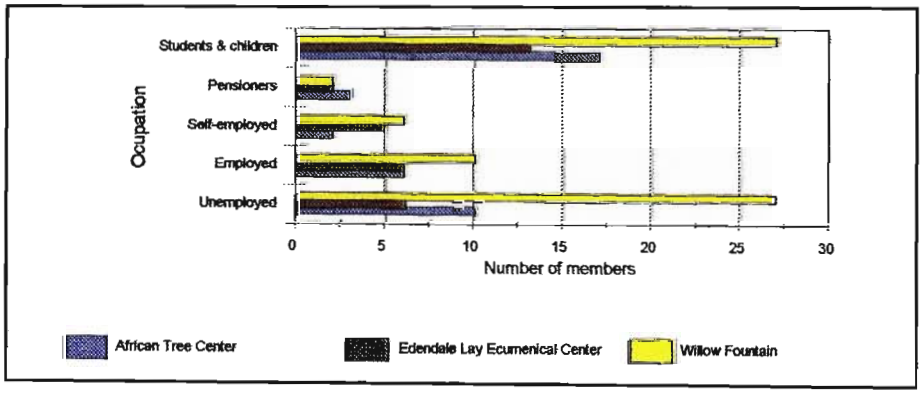

Figure 5.1 Work status and number of household members interviewed

Source : Field work questionnaire case study data

In the three organizations, students and children comprise the biggest number. Ten out of 18 in the ATC, 6 out of 17 in the ELEC and 27 out of 43 in WFC were potentially in the job market (currently unemployed) (Figure 5.1). The percentages of unemployment rates are (55.6), (35.5) and (62.8) in ATC, ELEC and WFC respectively.

N.B. Percentage of unemployment = [Unemployed / (unemployed + employed + Self employed)] x 100

5.2.3 Level of Education and Training

5.2.3.1 Level of education

Generally, the level of education in the study area was found to be low. In the three organizations, the majority of the members of the households interviewed, more than 50 percent, had levels of education between standard six and standard ten. In the ELEC no member was found with a level of education below standard one, but some members were found with a level of education greater than standard ten (Figure 5.2).

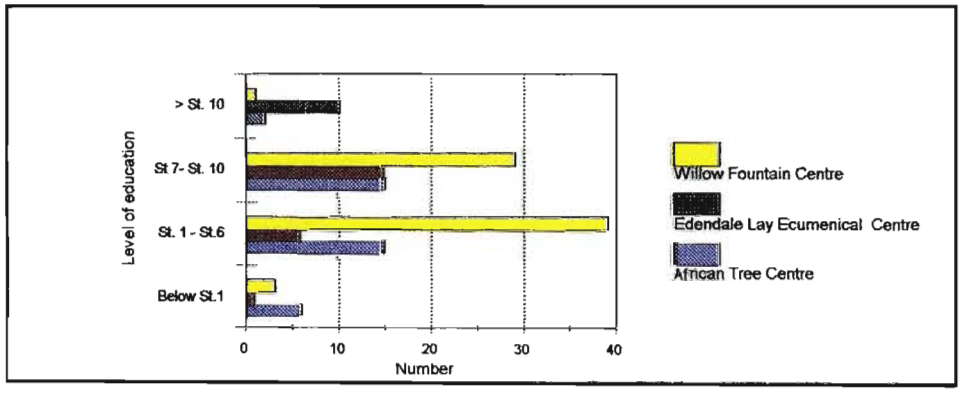

Figure 5.2 Level of education of the members of the households interviewed

Source : Field work questionnaire case study data

5.2.3.2 *Training*

Of the three organizations, formal training was given only in the ELEC. The training types this organization provides include an agricultural programme,women's programme, leadership, training and a youth programme (Section 3.2.3 and Appendix 2).

The training service was given to both men and women. The organization had trained 15 people in 1997 and 20 in 1998. But most of the people trained were men. For instance, 25 percent of the trained people in 1998 were women. Currently, only a few of the people who had been trained in the center were working in their own gardens. The others however were not involved in vegetable gardens although they knew the importance of the training, probably because of lack of finance and access to land. The duration of the training was found to range from 3 days to 5 months. Respondents explained that this training was helpful and relevant for them. The producers, who had started their gardens before their training explained that it helped them to improve their garden skills. All of them also explained that they would be happy if they could get further training.

5.2.4 Income of the Households

The household income of the study area is generally low. When respondents were asked if sales were increasing, most explained that it depended largely on weather conditions (drought, frost, etc.) and pest problems, quality of seed, price and cost of transport. For example, in the case of ELEC, it was found that the income of 1999 was lower than the income of 1998. According to the organization, the reason was because of unfavorable weather conditions. On the other hand, WFC explained that the production of 1999 was higher than the production of 1998 and hence the increased sales. The reason for the increase in sales was ascribed to the use of new seed varieties, winter planting, and due to training and motivation of members. However, ATC as a community garden, started only in 1999, so there were no comparative figures for 1998.

Eighteen out of 28 households were found to have an income per month of less than R 500. Only 10 households had an income greater than R 500 (Figure 5.3). In this case, 'income per month' of the households means the overall income obtained from all household members within a month. The main sources of the income explained in Figure 5.3, were found to be pensions, part time employment, self employment and full employment.

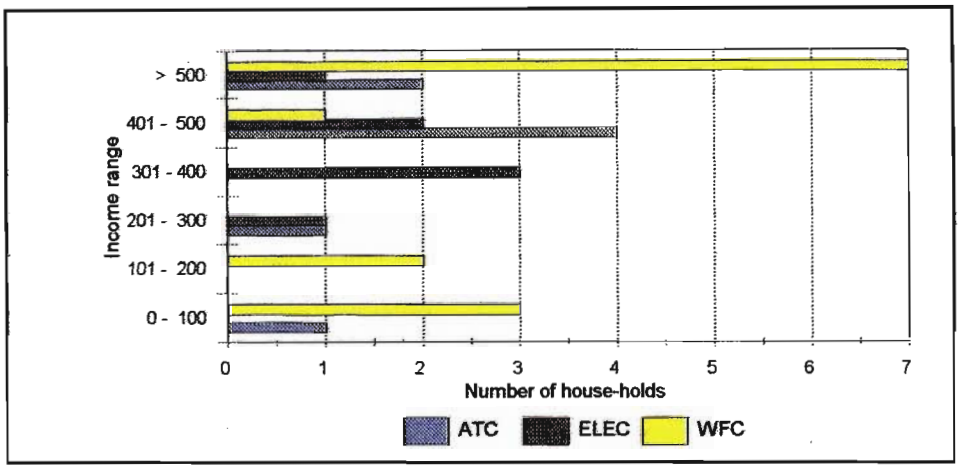

Figure 5.3 Monthly income range of the households interviewed

Source : Field work questionnaire case study data

The major part of the income of the households interviewed was spent on food and less was spent on clothing and other items. Most of the households did not save any money. The average money saved from all respondents of the three organizations was only 3 percent (Figure 5.4).

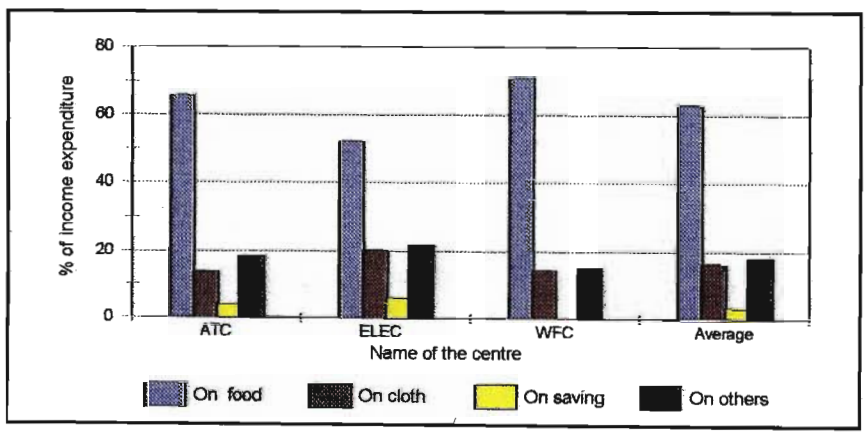

Figure 5.4 Average percent households' expenditure break down of the three organizations

Source : Field work questionnaire case study data

5.3 ROLE OF UA

5.3.1 Role of the Vegetable Gardens

Vegetable gardens were found to play an important role in supplementing the income of farmers in general and poor urban farmers in particular. The three organizations explained that their vegetable gardens helped them improving their economy as is explained in chapter two.They also explained that the vegetable garden played a role in changing the quality and quantity of their food. The types of UA that are best suited in the study area (including the case study areas) according to the interviewees were the growing of vegetables, fruits and the keeping of chickens. When respondents were asked whether they would rather do something other than vegetable gardening with a similar income if they could, 5 respondents out of 8 from ATC, all in WF and 6 out of 7 from the ELEC answered no. This shows the importance of the vegetable gardens to the producers.

In a similar manner, when respondents were asked, ' would you be happy to see many communal gardens established inside and at the edge of your township', the majority of respondents of the ATC, that is six out of eight and all respondents of the WF and the ELEC, answered yes. Their reasons for answering 'Yes' include to: increase production in the market so as to satisfy the demand and to supply enough fresh food at a fair price, particularly, to the poor people. Respondents learnt from the community garden to work together; to get to know others; to attract financial aid and to share resources, knowledge and experience.

5.3.2 Role of Livestock

Livestock was important for some households but not many were found to keep them. Four out of eight households of the ATC respondents did not have any livestock. But, four out of seven households in the ELEC had animals. Nine of the 13 respondents in the WFC had small and large livestock (Table 5.2).

Table 5.2 Livestock holding of the households interviewed ★

Types of animals	Organization								
	ATC			WFC			ELEC		
	No.	n	Purpose	No.	n	Purpose	No.	n	Purpose
Chickens	60	2	eat & sell	90	3	eat & sell	627	3	eat & sell
Cattle	-	-	-	46	5	eat, sell, lobola	2	1	Milk
Goats	-	-	-	28	3	eat & sell	-	-	-
Ducks	-	-	-	1	1	eat	-	-	-
Pigs	-	-	-	7	1	sell	-	-	-
Dogs	-	-	-	14	1	sell	-	-	-
Horses	-	-	-	3	1	power	-	-	-

★n = number of households that keeps the animal, No.= Number of livestock

Source : Field work questionnaire case study data

Chickens were kept by the members of the three organizations. This shows that chickens were relatively popular. The members of the WFC were also found to keep all types of livestock (Table 5.2). Factors such as money, culture, location or place, availability of water, grass and labour are some of the main issues that determine wether the households interviewed to keep or not to keep livestock.

5.3.3 Role of Government and NGOs and Their Relationships with the Local People

Generally, it was found that the TLC and NGOs did not play an important role in UA. Although some NGOs played a role in connecting funders and poor communities, their response toward urban agriculture in the three organizations studied was limited in relation to other activities such as social services and facilities. In general, the urban agricultural organizations explained that they got very limited technical and financial support from government and NGOs.

5.3.4 The Vegetable Gardens: Strengths and Constraints

The most common constraints or problems seen in the three organizations were: lack of land, lack of finance, lack of fencing and the pest problem. Lack of water and transport were also found to be major problems in the case of the WFC (Table 5.3).

In the ATC and the WFC, members of the community were asked to evaluate the problems explained in Table 5.3 and their response is explained in terms of number of respondents. However, the ELEC had no community members at its training centre, therefore, the problems they faced were commented on by a key informant ticking with (✓).

According to the organizations' and producers' belief, constraints besides those explained in the table above include lack of training , lack of capacity building, lack of government and NGOs' support, lack of facilities and equipment such as water pipes and working spades and lack of communication technologies.The potential possibility of increasing food security, job creation, income generation, fighting poverty, and the potential possibility of producing fresh food were described as some of the main benefits of vegetable production as was found in the literature review.

Table 5.3 Constraints or problems of the vegetable production

Type of problem	ATC	ELEC	WFC
	No. of respondents (Total No:8)	Key informant comments	No. of respondents (Total No: 13)
Price variability	8	✓	8
Damage by livestock	5		2
Transportation problem	6		10
Lack of land	8	✓	10
Lack of fencing	7	✓	8
Pest problem	7	✓	9
Theft and vandalism	5	✓	2
Climate problem	5		4
Communication problem	0		1
Lack of water	0		11
Lack of labor	5		-
Lack of knowledge	6		-
Poor soil condition	2		3
Lack of finance	8	✓	10
Lack of fertilizer	3		8

Source : Field work questionnaire case study data

5.4 ACCESS, USE AND COST OF RESOURCES

Access to and availability of resources in general is low in the study area. The three organizations had common as well as unique constraints or problems concerning resources. For example, lack of land, lack of finance, lack of fencing and the pest problems were found to be common to the three organizations. Although plate 6 in the garden of WFC shows some vacant spaces, members of WFC explained that they could not increase their garden as the land is owned by TLC. All respondents of the three organizations explained that access to land was limited and they were not satisfied with the land size they had. Water and transport problems were also significant in the WFC.

5.4.1 The African Tree Centre

5.4.1.1 Variable resources and costs

Seed:- the sum total of the seed cost was R 480 and spinach, turnip and cabbage were planted to a large area. A higher amount of money was spent on choumoli, cabbage and turnip (Figure 5.5). An area of 107 m^2 of the 360 m^2 garden was covered by vegetables during the study time. The other part of the garden was unplanted (it was under preparation to be planted). However, respondents could not give the amount of seed they use per area, the amount of production per seed or number of vegetables per area and they did not keep good records in relation to these information.

Fertilizers and chemicals:-this organization did not use chemicals and artificial fertilizer. However, it used compost and manure and this was bought from the local community. At the ATC, the use of manure and compost was rated as average.

Labour:- the organization employed one permanent labourer from among its members. All the necessary gardening activities were carried out by the employee (members did not work together as a group). When some of the respondents were asked why they did not work together in the garden, they explained that because they were not paid. But if they worked together, they could increase their product and share

experience and knowledge. Expecting some payment in return for working in the garden for their own benefits does not sound practical.

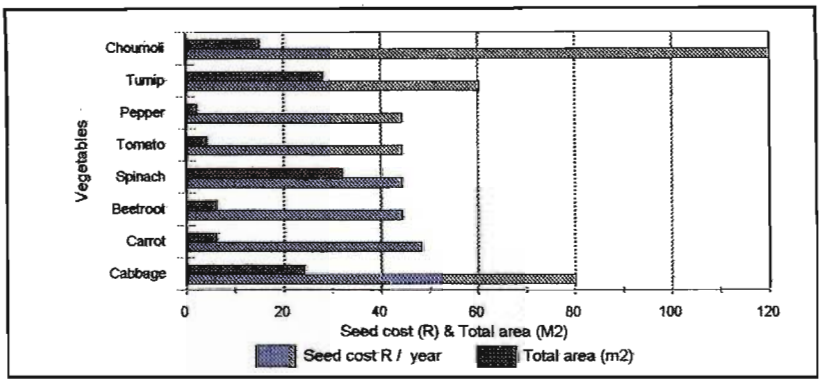

Figure 5.5 Seed cost and area coverage of vegetables at ATC

Source : Field work questionnaire case study data

Information in relation to seeds were obtained from the MacDonalds seed centre (Table 5.4). However, production of the vegetables per area was not possible to obtain. As a result, income per area (TR / M^2) can not be calculated. In this case, the price of seeds (such as price of tomato) for poor people is expensive to buy. But up-to 10 percent discount is possible for organizations like ATC, ELEC and WFC in the Macdonalds seed centre (personal communication Shangwe 2000). Therefore, it is advisable for these organizations to buy seeds to be benefitted from this discount, rather than individually buying seeds.

Table 5.4 Seed information (such as seed cost, seed / ha) at MacDonalds seed centre

Vegetable seed	Seed / ha		Price	Remarks
	Direct planting	Transplanting	(R / kg)	
Cabbage	2-3 kg	250 g	211	100g=35 000 cabbages=(1/2ha)
Spinach	10-15 kg	-	66	-
Turnip	2-3 kg	-	111	1plant = 1 plant
Choumoli	1 kg	-	210	-
Potato	25 x 90 kg	-	3	1 potato=16-19 potato
Carrot	2-3 kg	-	66	1 plant=1plant
Beetroot	0.5 kg		58	1 plant=1 plant
Tomato	1 kg	120 g	1099	Hybrid 1 plant = 36 tomatoes
Pepper	3-5 kg	250 g	961	-
Beans (greeneans)	25 kg	-	20	1/2 kg=11 bags 1bag=10 kg
Maize (silver king)	-	-	4	-

Source: MacDonalds seed centre (Mr. Shangwe 2000)

Water:- it was difficult to estimate the amount of water used for the garden as the organization did not pay any money for the use of water until the field work was carried out. Nonetheless, it was explained that payment is compulsory. But because of the small size of the garden, the cost of water was estimated to be roughly R 45 per year.

Transport:- they were not paying for transport at that time as they were selling their product locally. In this case, access to market according to that organization was low.

Table 5.5 Variable costs at ATC

Input types	Unit	Unit cost (R)	Total cost (R) / year ★
Seeds	Kg/g	-	484
Compost & manure	kg	-	240
Labour	No.	R300 /month / person	3 600
Water	Liter	R 0.04/liter	~ 45
Total variable cost			~ 4 369

~ = approximately

Source : Field work questionnaire case study data

5.4.1.2 Fixed resources and costs

The initial cost of establishment of vegetable gardens (such as cost of land, equipment, fencing, water) was too expensive to meet, particularly for the poor people in the study sites. The major equipment owned by the garden are presented in Table 5.6.

Table 5.6 Equipment and their costs at ATC

Material	No.	Cost / unit (R)	Total cost (R)	% Annual Depreciation		5% Interest charge on initial investment
				%	R	R
Wheelbarrow	1	185	185	15	28	9
Hose pipe	1	250	250	20	50	12
Spade	2	40	80	15	12	4
Fork	2	42	84	15	13	4
Rake	2	45	90	15	13	5
Hoe	2	48	96	15	14	5
Fence	They got the garden fenced (they did not pay)					
TOTAL	10	610	785	-	130	39

Source : Field work questionnaire case study data

5.4.2 The Edendale Lay Ecumenical Centre

5.4.2.1 Variable resources and costs

Seed:- at the ELEC, the total seed cost per year was R 1177 and the total area under cultivation was 0.07ha. In this case, the seed costs of carrot and spinach were high. Area coverage was also found larger in potato and spinach (Figure 5.6).

Labour:- the organization had five staff members who worked in the garden. It paid R24 000 per year for the whole staff (R 20/person x 5 days a week x 4 weeks in a month x 5 persons x 12 months) for the activities they performed in the agricultural programme such as vegetable production and other activities explained in appendix 2.

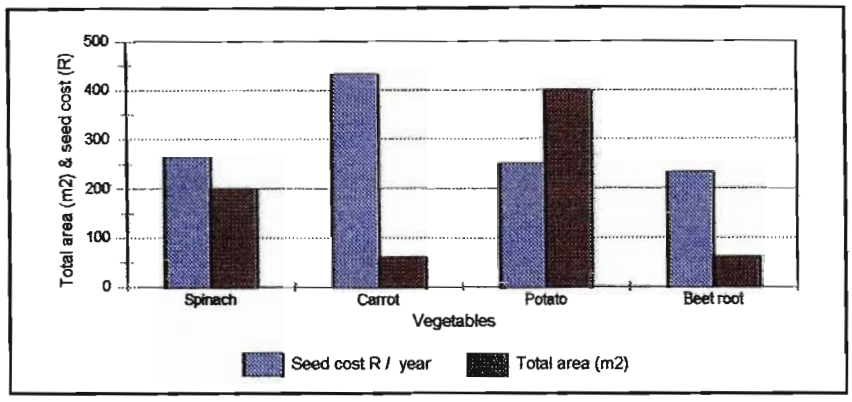

Figure 5.6 Seed cost and area coverage of vegetables at ELEC

Source : Field work questionnaire case study data

Water:- the organization used water from the Msunduzi river by means of an engine pumping. According to the organization water is not a major problem as ELEC is situated near Msunduzi river.

Transport:- although most vegetables are sold locally, R 100 / week is paid for transporting of some vegetables which gives the sum total of R 4800 / year.

Fertilizers and chemicals:- no artificial fertilizer and chemicals for crop protection were used in the organization, but manure and compost were used and which their use was rated as average and were made within the organization.

Table 5.7 Variable costs at ELEC

Input types	Unit	Unit cost (R)	Total cost (R) / year
Seeds	Kg/g	-	1 177
Labour	Number	20 / day/ person	24 000
Transport	kg	100 / week	4 800
Total variable cost			29 977

Source : Field work questionnaire case study data

5.4.2.2 Fixed resources and costs

The largest contributors of the total fixed cost were the costs of the tractor, fencing and water pump (Table 5.8). However, some of the fixed inputs (such as tractor,

fencing) were used for other purposes as well. For example, the organization hires the tractor to other people. The total cost of fencing was also for the whole compound not only for the vegetable garden.

5.4.3 The Willow Fountain Centre

5.4.3.1 Variable resources and costs

Seed:- at the WFC, the seed costs of potato, beans, spinach and cabbage are more expensive than the other crops at the centre. Cabbage, potato and spinach were under larger areas of cultivation than the other crops (Figure 5.7).

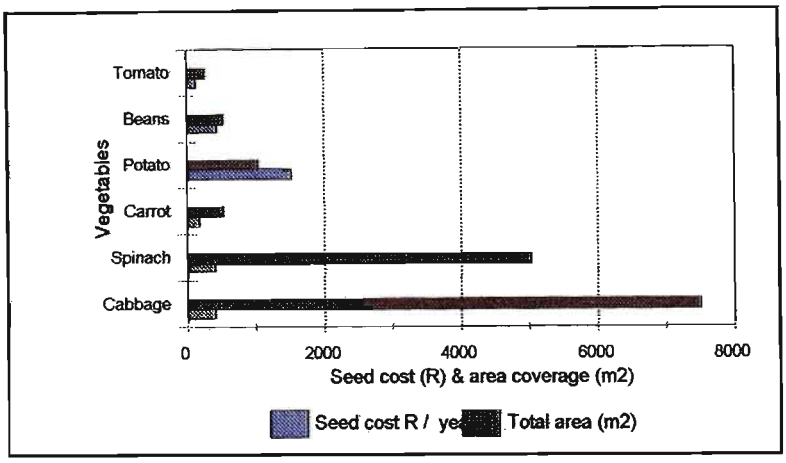

Figure 5.7 Area coverage and seed costs of vegetables at WFC

Source : Field work questionnaire case study data

N:B as mentioned earlier, the total area of the Willow Fountain garden is about 1.8 hectare, out of which about 1.5 ha was under cultivation during the time of the field work. The remaining area was under preparation for plantation.

Labour:- the organization did not employ any employee for the garden activities. Every activity was undertaken by members. However, when the labour was valued, it could amount to (R350 / person/month x 12months x 25 people) which is R 105 000 / year. R 350 was taken as an average wage at ATC (R300.00) and ELEC (R400) per person per month. Generally, labour power was not a problem in the organization, and its availability was rated to be high.

Table 5.8 Cost of fixed inputs at ELEC

Fixed cost	Unit cost (R)	Total cost (R)	Annual depreciation		5% interest charge on initial investment
			%	R	R
Fence	9.16 / m x (780m)	7 150	5	35 750	358
Tractor	34000/ x1	34 000	15	5 100	1 700
Water pipe & petrol	60 / m x 4 units	6 200	10	610	310
Fork	60 / x4	240	15	36	12
Spades	60 / x4	240	15	36	12
Hose pipe	60 / x4	240	20	48	12
Watering can	45 / X3	135	15	20	7
Total fixed cost	-	48 205	-	6 208	2 410

Source : Field work questionnaire case study data

The unit of all the fixed costs was '*Number*' except for the fence which was in '*meter*'.

Fertilizers and chemicals:- this organization used compost and manure which were prepared by the organization. Chemicals for plant protection and artificial fertilizers were not used.

Water:- this organization used water from a small reservoir (dam) situated above the garden. The organization did not pay any money for water use. The members explained that the availability of water was not reliable, particularly in winter times.

Transport:- generally, vegetables were sold locally. However, the organization used transport for some vegetables which were produced in relatively large quantity, such as cabbage, spinach and potato (Table 5.9).

Table 5.9 Vegetables and their transport costs at WFC

	Cabbage	Spinach	Potato	Total / Ave.
Amount (kg)	6 375	2 500	6 000	14 875 (total)
Cost (kg)	13c / kg	20c / kg	12c / kg	15c / kg (ave)
Value (R)	828	500	720	2 048 (total)

Source : Field work questionnaire case study data

Tractor hiring:- the organization hired a tractor for ploughing three times a year. In this case, the payment for the whole year was R 1700.

5.4.3.2 Fixed resources and costs

According to the organization, the list of equipment in Table 5.9 was what they bought in 1996 when they started the project. Some of these have been misplaced and broken and what is left is almost half of the original amount. Fencing was done by the government. It was well fenced. As a result, there was no problem of livestock damaging the garden. The organization also explained that theft and vandalism were not a problem.

Table 5.10 Fixed costs at WFC

Fixed cost	Unit cost (R/ unit)	Quantity (No.)	Total cost (R)	Annual depreciation		5% Interest charge on initial investment
				%	R	R
Fence(meter)	-	-	6 500	5	325	325
Wheelbarrow	125	3	375	15	56	19
Watering can	16	5	80	15	12	4
Fork	65	18	1 170	15	176	59
Spade	55	10	550	15	83	28
Rake	42	2	84	15	13	4
Hoe	35	12	240	15	36	12
Total			8 999	-	700	450

Source : Field work questionnaire case study data

5.5 PRODUCTION AND MARKETING

Generally, agricultural production in the study area was not very significant. However, it has a potential to play a role in alleviating poverty. According to the respondents, in addition to the types of urban agricultural activities in GEA, cereal crops such as maize can also grow.

5.5.1 The African Tree Centre

The main vegetables produced during 1998 / 1999 at the ATC were cabbage, spinach, turnip, and beet root (Table 5.11). The organization explained that it did not practise bartering of any production. Production for most of the vegetables was year round. Marketing frequency was also found to range 2-4 days per week. The market for the production was local.

Table 5.11 Production and marketing of vegetable and chicken production at ATC

Item sold	Size (m^2)	Unit	Quantity	Price R / unit	Total revenue (TR) (R)	Income TR / m^2
Spinach	32 (4x8)	kg	34 18★	1,5 - 2.00 1.00	60 18★	2
Turnip	28 (4x7)	kg	22	1.5	33	1
Cabbage	24 (4x6)	kg	6	2	12	1
Beet root	6 (2x3)	kg No.	6 6★	2 1	12 6★	2
Chicken	-	No.	15	22-25.00	352.5	-
Egg	-	No.	14	0.6	8.4	-
Total	90	-	-	-	501.4	6

★Represents seedlings.

Source: Organization's Record (between 31-07-99 and 15-10-99)

N:B the income per m^2 (TR/ m^2) in (Table 5.11), (Table 5.12) and (Table 5.13) differ significantly. The reasons for the differences might be factors such as, quality of seeds, way of production, fertility of the soils, incorrect estimation and incorrect record keeping.

In the ATC, monetary value of the vegetable consumption of the members was not included, as members did not consume production or if they did they bought it. In this organization, the total garden size is about 360 m^2. However, Table 5.10 shows that only 90 m^2 was used for the vegetable production. The remaining area was under preparation to be sown during the field work. This situation is also true in the WFC and the ELEC gardens.

Tomato and pepper were grown by the organization although these vegetables were not planted at the time of field work. Concerning the chicken, the organization buys 30 chickens for R 390 (R 13 each) and pays R 82 for feeding for the time of stay and R 70 for transport which comes to a total cost of R 542 / 30 chicken / 8 days. Then it was selling them after 8 days for a price of R 22- R 25 and the process continues. In this case, the net profit or net revenue = Total cost (TC)- Total revenue (TR) = R 705 - R 542) =R 163 if all can be sold. The table above shows that the organization sold 15 chickens for R 352 between 31-07-99 and 15-10-99. However, labour cost was not included in the total cost as no separate labour was used for chicken care.

From the organization it was found that the demand for cabbage, spinach and turnip was high. For beetroot, carrot, tomato, pepper and choumoli the demand was average. Therefore, the supply of cabbage, spinach and turnip was high, and the supply of carrot, beetroot, and pepper was low and average for choumoli.

5.5.2 The Edendale Lay Ecumenical Centre

The total area, total production, type of production, price, total revenue and the income per m^2 of the vegetables of ELEC is shown in Table 5.12.

Table 5.12 Production and marketing of vegetables at ELEC

Types of vegetables	Total area (m^2)	Total production Kg / year	Price R / Kg	Total revenue (R/ year)	Income R / m^2
Potato	400	1 000	1.5	1 500	4
Spinach	200	848	1.5	1 272	6
Carrot	60	300	1.5	450	8
Beetroot	60	318	1.5	477	8
Choumoli	60	159	1.5	239	4
TOTAL	780	2 625	-	3 938	5

Source : Field work questionnaire case study data

Season of production was year round except for potato which was only produced in summer. The market was local and the vegetables were marketed approximately daily.

N:B The information in the table, particularly total production, price (R/kg) and total revenue were not exact. This means they were only approximations made by the

researcher, the producers and office members (this is also true in the other organizations).The researcher could not get a chance to see the record of vegetable sales as the office was not able to provide information. In ELEC, demand and supply were not examined as the organization's aim was training. Vegetables were not used for consumption. Because this organization was not a community garden (it is a service provider organization not profit oriented). As a result, monetary value of the vegetable consumption was not included. But it sells vegetables for reasonable prices for the local people although sale record was not possible to get because of the reasons explained earlier.

5.5.3 The Willow Fountain Centre

The main crops with highest demand and supply and size of the area were cabbage, spinach and potato (Table 5.13) and the total area of the garden was approximately 1.8 ha. The purpose of production was for consumption and selling. In this case, the market for the vegetables was local.Tomato, pepper, carrot and turnip were grown during summer, whereas cabbage, spinach and potato were grown year round. The frequency of market for cabbage and spinach was found to be daily, but the frequency of the rest was approximately once a week. Highest income per m^2 was found in potato (R 6 / m^2) which was followed by pepper and beans, but the lowest was in spinach (R1 / m^2) (Table 5.13).

Table 5.13 Production and marketing of vegetables at WFC

TV	TA (m^2)	TP Kg /year	Season	MF / week	P R / Kg	TR (R) / year	Income / area (TR / m^2)
Cabbage	7 500	6 375	S	daily	2	12750	2
Spinach	5 000	2 500	YR	daily	2	5 000	1
Potato	1 000	6 000	S	once	1	6 000	6
Carrot	500	400	YR	once	2	800	2
Beans	500	300	Sp	once	3	900	2
Tomato	250	80	S	once	5	400	2
Pepper	250	83	S	once	6	498	2
Turnip	250	150	S	once	2	300	1.2
Total	15 250	15 888	-	-	-	26648	2

★= Consumption and selling; S=summer; YR = year round; Sp = spring, TV = types of vegetables, TA = total area, TP = total production, S = Season, MF= Market frequency, P = price, TR = total revenue

Source : Field work questionnaire case study data

According to the respondents of the organization, the demand for cabbage, spinach and potato was found to be very high; high for beans ; and average for carrot and tomato and supply was high in the case of cabbage and potato, average in spinach and low in carrot and tomato in relation to other vegetables of the organization.

Table 5.14 Quantity of vegetable Consumption and its monetary value at WFC

★	Vegetables						Total
	Cabbage	Carrot	Spinach	Tomato	Beans	Potato	
Consumption value R/ /Annum/ H.H	96 kg (R144)	24 kg (R 48)	84 kg (R168)	36 kg (R180)	48 kg (R144)	120 kg (R120)	408 kg R 804
Total (X25 H.H)	2 400 kg R 3 600	600 kg R1 200	2 100 kg R 4200	900 kg R 4500	1 200 kg R3 600	3 000 kg R 3 000	10 200 kg R 20 100

★H.H = household

Source : Field work questionnaire case study data

The first row on Table 5.14 shows the quantity of consumption per year per household and its monetary value. The second row on the other hand shows the total consumption by the 25 members and its total monetary value. The average household consumption per annum of the six vegetables was 408kg (R 804) and the total

consumption of the 25 members was 10 200kg (R 20 100) as is shown in the Table 5.14. This shows that the vegetable garden could save approximately R 20100 per year of the 25 households income which is significant for the poor people. Generally, the price of the vegetables in the three centres of the study area was lower than the other markets or shops such as local shops (in Willow Fountain), Spar and mini-market (Central business district 'CBD') and Checkers (in Scottsville) (Table 5.15).

Table 5.15 Comparing price of vegetables in different centres or markets

Vegetables	Areas of market and their prices at the time of the field work ★						
	ATC (R) / kg	ELEC (R) / kg	WFC (R) / kg	Spar (R) / kg (CBD)	Mini - market (R) / kg (CBD)	Local shop (R) / kg (WF)	Checkers (R / kg) Scottsville
Cabbage	2	-	2	2.4	2	2.5	-
Carrot	-	1.5	2	3	3	-	3.5
Beetroot	2	1.5	-	2	2	-	2.5
Spinach	2	1.5	2	3.6	3	2.5	2
Tomato	2	-	5	4	4	5	2.5
Pepper		-	6	5.6	5	-	9
Turnip	1.5	-	2	2	2	-	-
Choumoli	-	1.5	-	-	-	-	-
Beans	-	-	3	5	6.6	5	5.5
Maize	-	-	-	3.3	3	-	-
Potato	-	1.5	1	3	2	1	2.5

★CBD = Centre business dictrict, WF = Willow Fountain

Source : Field work questionnaire case study data

5.6 CONCLUSION

The chapter analyzed and presented the socio-economic information of the field work; the actual and potential benefits of UA; access, use, cost of resources and production and marketing of the three organizations. The implications of these issues are discussed in chapter six.

CHAPTER SIX: DISCUSSION

6.1 INTRODUCTION

According to the results of the case studies and the literature review, the present problems such as poverty, crime, high unemployment, low education levels and low quality of services are in part the result of past apartheid policy. In addition, urban population growth within the area itself due to migration and natural growth are also believed to aggravate the situation. Addressing problems caused by the past apartheid era will be difficult.

6.2 CONCEPTUAL FRAMEWORK

Based on the research work, a conceptual framework is postulated to show linkages between the different levels (local, provincial and national) in considering the needs and the factors influencing the disadvantaged urban fringe in local development programmes where UA has such a role to play (Figure 6.1).

The in-migration and rapid internal growth of population in the urban fringe has great impact on the living condition of city dwellers in general and the urban poor in particular. This situation has resulted in problems such as unemployment and poverty, social dislocation, limited access to resources and infrastructure, and environmental degradation. In such a case, urban agriculture has the potential to address the problems if government recognizes and appreciates urban agriculture. Certainly, the government has policies and strategies to address the socio-economic development of urban areas at local, provincial and national levels. However, authorities at national provincial and local levels have to work closely for a better results. Therefore, strong urban agricultural policy from government, adoption and modification of the policy from the provincial level and extreme creativity, commitment and implementation in a local development plan from the TLC is required to address the above mentioned problems (Figure 6.1).

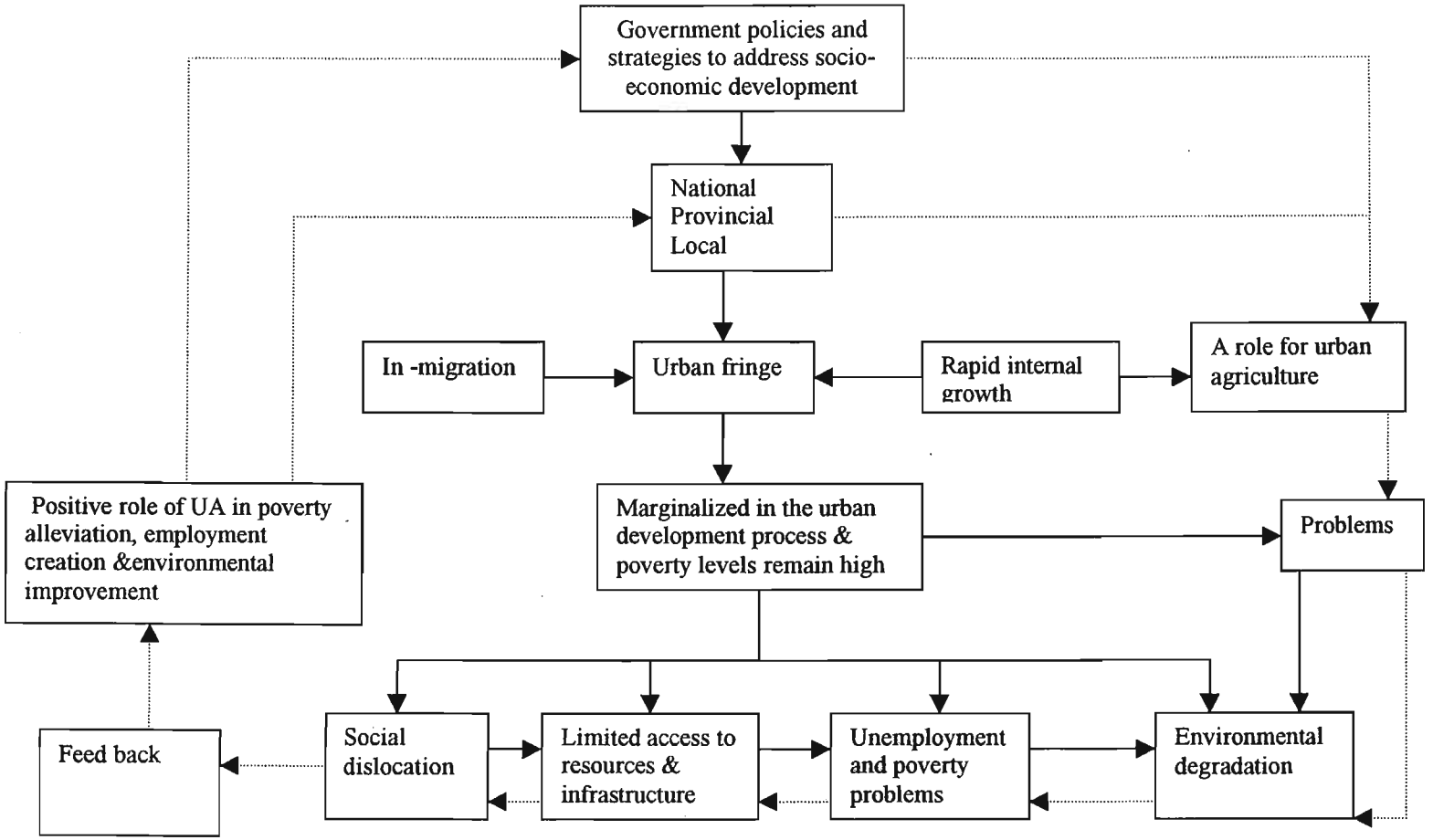

Figure 6.1 Conceptual framework for the incorporation of UA in food security, employment generation and improving the quality of life of the urban poor

6.3 SOCIO-ECONOMIC CHARACTERISTICS OF THOSE INVOLVED IN URBAN AGRICULTURE

6.3.1 Some Key Household Features

Household features such as gender, availability of labour power and size of households are important factors influencing agricultural activities. Hence, there is a need to consider these features critically in any agricultural project. They are explained below as follows.

Importance of gender:- the majority of the urban agricultural activities of the study area was found to be done by females which agrees with what is happening around the globe (Oliver 1994; and Section 2.2.2). However, all households interviewed in the ELEC were headed by men, probably because going to training for females may be uncommon.

Availability of labour power:- the number of household members less than 16 years and greater than 60 years was small (31%). The implication is that given the land, money, technical support and the interest, there is enough labour power in the study area (the higher the number of the people who are neither very young nor very old, the better).

Size of household:- in general, the sizes of the households interviewed were large. Large households consume more food and food availability is difficult to maintain in such cases. This situation can cause economic problems. However, such types of problems can be solved if households try to supplement their income through urban agricultural activities.

6.3.2 Work Status

Unemployment in the case of the WFC and the ATC was higher than the ELEC and it was higher in women than men. Few people were employing themselves by practising different types of UA which could be important way to reduce poverty and unemployment particularly for the poor people of the study area.

The reason why many of the poor people of the study area did not practise UA was due to lack of land, equipment, resources (such as, fencing, water), financial and technical support. Many people would become involved in agricultural activities if agriculture was viewed as a micro-business sector and received technical and financial support from government and NGOs.

6.3.3 Level of Education and Training

6.3.3.1 Level of education

Generally, people of the study area were not educated. Of the three sites, more than 50 percent of the people had attained the education level only of standard 7 - standard 10 (Figure 5.2). The possible reasons for the low level of education in the study area include the effect of the past apartheid policy, the large family sizes and the low income levels. Most of the time, men and women with a low level of education marry at an early an age and produce children early. Research also indicates that women in Africa with 4-6 years of formal schooling have 5 percent lower fertility rate than those who never attend school. Women with a level of education of seven or more years of formal schooling have 2.2 children less than those who never attend school (Vos 1992). In such a case, it would be good for the government to plan strategies, such as adult education, family planning and appropriate training for the people with no or low level of education to address the above issues.

6.3.3.2 Training

Although the people trained in the ELEC improved their knowledge on vegetable production, most of them were not working their own gardens due to lack of resources and lack of technical and financial support.

Literature showed that the majority of urban poor are found to be women (Section 2.2.2). In Sub-Sahara Africa, for example, women constitute 60-80 percent of the agricultural labour force, but receive only 4-6 percent of extension visits; 'Because of the pivotal role of women as food producers investing in women farmers in cities is more likely to improve the nutrition and health of their families than investing in male farmers; UA in the hands of women is a powerful tool to uplift women's social position

as well as to improve their families' diets, incomes and food security' (Ratta 1993). Therefore, government should play a role to encourage and support the participation of women in these training activities.

6.3.4 Income and Expenditure

6.3.4.1 *The tragedy of low incomes*

As a whole, the income of the people interviewed in the study area was very low. It was very difficult for the people interviewed to make a living and send children to school because of large family sizes and low incomes. The sources of income were found to be a pension, part time employment, self employment and full time employment. A pension was a significant source of income for some of the households. The low level of income made the people in the study area liable to poverty, illness, and illiteracy.

6.3.4.2 *Urban agriculture as an income generator*

Respondents explained that sales were increasing. However, because they had no or very limited records of costs and sales, it was difficult to reach concrete conclusions regarding costs and sales. But in some cases it was explained that sales also depended on weather conditions (heavy rains, change, drought, etc). The activity of vegetable production in WFC was relatively better than the ATC and ELEC. This means they were producing relatively good vegetables in quality and quantity and producers benefitted from their consumption and their income generating ability.

Poor urban people can make a living (money) by employing themselves in some agricultural activities such as growing vegetables and keeping livestock particularly chickens, to supplement their income as these activities were doing relatively well (Section 3.4.2). Poor people with an unstable income, who grow their own food can provide food security (Oliver 1994).

6.3.4.3 Expenditure of the household income

In most cases, low income people spend most of their income on food. In developing world cities, the people spend more than 50 percent of their income on food (Smit and

Ratta 1992). On average, the households in the three sites were also found to spend most of their income on food (Figure 5.4). This shows that food expenditure outweighs other expenditures. As a result, growing one's own food could be significant in saving part of the income spent on food. This fact agrees with the situation of all poor developing nations of Africa and other parts of the world (Tinker 1994; Oliver 1994 and Section 2.3.2).

6.4 THE ROLE OF URBAN AGRICULTURE

6.4.1 The Role of Vegetable Gardens

The case studies showed that community vegetable gardens (UA) have the potential to improve the economy of the urban poor (Tinker 1994; Smit and Nasr 1992 and Oliver 1994). Working in groups in the community gardens, was important in sharing resources, (such as land, fencing, equipment, water) and in attracting financial and technical aid. Many of the respondents in the three sites explained that they would rather practise UA as opposed to other activities. This shows that UA is important for most of the households interviewed.

6.4.2 The Role of Livestock

Livestock production as part of UA has the potential to supply food and to generate income. In the three organizations (sites) under study, more than half of the households interviewed were found to keep livestock, particularly chickens and cattle. The animals serve for different purposes such as for selling, milk, meat, and for power and lobola. Some people who kept livestock particularly cattle, were more concerned with number than with other uses. Nevertheless, livestock were kept by a small number of households. Small livestock rearing particularly chickens should be encouraged in the case study areas as they were kept by many of the households interviewed relative to other livestock (Table 5.2) and (Section 3.4.2 and Section 5.5.1).

6.4.3 The Role of Government and NGOs and Their Relationships with the Local People

Despite the economic, social and environmental roles of UA, the majority of the respondents of the three sites explained that they got little support from the government and NGOs and none from TLC. In this case, respondents explained that they need support in acquiring equipment such as spades, wheelbarrows, rakes; seeds; financial support; training (as ELEC might not be capable to accommodate every one from the study area); and extension services. The WFC in particular also needed an engine for pumping water, help for the maintenance of the dam (reservoir), as water is not enough particularly during winter times and a tractor for ploughing.

Therefore, if these organizations and producers could get reasonable technical and financial support, they could be an example to other people to perform agricultural activities in the study area. Nonetheless, people should not expect every thing to be done by the government, because the government could not supply and provide every thing to all the poor people of the country. People also have to make some sort of effort and show creativity to be helped.

6.4.4 Problems, Constraints and Strengths of UA

The major problems of the organizations under study were found to be a lack of access to resources (such as land, water, fertilizers, equipment, technical and financial assistance) and an insecure and illegal access to land. The strengths and constraints of the organizations pointed out by respondents are described below.

6.4.4.1 Constraints or problems

Lack of finance:- the majority of the respondents of the three organization explained that money was a major problem in vegetable production. They needed money for fencing, equipment, transport, ploughing etc.

Lack of land:- land is a very scarce resource in cities. In PMB, most of the land is owned by the TLC. However, there was also land which was owned by the state, organizations and individuals. Land in the ATC for example, was owned by individuals, as a result they received rent for the land from the gardeners. The

implication is that the land ownership is less secure as the owners could claim their land at any time. As a result, the land users (communities of the three organization) needed to have valid permission to use land in order to invest and allocate resources in the long term.

Fencing problem:- in the study area vegetable gardening was found to be made impossible if there was no fencing. Fencing a garden however, is expensive. Results of the case studies showed that fencing was one of the main constraints of the vegetable gardens.

Water problem:- water is one of the most important resources for UA. The ATC used tap water for its vegetable garden. The ELEC on the other hand, used water from the Msunduzi river. Therefore, water was not seen to be a problem in these two organizations. But it was a problem and had the potential to be a problem in the WFC. It was explained that there was a problem of shortage of water particularly during winter seasons. It might be good to improve and enlarge the reservoir or add another reservoir to guarantee the water source.

Transportation problem:- according to the respondents, although produce of the organizations have local demand, it was explained that it is not always the case. some times (for example when produce is high and when local demand is low), transportation was described as being a problem by the organizations. The ELEC and the WFC in particular had a problem in transporting their products in such a case. The WFC sold its produce to individual traders in the township, besides selling to the community of WF. But it might be good if the organizations established their own centres in the township for selling their products. Because, buying a means of transport or paying for transport is expensive and because their production at present is not high enough, it is not advisable to buy their own transport.

Pest problem:- the three organizations experienced pest problems. But they mentioned that they did not use chemicals for crop protection. The ELEC and the ATC explained that they used natural chemical which was made up of plant leaves and they found it effective. Therefore, using these natural chemicals can decrease the cost of chemical control and also decrease environmental pollution.

Theft and vandalism:- theft and vandalism, were not major problems in the WFC. However, it was experienced in the ELEC and the ATC although it was not serious.

Price variability:- price variability (such as increasing or decreasing of vegetable prices) was also explained as a problem by respondents as it could result in losses.

Climate problem:- climate problems such as heavy rain, drought, frost, were explained as problems particularly in ELEC. Lack of knowledge, labour and communication, and soil related problems were not found to be common in the three organizations.

6.4.4.2 Strengths

Results showed that UA played a role and has a potential role to play in supplementing the urban poor households' income (Section 5.3.3). Ability to prepare compost and manure, sharing resources, ideas, cost of transport and experience were also other advantages or positive sides of the vegetable gardens of the study area. If supported by governments and NGOs, UA could achieve its potential role (Smit and Ratta 1992).

6.5 ECONOMIC ANALYSES OF POTENTIAL PRODUCTION

6.5.1 Inputs

Identifying and examining the availability and use of inputs is important in UA. Land, equipment, fencing, water, seed, fertilizer and labour are some of the most important inputs used in UA. The availability and ownership of land in particular is a controversial issue in cities. The availability and use of resources in the three organizations is discussed below.

The organization of the ATC has got its land from individuals. It was using tap water for its garden. The organization's rating of labour availability and access to market was low. Time for work was not a problem in this organization. But members were not satisfied with the availability of money and access to a market. The main equipment of the organization for the vegetable production were wheelbarrows, hose-pipes, spades, forks, rakes and hoes. It was explained that the organization obtained little

financial and technical aid from the department of health. Low availability of cash, inability to prepare compost and manure by the organization and the high cost of seeds, labour and equipment were some of its challenges.

In the ELEC, it was explained that the availability of land, labour, water and seeds was found to be low. Also, access to market, and availability of time for work were rated as average. This organization had little financial and technical assistance from NGOs (particularly churches). Chemicals for crop protection and artificial fertilizer were not used. But compost and manure were used at average rates and were prepared by the organization itself.

The organization rated the availability of land as low. However, as the aim of the organization of producing vegetables was for training purposes, the size of the land (~ 0.07 ha) seemed to be enough. In principle, for a business or project to remain viable, at least it has to cover the variable cost. In this case however, the variable cost was greater than the total revenue. Resources such as labour, water, and transport were used not only for the production of vegetables but also for other activities such as chicken production, beekeeping (overlapping of activities). Morever, the aim of the organization of producing vegetables was not for profit and there was no good record keeping. Therefore, it was very difficult to estimate and compare the exact cost and revenue of vegetable production at ELEC. In general, the high expenditure on fixed and variable costs and the inability to get a significant amount of financial and technical support were some of the challenges the organization faced. The ability to produce compost and the availability of manure from its own farm and the possibility of selling most of the product locally on the other hand, were the advantages the organization had.

Within the WFC, the availability and use of resources ranges widely. The organization used largely compost and manure and this was prepared by the members. This avoided the cost of using artificial fertilizers and chemicals and this also played a role in environmental quality. The equipment used by this organization was similar to that of other organizations. In this organization, the cost for fencing was high. Other fixed costs were the cost of wheelbarrows, watering cans, forks, spades, rakes and hoes. In general the total cost was too high for this poor community to afford.

Although the organization gets some technical and financial support from the government and NGOs, it was not significant. But support of NGOs (such as technical and financial) was relatively higher than the government's in this organization. The organization was doing relatively well to the other two organizations and could play a role in supplementing the income of the members and supplying the Willow Fountain township with fresh vegetables if supported. Hence, the government and NGOs should play a role in supporting this organization financially and technically. In all the three organizations, the cost of establishment was found to be high.

6.5.2 Outputs

Generally, vegetable production in the study area was very low and also the production system was traditional. However, they do have the potential for good production. The possibility of year round production of the organizations was also their strong point in supplying continuous income and fresh food to the producers as well as to the community as a whole. Vegetables such as spinach, cabbage, beetroot and carrot were produced year round. As a result, growing such vegetable types is advisable and should be encouraged.

6.5.3 Marketing of Vegetable Production

In most cases, the market for the three organizations was local although they transported their produce to the township if produce was high and local demand was low. For example, vegetable produce was either sold for cash to the consumers of the WF community directly from the site or to the traders of the township. As a result, the WFC spent R 2 048 per year to transport some of its produce such as cabbage, spinach and potato (Table 5.8) to township.

6.5.3.1 Price of vegetables

It was found that the prices of vegetables in the three sites were very similar, but cheaper than the prices of the Spar, mini- markets, local shops and super- markets (such as Checkers) (Table 5.15). It was more economical for the consumers to buy from these vegetable gardens than to buy from the city. One can save the cost of transport. The vegetable gardens had the advantage of supplying the local market

whenever the price of the market was high due to the gardens' nearness to the market. This could make producers to some extent price makers (influence the market). It is advisable then, for both producers and consumers to adopt and develop the local market as this could cut their cost of transport significantly.

6.5.3.2 Advertising

It is known that advertising plays an important role in the marketing of production. However, although the price of the three organizations was found to be lower than the other markets (Table 5.15), the main problem of these organizations was that they did not have the ability to advertise their product. As a result, they did not attract as many customers as they could have.

6.5.3.3 Demand and supply

Findings showed that in the WFC, cabbage, spinach and potato had high demand and high supply. In the ATC, cabbage, spinach, and turnip had high demand and high supply. Production and marketing in the three centres were not well developed and were financially and technically weak. Vegetables such as spinach and cabbage that were grown in large areas or plots showed that they were the ones that had high demand and supply. Therefore, those vegetables have to be encouraged, planted and given priority in production.

6.6 CONCLUSION

The chapter discussed the implication of the socio-economic characteristics of the people interviewed; the role, strength and weakness of UA; the availability , use and cost of resources and the economic situation of UA. Based on this discussion , chapter seven will deal with the conclusion and recommendations.

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

This chapter draws conclusion and makes recommendations. In this case, conclusions are drawn and suggestions are made based on the implications of the results discussed in chapter six.

Despite the actual and potential importance of urban agriculture, it has not been given due recognition. Although the majority of the urban population in South Africa in general and in the cities in particular are poor due to unequal distribution of resources, urban agriculture has not been widely practised.The literature review helped the researcher to understand the problems and potential solutions to these problems concerning urban agriculture.

The past apartheid policy badly affected the people of the study area. The standard of living of the people in the study area still remains low and the people are socially and economically weak due to this policy. The study area was characterized by high unemployment rates, large household sizes and low income. Due to informal settlements in the potential flooding area, flooding is also a problem which causes huge biophysical and human losses. The past apartheid policy together with the in-migration and natural population growth were the main causes for the current problems of poverty, unemployment, unequal distribution of resources, poor social services and facilities and flooding problems in the study area.

The initial visits to the study area together with the literature review were important to define the problem and formulate and develop aims and objectives of the study. The structured and unstructured interviews and records and documents helped to understand the perception of the community members of the three organizations toward urban agriculture and the support given by the governmental and NGOs. The researcher encountered many problems, for example, other commitments of research assistants, difficulty in meetings and appointments with respondents and lack of records and documents.

The purpose of the case studies was to identify and examine the role played and potential socio-economic and environmental importance of urban agriculture in the Greater Edendale Area.

The literature review and the case studies of this research project showed that urban agriculture has the potential to address the food problems of the urban poor. However, not many people were practising the activity in the study area probably due to lack of land and lack of technical and financial support. Nevertheless, it was found that local government and NGOs did not play a significant role in supporting the poor. Production of urban agriculture was not very significant in the study area. The main vegetables grown common to the study area were cabbage, spinach, turnip and potato. The findings of the study in general showed that vegetables, fruit and chicken could well suit the study area.

The major market for the vegetable production of the three sites was the local market. The local market could cut transport costs for both the producers as well as consumers if developed, improved and supported by the local authorities. Generally, the price of vegetables of the three organizations was found to be lower than local shops, mini-markets, supermarkets such as Spar and Checkers. However, the organizations were weak in marketing because they lacked capacity to advertise their product, and the local market was not organized.

Generally, the availability of resources or inputs was low, and the cost of the establishment of vegetable gardens was found to be difficult for the poor people in the study area. In this case, the government and NGOs should play an important role to address these problems by supporting the poor urban farmers technically and financially.

Although urban agriculture lacks information due to poor documentation and record keeping, it is still an efficient and effective instrument available in converting urban wastes and underutilized resources into important resources for the production of food, creation of jobs and improving the quality of the environment. The activity could also play a role in improving public health and saving energy, natural resources (such as land and water). Morever, it needs capital that is affordable by the urban poor

relative to other economic activities such as industries and manufacturing. It is also possible to optimize the capacity of urban agriculture with little effort. Urban agriculture also has high production per hectare and is well suited to low-income families among them particularly women, who constitute the majority of urban farmers and the unemployed.

These days, the recognition of the potential benefit of urban agriculture is on the increase all over the world and some people are getting nutritional food and income benefits from this activity already. Nonetheless, many governments, urban planners, developers, researchers, policy makers and NGOs have not understood and appreciated its actual and potential benefits. This limited recognition hinders the realization of the potential role of urban agriculture.

To summarize, it is important to identify the farming systems that constitute urban agriculture and to study how urban agriculture functions in South Africa and around the world. It is also important to make a cost benefit analysis of the activity to determine the economic importance of urban agriculture in quantitative terms. Exchanging ideas and information through conferences and workshops is also another important tool for education and public awareness concerning the activity. In this respect, the following recommendations are made:

RECOMMENDATIONS

7.1 GREATER UTILIZATION OF VACANT AND UNDERUTILIZED LAND

The fast growth of cities due to natural growth and in-migration from rural areas to cities have resulted in competition and conflict for land and other resources. Also most land is owned by the Transitional Local Council, and some by private individuals or organizations (Section 3.4.1and Section 5.4). Lack of land in the study area was explained as a big problem which hindered the activity of urban agriculture. Despite the above fact, most cities and towns have a number of vacant and under-utilised areas that are not suitable for construction purposes and that can be used for urban agriculture (Smit and Nasr 1992). For example, potential areas for gardens were observed on the two sides of Msunduzi river and Willow Fountain stream (Figure 3.3). These areas could provide ideal sites for short or medium-term allotment of land to

the urban poor giving priority access to women particularly those who are heads of families.

7.2 A MORE PROACTIVE CONTRIBUTION FROM THE TLC

Most of the poor urban farmers of the study area did not get access to resources such as land, fencing, water, capital and equipment that could facilitate the move of urban farmers from growing only for supplementary home consumption to production for market. They also could not afford the initial cost of establishment of urban agriculture as it is so high for them (Section 5.4). Therefore, funding is needed to cover at least the initial costs. In such a case, some organizations play important role in facilitating funding sources and projects for example, Greater Edendale Environmental Network. However, investigations showed that the TLC did not play a significant role. Therefore, TLC should play a role in supporting these urban poor by supporting urban agricultural projects and making available food gardening resources (such as tools, water, fencing, seed and fertilizers) for free or at low cost through budgeting long term programmes and facilitating other funds.

7.3 SPECIAL CHALLENGES FOR THE TLC AS FACILITATOR OF UA

Poor urban farmers lack access to markets and the capacity to compete with other big producers or traders of vegetable production in the market place. This situation could force them out of practising UA. However, their contribution in generating income, providing the urban poor community with fresh and affordable produce is significant. Institutions such as schools, workplace cafeterias, hospitals and other organizations are important potential markets for such food products. Therefore, local government's (TLC) and NGO's intervention in encouraging such institutions to purchase food production from the targeted urban food producers can have a significant impact in encouraging and supporting urban farmers.

7.4 A NEED FOR TRAINING AND EXTENSION SERVICES

Most of the residents of the Greater Edendale Area were poor, unemployed, informally settled, untrained and lived below the normal living standard or below the poverty line. For example, in the Edendale Lay Ecumenical Centre, only a few people (15 in 1997

and 20 in 1998) were trained in urban agriculture and women constituted a few of these (for example 25 percent in 1998). Those who trained in the centre explained that the training given was helpful. However, all the three organizations or case study areas did not have input and output records. In this regard, training is recognized as being one of the most powerful tools in improving skills and addressing both poverty and unemployment (Coetzee 1992). Therefore, TLC interventions in supporting training and extension services in relation to urban agriculture is so important to uplift the urban poor by alleviating poverty and unemployment and improve their record keeping.

7.5 A MORE CENTRAL ROLE FOR WOMEN IN URBAN AGRICULTURE

The majority of urban farmers are women and they could play a more important role than men do in securing food and nutrition of their families, yet they are underestimated, and are not given the status given to men in the society in general. Morever, they could not get access to resources such as land and credit. and women's non agricultural wage rate is still only three fourth of men's (Human Development Report 1995). Therefore, the above situation is a very crucial issue that needs careful attention and consideration. In this regard, the government and NGOs should play a role in changing the perception regarding women as being inferior to men and they should give them the status and opportunities given to men.

7.6 PERCEPTION OF URBAN AGRICULTURE

Despite the actual and potential importance of UA, it has not been adequately appreciated by governments, researchers, policy makers, developers and organizations (Section 2.7 and section 5.3).

Therefore, research institutions need to launch new research into UA to persuade leaders in the government, and to eliminate unnecessary constraints of its growth. Government should also recognize, appreciate and understand the potential benefits of UA and afford it the status given to other activities such as industries, manufacturing, and other economic activities in cities.

7.7 LACK OF INFORMATION AND AWARENESS

There is lack of information and awareness concerning the actual and potential benefits of UA. Therefore it is important to:

- identify important issues with stakeholders to generate information on UA,
- create awareness concerning the potential benefits of UA to facilitate its recognition,
- integrate UA into the policies of government and funding agencies.

7.8 A POSITIVE ENVIRONMENTAL ROLE FOR URBAN AGRICULTURE

The PMB-Msunduzi TLC area is characterised by a relatively dense network of streams draining into the Msunduzi flood plain. The rivers and flood plains of the PMB-Msunduzi TLC area have been associated with serious problems of flooding which causes huge biophysical and human losses (Section 3.5.3). The main reason for the huge biophysical and human losses are believed to be the informal settlement of the people in the potential flood areas (Maphanga 1997). Yet these areas are suitable for UA.Therefore, TLC should try to settle elsewhere the people living in the flooding plains and re-allocate the flooding areas for UA.

7.9 A CALL FOR DENSIFICATION

The homesteads in the study area are very scattered and of various standards of construction. This situation is clearly seen in the GEA area in general and the Willow Fountain area in particular (Butler *et al.* 1993; and Plate 6). This makes the delivery of facilities such as roads, education and health services, electricity supplies and agricultural projects very costly and difficult. This means it is very difficult and costly to initiate and implement social services and facilities and agricultural projects in such very scattered and irregular settlement types. Therefore, it might be good if the people who are scattered over a wide area, concentrated in some central areas to more easily get social services and facilities and attract agricultural development projects.

REFERENCES

A) Books, Journals and Reports

Ableman, M. 1998. **On good land: the autobiography of an urban farm**. Chronicle Books, San Francisco.

Addo, P. and Jaganyi, J. 1999. Greening of urban city: best practices and critical factors for successful urban greening. Institute of Natural Resources (INR) investigational report (No report number) Pietermaritzburg, P:1-15.

Adzobu, C. 1995. **New roots: institutionalizing environmental management in Africa**. World Resource Institute, Washington DC.

Arrossi, S; Bombarolo, F; Hardoy, J; Mitlin, D; Cocio, L; and Satterthwaite, D.1994. **Funding community initiatives**. Earthscan, London.

Asian Vegetable Research and Development Centre. 1985. Gardening nutritious vegetables. March 1988, P: 80-113.

Babbie, E. 1995. **The practice of social research**. Wadsworth Publishing company, Washington.

Bouma, G. and Atkinson, G. 1995. **A hand book of social science research**. Oxfam, Oxford.

Bowyer- Bower, T. and Tengbeh, G. 1995. The environmental implications of illegal urban agriculture in Harare, Zimbabwe. Working paper No.4, P: 4 - 18.

Butler, M; Harley, A; and Aitchison, J. 1993. **Imbali: a Centre of Adult Education Study:** Imbali rehabilitation programme conference. University of Natal, Pietermaritzburg.

Coetzee, D. 1992. Training as investment to combat poverty and unemployment: a national and international perspective. **Development Southern Africa**. 9 (3): 295-315.

Danish Forest and Land Scape Research Institute. 1999. Planning and rehabilitation of urban green areas in St. Petersburg, June 30, 1999. P: 1-22.

Devas, N. and Rakodi, C. 1993. **Managing fast growing cities: new approaches to urban planning and management in the developing world.** Longman Singapore Publishers, Singapore.

Development Information Unit. 1998. KwaZulu-Natal: development profile, Development Bank of Southern Africa. Development paper 133, P: 1-87.

Egziabher, A. 1994. urban farming cooperatives and the urban poor in Addis Ababa. In : Egziabher, A ; Smith, D ; Maxwell, D ; Memon, P; Maougeot, L ; and Sawio, C. (eds). **Cities feeding people: an examination of urban agriculture in East Africa.** International Development Research Centre, Ottawa. P : 84-115.

Gouws, J. and Zeyl, P. 1994. Conference-Urban Open Spaces: potential for productive utilization. Department of Environmental Affairs. February 24-25, Technikon, Pretoria. P:1-3.

Integrated Planning Service (PTY) LTD 1998. Pietermaritzburg-Msunduzi Draft of Integrated Development Plan. Working Document No.2, 22 April, P: 1-112.

Janeiro, R. 1992. **Building the foundation for sustainable development in SA: national report to the United Nations, Conference on Environment and Development (UNCED)**. June 1992. Department of Environment Affairs, Pretoria.

Laband, J. and Haswell, R. 1988. **Pietermaritzburg 1838 - 1988: a new portrait of an African city**. University of Natal Press and Shuter & Shooter, Pietermaritzburg.

Lockeretz, W. 1987. **Sustaining agriculture near cities**. Papers presented at the National Conference on sustaining agriculture near cities, held in Boston. Massachusetts, Nov.20-21, 1986, sponsored by the School of Nutrition, Tufts University.

Maphanga, K. 1997. People's perceptions of flood hazards and their attitudes toward resettlement: a case study of the community of Azalea in the Greater Edendale complex, KwaZulu-Natal, SA. Mini-dissertation submitted in partial fulfilment of the requirement of the degree of Master of Environment and Development in the School of Environment and development, University of Natal, Pietermaritzburg.

Maxwell, D. 1994. The household logic of urban farming in Kampala. In : Egziabher, A ; Smith, D ; Maxwell, D ; Memon, P; Maougeot, L ; and Sawio, C. (eds). **Cities feeding people: an examination of urban agriculture in East Africa**. International Development Research Centre, Ottawa. P : 47-65.

May, J. 1994. Development policy options for urban agriculture in SA: data research Africa. In: Roberts, D. (ed).**Conference proceedings on Urban Open Spaces: potential for productive utilization**. February 24-25 , 1994. Technikon, Pretoria. P:4-11.

May, J. and Peters, A. 1984. A **study of income and expenditure and other socio-economic structures in urban KwaZulu- Edendale-Imbali:** KwaZulu Finance and Investment Corporation, Pietermaritzburg.

May, J. and Rogerson, C.1994. How green is your garden? **Indicator SA.** 11(3):89-96.

Mougeot, L. 1994. African city farming from a world perspective. In: Egziabher, A; Smith, D; Maxwell, D; Memon, P; Maougeot, L; and Sawio, C.(eds). **Cities feeding people: an examination of urban agriculture in East Africa.** International Development Research Centre, Ottawa. P: 1-24.

Nichols, P. 1995. **Social survey methods: a field guide for development workers.** Development Guide No. 6, Oxfam Print Unit, Oxford.

Oliver, P. 1994. Sludge Consult. Workshop on small farmer development Sandton, appendices: VI, VIII and XI. Cedara Report. No. N / A/94/87. September 14, Department of Agriculture, KwaZulu Natal.

Ratta, A. 1993. City women farm for food and cash: **women farmers in urban agriculture**. 1 (2) :1-7.

Roberts, D.1994. Conference on urban open spaces: potential for productive utilization. February 24-25, 1994. Technicon, Pretoria.

Rogerson, C. 1989. Urban agriculture in SA: policy issues from the international experience. **Development Southern Africa.** 10 (1): 33-43.

Sachs, I. and Silk, D. 1990. **Food and energy** : strategies for sustainable development. United Nations University Press, Tokyo.

Saunders, M; Lewis, P; and Thornhill, A. 1997. **Research methods for business students**. Pitman publishing, London.

Sawio, C. 1994. Who are the farmers of Dar es Salaam? In : Egziabher, A ; Smith, D ; Maxwell, D ; Memon, P; Maougeot, L ; and Sawio, C. (eds). **Cities feeding people : an examination of urban agriculture in East Africa**. International Development Research Centre, Ottawa, P : 25-46.

Smith, D. 1998. African urban agricultural policy: issues and priorities. In: Robert, D.(ed). Productive open space management with a shared focus on the potential of urban agriculture and agenda 21- A programme for achieving socially, economically, and environmentally sustainable development. International conference on urban policy in Southern Africa. March 3-5, 1998. Technician, Pretoria. P:5.

Smit, J. and Nasr, J. 1992. Urban agriculture for sustainable cities: using wastes and idle land and water bodies as resources. **Environment and Urbanization**.4(2):141-152.

Smit, J. and Ratta, A. 1992. Urban agriculture: a tool to reduce urban hunger and poverty. The Urban Agriculture Network, Washington D.C. In: Tinker, I. 1992. **Hunger notes**: urban food production: neglected resource for food and jobs. 18 (2):7-12.

Tinker, I. 1994. Urban agriculture is already feeding cities. In: Egziabher, A ; Smith, D ; Maxwell, D ; Memon, P ; Mougeot, L ; and Sawio , C. (eds). **Cities feeding people: an examination of urban agriculture in East Africa**. International Development Research Centre, Ottawa, P:67-84.

United Nations Development Programme, 1995. **Human development report**. Oxford university Press, New York, Oxford.

United Nations Development Programme, 1998. **Human development report**. Oxford university Press, New York, Oxford.

Vos, M de. 1999. A theoretical perspective on population policy in SA. **Development Southern Africa**. 9 (3):347-363.

Webb, N. 1998 . Urban agriculture: an idea in good standing. In: Robert, D. (ed). Productive open space management. Department of Environmental Affairs and Tourism. International Conference, March 3-5, 1998. Technician Pretoria.

B) Websites

Anonymous. 1996. Cameroon urban agriculture; http://www.cityfarmer.org/cameroon.html

Anonymous.1996.Global facility for urban agriculture;http://www.cityfarmer. Org/GlobalFacl.html.

Anonymous. No date. Urban and peri-urban agriculture; http://www.fao.org/unfao/bodies/ COAG15/xoo76e.htm.

Anonymous. 1995. World population; http://www.cityfarmerOrg/world pop71.html.

Bob, A.1998. Raiding Rabbits in cities; http://www.cityfarmer.org/rabbits.html.

Cityfarmer.1996. International urban agriculture; http://www.cityfarmer.org/ internationalUrbAg6.html.

Cityfarmer.1999. Urban home composting; http://www.cityfarmer.org/homecompost4.html.

Cohen, A. 1999. Urban agriculture: Initiative in Chicago; http://www.cityfarmer.org/animalog.html.

Community Composting Net-work. 1999. What is community compost?; http://www.chiron-5.demon.co.uk/ccn/.

Drescher, A. 1997. Management strategies in Africa home gardens and the need for new extension approaches; http://www.cityfarmer.org/arelA.html.

Dubbeling, M. 1999. Urban agriculture and feeding Latin American and Caribbean cities; http://www.cityfarmer.org/fedingLatAmer.html.

Food and Agricultural Organization of the United Nations.1999. Urban and peri-urban agriculture; http://www.fao.org/unfao/bodies/COAG15/X0076e.htm.

Koc, M; MacRae, R; Mougeot, L; and Welsh, J. 1999. For hunger proof cities. Sustainable urban food systems; http://www.idrc.ca/books/882.html.

Kurnicki, A. 1999. Urban agriculture at South East False Creek;

http://www.cityfarmer.org/FalseCreek.html.

Maxwell, D.1994. International struggle over resources: urban women and subsistence house-hold production. May 17, 1999; http://www.cityfarmer,org/danmax,html.

Mougeot, L. 1994 . Urban food production: evaluation, official support and significance with special reference to Africa; http://www.cityfarmer.org/lucintro27.html.

Murphy, C. 1998. Cultivation Havana: urban agriculture and food security in the years of crises; http://www.foodfirst.org/highlights/Cuba/murphy.html.

Musa,T.1996.Cameroon urban agriculture: capital becomes garden city; http://www.cityfarmerOrg/Zimbabwe.html.

Nugent, R. 1997. The significance of urban agriculture; http://www.cityfarmer.org/racheldraft.html.

Ress, W. 1997. Why urban agriculture ?; http://www.cityfarmer.org/ress.html.

South Africa's food gardens. 1995; http://www.cityfarmer.org/s.africa.html.

Urban agriculture support group.1996. Global facility for urban agriculture; http://www.cityfarmer.org/GlobalFacl.html.

Urban agriculture in Kampala, Uganda. 1994; http://www.cityfarmer.org/danmax.html.

Urban Open Land Project.1999. Urban greening: land protection and urban greening; http://www.cityfarmer.org/racheldraft.html.

C) Other Reference Materials

Anonymous. 2000. A glimpse into the future. Newsweek. Special Double Issue (January 3), P:32-33.

Anonymous. No date, No Title. Photocopy of document obtained from the African Tree Centre.

Anonymous. No date, No Title. Photocopy of document obtained from the Edendale Lay Ecumenical Centre.

Anonymous. No date, No Title. Photocopy of document obtained from the Greater Edendale Environmental Network office.

Anonymous. No date, No Title . Photocopy of document obtained from the KwaZulu Natal Department of Agriculture and Environmental Affairs.

Data World consultant to the Masakane project, January 1998, a two page document obtained from the TLC.

Dlamini, P.Catchment management. Newsletter of the Greater Edendale Environmental Network. 1(2) September/ October 1998. P: 1-8.

Personal communication with Professor Robert Fincham, the director of the Centre for Environment and Development, December 12, 1999.

Personal communication with Mr. Shangwe, Macdonalds seed centre, 2000.

Pietermaritzburg Bureau. 'Tree man' Mazibuko has died. Daily News. July 18, 1994. P: 1-4.

Ratta, A. and Smit, J. Urban agriculture: it's about much more than food. Why magazine. Summer 1993. P: 26-29.

Hodie, S. Youth initiative at Willow Fountain. Newsletter of Greater Edendale Environmental Network (GREEN). 1 (2) September/ October 1998. P: 1-8.

APPENDIX 1:QUESTIONNAIRE

CENTRE FOR ENVIRONMENT AND DEVELOPMENT
UNIVERSITY OF NATAL (PIETERMARITZBURG)

This case study is undertaken by a Master's student from the Centre for Environment and Development at the University of Natal. The aim of the study is to make an economic analysis of food production in the GEA of PMB. In this regard, the response to the following questions must be answered by ticking with (✓) in the boxes or tables provided. In the case of open-ended questions, the ideas of the respondents must be set out in the space provided.

PART ONE
Questionnaire to Organizations

Name of the organization .....

Name of the interviewee .....

Date of the interview .....

a) Background of the organization

1 Could you please give a short description of your organization ?

.....

2 What is the goal of your project?

.....

3 When did you start the project? .....

4 a) Are you involved in any community projects of urban agriculture ?

Yes □ No □

b) If yes, what are the main agricultural activities of your project? Please tick with (✓) for your answer (s)

Vegetables □ Vegetables and fruits □ Livestock □

Forest □ Fish □ Bee keeping □

5 What role does your organization play on the project

. . . . . .

6 How does your organization value, understand, and appreciate the role of urban agriculture ? Please tick with (✓) for your answer (s)

Very high □ High □ Average □

Low □ Very low □ No role □

7 Which type of urban agriculture do you think is best suited to this area? Please tick with (✓) for your answer (s)

Vegetables □ Vegetables & fruits □ Cattle □ Sheep & goat □

Chicken □ Pigs □ Rabbits □ Fish □

Forests& trees □ Flowers □ Cereals □ Bee Keeping □

8 What is the level of the community involvement and participation in the project? Please tick with (✓) for your answer (s)

Very good □ Good □ Average □

Poor □ Very poor □ Not at all □

9 What are the main objective of the community garden? Please tick with (✓) for your answer (s)

Consumption □ Employment creation □

Income generation □ Social benefit □ Environmental benefit □

For saving □ Culture □

10 How do you see government policy in relation to urban agriculture?

Highly supportive □ supportive □ Less supportive □

Not clear □ Doesn't concern □

11 How do you value urban agriculture in food security, income generation, and employment creation and environmental sustainability?

Very high □ High □ Low □ Insignificant □

12 What are your main constraints in you garden activities? Please tick with (✓) for your answer (s)

Price variability □ Pest problem □ Lack of labour □

Damage by livestock □ Theft & vandalism □ Climate problem □

Lack of knowledge □ Transportation problem □ Lack of land □

Poor soil condition □ Land problem □ Fencing problem □

Lack of finance □ Lack of communication □ Lack of Fertilisers □

Lack of water □

b) Training and education in urban agriculture (for 'ELEC')

1 Could you list the training services your organization provides ?

. . . . . .

2 To which of the following do you give training service? Please tick with (✓) for your answer (s)

Women □ Men □ Children □ Students □

Families □ Disabled □

3 How many people has your organization given training in community gardens so far?

1997..... 1998..... 1999 . . . . . .

4 a) Are people who have been trained by your organization practising in their own gardens at this time? Yes □ No □

b) If yes, are they doing it successfully? Yes □ No □

c) If not why not? . . . . . .

. . . . . .

d) How many of them are practising in their gardens?

Many □ Few □ very few □ None □ Not sure □

5 Are people interested in this type of training? Yes □ No □

6 Is the number of the people who have been trained by your organization increasing or decreasing? .....

Give reason for your answer .....

7 Where is the origin of the people your organization have trained?

From greater Edendale □ From PMB □

From anywhere else in the country □

8 What percentage do women constitute out of the people your organization has trained in 1998..... 1999.....?

c) Income conditions

1 a) How does your organization compare its production of 1999 with 1998 ? Please tick with (✓) for your answer

Increasing □ Decreasing □ Same □ Not sure □

b) If increasing why? .....

c) If decreasing, why? .....

2 a) Has your organization made any change in the products to improve marketability?

(e.g introducing new variety, changing quality, size) Yes □ No □

b) If yes did it increase sales? Yes □ No □

3 If sales are increasing, what is the reason (s) ?

the product is winning over the competition □

technology is increasing □

size of the garden is increasing □

cost of production is decreasing □

other reasons (specify if any) □

.....

4 If sales are not increasing, what is the reason behind this?

the market for the product is saturated	☐
lack of transport	☐
other enterprises are producing a better product	☐
prices are too high	☐
other reasons (specify if any)	☐

. . . . . .

5 Where does your organization get technical and / or financial assistance?

NGOs	☐	Government	☐	Private sectors	☐
Ministry of agriculture	☐	CBOs	☐	Banks	☐
Churches	☐	Foreign agencies	☐	No means	☐
Researchers	☐	Developers	☐	Friends	☐

d) Measuring availability and use of inputs; financial and technical aids; and problems associated with vegetable production.

Please measure the following issues by ticking with (✓) whichever is appropriate

Issues	Measure			
	High	Average	Low	None
1 Availability of land (Open space)				
2 Availability of cash				
3 Availability of labour				
4 Availability of water				
5 Availability of seeds				
6 Availability / access to market				
7 Availability of time for work				
8 Financial and technical aids				
-Government				
-NGOs				
-Private sectors				
-Foreign assistance				
-CBOs				
-Banks				
9 Use of chemicals for crop protection				
10 Use of fertilizers				
- Manure				
-Compost				
-Artificial fertilizers				
11 Theft and vandalism				
12 Land degradation and pollution				
13 Land security				

e) Production and marketing

Could you please provide an estimation of the vegetables produced during 1998 / 1999 , the total area, and the purpose of production using the following table? *

Veg	Est		PP (%)				Grn Y/N	Sea	MR (Km)	FM	P (R/Kg)
	Total area (ha)	Production (kg)	Consumption Y/N	Market (Sale)		Barter Y/N					
				local Y/N	balk Y/N						
Cabbage											
Carrot											
etc											

* Veg = vegetables, Est = estimates, PP = purpose of production, Grn = grown, Sea = season, MR = market distance, FM = frequency of market, P = Price, Y = yes, N = no

f) Cost of production

Could you please fill in the estimation of vegetable input costs in the following table?

Inputs	Vegetables										
	Cabbage	Carrot	Beetroot	Spinach	Tomato	Pepper	Potato	Turnip	Choumoli	Beans	Maize
A **VARIABLE COSTS**											
1 Seeds											
Amount (Kg)											
Cost (R/kg)											
Value(R)											
2 Compost											
Amount(Kg)											
Cost (R/kg)											
Value (R)											
3 Manure											
Amount (Kg)											
Cost (R/kg)											
Value (R)											
4 Chemicals for Plant Protection											
Amount (Kg)											
Cost (R/kg)											
Value (R)											
5 Labour											
Amount (Number)											
Cost R /Number)											
Value (R)											
6 Water											
Amount (litre)											
Cost (R/litre)											
Value (R)											

7 Transport	
Amount (Kg)	
Cost (R/kg)	
Value (R)	
8 Fencing	
Amount (metre)	
Cost (R/metre)	
Value (R)	
B FIXED COST	

g) Demand and supply (for 'ATC and WFC')

Could you please show the demand and supply of the vegetables by ticking with (✓) in the space provided?

Vegetables	Demand					Supply				
	very high	high	average	low	very low	very high	high	average	low	very low
Cabbage										
Carrot										
Beet root										
etc										

h) Strengths and constraints of urban agriculture

1 What do you think is / are the main constraint (s)of the urban agriculture?

. . . . . .

2 What do you think the main strength (s) of urban agriculture is / are?

. . . . . .

PART TWO

Questionnaire to the Producers

Name of the interviewee .....

Name of the organization .....

Date of the interview .....

a) Background of the interviewee

Member/ household	Background of the house-hold						
	Sex	Age	Occupation	Marital status	Source of income	Level of education	Employed or unemployed
1							
2							
etc							

b) Training (to the people trained in ELEC)

1 For how long was your training in the ELEC ? .....

2 Did you find it helpful? Yes □ No □

3 a) When did you start your gardening ?

Before training □ After training □

b) If your answer is before training, did it help you in improving your garden output? Yes □ No □

4 a) Do you advise people to be trained in this center? Yes □ No □

b) Give a reason for your answer .....

.....

5 a) Do you want further training if you get the chance? Yes □ No □

b) Give a reason for your answer . . . . . .

c) Land and garden conditions

1 When did you join the community garden ? . . . . . .

2 Who owns the land of your garden ? Please tick with (✓) for your answer

TLC □ Public □ State □ Private sector □ Individuals □

3 How do you rate the access to land for urban agriculture?

Easy □ Very limited □ No access □ Not sure □

4 Are you satisfied with the size of your garden? Yes □ No □

5 Does the TLC help the urban poor by setting aside open places for urban agriculture? Yes □ No □

6 Who has helped you the moste in your community garden?

TLC □ NGOs □ Other private sectors □ Not sure □

7 What is your goal in producing vegetable crops? Please tick (✓) whichever is appropriate

Food / consumption □ Income generation □

Employment creation □ Recreation □ Culture □

8 Which of the following have been increased by your community garden? Please tick with

(✓) for your answer (s)

Employment creation □ Food security □

Income generation □ Savings □

9 Has this community garden made any change in the quality and quantify of your food? Yes □ No □

10 Do you make use of urban wastewater ? Yes □ No □

11 a) Would you be happy to see many communal gardens established inside and at the edge of you township? Please tick with (✓) for your answer.

Yes □ No □ Not sure □

b) Why ? . . . . . .

12 a) Does your garden produce year round? Yes □ No □

b) If not, why not? . . . . . .

13 a) If you were offered other opportunities with a similar income would you rather take them?

Yes □ No □

b) If yes, why would you prefer to take them? . . . . . .

14 What positive aspects do you experience from community gardens (Urban agriculture) ? Please tick with (✓) whichever is appropriate

Learning to work together □ Getting to know others □

Attracting financial Aid □

Learning to share resources, knowledge and experience □

15 How would you rate your garden skills?

Very good □ Good □ Average □ Poor □ Very poor □

16 How would you rate the TLC involvement in your garden activities?

Supportive □ Less supportive □ Not sure □ Does not support at all □

17 What are your main constraints? Please tick (✓) for your answer (s)

Price variability	□	Pest problem	□
Lack of labour	□	Damage by livestock	□
Theft & vandalism	□	Lack of knowledge	□
Transportation problem	□	Climate problem	□
Poor soil condition	□	Lack of fencing	□
Lack of communication	□	Lack of finance	□
Lack of land	□	Lack of water	□
Lack of fertilisers	□		

d) Employment conditions

1 For how long have you been in Greater Edendale ? . . . . . .

2 How hard is it to find job in the GEA? Please tick (✓) for you answer.

Easy □ Fairly easy □ Hard □ Very hard □

3 How many people here are looking for work and can not find it? Please tick (✓) for your answer

None □ Few □ Some □ Many □ Too many □

5 How do you rate self employment in this area? Please tick (✓) for your answer

More □ Less □ Some □ None □

6 What type of labour does your organization use? please tick (✓) for your answer(s)

Hire permanent labour □ Hire temporary labour □

Use labour of members □

e) Income conditions

1 Into which of the following income categories does your monthly income fall ?

R0 - R 100 □ R101- R200 □ R201-R300 □ R301-R400 □

R401- R500 □ > R501 □

2 If you have R 100, how would you use (spend) it per month?

On food..... On clothing..... For saving..... Others.....

3 Do your community garden activities :

Increase your income	Yes □	No □
Reduce hunger	Yes □	No □
Increase food	Yes □	No □
Improve nutrition	Yes □	No □
Create employment	Yes □	No □
Improve environmental quality	Yes □	No □

4 a) Do you usually produce surplus ? Yes □ No □

b) If yes , for what purpose do you use it? .....

5 Are sales of food production increasing? Yes □ No □

f) Animal conditions

Could you please list the animals you keep , their number and show their objective for production by ticking (✓) in the space provided?

Animal type	No.	Purpose of production					
		Eat	Sell	Milk	Power	Lobola	Others
Cow							
Chicken							
Goat							
etc.							

APPENDIX 2 : LOCAL AND INTERNATIONAL INFORMATION ON URBAN AGRICULTURE

N:B These are original documents and the English may not be correct

A) Documents obtained from the organizations

A1 Document from Siyaphila (ATC)

AIDS Outreach Programme

Region 'B' PWA's Support Group

Siyaphila is the Support Group for people living with HIV/AIDS

AIMS:

- to give support and care to people living with HIV/AIDS
- to educate the communities in HIV/AIDS
- to build capacity for the infected and affected

For more information contact:

Jabu Molefe, Chairperson: (033) 951612 or 0824792904

Sbo Shabane, Coordinator: 0826641503

Mdu Ngubane: 0835145553

Source: One page photocopied document from Siyaphila (ATC)

A2 Document from ELEC

The Edendale Ecumenical Centre near Pietermaritzburg in Natal, is an Interdenominational Lay Academy. Laymen of all

denominations and from different occupations are, and can be co-owners of the centre by contributing an annual membership fee.

It was established in 1966 and is run by a Board of Trustees and a Management Committee (elected from time to time), through the Administration staff, headed by the Director.

The Lay Ecumenical Centre was designed through the inculcation of Christian principles. Here, people come together to search for truth in action, through Bible studies and discussions, and also to be encouraged in fellowship which, through Christ, reaches beyond denominational affiliations.

To achieve these aims the Centre provides facilities viz. the main hall, accommodation facilities, seminar rooms, sports facilities which are used for various activities ranging from religious services, organizational consultations and workshops of different kinds. Different programmes are arranged to educate, inspire, promote and raise the awareness of the black people to the needs of their communities.

A wide range of activities has been set up at the Centre, viz:

Agricultural Programme

This is designed to educate communities about the value of utilizing the soil and other natural resources with a view to providing nutritious foodstuffs and also to enabling the people earn a living. Participants are trained in the following:

- the art of vegetable growing;
- fruit culture;
- fish culture;
- organic farming

Women's Programmes

These programmes draw women from far and wide. They are designed to equip the participants with self-help skills and skills necessary for managing small home or neighbourhood industries. Participants receive training in:

- sewing skills;
- housecraft;
- nutrition;
- health education

Leadership Training

This is an all inclusive programme. Leadership is defined in broad terms and is not seen as confined to those who hold status positions in the power echelon. This programme is underpinned by the consideration that the centre must bring good news to all those who have the unenviable responsibility or organizing the ways in which men must live with one another, and also those who must live with these decisions. Participants are provided with:

- a neutral ground

  which promotes openness;
- a cradle for new concepts of human life;
- a ministry which

  proclaims the

  freedom of Christ;
- a venue for symposia, seminars, consultations and conferences.

Youth Programme

The organization of this programme is based on the understanding that wherever there is honest confrontation possibilities for mutual under-standing and sharing emerge. In the presentation of this programme an attempt is made to create an open humanizing context through competent, relevant and realistic information. In this programme emphasis is placed on:

- group dynamics;
- communication techniques;
- decision making techniques
- education and recreational activities

or further information contact:

The Secretary
Edendale Lay Ecumenical Centre
P O Box 63
Plessislaer
3216
Telephone (033) 981018

Some of the activities which are offered or can be arranged by the Centre:

* Lectures/Addresses by renowned speakers

Members are invited to these activities.

* Seminars to establish community needs and aspirations.

*Functions of a recreational nature.

The following facilities are available at the Centre:

*Hall: seating 2000 people; can be used for functions, conferences, meetings etc.

*8 Seminar Rooms: each accommodating 25 people can be used for executive meetings, study groups, etc.

Kitchen and Dining Hall can be used for parties and small gatherings

Sleeping units for up to 150 people: can be used by conference delegates or attendants at programmes run at / by the Centre.

*Educational programmes:

Adult literacy
Dressmaking
Agriculture
Vacation School
Supplementary Education etc.
Appropriate Technology

*Debates and discussions

*Seminars can be arranged and organised by outside companies or groups.

*Special programmes can be requested/ recommended by individual members or groups.

Membership Fee:

Students: R10.00
Adults: R20.00

Source: Two page photocopied document from the Edendale Lay Ecumenical Centre

A3 Documents from green

- **Youth initiative at Willow Fountain**

The area-of Willow fountain is a huge piece of land occupied by more than thirty thousands (30 0(inhabitants living in more than five thousands (5000) dwellings. More than sixty percent of the residents are either unemployed or live from hand to mouth. Willow Fountain is divided into sev areas, namely Tomu, Right, Phupha, Bulwa, EE North, Kuzwayo and Terminus. Willow Fountain h been a farm for more than forty years, this place has been mainly used for agriculture.

Some parts of these are arable land and some have been cultivated before and are rich in humu The low-lying areas especially the flood plain areas are extremely rich in humus and moisture. All tl top soil eroded from higher altitude areas settle there. Trees especially fruit trees are good in the: areas. Pecan nuts, oranges, lemons, apples, etc. are good examples.

Vegetable gardens are a good source of food for both subsistence and commercial purposes. Tl Willow Fountain vegetable garden is too small to feed the entire community, and as such Willc Fountain farmers are currently involved in subsistence agriculture. They cannot sell some of the produce. They definitely need to expand and improve the garden to be able to produce good quali vegetables etc. in large quantities. The farming group can only hope that through collective hard wor commitment and some kind of help in terms of financial resources they will be able to extend the gardens.

Source: Hodie, S. Newsletter of GREEN (1998)

- **OPPORTUNITIES FOR COMMUNITY INVOLVEMENT IN URBAN AGRICULTURE, GRAZINC PURPOSES ETC. IN THE PIETERMARITZBURG-MUSUNDDUZI TLC.**

1 Introduction

The primary task that community would normally do is to identify land and its ownership where it wi be utilized for cultivation purposes. The community has to begin at this level initially, but it i fundamental for the community to be organized in the form of a group and formalize themselves int clubs or association, that has an opportunity to form a large association which can be named, eg Urban Agriculture Association, Urban Farmer, Alliance etc.

2 Constitution

The constitution has to be organized for these groups in order for them to know their rights and to be able to control their association. This has to happen once the community has constituted themselves as a group.

2.1 Trusts

This is a vehicle that the organized structure can possible use to formalize itself. It is assumed that this route is expensive and time consuming to let it functioning due to the fact that it has to involve attorneys and register the trust with the Master of Supreme Court.

2.2 *Community properties Association*

Community Properties Association Act is the Act that the Department of Land Affairs prepared f community to enable them to obtain landownership as a group. (Our understanding is that this A provide an opportunity for communities to practice sustainable land use in a form of urban agricultur (land ownership would vest with the CPA).

If they are to hold / use government land, this would need to be by means of a formalized leas agreement.

2.3 *Leasing of land to Community*

Land that is presently owned and controlled by the Transitional Local Council e.g. Sobantu an northern areas, con be leased to community for cultivation purpose. A reasonable time frame neec to be considered.

3 Types of organizational structure

There are at present existing structures that are operating as food producers within the TL boundaries that are purely community initiated projects. These community groups have different type of structures and have an average of 20-25 members coming together for the purpose of urba agriculture. Some of these organizations are not organized as a visible agricultural group. An invisibl group in this context is a group that is passive, sometimes they meet once a year, some times you' find that they met when they were talking about the food gardening (after that they would name them) One person would represent a group at a certain meeting. This group has an interest in foo gardening. When they discover that there is a contribution that needs to be made, such as in kind an finance for purchasing of fencing materials, seeds/ seedlings etc. people find it difficult to do tha because they do not have money. The person would continue to represent and sell the group's ide when the resources become available, she or he organizes community people again and sta interpreting the theory into practice.

Sometimes when there is an agricultural workshop or course, this representative will organize on or two interested members to attend the event. In other words you cannot see a group but you hea about it, you'll know the name and hear the idea and aims of the groups. That is why when the new initiatives start with full resources, you find someone comes and question that initiative and it end up failing because the invisible group is there. Why invisible groups? People lack awareness, they are not aware what to do once thy have an organized community. At some stage the community is organized by one person who has an interest in physical project, and unable to be in contact with the right organizations and people in order to get advice and assistance.

3.1 Co-operatives

Two co-operatives have been formed as a collective, these are community based informal co-operative (not registered) at present,

3.1.1 Sobantu, known as *Sobantu Agricultural Co-operative.*

- Due to the fact that the co-operative is informal, it is not seen as a problem at this stage. The community just calls itself a co-operative (using that as a name). Its still early days for the community at Sobantu to be looking at an official co-operative. It is a co-operative in the sense of a spirit of working together (togetherism and co-operationism).

- The crops that the co-op produces are marketed within the Sonbantu township, the wish of the co-operative is to market in the city where there is large market movement. The formal produce suppliers cut the small producer out due to lack of public awareness and transport problems. This is causing a growing common problem.
- This market system that is presently used in Sobantu is marketing within the township, by supplying to the local one, Spaza shops and supermarkets including tuck shops
- The members of the co-operative are discussing the possibility of opening a central market point where all the crops will be brought together at one point. One person would sell on behalf of the co-operative members. This is seen as a vegetable market centre for the community. Run and managed by the community members, and is seen as a development model for Sobantu.
-

3.1.2 Willow Fountain Zenzeleni Agricultural Co-operative

This organization is active in using open space for vegetables production purposes. The aim is to produce vegetable of good quality for sale.

- The above co-operative's status is the same as Sobantu, it is still early at this stage for the co-operative to be a registered as a bona fide Co-operative. The idea of co-operative is to cultivate the land together and sell the produce together.The income that is received is to be banked in one account for benefit of the members.
- The vegetables are sold internally to the community and the surplus is consumed by individual members. The main problem is to supply the market at Mkondeni in bulk. The lack of back-up facilitation support toward the arrangement with the market as an interim measure is a big problem. The long term objective is packaging and processing vegetables for the greater Edendale business community, and they see the problem as being local businesses are not organized. This is a threat because the business people would still buy at the big markets which will disadvantages them.

4 Status of land ownership

The land in Greater Edendale is mostly owned by the provincial administration (Department of Local Government and Housing). Some of the land is privately owned. The northern side of Pietermaritzburg-Msunduzi and the north eastern of Sobantu is TLC land.

4.1 *Land users versus private land owners:*

The private land owners in principle agree with the use of land, especially the land on the flood plain. The problem is where there is a lack of legal agreement between the land users and the landowners. There are also problems of communication between individual land owners and the users as a group. The land owners are organized in an association. When it's coming to the land releases for community usage, different approaches become a serious (political) problems.

4.2 Land users versus state own land

Most of the state land is in the city councillor's wards. The land users approach the ward councillor for a permission to use land for food gardening purposes with an expectation that the TLC own and control the land especially in Imbali and Willow Fountain. The present land users however have a problem often being in a position of not having valid permission to use land. This becomes a serious problem when they are looking for resources. And the question of land guarantees becomes a stumbling block.

5 Capacity building

Capacity building is vital for the present community that is working on urban agriculture, especially ir the following areas:-

- agricultural and farming techniques,
- stock production and control,
- leadership skills,
- financial management,
- book keeping /accountant, and
- other necessary envisaged skills.

Some communities have received basic training in gardening including the above mentioned co operatives and a few community members within the TLC.

6 Community

The community has seen the benefits and the need for producing crops for their subsistence, there are three groups that are actively involved with cropping. They are within the TLC area. Refer to Table I

Table I the vegetable gardens in GEA

Names of Groups	Area/community	State of garden sites
Dumakahle Women and Agriculture	Caluza	No vegetables, and no fence
Sizanani Agricultural Co-op	Willowfountain	Fenced with vegetables
Siyathuthuka Agricultural Co-op	Sobantu	No fence vegetable in place
Sinethemba	Imbali unit 2	No fence no vegetables
Bambisanani Agriculture	Imbali unit 13	Fenced with vegetables
Ibambwewena	Imbali unit 2	Fenced with vegetables
Smero	Georgetown	No fence no vegetables
Africa Tree Centre	Machibisa	Fence with vegetables
Edendale Lay Ecumenical Centre	Machibisa	Fenced and training provider

7 Grazing

The commonage areas, in particular Edendale, have been invaded which has caused a shortage o livestock grazing land. The only land that can be used for grazing purposes is land that is not suitable for vegetables (Steep land). The livestock owners need to be involved and be part of the group ir order to discuss such issues and find common ground for sustainable land use. Most of the livestocl are in Greater Edendale. It's noticeable that the livestock also affect Prestbury and Blackridge. The reasons for this include the following:

-dis-organization among the livestock owners, e.g. in a form of association etc,

- uncontrolled grazing (no grazing systems in place),

- no defined grazing land,

- no clear policy and by laws on livestock control and grazing within the TLC.

8 Forestry

There are open spaces that are not suitable for both vegetable production and grazing. Some of which are affected by dumping. A soil survey needs to be done in order to determine the types of trees that can be produced on this land some land can sustain indigenous plants. Muthi plants and fruits trees etc. for the benefit of the city and the community.

9 C onclusions

Conflict resolution and dispute management needs to be implemented. Availability of dry lands need to be investigated. Some land can be used as social forestry and be managed by the community as a group. The opportunity for community involvement in cultivation of crops is wide open. Another opportunity is the possibility to supply an organic vegetable market shop in the city.

Source: Photocopied document obtained from GREEN

B) Significance and research in UA and local and international developmen agencies

Table II significance of UA

Latin America	
Buenos Aires, Argentina:	20 percent of nutrition needs of city produced by part time farmers.
Jerusalem, Colombia:	Average participant with 60 sq metres of hydroponics producing a net income worth two minimum wages. 67 percent of cultivators are women.
Asia	
China:	18 of China's largest cities produce over 90 percent of vegetable demand and over half of meat and poultry.
Guangzhou, China	Produces nine crops a year in open site, with light soil and urban compost.
Hong Kong:	Produces 45 percent of vegetable demand on five to six percent of land area.
Singapore:	Produces 80 percent of its poultry and 25 percent of its vegetables.
Java, Indonesia:	Home gardens produce one-fifth of calories and one-seventh of protein needed.
Africa	
Kampala, Uganda:	70 percent of poultry needs produced inside city.
Nairobi, Kenya:	65 percent of urban farmers are women.
Kisangani, Zaire:	64 percent of urban farmers are women.
Karthoum, Sudan:	27 percent of all solid waste eaten by cattle.
Bamako, Mali	Totally, self-sufficient in horticulture products, and exports.
Kenya:	29 percent of urban residents do urban farming.

Table III international development agencies in UA

ORGANIZATION	LOCATION	PROJECT DESCRIPTION
FAO & Belgium	Dakar	Support small scale horticulture
FAO		Supports street food upgrading projects.
UNDP	Latin America	Supports shantytown hydroponics projects
UNDP/WB	Global	Programs in wastewater-fed fish and irrigation.
UNICEF	Global	Household and community gardens, policy studies.
UNU	Global	Funded Food-Energy Nexus Program in the 1980s.
IDRC (Canada)	Kenya and Tanzania	Funded urban agriculture surveys and research projects.
USAID	Philippines and Thailand	Support urban agriculture in its MEREC program.
GTZ	Mexico City	Supports sewage-fed fisheries, composting and other projects.
Italian Government	Argentina	Supports Govt and NGOs.
SIDA	Mozambique and Ethiopia	Provided support for urban agriculture in the 1980's.
JICA	Philippines	Supported urban agriculture and marketing.
Taiwan	Panama	Supports urban agriculture and provides fellowships in Taiwan.
Inter American Foundation	Chile	Supports urban gardening programs.
Ford Foundation	Nairobi	Supports an NGO, Undugu Society
Oxfam	Peru	Supports an NGO, Peru Mujer
Save the Children	Central America	Support for local gardening.
CARE	Haiti	Promoting UA sub-sectors.

Table IV local organizations promoting UA

ORGANIZATION	LOCATION	PROJECT DESCRIPTION
Urban Food Foundation	Philippines	Instrumental in forming a co-op of 500 small livestock producers.
SODEM	Chile	Uses model gardens to train home gardeners. Provides extension help.
UNDUGU	Kenya	Supports urban farming for food security, enterprise, disaster management
CET	Chile	Training and extension to low-income for bio-intensive gardening.
PERU MUJER	Peru	Training and organizing community gardens for low-income women.
GRUPO DE ESTUDIOS AMBIENTALES	Mexico	Provides technical advice to Chinampas farmers.

Table V research in UA

ORGANIZATION	LOCATION	PROJECT DESCRIPTION
Sokoine University	Tanzania	Completing a two-year survey.
AIT	Bangkok	Pilot projects in intensive agriculture techniques.
J. of Philippines	Los Banos	Research on small-scale farming.
CDH	Senegal	Research and extension on urban horticulture.
AVRDC	Taiwan	Horticulture and household gardens research and extension in East Asia and Africa.
CIPES	Peru	Wastewater aquaculture and horticulture.
CANELO	Chile	9 Research projects in urban farming technologies.
Mazingira Inst.	Kenya	Survey of UA in 6 cities.
University of Cairo	Egypt	Plastic tunnel horticulture
Centro Las Gaviotas	Colombia	Hydroponics for low-income
Makerere University	Uganda	Research and surveys on UA

Source: for Tables II, III, IV and V (Oliver 1994: Appendix VI)

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