URBAN AGRICULTURE IN THE DURBAN UNICITY

A CASE STUDY OF DEMAT

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ABSTRACT

Recent trends indicate that there has been an expansion of food production in cities. The urban areas were traditionally the focus of commercial, industrial and residential land use. Although agriculture was the forte of rural areas, urban agriculture presents an emerging land use in South African cities. Thus urban agriculture is an unconventional land use in terms of city space. This must be viewed within the context of rapid urbanization, especially in developing countries that have experienced rapid growth in urban population numbers through in-migration and natural population growth. This resulted in unemployment and wide scale poverty. As an innovative response to poverty, the poor have generated alternative livelihood strategies, inter alia, the growing of food crops as a means to achieve supplementary sources of food.

This study is an examination of the impacts of urban agriculture in the Durban Unicity and uses the case study of the Demat community in Welbedacht.

The purpose of the study was firstly to determine the socio-economic profile of the community of Demat. Secondly, the study intended to examine the nature and extent of agriculture in the urban residential area of Demat. Thirdly the study focused on the accessibility, ownership and availablility of resources needed by the people to engage in agricultural production in the community of Demat. The fourth objective was to determine whether urban agriculture was supported by the state and other non-governmental organizations. A critical objective was to assess the potential role of urban agriculture in food security, income generation and employment creation in the community of Demat. The sixth objective was intended to provide recommendations for improving urban agriculture in the residential area of Demat.

The study revealed that the majority of the people were poor. In the absence of formal employment opportunities, the majority indicated that they were involved in urban agriculture to supplement incomes as a means of contributing to food security and to alleviate poverty generally. Even pensioners who are not normally considered to be economically active were involved in urban farming. Although food crops were grown for household consumption, they were also sold to generate supplementary incomes. As this form of agriculture was characterized by low energy inputs, evidence of environmental degradation was non-existent or minimal. In the main, crop cultivation was shaped by multiple influences. Some of the primary factors were food shortages, unemployment, household labour availability and prevailing poverty. Specific problems related to crop production were as follows: damage by livestock, lack of fencing, lack of water, lack of land, lack of fertilizers, lack of finance and the lack of support services.

The recommendations provided in the study relate to general and specific concerns raised by the community of Demat. In this respect the national government, the provincial government and the Durban Unicity must make resources available to alleviate the plight of the poor.

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ABBREVIATIONS

OECD	Organisation for Economic Co-operation and Development
SGUA	Urban Agriculture Support Group
UN	United Nations

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CHAPTER ONE
INTRODUCTION

1.1. PREAMBLE TO THE STUDY

The study derives its personal context from my childhood and as a practicing educator adjacent to the study area. The writer grew up in the area of Chatsworth, which is adjacent to the area of Welbedacht. In order to supplement the earnings of my family I sold cosmetics to residents in the area bordering Chatsworth and Welbedacht, the time frame being between 1972-1977. The area of Welbedacht was characterised by continuous agricultural forms. This provided a platform for mutual interaction, as it was cheaper to purchase fruit and vegetables from the makeshift roadside stalls, than the local supermarkets of the time. Although there were pleasant memories, I was particularly galled by police raids in the ostensible pursuit of confiscating illegal substances, but in the main attempting to rid the area of 'unlicensed vendors'. However, my parents always responded cynically to these episodes that the police saw it fit to attack harmless people, but were impotent against the proliferation of criminal gangs during that decade. In essence, Welbedacht appeared to be separated from the formalized urban spatial forms in the neighbouring area of Chatsworth. It represented the largest green space adjacent to Chatsworth, Umlazi and Marianhill, at that time.

As a former resident of Chatsworth, and currently teaching in Chatsworth and an area from which my school draws some of its pupils, Welbedacht presents a strong sense of magnetism to explore the impacts of urban agriculture. Past forms of extensive green spaces have been replaced by formal and informal housing.

This study is about the diverse potential of the practice of urban agriculture as a survival strategy within the context of urbanization and urban poverty.

1.2. NEED FOR THE STUDY

The world's population is rapidly urbanizing, especially in developing countries. According to Ferguson and Maurer (1996), in 1950, only 30% of the world's population was urbanized and by 2030, 60% of people will live in cities. The OECD Report (2001) asserts the following.

- Much of the urbanization is taking place in large cities.
- The number of megacities with populations over ten million people, large cities with population figures between five to ten million people and medium cities with population numbers between one to five million people are increasing rapidly, especially in the developing world.

In 2020, Southern Africa's urban population is projected to be double than what it was in 1996 (Hope and Lekorwe, 1999). At the local level, in the case of Durban, recent surveys have indicated a decline in the rates of increase in population growth, attributable largely to the general decrease in family size as well as the impact of Acquired Immune Deficiency Syndrome (AIDS) (Dorrinton, 2000). The projected urbanization levels for 2010 and 2020 are 59% and 62% respectively which implies that in 20 years time almost two thirds of the total provincial population will be living in urban areas of which the Durban Metropolitan Area is the largest (Durban Metropolitan Area Report, 1999). This has been expanded to the Durban Unicity.

The rapid growth of urban population can be directly linked to in-migration and natural population growth. Hitherto urban strategy development has focused on the development of commerce and industry, as well as the growth of transportation, communication, education, housing and other types of infrastructure in the urban areas. Although cities are the main catalysts of economic growth and prosperity, it epitomizes the great divide between the well-endowed formal sector economies and the marginalized informal sector. The informal sector will include the bulk of the urban poor who make their living through subsistence activities and other informal jobs.

Poverty has various manifestations, including lack of income and productive resources sufficient to ensure sustainable livelihoods, hunger and malnutrition, ill health, limited or

lack of access to education and other basic services, increased mortality from illness, homelessness and inadequate housing, unsafe environments, and social discrimination and exclusion (Dept. of Environmental Affairs and Tourism, 1999). In South Africa this was given further legitimacy through apartheid induced scarcities.

The resources of the country were for the exclusive benefit of the minority. Urbanisation has created inter alia a dire need to attain food security and to secure sustainable livelihoods and a sustainable resource base to meet the survival needs of the urban poor in particular (UN-Habitat, 2002). The inadequate response from the urban authorities has spawned self-help measures from the poor who have built informal houses, introduced animals and ploughed up vacant land at every available opportunity, often in marginal areas (Drakakis-Smith et al, 1995).

Urban agriculture is a concept that evokes contradictory images. Agriculture is commonly viewed as a rural land use and not an urban one. It has been common for development researchers, policy makers in developing countries and technical professionals in assistance agencies to overlook the vast numbers of urban poor who generate at least a portion of their livelihood from agricultural production (Remenyi, 2000).

Urban agriculture is defined here as including production for domestic consumption or sale of food grains, tree crops, horticultural produce and animal products within and or on the periphery of urban areas. It is characterized by a variety of spatial forms or types, depending on resource availability and or production systems. These include:

- Home gardens
- Community gardens
- Poultry production
- Horticulture
- Floriculture
- Urban forests
- Aquaculture

- Animal husbandry

This study is intended to evaluate and conceptualise the impacts of urban agriculture, using the case study of Demat, in Welbedacht.

1.3. THE AIM OF THE STUDY

This study intends to critically examine the impacts and nature of urban agriculture on household survival by using the case study of the Demat community in Welbedacht.

1.4. THE OBJECTIVES OF THE STUDY

i. To examine the socio-economic profile of the people in Demat.
ii. To examine the nature and extent of agriculture in the urban residential area of Demat.
iii. To examine access, ownership and availability of land, agricultural inputs and labour needed to engage in agricultural production in the community of Demat.
iv. To ascertain whether urban agriculture is being supported by the state, NGOs, and other allied role players in Demat.
v. To assess the potential role of urban agriculture in food security, income generation and employment creation in the community of Demat.
vi. To provide and recommend suggestions for improving urban agriculture in the residential area of Demat.

1.5. CHAPTER OUTLINE

Chapter one presents the preamble to this study. It examines the needs for the study within the context of urbanization and the urban poor. The chapter also internalizes the writer's justification to explore the potential of urban agriculture. Additionally, it also sets out the main aim and the objectives of the study. Overviews of the different chapters are also presented.

Chapter two presents the conceptual framework for this study from which the analysis of the later chapters will be elicited. This chapter presents the definition and the different forms of urban agriculture. Simultaneously, the literature review addresses the critical issues of food security and sustainable agriculture within the context of sustainable development. The chapter also encapsulates the different perspectives that urban farming offers, including gender aspects and other ecological benefits.

Chapter three provides the background to the case study. It seeks to describe the status quo of the study area in terms of its geographical locality and a brief on the proposed development of new housing units. The chapter proceeds to discuss the research methods and techniques used in this study. It also provides an explanation for the techniques and methods used.

Chapter four deals with an in-depth analysis of the data collated from household interviews, formal structured surveys and semi-structured surveys, interviews with key informants and focus group activities. The socio-economic profile of the people of Demat is presented. The operational mechanics of urban agriculture in this community is extrapolated and presented. These relate to the agricultural inputs, problems and sales distribution of crop commodities.

Chapter five commences with a summary of the findings of the study and forwards recommendations based on these findings. The chapter also discusses the problems associated with urban agriculture and the need for institutionalized support to sustain this strategy for survival. The major limitations regarding this study are discussed briefly, with concluding comments.

1.6. CONCLUSION

The chapter initially dealt with a personal context for undertaking this study. This was followed by contextualising the issue within the tenets of urbanization, which provides the broader conceptual justification for the study. The aim and objectives were outlined. Critical to this are issues pertaining to food security and sustainable agriculture to ensure

sustainable livelihoods. Supporting and encouraging urban agricultural practices in certain contexts can achieve the alleviation of poverty, which is one of the national and international priorities for achieving social justice.

The next chapter presents a review of the literature available on the impacts of urban agriculture. It presents a conceptual framework for the study.

CHAPTER TWO
THE PRACTICE OF URBAN AGRICULTURE

2.1. INTRODUCTION

This chapter deals with the literature review, which aims to examine the nature of urban agriculture. It focuses on food production within urban and peri-urban areas. The intention is to outline the nature of urban agriculture, the potential benefits and the potential negative impacts.

Invariably, there is considerable debate on the differences between urban and rural settlements. Past eurocentric literature tended to punt the functional differences as points of departure between urban and rural areas (Tinker, 1994). According to Drakakis-Smith et al (1995), there is emerging literature that urban areas, besides being the nexus of commercial, residential and industrial activities, are beginning to demonstrate that they are areas of agricultural production. The former view of the city is being challenged by research showing complex processes of 'ruralization' of the urban landscape, which do not conform to western concepts of city development (Stren, 1986; Satterthwaite, 1990 cited in Rogerson, 1993). According to Asefa (1994), urban farming initiatives were seriously disrupted in countries like Ethiopia, Uganda and Cameroon by their respective local authorities, prior to 1990. However, the literature points out that attitudes have changed with increased support in such ventures as a result of the fluctuating food supplies from rural subsistence economies (Simon, 1992 cited in Obosu-Mensah, 1999).

2.2. WHAT IS URBAN AGRICULTURE?

2.2.1. *Definitions of Urban Agriculture*

A new global facility for urban agriculture was created in March 1996 at an international consultation held by the Urban Agriculture Support Group (SGUA). This group examined the issues related to food security and urban agriculture, especially for developing countries. Urban agriculture can be defined as the growing of plants, trees and the raising of livestock within and on peri-urban areas (Mougeot, 1994). In essence this

type of activity refers to the growing of food whether it be fruit, vegetables, and livestock rearing.

2.2.2. *Growth of Urban Agriculture*

Urban agriculture is closely linked to population growth in urban areas. Urban land use patterns manifests itself in the form of three basic spatial forms: industrial, commercial and residential. According to Arndt et al (2000), the attraction of employment, housing and other social services and perception that cities create wealth have resulted in massive population movements to urban areas. Other reasons, according to Arndt et al (2000), include forced dislocation due to civil unrest, war, famine, land degradation and natural population growth.

Whereas there has been tremendous increase in urban population, there has been little commensurate growth in the social well being of persons. This has expressed itself in widespread poverty and other social evils, reflecting in essence the current scenario (Hope and Lekorwe, 1999). Within this context urban agriculture in developing countries has persisted through the colonial and post-colonial periods on a widespread basis. The sustained increase in urban populations during the final quarter of the 20th century has refocused attention to urban agriculture and its growth, in spite of competition from other land uses (Smith, 1999). In effect the poor have utilized this form of food production as a coping mechanism, against rising adversities.

Notwithstanding the coping strategy mentioned above, Mlozi (1996) asserts that there are many middle and high income groups involved in urban farming, with the focus on agriculture being an entrepreneurial activity. Moreover world wide approximately 200 million urban dwellers are now urban farmers providing food and income to approximately 700 million people (Mougeot, 1994).

2.2.3. *Categories or Types of Urban Agriculture*

According to Obosu-Mensah (1999), urban agriculture takes on a variety of forms on the basis of location:

- Open space farming, where the activity takes place some distance away from the home. Farming is done in the open on land that does not normally belong to the cultivator, possibly leased or public owned land.
- Enclosed farming where agriculture is practiced within fences, walls and legal boundaries of the property owners.

Competing land uses in urban areas, especially demand for commercial, residential and industrial land has restricted the proliferation of both forms of urban agriculture. Invariably the size, scale or dimensions of the plot sizes differ within and across national boundaries.

2.2.4. *Scale and Dimensions*:

According to the Integrated Planning Services (1991 cited in Epstein, 1994), the following plot types may be identified:

- Individual or backyard gardens, which are non-viable in the sense of earning an additional income; but serve to supplement household diet (subsistence purposes) and reduce costs. The gardens are located on vacant land or residential properties. They range in size between 10-100m^2.
- Community gardens, which are used mainly to produce vegetables for home consumption and in which a number of households pool their resources (in basic infrastructure and fencing) on a portion of land accessible to their homes. They range in size between 100-500m^2.
- Allotments, which are usually set out in blocks sharing common infrastructure are used mainly for intensive vegetable production. They tend to be larger than that of the gardens (one tenth of a hectare) and are intended to be income generating (they can be used to augment household earnings in addition to supplementing household food requirements). Allotments are set aside as a block of land in an urban development and range in size between 1000-2500m^2.

- Smallholder and small commercial units tend to be commercially oriented, located on the periphery of urban areas and range in size between 20 hectares and 50 hectares respectively.

However, the above differential forms represent broad generalizations and therefore need not necessarily fully address scales of urban agriculture in all areas. The limitations are that individual plots (backyard or front-yard gardening) may well serve to augment or supplement income. Simultaneously community gardens, besides producing on a subsistence scale could also supply surplus to informal market networks. The magnitude of these forms also relate to actual urban agricultural activities.

a) ***Home Gardening***

This process takes place within an enclosed private space. The householder usually owns the plot or it could be leased from medium to long term. In view of escalating food prices and in order to provide basic nutrition for families, small vegetable patches are created. In essence, the poor faced with diminishing purchasing potential attempt to make maximum utilization of space for growing vegetable crops. This is performed within the limitation of the costs of production – water, land, capital, fertilizer, and stress on labour; especially where housewives perform the normal chores, maternal duties and labour intensive gardening (Gowon, 1996). Whereas the material costs of production can be readily quantifiable, the psychological costs of dualistic labour performance by women are difficult to ascertain.

Also some researchers suggest that in view of escalating urban food prices, an expansion of the practice of self-food cultivation in city gardens offers hope for the urban poor, not least in terms of improving their standards of nutrition (Drakakis-Smith, 1997: 799). Urban gardening is thus seen not as a pleasant or subsidiary activity but as vital for developing 'more productive and viable urban habitats' (Rogerson, 1993: 34).

b) ***Community Gardening***

This type of gardening refers to cultivation providing increased food production. Gardening is performed usually in an open space system. Groups of people work intensively to produce food for themselves and their community. The garden plots may be some distance away from their homes. Community gardening develops a sense of belonging and it fosters a sense of empowerment and fulfilment. Resources are communally owned and in general people invariably pride themselves over such assets. Assets and liabilities are mutually shared, an advantage over the private enclosed cultivator, who runs the risk of major losses. However, the individual cultivator stands to gain from the benefits of higher income spin offs. This form of collective agriculture acts as a bulwark against the possible threats of other competing land uses.

c) ***Urban trees and forests***

Trees are crucial structuring elements in settlement planning and they perform a number of roles in the open space system. Urban forests play an integral role in the bio-diversity of the open space systems in city areas. Aesthetically it needs to be remembered that edible plants also have edible qualities and should be used by planners to produce more functional relevant urban spaces, for example, through planting fruit trees (Eglin, 1990). Its relevance then, an environment under production, is more beneficial to society than those that are unifunctional, that is, in the case of ornamental trees.

The D'MOSS (Durban Metropolitan Open Space System) is one such initiative undertaken by the City of Durban. The creation of a green belt through spontaneous natural growth, and purposeful endeavours to encourage residents to plant fruit trees serves a dualistic function, that is, to manage and sustain the urban bio-diversity (The Durban City Council Report, 1994). It could act as a subsistence spin off for the lower socio-economic groups.

d) ***Livestock***

Residents in many towns and cities are involved in livestock production for various reasons. They include economic, nutrition, social and traditional reasons. The economic reasons derive from the demand for meat and other by-products by urban residents; whilst household consumption serves as a nutritional goal. In certain Asian countries, for example, cattle are reared for milk and more significantly as divinity symbols (Flynn, 2001). In Dar es Salaam, an African city, characterized by high population density, significant numbers of cattle were kept, approximately 86 cattle per person, in 1993 (Mlozi, 1997). According to Mosha (1991 cited in Rogerson, 1993: 5), there is evidence of animal husbandry, market gardening and similar activities; everywhere and the towns are characterized by roaming goats, sheep, cattle, pigs and chickens as well as by the unpleasant stench stemming from the haunts of such animals, especially in the rainy season. Figures for 1994 indicate that in the city of Dar es Salaam, over 900 000 poultry birds were part of the livestock of the residents (Mlozi, 1996).

2.3. Potential Benefits of Urban Agriculture

The practice of urban agriculture could be beneficial in many ways:

- Ensuring sufficient and/ or supplementary affordable food (food security)
- Creating employment opportunities at low cost (relative to industrial and/ or commercial employment opportunities) and supplementing incomes (economic principle)
- Creating social awareness and cohesiveness
- Ecological sustainability
- Development of aesthetic and recreational spaces

The benefits are discussed in the next sections.

2.3.1. The Potential of Urban Agriculture to Ensure Food Security.

Food security is the state of having secure and sustainable access to sufficient food for an active and healthy life (Maxwell and Wiebe, 1999). To this extent the World Bank stresses that there should be food availability at all times, to meet the tenets of food security (World Bank Report cited in Maxwell and Wiebe, 1999). By contrast food insecurity is generally defined as a lack of access to sufficient food. Persons who do not enjoy sustainable access to sufficient food during a particular period of time, are likely to be categorized as people who suffer from food insecurity. It is estimated that over 100 million people in various countries throughout Africa suffer from food insecurity (Asefa, 1994). This problem is further exacerbated when viewed globally; when one contrasts the developing world with that of the developed.

The problem is that there is no shortage of food but the distribution of food between the 'haves and the have-nots'. Whereas the developed world has managed, with ease of efficiency, to stockpile and dump food with institutionalized regularity, such a substantial security has not been forthcoming in the Third World scenario (Amrita, 1996). This skewedness in food security does not only occur on the macro-scale but regionally and within nations. South Africa purports to be Southern Africa's economic giant but its agricultural sector, inter alia, demonstrates such a divide. It follows then that a dualistic agricultural economy exists, which does not augur well for total economic development, that which is measured as the gross domestic product (Farmworkers Research and Resource Project, 1997). On the contrary, the GDP is not necessarily an exacting measuring instrument. It does not adequately quantify the value of subsistence agriculture, nor is it able to adequately measure other economic pursuits. Having adequate food and ensuring sufficient accessibility are necessary preconditions for economic, social and political stability; at the same time meeting the physiological needs of households are of paramount importance (Pretty, 1995). Therefore, it is suffice to state that economic development and food security are not mutually exclusive entities.

Widespread hunger and malnutrition still persists throughout the developing world, despite advancement in agricultural technology. There is a popular school of thought that Third World food production can be secured if they revolutionise their technology, inclusive of adopting hybrid seeds and more sophisticated irrigation systems (Asefa, 1994). This is rooted in the tenets of the Green Revolution. Whereas this has radically increased food production in the developed world; such applications in poor communities are doomed to failure. As Hyami (1981: 417) asserts, "Green Revolution technology tends to be monopolized by large commercial farmers, who have better access to new information and better financial capacity". This assertion remains largely true today. The adoption of such measures is difficult for poor communities who have little financial capacities to purchase these inputs. Such technologies, also promotes specialization of production which are more vulnerable to climate and external markets. The poor or subsistence farmer does not have such infrastructural capacities to innovate or increase food production.

Commercial food production has been characterized by "excessive concentration, corporate conglomeration, collusive practices, and the abuse of economic power by enterprises in a dominant position" (Farmers Research and Resource Project, 1997: 6). This further entrenches the status of poor who not only face competition from within but also the external conglomerates. Given the fact that First World countries have evolved through a large time frame, their economies are much more consolidated; though it has been achieved through colonial exploitations. Through military superiority the colonial powers were able to sustain the flow of primary resources to the mother country, thereby developing their secondary and tertiary sectors of the economy. There was marginal or negligible growth in the secondary and tertiary sectors of the host countries. Thus the colonial powers had an overwhelming advantage over the developing countries, in that their economies have been consolidated over a longer period of time. They are able to hold down market prices in the short term, thus squeezing out the small entrepreneur, and then monopolize the market prices once their initial objective of removing the quasi-competitors has been achieved.

The net result of such processes is that poverty becomes more firmly rooted, as the poor are unable to break free from this vicious cycle. This creates a dependency crisis as the developing world constantly looks to the first for food and other social securities. Food aid itself is stringently manipulated, as donor nations seem to assist those who have similar political and economic policies (Mills, 2000). This could be borne out by the Ethiopian famine, during the decade of the eighties, where Western countries, especially the United States of America were reluctant to send relief aid until they were satisfied that the interests of capitalism would be best served if they did so.

Faced with such adversities the urban poor have initiated agricultural practices as a strategic response to food insecurity. Urban agriculture represents an innovative response by the urban poor to ensure survival, a spontaneous response, in the absence of purchasing power. It is a response for the need to exist despite prevailing socio-economic or political circumstances that either precipitates a low per capita income or excludes employment in the formal economy (Coovadia, 1995). Macro-economic policy and local economic development initiatives rely on 'trickle down' effects, as it does not necessarily benefit the impoverished masses (Maharaj and Ramballi, 1998).

It is a logical response to poverty by the poor, then, to establish food gardens. Support for such initiatives could lead to increased food security for the urban poor, with possible economic spin offs in terms of supplementary income and creation of job opportunities. Increased productivity could lead to low-level competition amongst producers resulting in decreased food prices, making it attractive to other consumers who generally service the formal market economies. However, this is a cautionary comment as in reality the informal sector offers little resistance to the monopolistic commercial producers.

Moreover, it could also enhance the freshness of perishable foods reaching urban consumers, increasing variety and nutritional value of food available. According to Sawio (1994), savings on transportation charges would be beneficial to the grower where the urban farmer establishes *'U- pick'* operations. The advantages of this system, according to Sawio (1994), are as follows:

- Less labour required for harvesting, shipping and storage.
- Growers receive immediate payment for their produce.
- Largest sales per customer relative to other market channels.
- Growers are able to develop a loyal following of customers.

Quite evidently this form of agriculture can make a significant contribution to food security in many 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. Currently it provides income or income-substituting food to a significant number of urban residents (Tinker, 1994 cited in Ghebremicael, 2000).

2.3.2. Creating Employment Opportunities and Supplementary Incomes

In Africa, urban agriculture may be regarded as a micro-level or people's initiative (Mlozi, 1996). In Mlozi's (1996) survey of five areas, the average household earned an annual salary income of 2 578 US dollars at 1993 exchange rates from different agricultural enterprises. Significantly though in two survey areas that earned a high income, could be attributed to the fact they were characterized by large farm sizes. Whether this is adequately enabling enough to secure sustainable livelihoods with upward economic mobility is uncertain (Coovadia, 1995; Epstein, 1994). Notwithstanding the above, within the context of rising unemployment, rising costs of living and in particular, soaring food costs, urban agriculture can contribute by creating a few-full time jobs and casual employment thereby supplementing incomes (Chiapa and King, 1998). Seasonal labour may be needed for harvesting or other activities; someone has to take care of marketing the produce, and there might be a need for processing and packaging. Urban agriculture by its very nature is labour intensive. It essentially employs unskilled to semi-skilled workers. Exceptional skills are less of a demand for such practices, and as such little opportunities exist for vertical progression. In this respect, unlike large scale commercial farming, where opportunities exist for highly skilled personnel, for example, agricultural engineers, quantity surveyors, machine operators and drivers; they are not necessarily the labour force required for urban agriculture.

Therefore urban agriculture does not offer the opportunity to progress to highly skilled jobs, as essentially this form of agriculture employs people of the same socio-economic profile.

2.3.3. Creating Social Awareness and Cohesiveness

This refers to urban agriculture as a focal point of human development, an educational medium and as a vehicle for interaction in the community (Eglin, 1990).

a) ***Awareness and Education***

Urban agriculture alerts the individual to the time honoured process of creation, growth (maturity) and degeneration. This presents the cyclic realm of natural processes. It serves as models for the 'start' and 'end' points in life. Edmund Husserl's assertion that knowledge is not acquired only by the positivists, but that human beings in the very act of experiencing life come to have knowledge related to those experiences, which is an intuitive, and non-systematized (Graves, 1980). Humans gain education through experiential learning. Urban agriculture then facilitates learning from the known to the unknown.

To this extent urban agriculture offers a valuable learning environment for school pupils. Instead of trying to teach topics related to agriculture within the classroom, relevant field trips can be organised to urban agricultural areas, which are in close proximity to the school. Further to this pupils have the opportunity to appreciate the geography of inequalities, between the rich and the poor, the 'haves and the have nots'. The ornamental gardens of the rich and the food gardens of the poor show different forms and processes at work. As such it offers opportunities for pupils to conduct basic geography projects commensurate with their levels of experience.

b) ***Recreation and Leisure***

An urban garden may be aesthetically pleasing and brighten up an otherwise drab environment. Simultaneously a productive garden instils in persons a sense of satisfaction or accomplishments. Ensuring optimal production fulfils an intrinsic goal and external rewards. Self satisfaction serves to motivate urban growers to extend, and pride themselves in their endeavours. A full time formal sector employee may well grow ornamental plants, flowers and food crops as a part-time therapeutic activity. Whilst ostensibly pursuing pleasurable goals, one cannot disregard the prospects of supplementary incomes and/ or supplementary food supply, and reduced expenses on other household necessities.

c) ***Social Cohesiveness and Interaction***

Urban farming can be a useful tool in enhancing social cohesion in neighbourhoods by bringing people together. Community gardens facilitate community development – the operational mechanics are mutually shared, as well as the assets and liabilities. According to Webb (1998), their cohesiveness derives from group identities in relation to environmental and human induced constraints, which precipitates a self-nourishing community spirit, respect, responsibilities and mutual trust. The collective whole is more important than the status of the individual.

d) ***Gender***

It is estimated that at least two thirds of urban cultivation in Africa are women (Rakodi 1988; Saito, 1993; Gowon, 1996). Over the years, women have developed practices for the efficient and sustainable use of resources available to them (Gowon, 1996). As opposed to men, the lives of the majority of women in rural and urban areas of South Africa are linked intimately with their natural environment in the course of their daily activities. According to Percival and Homer-Dixon (1995), women are responsible for providing food, water and fuel (survival tasks), preparing food and caring for children (household tasks) and income generating activities. However, given access to appropriate resources, they practice fallowing, crop rotation, mulching and a variety of other soil conservation and enrichment techniques (Mbiba, 1995). At the same time they are poor and face many legal and cultural obstacles, which deny them rights to own and control natural resources (Percival and Homer-Dixon, 1995). Despite their powerful input into ensuring food security, women are generally marginalized in respect to a variety of access points, namely, land, credit, agricultural inputs, markets and education. Though there are current legislative processes in South Africa to rectify this anomaly, progression in gender equality has been negligible.

Gender inequality also manifests itself in other parts of the developing world. According to Flynn (2001), in her study of urban agriculture in Tanzania, men controlled most of the monetary, material and social wealth and had greater access to land, credit, agricultural inputs, markets and education. So when it comes to women's relation to land, women at all levels often have only use rights. In sub-Saharan Africa, most men work on farms to earn cash while the women are institutionally predisposed to engage in subsistence agriculture (Obosu-Mensah, 1999). However, it is not only substantial legislation that will address these severe limitations, but there is a need for serious shifts in present paradigms and thinking. Social policy in this regard needs to ensure capacity building and empowerment. As such, women must be involved in policy making, planning and development.

e) Race and Class

The South African city is not the typical western model. Market forces largely drove the latter type land use patterns; a system characterised by demand and supply, causing succession and invasion of land uses, with very little state intervention. Spatial patterns in South Africa reflect in essence, apartheid induced scarcities and environmental degradation. According to Percival and Homer-Dixon (1995), the apartheid system institutionalised the uneven social distribution of environmental resources, which caused serious structural scarcity for Blacks and therefore land ownership by urban Africans was severely limited. These gross inequalities reflect not only in the quantity of land available, but also in the quality (Rangan, 1997).

In South Africa, these relations are shaped by the historical development of racial capitalism characterised by land dispossession, forced removals and the creation of reserves and townships for Africans (Wildschut and Hulbert, 1998). This resulted in overcrowding, poverty and underdevelopment. Further these distortions inform the current land ownership patterns and relations of production on land.

Urban agriculture as a survival strategy must be viewed in the context of the above. In the absence of infrastructure in the past and relative progress in the new South Africa, it is not unusual therefore that the displaced majority, Africans, are intimately linked to the natural environment as a means to supplement food and social security (Rangan, 1997). Even though high population pressure on the land presents a case for land degradation, they are mitigated against ensuring supplementary food supply and income.

2.3.4. Ecological Value

a) ***Micro-Climate***

The benefits of urban agriculture vary with time and place. The quality of the urban environment is improved through urban greening, with a reduction in pollution (Smit, 1999). At the local level, it is one way of reducing the vulnerability of the world's urban population to global ecological change. Plants and trees reduce the effects of urban heat islands and therefore regulate temperature. Simultaneously, they act as vegetative sinks, assimilating or reducing levels of smoke pollution, thereby recharging the atmosphere with oxygen, through the process of photosynthesis.

b) ***Open Space System***

Urban agriculture could extend the amount of available green space. It will increasingly become a necessary function of open space to which urban design and planning should be addressed (Hough, 1984 cited in Eglin, 1990). The social relevance of open spaces increases due to the increased capacity of public involvement in the creation and maintenance of such systems.

On the contrary, hitherto, open spaces are generally places of neglect, often being targeted for illegal dumping (Smit and Nasr, 1999). This does not imply that the city authorities use tougher legislation and manpower to police these areas. The utilization of such urban forms, through productive agricultural practices, inculcates capacity building, empowerment and mutual responsibility. Diminished perceptions and irresponsible behaviour have been institutionally orchestrated as a result of previous colonial dispossessions in the developing world and the apartheid policy in South Africa (Percival and Homer-Dixon, 1995). By facilitating greater social inclusiveness, accountability is ensured, as well as the ability to develop more productive and viable human habitats. According to Eglin (1990), the following types of open spaces should be utilized:

- unproductive open space, for example, buffer strips, alongside communication and transportation links (power lines and railway lines);

- playing fields and golf courses, for example, around the edges and in the rough for both grazing and growing;
- cemeteries, churches, universities and other institutional locations which have the added benefit of usually being expansive, with trees and open space providing habitats for wild animals and grazing and tranquil relief from high intensity urban living; and
- large extensive private real estate, for example, industrial land which is usually separated from public accessibility and hence defensible. With careful public-private co-operation this land could be leased to private developers.

c) ***Increased Bio-Diversity***

The urban environment is characterised by steel, concrete and tarred surfaces, which vanquishes indigenous plants, animals and insects (Acho, 1998). Urban agriculture could be a regulatory mechanism to manage the bio-diversity of fauna and flora. While overtly pointing towards food security or supplementary food, it can serve to sustain the ecological balance in an urban environment. Fruit trees, medicinal plants, and the practice of floriculture serves to regenerate habitats previously destroyed. According to Hordijk (1999), food webs and nutrient recycling can be re-established, reaffirming the symbiotic relationship between people and nature. Similarly, the removal of alien plant and subsequent replacement by indigenous varieties increases the natural bio-competition between the different species. Simultaneously, water resources, especially groundwater utilization can be sustainable, as against rapid depletion by alien plants.

2.4. Sustainable Development and Urban Agriculture

Sustainable development establishes a focal point between the interest of development and the interests of resource conservation. The following has relevance in this regard:

> Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits – not absolute limits but limitations imposed by the present state of technology and social organisations on environmental resources and the ability of the biosphere to absorb the effects of human activities.
> (Our Common Futures, 1987 cited in Business Futures, 1999: 152).

In essence it involves the following principles (Yeld, 1997: 18).

- Respect and care for the community of life
- Improve the quality of life
- Conserve the earth's vitality and diversity
- Keeping within the earth's carrying capacity
- Changing personal attitudes and practices
- Enable communities to care for the environment
- National framework for integrating development and conservation
- Global alliance

Whilst conceding that these principles have merits, its downside is that it has no clear meaning. According to Eden (2000: 112): "sustainability can be made to mean what one would like it to mean as it is measured in terms of economic indicators, and renders the measuring instruments powerless to challenge existing inequalities and magnifies the public as passive consumers, rather than being engaged in the sustainability process."

However, well managed sustainable initiatives with the direct involvement of the local communities can be fruitful. One needs to proceed with caution, as there is an assumption that community implies some sort of homogenous grouping with like minded interests in a relatively confined space. In the South African contexts, the term is linked to ethnic, cultural and historically discriminatory episodes where community life was all but destroyed (Manqele et al, 2000).

2.4.1. Urban Agriculture as a Focal Point for Sustainable Development

Urban agriculture is an example of a survival strategy that requires urban policies that will enable positive environmental impacts while contributing to the increasing sustainability of urban areas. The potential of the informal sector has to be recognised and supported – the survival activities of the urban poor reflect the relative success of trying to make a living against all odds, and the potential of supporting such activities to the extent that they help to break the cycle of poverty, or at least providing relief in the short to medium term.

The sustainable development approach has provided an alternative perspective, definition and understanding of the nature of urbanisation and urban poverty, one that transcends the concerns for the biophysical environment, an inclusive process encompassing economic, social, political and ecological goals. It seeks to improve the quality of life, not as pure economic growth, but which encapsulates respect for human rights, dignity, equality and justice. Pivotal to this is the need to rigorously involve target groups at all levels of the developmental process. Articulating and assimilating the interests of target groups, even though they may be divergent, serves to augment the goals of sustainable development. Within this context it is the marginalized poor who seek to practice urban agriculture as a survival strategy. As an established enterprise in many developing and developed countries, and an emerging process in South Africa, further challenges are directed at the processes of urbanisation.

The urbanisation process has been fraught with problems: overcrowding, poverty, hunger, sanitation, air and water pollution, soil erosion and solid waste disposal (Remenyi, 2000). Cities can provide healthy, safe and stimulating environments for their inhabitants without imposing unsustainable demands on natural resources, ecosystems and global cycles. A successful city, in this sense, is one that meets multiple goals. According to Hardoy et al (2001), such goals would include the following:

- healthy living and working environments for the inhabitants;
- water supply, provision for sanitation, rubbish collection and disposal, drains, paved roads and footpaths, and other forms of infrastructure and services that are essential for health (and important for a prosperous economic base); and
- an ecologically sustainable relationship between the demands of consumers and businesses and the resources, waste sinks and ecosystems on which they draw.

Primarily, urban agriculture is a subsistence orientated enterprise, although there are instances of commercial agriculture (Drakakis-Smith et al, 1995; Mlozi, 1996). It is generally conceived off as a low energy input system, which is uncharacteristic of large-scale commercial agriculture. Energy systems would embrace technology, irrigation, fertilisers, genetic and hybrid seed varieties, chemicals, pesticides and insecticides.

Notwithstanding the dependency between these linkages of production in relation to outputs, high levels of environmental damage have been recorded (Colyer, 1994; Pretty, 1995).

According to Pretty (1995), limits to development are not absolute but are sometimes imposed by present states of technology and social organisation and by their impacts on environmental resources and on the biosphere's ability to absorb the effect of human activities. Both technology and social organisation can be improved to make way for a new era of environmentally sensitive growth. This process of change is underway in the field of agricultural development, in which a transition towards sustainable agriculture is improving food production, particularly for the poor as well as protecting the environment (Hardoy et al, 2001).

To this extent sustainable agriculture within the ambit of sustainable development provides a vehicle for conserving the earth's vitality and diversity; as well as integrating the principle of communal care for the environment. It finds expression in the following ways. Fertilisers are normally considered to be an external resource, but it can well be produced internally. Opportunities exist for composting, especially in view of the inability of the poor to purchase such externalities. Organic material such as scraps of food and garden waste can be turned into compost. Turning all organic wastes back into crop nourishing humus helps to enrich the soil for growing good crops and to hold more water (Sawio, 1994). Compost can be derived from kitchen waste, grass, weeds, leaves and manure. Composting is a cheap alternative input especially for small-scale vegetable production. Community composting requires participation by the local population, where people pool their organic materials to recycle larger amounts of waste in order to manufacture substantial amounts of compost. Community compost has environmental benefits (minimises pollution), social benefits (involves people) and economic benefits (marketing compost for selling) (Community Composting Network, 1999 cited in Ghebremicael, 2000). In Calcutta, for example, vegetable farms developed on refuse dumps where the mixture of organic refuse, coal ash, street sweepings and animal dung have allowed intensive production and these farms, combined with farms, in adjacent

villages that use garbage as fertilizer, provide some 150 tonnes of vegetables each day to the city (Furedy, 1990 cited in Hardoy et al, 2001).

Similarly, utilizing urban waste water, residential domestic water, could reduce other external costs like water supply. This source of water, excluding raw untreated sewage can enhance vegetable production, and increase the availability of water for other household purposes. Furthermore, Smit and Nasr (1999) assert that domestic effluent, inclusive of sewage containing pathogens can be biologically treated, and thereafter safely used for irrigation and as a medium for raising fish and other aquatic crops. Again in Calcutta, it was observed that water hyacinth thriving on sewage and storm water fed areas provided grazing areas for cattle (Hardoy et al, 2001). It was also observed that fruit crops are less susceptible to pathogenic contamination than leafy crops such as lettuce or cabbages (Hardoy et al, 2001; Smit and Nasr, 1999).

The following table serves to illustrate the dichotomy between low input urban agriculture and commercial high input agriculture (See Table 2.1.).

Table 2.1. Dichotomy Between Sustainable Urban Agriculture and Commercial Agriculture.

	Sustainable Urban Agriculture	**Commercial Agriculture**
Sun	Main source of energy	Supplemented by fossil fuels
Water	Mainly rain and small irrigation	Large dams, centralized distribution and deep wells
Nitrogen	Fixed from the air and recycled in soil organic matter	Primarily from inorganic fertiliser
Minerals	Released from soil reserves and recycled	Mined, processed and imported
Weed and Pest Control	Biological, cultural, mechanical and locally available chemicals	With pesticides and herbicides
Energy	Some generated and collected on site	Dependence on fossil fuel
Seed	Some produced on farm	All purchased
Management-decisions and information	By farmer and community gathered locally and regularly Indigenous knowledge	Largely provided by input suppliers, researchers and extension services
Animals	Integrated on farm	Production at separate locations
Cropping system	Rotations and diversity	Monocropping
Plant Variety	Thrive with lower fertility and moisture Indigenous species, more resistant to drought and pests.	Need high input levels to thrive Hybrid varieties and genetically modified More susceptible to drought, and pests
Labour	Work done by family on farm & casual hired labour Largely performed by women.	Most work done by hired labour and mechanical replacement of manual labour
Capital	Initial source is family and community; any accumulation invested locally	Initial source is external indebtedness or equity, any accumulation leaves community.
Wastes	Re-used or recycled – becomes a resource	Collected and moved to external locations

Source: Adapted from Pretty (1995: 10)

Smit and Nasr (1999) conclude that 10% of the human population currently consume food produced by the direct use of waste water, most of it with no or incomplete treatment. When consumption of such organically grown food is socially accepted,whether at the level of the lowest socio-economic group to that of the urban bourgeois, it serves to substantially manifest urban agriculture as a sustainable form. This form of agriculture may well titillate the palates of the rich, creating demand and thus leveraging towards economic growth for the poor within the framework of sustainable development.

As a food security strategy, with a latent economic motive, urban farming reinforces or invigorates the principle of caring for the environment. It is an enabling strategy for capacity building, refocusing on improving the quality of life in terms of physical and mental health. The participatory nature of sustainable development ensures appreciation and it constantly alerts people about the carrying capacity of the environment. Previous notions of the word, "carrying capacity" were confined to an ecologically defined limit of a system. However, recent ecology theory suggests that "carrying capacity" refers to a socially determined limit, which defines a level of damage that a human community will accept (Brugmann, 1997).

Conserving the earth's vitality and biodiversity is best witnessed at the micro-level of agriculture, urban farming. The time-honoured mechanisms of birth, maturity, degeneration, reflects the harmonious cyclic nature of life sustaining processes and forms (Eglin, 1990). A carefully managed strategy, using indigenous knowledge, ensures a balance between conservation and utilization. Experiential knowledge is a pillar on which indigenous agriculture thrives on, without threatening the natural, adaptive, built-up or social environment. There may be short-term production impediments, but in the main such agricultural ventures within the tenets of sustainable development are able to emerge relatively unscathed, with ease of restructuring to sustain productive flows, without permanently dislocating the sub-systems they depend upon.

The basic challenge facing urban agriculture as a sustainable form is its social acceptance and assimilation by society. Quite often it can be regarded as an archaic or anachronistic form of agriculture, perpetuating urban decadence and should be vigorously removed (Tinker, 1994). On the contrary it, offers an alternative for an integrated approach to food security, with resources used more efficiently and effectively. Sustainable agriculture, therefore strives for the integrated use of a wide range of pest, nutrient, soil and water management strategies. By-products or wastes from one component or enterprise become inputs to another. As natural processes increasingly replace external inputs, so the impact on the environment is reduced (Pretty, 1995). Sustainable urban agriculture is not an elusive ideal. According to Manqele et al (2000), sustainability becomes less of an objective and more of a pathway or a transition to a state where nature and humanity have come to terms with themselves in a demonstration of mutual respect and forgiveness.

2.5. Potential Negative Impacts of Urban Agriculture

As agriculture is a human endeavour, it leads to the modification of the natural landscape. The literature points out that there has been evidence of environmental degradation. Flynn (2000) in her study of urban farming in Mwanza, in Tanzania, noted the following.

- Loss of topsoil due to the removal of the indigenous vegetation.
- Insecticide residue, fertilizer and animal wastes were washed into Lake Victoria, directly as a result of urban agricultural practices.

Further to this where urban farming involves livestock rearing, other concerns are raised. Mlozi (1997) asserts that the waste products of animals pollute the water and air, as well as attract disease causing vectors such as mosquitoes. In addition, cattle foraged off ornamental gardens as well as disrupted water lines, fences and traffic signs (Mlozi, 1997). Thus, livestock rearing without adequate controls could lead to the safety of residents being compromised.

These confirm earlier findings by Mbiba (1995), in the town of Chitungwiza, Zimbabwe, who in addition to the above, noted the following:

- Residents cited roaming cattle as a factor, which devalued their properties.

- Cattle destroyed valuable vegetable crops.
- The potential existed for conflict between cattle breeders and crop cultivators.

Quite evidently the literature points out that urban agriculture has the potential to be counter-productive. However, urban agriculture is a micro-level form of farming and the problems of environmental degradation can be effectively managed and controlled, especially in respect of crop cultivation. Whereas cattle poses a threat to the livelihood of the crop cultivators, the wastes of the animals could provide valuable agricultural inputs. The researcher cannot readily offer other solutions to the problem of livestock, as further investigations are needed in this regard.

2.6. Conclusion

Urban agriculture as a form and process presents many opportunities for urban dwellers. Although this form of agriculture is performed at a micro-scale, it offered numerous benefits to urban dwellers. A vital contribution in this regard is the potential to provide supplementary food resources for the urban poor. In the face of soaring costs of food it offers a source of affordable food. Simultaneously, urban agriculture demonstrated that it could offer employment opportunities though at a relatively low scale in contrast to industry and commerce. Social and ecological benefits formed the latent benefits of urban farming.

Although there were instances of environmental degradation the literature also suggests that urban agriculture is a vibrant and vital sustainable activity. Through the case study of Demat, in Welbedacht, the nature, extent, process and benefits of urban agriculture will be examined.

The next chapter presents the research approach and methods used in the study. It also provides justification for the choice of the methods used in this study.

CHAPTER THREE

CASE STUDY AND METHODOLOGY

3.1. INTRODUCTION

Research can be seen as a process of expanding the boundaries of our ignorance. The person who believes he knows everything reveals not only arrogance but also ignorance (Melville and Goddard, 1996). A prerequisite to a research project is a thoroughly formulated research design. There are two major aspects of research design. These specify what you want to find out, and determining the best way to accomplish that (Babbie, 1995). The methodology under review is guided by different methodologies consistent with human geography approaches. Both quantitative and qualitative methods are used. In this chapter, the background to the case study and methodologies are presented.

Prior to the field study being undertaken, the researcher assessed on the ground the number of households practicing any form of agricultural activities. This took the form of casual conversations with supermarket employees, vegetable vendors and the persons who were busy tending their crops. The field research was conducted in May 2002. Four trained field-workers formed part of the interview team. This augured well for the interview process, as they were conversant in English and Zulu. Where the intended respondents were away or not available, the researcher had to return to the study area on different occasions to complete the questionnaires.

This chapter commences with a background to this case study. Thereafter, details of the study area are presented and this is followed by a presentation of the key questions to be answered in this study. Next, a discussion of the research approach to this study is presented and this is followed by a detailed account of the research methods used for data collection. In this section the main reasons for using Participatory Rural Appraisal (PRA) is outlined.

3.2. THE STUDY AREA

The study area is situated west of the formal residential township of Chatsworth (See Map of Durban Metropolitan Area, 1999). It is an area characterized by steep topography. Welbedacht can be divided into two distinct spatial forms, Welbedacht East and Demat (Welbedacht West). Welbedacht East is presently characterized by high-density urban sprawl. There has been a proliferation of informal dwellings during the last 5-7 years. The lower areas in the valley bottoms were traditionally farming areas, owned by wealthy landlords who have since moved away. The land has been purchased by the Durban Unicity and has been earmarked for extensive low cost housing. The individual plot sizes vary between 250m²-300m² (Daily News, 2002). In essence the community, although not homogenous, is vibrant and enduring, and united by poverty.

Demat which is the focus of the case study, is also commonly referred to by residents and visitors as Welbedacht West or Welbedacht. The area of Demat is sited on a spur, with its southern end dropping towards the Umlazi River. The eastern slopes drop sharply in places to a ravine, while the southwestern slopes are gentle. The latter slopes are characterized by the development of typical middle class homes, with three to four bedroom dwellings, driveways and manicured lawns. The actual case study area is confined to the top of the slopes. Formal and informal housing occur along the central axis of Demat Road (See aerial photographs 1, 2 and 3). It represents a mix of linear cluster and linear dispersed homes, which are normally typical of rural forms and patterns. Demat Road serves as the only transport route to the township of Chatsworth, Savannah Park and Klaarwater. Entrance and exit points are thus severely limited.

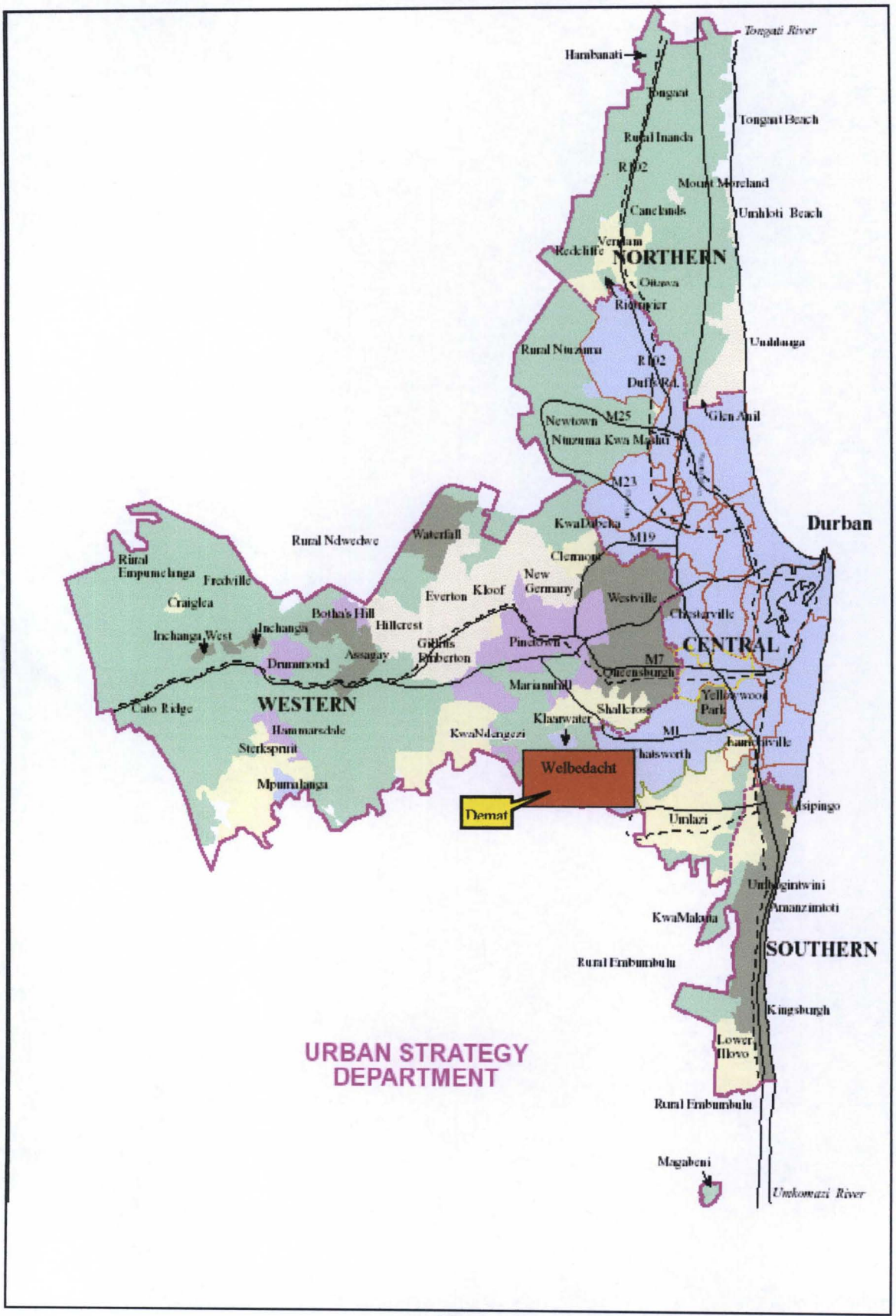
The following table illustrates the major land uses as of January 2000.

Table 3.1. Major Land Uses in Demat.

Undeveloped Land	Urban Formal	Peri-Urban	Others
64,3 %	12,4%	10,7%	12,6%

Source: Community Profile (2001)

Map of Durban Metropolitan Area (1996)



Aerial Photograph 1 of Demat

Aerial Photograph 2 of Demat

Aerial Photograph 3 of Demat

Black and Indian communities make up the majority of the population. However, there has been a continual flow of in-migrants and out-migrants between 1996 and the current year (informal discussion with key informants). In addition the number of informal dwelling units have increased in the past five years.

There is one primary school, which serves over 600 pupils. Margotfonteyn High and Savannah Park Secondary and the surrounding secondary schools in Chatsworth serve secondary school pupils. Besides the two secondary schools and seven centers of worship, no other community facilities exist. Both secondary schools are within easy reach of the local residents.

It was quite observable that a number of school going youth and older men spend their time around the shopping centers with a number of them looking for the odd casual employment in Demat and in the surrounding township of Chatsworth. It would appear that unemployment is rife, thus increasing the levels of poverty.

3.3. KEY QUESTIONS TO BE ANSWERED IN THE RESEARCH

The following key questions informed the study:

i. What is the socio-economic profile of the people in Demat?
ii. What is the nature and extent of urban agriculture in the study area?
iii. What is the nature of accessibility, ownership and availability of land, agricultural inputs and labour needed to engage in small-scale agricultural production?
iv. Is urban agriculture a viable employment sector for income generation?
v. What is the role of urban agriculture in sustainable development?
vi. What is the role of urban agriculture in food security or as a supplementary food source?
vii. What are the roles played by the state, NGOs, and other allied players in supporting urban agriculture?
viii. What are the ecological and social benefits of urban agriculture?

ix. What are the recommendations for improving agricultural production and development in urban residential areas?

3.4. RESEARCH APPROACH

The methods employed in this study are guided by the research questions and methodologies. The information analysed in this study is based on multiple sources, which can be divided as into two categories. Primary and secondary sources of data were collected and utilized. Primary data included the questionnaire survey and participatory methods. Secondary data were extensively used in the literature review to establish a conceptual framework for the study. The study therefore integrated both qualitative and quantitative methodologies to access relevant data to establish an understanding of urban agriculture, especially in developing countries.

3.5. RESEARCH METHOD USED FOR DATA COLLECTION

Multiple methods and techniques were used interchangeably to complement each other and to provide different perspectives on the topic under study. The collection of data from the field was done using mainly the Participatory Rural Appraisal (PRA) or the Participatory Action Research approach. This method aims to collect different types of data, identifies and mobilizes intended groups, encourages their participation, creates ways for the involvement in decision making, project design, execution and monitoring (Schurink, 1998). The subjects that are studied are enabled in a partnership with researchers to become actively involved in collective decision-making. This allows the researcher to play a facilitating role, to build rapport and confidence with the subjects. Assimilating existing indigenous knowledge into a coherent complementary whole facilitates this. This ensures that experiential knowledge is not fragmented or discarded, but fully integrated so as to ensure that the subjects' cognitive and social skills are optimally operational to improve their quality of life. Jorgnesen (1989) asserts that a critical issue in this method is that there is a need for a logical process of inquiry that is open-minded, flexible, opportunistic and requires constant redefinition of what is problematic, based on facts gathered in concrete settings of human existence.

Participatory Action Research offers an alternative system of knowledge production based on the subjects' involvement in decision-making regarding the questions to be asked, who the respondents will be, the manner in which the questions would be asked, the differential roles of the subjects in data gathering, interpretation, modeling and assessing the development efforts (Schurink, 1998). This type of research makes use of qualitative and quantitative research designs, data gathering, as well as data analysis. However, the evolving processes of collaboration, mobilization, empowerment, capacity building, community awareness and camaraderie take precedence over the actual research. Pivotal to this is trust, mutual respect that becomes self-sustaining and enduring.

Scientific enquiry is not necessarily the forte of knowledge as was conceived by the positivist school of Auguste Comte who viewed the scientific method, as in quantitative methodology, as the only relevant methodology in pursuit of knowledge (Holt-Jensen, 1999). Whereas the quantitative methodology places clinical detachment between the researcher and the subject, participatory research is based on the premise that there can be no meaningful understanding of the real world of human existence without the subjects themselves and the researcher being involved in the steering and rowing process.

The main reasons for using the PRA method (Chambers, 1994; Schurink, 1998) include:

- To accommodate the respondent's literacy level.
- To allow an opportunity for visual sharing of knowledge.
- To empower rather than to dominate respondents.
- To encourage participatory and group responses.
- To disarm and to establish relaxed rapport between the respondents and the researcher.
- To learn from local people, directly, on site, and face to face, gaining insight from their local physical, technical and social knowledge, for outsiders themselves to share what they learn with each other and with local people.

- To look, listen and learn from the belief that indigenous knowledge constitutes the foundation for socio-economic and agro-ecological information.
- To provide a forum for people to collectively cogitate and to alleviate their social problems. The task of the researcher is facilitating investigation, analysis, as well as encouraging local people to learn themselves so that they generate their own outcomes.
- To move from a closed mandate to an open mandate facilitated by inter- and intra-collaboration.
- To allow for a reversal of relations: from reserve to rapport, and from frustration to fun.
- To provide for people's ownership of information, but shared with all role players inclusive of the researcher.

Thus, PRA provides points of departure from the traditional methods of enquiry to an open and reflexive paradigm, allowing for an evolutionary and transparent pursuit of knowledge.

3.5.1. RESEARCH TECHNIQUES

Various techniques informed the study. The following techniques were used: observation, household surveys, key informant interviews and focus group workshops. These will be discussed below.

3.5.1.1. Observation

According to Jorgensen (1989) and Bailey (1994) direct observation and experience are primary forms and methods of data collection. They also assert that although observation most commonly involves sight or visual data collection, it could also include data collection via the other senses, and it does not preclude simultaneous use of other data-gathering techniques. It therefore provides a first hand sensory experience of the intended study.

Direct observation was made to identify the locations of the households involved in agriculture. Simultaneously a sketch map was drawn with the assistance of a local youth

to orientate the researcher and the fieldworkers prior to the survey. The directly observable features were discussed under paragraph 3.2. (The Study Area). Data was also collected through informal conversations with the youth outside the local supermarkets, Thandabantu Stores and Sunshine Stores.

3.5.1.2. Household Surveys

A survey consists of asking questions of a (supposedly) representative cross-section of the population at a single point in time (Bailey, 1987). Survey methods include both interviews and questionnaires. Interviews, fully structured questionnaires and semi-structured questionnaires, were administered in the study area. Whereas the semi-structured questionnaire leaves the respondent free to respond in a relatively unrestricted manner, by contrast the fully structured questionnaires (closed ended) restricts choice of responses by forcing the respondent to respond in terms of present categories or alternatives (Smith, 1988). In this study a total of 30 structured questionnaires were administered to 30 different households who were involved in some form of agricultural activity. Additionally, semi-structured questionnaires were administered to 15 households who were not involved in any form of farming. Questions were generally open ended, except for those ascertaining the socio-economic attributes. The questions were revised during the field studies to ascertain a variety of responses.

3.5.2.3. Key Informant Interviews

Interviews were conducted with the following key informants:

- Mr R.M. Pillay, the principal of Shallcross Primary in Demat.
- Mr Daya Moodley, a local entrepreneur.
- Mrs Porugoonam Govender, a local community worker.

Each of the interviews lasted between 30 to 45 minutes. A variety of different responses were elicited from the above respondents. Issues such as service delivery, unemployment, poverty, AIDS and hunger were discussed at length.

3.5.2. PARTICIPATORY METHODS USED IN THE STUDY

Various participatory methods were used in the study. These were mental mapping, ranking and scoring a well as focus group workshops. These will be discussed below.

3.5.2.1. Mental Mapping

Local people have a greater capacity to map, model, observe, quantify, estimate, rank, score and sketch than outsiders generally supposed them capable of (Chambers, 1994). Mental maps are crucial in participatory methodology and can be used to illustrate cultural and natural features as perceived by the local people. Indigenously drawn maps afford the opportunity to study phenomena in a non-threatening manner as they appear to be more relevant and real than those those are conventionally produced. In this study mental maps were used to gather information about existing services and provisions, and to plot future needs.

3.5.2.2. Ranking and Scoring

In addition to the methods outlined, problem ranking exercises using pair-wise ranking and scoring were conducted with focus groups. This essentially involves contrasting one problem against another to determine which one was more severe, and plotted accordingly onto a matrix table. The problems were then scored and ranked, establishing issues that needed prioritizing.

3.5.2.3. Focus Group Workshops

The workshop approach was also used to gauge community problems relating to their general well-being, poverty, health, and infrastructure needed to grow crops to supplement their food requirements. According to Cohen et al (2000), group discussions are more dynamic and inclusive and adopt a consensus approach and it is not detached as in the structured questionnaire interview. Furthermore, group discussions helps to establish confidence as the participants are regarded as peers, without domination by persons from different social backgrounds. The workshop approach gave the researcher

the opportunity to gather information relating to common community interests and areas of community concerns in a group setting.

In total two workshops were conducted to gather information, one at the local primary school and the other at the home of the community worker mentioned earlier. The aims of the exercises were to ascertain the problems and needs of the people as the respondents perceived them.

The attendance and composition of the focus group workshops are presented in the table below.

Table 3. 2. Attendance and Composition of Focus Group Workshops

WORKSHOP	MALES	FEMALES	AGE RANGE
Shallcross Primary School in Demat	3	Nil	35-50
Residence-Key Informant	3	5	22-55
TOTAL	6	5	

3.6. SAMPLING TECHNIQUES

It is not always possible to study the total population; therefore samples are derived which must be representative of that population. Since less than all objects are experienced in sampling, the researcher must be concerned that the numbers and kinds of objects in the sample are sufficiently representative of the total population to enable sound generalizations about that population (Smith, 1988). Critical to this is that the sample must be relevant to the needs of the study, sharing the same experience or knowledge. The sampling methods used to gather data and information included snowball sampling, expert sampling, accident or convenience sampling and purposive sampling. These will be discussed below.

3.6.1. Snowball Sampling

The term snowball sampling derives it metaphor from a small snowball growing in size as it moves down a hillside. It initially involves identifying and interviewing persons

with the required characteristics, who in turn identify other persons who qualify for inclusion in the sample (Bailey, 1994). This is especially significant in geographic areas that are unfamiliar with the researcher. Interviews were conducted with relevant persons in the community as key informants to gather information. Although key informants are relevant in unraveling the issues, problems and needs of communities, there is always the danger of misinformation for purposes of 'hidden political agendas' steeped in the power dynamics of the community (Babbie, 1995). The key informants identified, on their own volition, households engaged in garden level agriculture, without specific requests by the researcher.

3.6.2. Expert Sampling

Expert sampling involves the assembling of a sample of persons with known or demonstrable experience and expertise in some area (Trochim, 2002). In this respect a specific persons or person is targeted to provide information that may be hidden from the researcher. In the study the researcher elicited information from the principal of the primary school and a local entrepreneur. The principal was most likely to provide information on education and the influential role of other factors within the community. Similarly, a local entrepreneur was interviewed to canvass information on employment and other related matters.

3.6.3. Accident or Convenience sampling

The investigator merely chooses the closest live persons as respondents, who show some attribute or characteristic of the phenomenon to be investigated (Bailey, 1994). The intended respondents happen to be there at the opportune time and place. When the researcher drove along the main road contact was made with the roadside vegetable vendors who were willing to be interviewed at their place of residence. The encounter was fortuitous but relevant.

3.6.4. Purposive Sampling

This sampling technique allows the researcher to use his/ her own judgment to direct the research to those households that best meet the criteria for the purposes of the study

(Bailey, 1994; Smith, 1988). As the focus of the study was on urban agriculture, those households involved in crop production were targeted.

3.7. TRIANGULATION

According to Smith (1988) triangulation simply means that multiple as opposed to single observations are employed. Multiple sources of data in research are likely to increase the reliability of the observation. Thus, triangulation can be conceived of as a strategic mechanism to cross-check and authenticate data. The methods used in this study included a literature review, observation study of the field and subjects, interviews with key informants, surveys, focus group workshops and participatory methods.

3.8. RESEARCH EXPERIENCES

As a relative novice in conducting interviews, gaining entry to the community seemed a difficult task. Establishing a rapport with the respondents was initially demanding as the interviewee's insecurity mirrored the researcher's own feeling of insecurity. However, these impediments were temporal, and confidence gained became self-sustaining as the process evolved.

Over 95% of the respondents were cordial, warm and accommodating. Whilst initially appearing to be apprehensive, there seemed to be a genuine need to break the code of silence with people speaking spontaneously during the focus group workshop exercise. The three key informants were diligent in their endeavours to highlight the problematic issues of their community. The field workers who gainfully used their experience to gauge a wide range of responses, especially where Zulu was the respondents' language of communication, also made the researcher's task easier.

3.9. CONCLUSION

Initially, the nature of research design was outlined, together with the personnel involved in field-work. The study area was then discussed. Key questions to be answered in the research were then presented. A discussion followed on the research approach that was

used. It also discussed the methods and techniques that were used in the collection of information and data. The rationale behind using participatory methodology was also discussed. Thereafter, the types of sampling techniques used in the study were then discussed. Finally, the researchers' experiences were discussed with a brief commentary on the attitudes of the respondents. The next chapter deals with the presentation and analysis of the data.

CHAPTER FOUR
DATA ANALYSIS

4.1. INTRODUCTION

The aim of this chapter is to analyse and present the data obtained from the fieldwork. In analyzing the data, seven key issues that relate to the research questions identified earlier are discussed. The first section presents the socio-economic characteristics of the people in Demat. The next section presents the role of urban agriculture. A description of accessibility and use of resources follows in the next section. The fifth section deals with the social, economic and physical constraints which impact upon urban agriculture. The sixth section discusses the generally expressed needs and concerns of the people.

The processes discussed in each section are interlinked. Lifestyles derive from the resources of people, which are socially, politically and naturally endowed. Natural resources are in turn socially and politically manipulated, to the extent that previously disadvantaged people do not necessarily enjoy a better quality of life in the new political and social order. It is imperative, then, that the socio-economic profile of the people of Demat be presented as a framework to the practice of urban agriculture as a strategy for survival.

4.2. THE SOCIO-ECONOMIC PROFILE OF THE PEOPLE IN DEMAT.

The background characteristics of the respondents are summarized and presented in this section.

Table 4.1. Age Profile of the Respondents

AGE CATEGORY	% MALE	% FEMALE
20-39	10	NIL
40-49	6.7	13.3
50-59	20	13.3
60-69	20	6.7
>70	3.3	6.7

n=45

The profile indicates that a significant majority of the respondents were over the ages of thirty-nine years (90%). The number of male interviewees was more than the female respondents, translating into 60% and 40% respectively. This is possibly due to male-headed householders being prevalent in the community.

Table 4.2. Employment Status of Households-Multiple Responses

EMPLOYMENT STATUS	PERCENTAGE
Formal Sector: Wage Employment	48.9
Pension, Welfare, Grants	28.9
Informal Sector: Farming	66.7
Not Economically Active (Excluding Pensioners*)	22.2

n=45

*Pensioners are involved in farming to supplement their income.

The respondents in this study indicate that many of them are engaged in various income-generating activities. Although 48.9% are engaged in the formal wage sector, they are also involved in farming as a means to supplement their income. Similarly persons who are not considered to be economically active, pensioners, are also involved in crop production either to supplement their income or to supplement their food resources. The majority of the pensioners rely on old-age state pensions, which is a meagre R640-00 per month. In addition many of the pensioners support their extended family, their children and grandchildren. Faced with the spiraling costs of living, it is not surprising that 66.7% of the respondents are also engaged in urban agriculture to supplement their income and to enhance their quality of life. The three sources of income described above are also support mechanisms for 22.2% of the population who are not economically active. They are made up of the youth and adult population. This is reinforced by the data presented in the dependency profile in Table 4.3.

Table 4.3. Age Dependency Profile

AGE CATEGORY	PERCENTAGE
0-20	53.0
21-39	18.5
40-49	7.4
50-59	7.4
60-69	11.2
>70	2.5

n=45

Whereas the youth population normally presents a case for greater dependency, figures for the adult group between the ages of 21 years and 59 years (33.3%) are alarming. They are conventionally the economic nucleus of any population group, but the profile here indicates that they are economically dysfunctional. As such the utility value of the small economic base represented by the formal sector, informal sector and incomes derived from social welfare and pensions diminishes, thereby widening the poverty gap.

Table 4.4. Education Level of Respondents

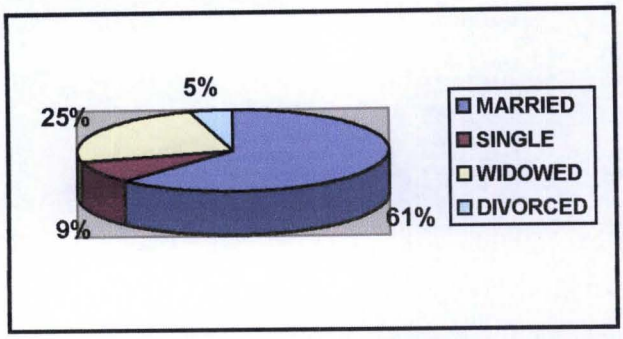
EDUCATIONAL LEVEL	PERCENTAGE
None	17.7
Partial Primary	28.8
Partial Secondary	44.7
Matric	8.8

n=45

The education status presented here reflects in part the status quo of the disadvantaged communities throughout South Africa. Only 8.8% of respondents possess a matric qualification, which is considered to be a base line entry point for the job market. At the other extreme, 17.7% have no formal education at all. Rudimentary literacy is reflected by 28.8% of the respondents having received partial primary school education and 47.7%

having received in part secondary school education. None of the respondents possessed a post matric qualification.

Figure 4. 1. Marital Status (in %)



The graph indicates that 61% of the respondents were married. On the face of it these families benefit from more established structures. Single parent families are indicated by 25% who are widowed and 5% who are divorced, a source of concern considering the benefits of dual parent families. Fragmented families have to cope with greater economic stress, as well as social and psychological pressure.

The next section presents the role of urban agriculture, with an examination of the motivations and rationale for growing certain crops, as well as an analysis of its potential as an income generating strategy.

4.3. THE ROLE OF URBAN AGRICULTURE

Table 4.5. Goals in Producing Vegetable Crops- Multiple Responses

GOALS IN PRODUCING VEGETABLE CROPS	PERCENTAGE
Food for Consumption	93.3
Reduce Hunger	83.3
Sale for Income Generation	73.3
Improve Nutrition	50
Employment Creation	16.6
Recreation/ Leisure/ Therapeutic	3.3

n=30

The primary goal in producing crops is indicated by 93.3% who practice agriculture for their own consumption. The high percentage suggests their endeavours to achieve food security or supplementary sources of food, which is further reinforced by 83.3% of respondents indicating that it helps in alleviating poverty. In addition, 50% of the respondents indicated that producing their own vegetables increases their nutrition status. Whilst pursuing the goal of producing for their own consumption, surpluses are sold off as a supplementary income source. This is indicated by 73.3% of the respondents. However, the data also suggests that the ability of such forms of agriculture to generate jobs is negligible as evident in the figure of 16.6% for employment creation. Similarly, the growing of crops as a past-time or leisure activity is relatively inconsequential, as evident by the figure of 3.3%. The primary reasons for crop production is linked to daily survival strategies to reduce hunger and poverty. Multiple strategies are used to minimize the risk of starvation and the income derived through sales is used to mitigate against poverty.

Table 4.6. Income derived from Sales per Month

INCOME	PERCENTAGE
R100-R200	22.7
R201-R300	18.2
R301-R400	18.2
R401-R500	13.6
>R500-	27.3

n=22

The majority of the respondents, 72.7%, earned between R100 to R500, whilst 27.3% earned above R500 per month. The lower category earners were those confined to farming in and around the immediate vicinity of their homes. Those earning above R500 per month, with a few exceptions, utilized previously privately owned land at nominal rentals. Some of the respondents also utilized open spaces for production.

Table 4.7. Types of Crops: Multiple Responses

TYPES	PERCENTAGE
Vegetables	96.7
Fruit	73.3
Flowers	60

n=30

Table 4.7. indicates the diversified nature of urban agriculture, unlike the characteristic mono-crop practice of large commercial farms. A substantial portion of the people grow food crops, vegetables and fruit, 96.7% and 73.3% respectively. Vegetable crops included legumes and salad vegetables. This is done to maximize the food potential capabilities of the poor, as a means to achieve food security. This position is further supported in Table 4.8 where 83.3% have indicated household consumption as the priority reason for cultivation of specific crop types. The practice of floriculture accounts for 60% of the respondents. Again, multi-cropping is evident.

Table 4.8. Rationale for Cultivation of Specific Crop Types: Multiple Responses

REASONS	PERCENTAGE
Household Consumption	83.3
Cheaper to Produce	50
Demand for Goods	43.3
Less Prone to Disease / Pests	23.3

n=30

Besides growing crops for household consumption, 50% of the respondents considered that the select crop types were cheaper to grow. As such it reflects on their entrepreneurial capabilities and alertness to economics of production, though on different scales of production. The fact that they take into account demand and supply is also relevant in this regard as 43.3% of the interviewees grow crops because of specific demands. In a similar vein, 23.3% of the respondents indicated that their crops are less prone to diseases or pests, thereby reducing costs of pesticides and insecticides.

The following section reviews the availability, accessibility and utilization of resources.

4.4. ACCESS, USE AND RESOURCES

The different inputs needed for agricultural production are analysed and described in this section. They include land ownership, rentals, water resources, distribution points for products, equipment, labour, the role of support services, and the acquisition of seeds and fertilizers.

Table 4.9. Land Ownership

OWNERSHIP	PERCENTAGE
Interviewee	20
State	6.6
Private Landowner	40
Family/ Extended Family	16.7
Unknown	16.7

n=30

Where the land belonged to a private landowner, 33.3% of the owners lived on the same property, whilst 66.7% lived either in a surrounding suburb or city. In only 20% of the cases were the land owned by the interviewees. Family or extended family proprietorship were usually held in the trust of deceased estates or other family trustees or as shares awaiting allocation. Some crop cultivation took place on land where the identity of owners was unknown, which was indicated by 16.7% of the case study. These properties could be privately or state owned. The following table illustrates the different rentals paid.

Table 4.9.1. Rent per Month

AMOUNT IN RANDS	PERCENTAGE
200-300	66.7
301-400	22.2
401-500	11.1

n=9

In the case where there was no cash transfer, the landowner was compensated in kind by the tenants caring for the property and as a bulwark against land invasion. This translated into 80% and 20% respectively. According to the tenants landowners were concerned with unutilized land being occupied illegally, as there were such incidents in Welbedacht East. As a preventative measure against land invasion some landowners allowed tenants the use of the land free of charge.

Table 4.10. Marketing Mechanisms

POINTS OF SALE	PERCENTAGE
Sell to Hawkers	6.7
Sell to Neighbours	20
Door to door in Neighbouring Townships	23.3
Local Market Place	50

n=22

Whilst 68.2% of the respondents sold their produce over weekends, 31.8% sold their product on a monthly basis. The majority of the respondents sold their produce away from Demat; through door to door vending in the surrounding townships or at a local market place, called Bangladesh, in Chatsworth. This made up 20% and 50% respectively. A significant portion, 56.3%, of those who sold their produce at Bangladesh, used the pavement or car park as vending areas, whilst the remainder 43.7% sold their produce within the formally designated market square (See Plate 1 and Plate 2). This was done by the respondents or their family members as none of the respondents used an agent or association to market their goods.

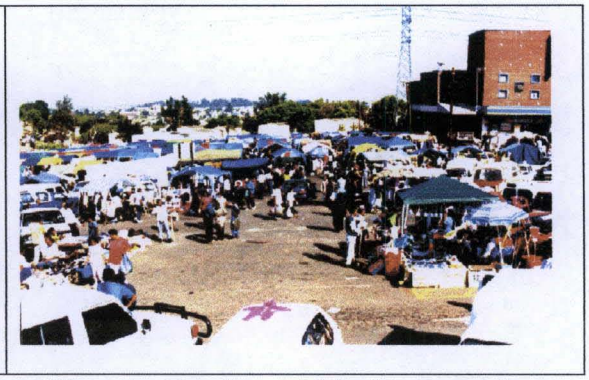


Plate 1: Formally designated Market Square. Plate 2: Vending within the car park.

Table 4.11. Size of Area Under Cultivation-m^2

AREA SIZE	PERCENTAGE
< $100m^2$	26.7
$100m^2$ to $200m^2$	16.7
$200m^2$ to $300m^2$	3.3
$300m^2$ to $400m^2$	6.6
>$500m^2$	46.7

n=30

The largest plots under cultivation, that is, those over $500m^2$, accounted for 46.7%. These were considerably larger plots, with two respondents indicating that their plots were approximately $1000m^2$ each, and were privately owned. This category was 20% higher than those who utilized plot sizes less than $100m^2$. A small percentage (3.3%) produced crops on plots between $200m^2$ to $300m^2$. Those farming on plot sizes between $300m^2$ to $400m^2$ were twice the number than the median size plots.

The larger plots, that is, between $300m^2$ to that greater than $500m^2$ were characterized by vegetables and marigold production. In this respect the cultivators grew different vegetable crops, namely, legumes, lettuce, carrots and brinjals (egg plants). The smaller plots, that is, those below $300m^2$ were utilized for the growing of bananas and vegetables. Whereas the cultivation of crops on smaller plots are used for household consumption and sales, the larger plot cultivation was geared mainly towards sales.

Two different areas under cultivation are presented in Plate 3 and Plate 4

Plate 3: Fruit Cultivation-(<100m²)

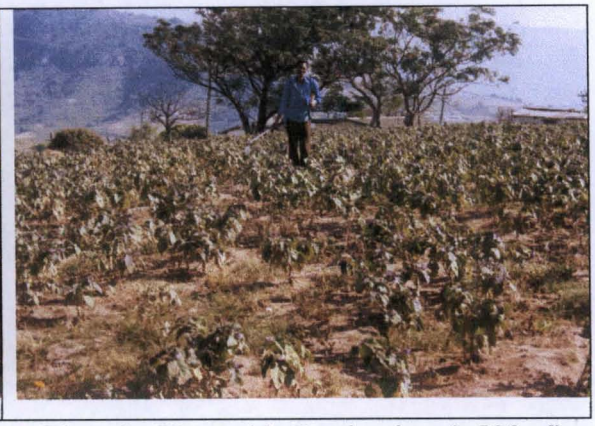


Plate 4: Vegetable Production-(>500m²)

Table 4.12. Sources of Water-Multiple Responses

WATER SOURCES	PERCENTAGE
Rainfall	90
Normal Garden Hose / Sprinklers	50
Waste Water: Run-off from Gutters, Kitchen, Bathroom	23.3
Ground Water-Spring	6.7

n=30

The low energy input characteristic of urban agriculture is borne out by the frugal nature of water provisioning, where 90% of the respondents rely on rainfed agriculture and 50% used the conventional garden hoses to provide water for their crops. There was no evidence of irrigation schemes or the use of borehole water. An innovative response to limited water resources is the use of waste water which is utilized by 23.3% of the respondents. Other sources include ground water sources such as springs, which were cited by 6.7% of the respondents.

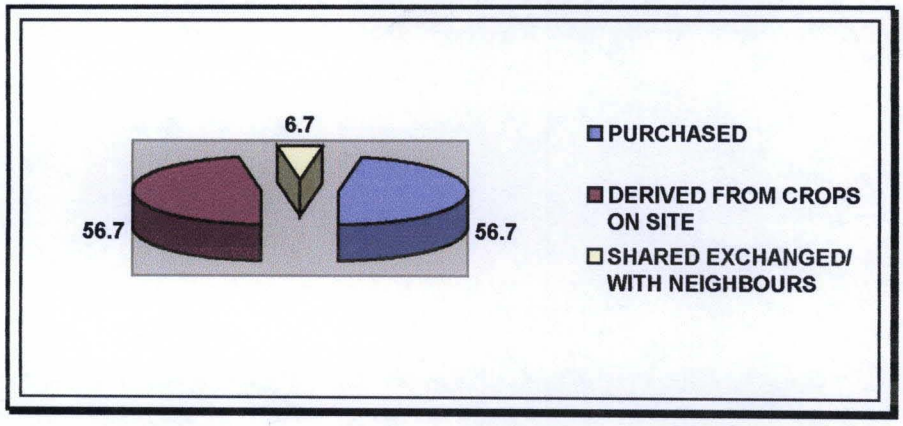
Table 4.13. Fertiliser Use and Acquisition: Multiple Responses

FERTILISERS	PERCENTAGE
Purchased	47
Produced on Site-Composting	31
Recycled Animal Manure	3
No Fertiliser	19

n=30

A total of 81% of the respondents used fertilizers, which was acquired through purchases, composting on site and recycled animal manure. Purchases of fertilizer was cited by 47% of the respondents. Those producing fertilisers on site accounted for 31% of the respondents and 3% of the respondents indicated that they also utilized recycled animal manure.

Figure 4.2. Seeds Acquisition: Multiple Responses (n=30)



Seeds were acquired through 3 different means. Purchasing of seeds were cited by 56.7% of the respondents, whilst the same is true for seeds derived from crops on site. Sharing and exchanging of seeds were cited by 6.7% of the respondents as their means of acquisition.

In respect of technology, it was observed that rudimentary equipment was used. Conventional gardening equipment was cited as being purchased by 93% of the

respondents. Some of the respondents (10%) borrowed equipment when necessary, whilst the same percentage held true for those residents who received equipment as gifts. There was no evidence of animal driven ploughs or machinery such as tractors being utilized.

Table 4.14. Labour: Indicated as a Percentage

AGE (In years)	*<15*		*16- 21*		*22- 60*		*>60*	
Male/Female	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Hired labour	1.4	-	1.4	5.7	7.1	22.9	-	-
Family members	-	-	4.4	2.9	5.7	5.7	5.7	5.7
Interviewee (Personal Undertaking)	-	-	-		7.1	8.6	7.1	8.6

n=70

Female labour accounted for 60.1%, whilst 39.9% involved male workers. A high percentage of 71.5% of the total work force were in the age category between 16 years to 60 years. Furthermore, 27.1% were persons over the age of 60 years. These are persons who are not normally considered to be economically active. Hired labour accounted for 38.5% of the labour force, whilst the balance was made up of family members and the respondents.

4.4.1. Support Services

Only 3.3% of the residents indicated that they received support from the state. The respondents received a one off payment of R5000-00, for flood damages after the 1987 Natal Flood. This relates to compensation rather than continued support. Neither did the respondents receive any support from non-governmental organizations. As such the respondents indicated that they needed support from the government and other support groups. Some also expressed the idea that they should be subsidized by the state and they cited the support given to White commercial farmers in the past.

4.5. SOCIAL, ECONOMIC AND PHYSICAL CONSTRAINTS

Problem areas were rated using the following key.

1. Very Severe
2. Severe
3. Moderate
4. Very Slight/ Mild
5. Nil

Table 4.15. Rating of Social, Economic and Physical Constraints (in %) –Multiple Responses

PROBLEMS	1	2	3	4	5
Damage by Livestock	80	-	3.3	6.7	10
Lack of Water	53.3	26.6	6.7	6.7	6.7
Lack of Finance	53.3	16.7	20	6.7	3.3
Lack of Fertiliser	50	23.3	16.7	3.3	6.7
Lack of Fencing	46.7	16.7	16.7	3.3	16.7
Lack of Land	43.3	16.8	13.3	13.3	13.7
Transport	36.7	13.3	20	13.3	16.7
Theft and Vandalism	36.7	16.7	10	10	26.6
Pest	30	36.3	16.7	3.3	13.3
Price Variability	10	13	33.3	16.7	26.7
Poor Soil Condition	10	3.3	40	20	26.7
Lack of Communication	10	3,3	23.3	16.7	46.7
Lack of Labour	6.7	-	16.7	33.3	43.3
Lack of Knowledge	6.7	6.7	33.3	23.3	30
Conflict	-	3.3	10	-	86.7
Climate	-	6.7	26.3	30	36.7

n=30

The above responses were extrapolated directly from the questionnaires to determine the severity of the problems facing persons engaged in urban agriculture.

Damage by livestock to crops is high on the agenda of problems and concerns for the residents. The majority of the residents (80%) cited damage by livestock as a very severe constraint to crop production. Although the residents did not keep livestock, these animals roamed freely at night from the flood plain of the Umlazi River. The lack of adequate fencing allowed the animals unhindered access to the crops, which diminishes the food capacities and the income generating sources of the residents. The lack of fencing was cited as a very severe problem by 46.7% of the residents. Further to this, 53.3% of the respondents cited the lack of finance as being a severe impediment to sustain crop production. Adequate finance to establish animal proof fencing could alleviate this problem.

Other severe problems include access to fertilizers, land and water, which was cited by over 40% of the respondents. Hitherto the problems and concerns described needed urgent attention as they impacted directly upon the well being of the respondents. However, many of the respondents, over 30%, claimed that other problem areas listed in the questionnaire (for example, conflict, climatic conditions and the lack of labour) posed no limitations to their agricultural livelihood activities. Some of the specific problem and concerns described above were raised again in the focus group workshops, as general concerns, which impact on the community's agricultural livelihood activities.

4.6. GENERAL CONCERNS AND NEEDS

Two focus group workshops were held during which broad concerns and issues were raised. The areas of concern were then ranked and compared to the findings elicited through the questionnaires.

FOCUS GROUP WORKSHOP 1 –Residence-Key Informant

PR.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.	o	1/2	1	1	1	1	1	1/8	1/9	1/10	1/11	12	13	14	1	1	1/17
2.	o	o	2	2/4	2/5	2	7	2/8	2	2	2	12	13	2	2	2	2
3.	o	o	o	4	3	3	7	8	3	10	3	12	13	3	3	3	17
4.	o	o	o	o	4	4	4	8	4	4	4	12	13	4	4	4	4/17
5.	o	o	o	o	o	5	5	8	9	10	5	12	13	5/14	5	5	17
6.	o	o	o	o	o	o	7	8	9	10	11	12	13	14	6/15	6	17
7.	o	o	o	o	o	o	o	8	7/9	7/10	7/11	12	13	14	7	7	17
8.	o	o	o	o	o	o	o	o	8	8	8	12	13	8	8	8	17
9.	o	o	o	o	o	o	o	o	o	10	9	12	13	14	9	9	17
10.	o	o	o	o	o	o	o	o	o	o	10	12	13	10/14	10	10	17
11.	o	o	o	o	o	o	o	o	o	o	o	12	13	14	15	11	17
12.	o	o	o	o	o	o	o	o	o	o	o	o	12/13	12/14	12	12	12/17
13.	o	o	o	o	o	o	o	o	o	o	o	o	o	13	13	13	13/17
14.	o	o	o	o	o	o	o	o	o	o	o	o	o	o	14	14	14/17
15.	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	15	17
16.	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	17
17.	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o

Key for Focus Group Workshop-Problems

1. Damage by Livestock	10. Theft
2. Sewage Disposal	11. Bush Clearing
3. Poor Roads	12. Clinic
4. Ticks	13. Police Station
5. Open Plan Market	14. Training School
6. Fertiliser Subsidy	15. Community Hall
7. Water Subsidy for Agriculture	16. Electricity
8. Public Transport	17. Post Office
9. Fencing	

Scoring and Ranking of Problems-Focus Group Workshop 1

PROBLEMS	SCORE	RANK
Clinic	16	1
Police Station	16	1
Post Office	15	3
Water Borne Sewage Disposal	14	4
Damage by Livestock	13	5
Public Transport	13	5
Ticks	12	7
Training School	11	8
Theft	10	9
Water Subsidy for Agriculture	8	10
Poor Roads	7	11
Open Plan Market	7	11
Fencing	7	11
Bush Clearing	4	14
Community Hall	3	15
Fertiliser Subsidy	2	16
Electricity	0	17

Although the damage by livestock was an imposing limitation, elicited through the questionnaire, analysis of the focus group workshop exercise shows that this problem was ranked 5 and the problem of ticks ranked 7. Both problems were closely ranked as the cattle were hosts for the ticks. The residents also claimed that on numerous occasions they had to seek medical attention for tick bites, although tick bite fever was not diagnosed. Furthermore, residents were concerned that there could be an outbreak of tick bite fever. In this instance the need for a clinic was ranked 1, as the nearest state medical facilities were in Pinetown and Chatsworth, which are 12 kilometres and 5 kilometres away respectively. This necessitated more costs and was time consuming, as the area was poorly serviced by the public transport sector. Public transport was therefore ranked 5 on their priority list. Similarly, the need for the clinic was further motivated by the

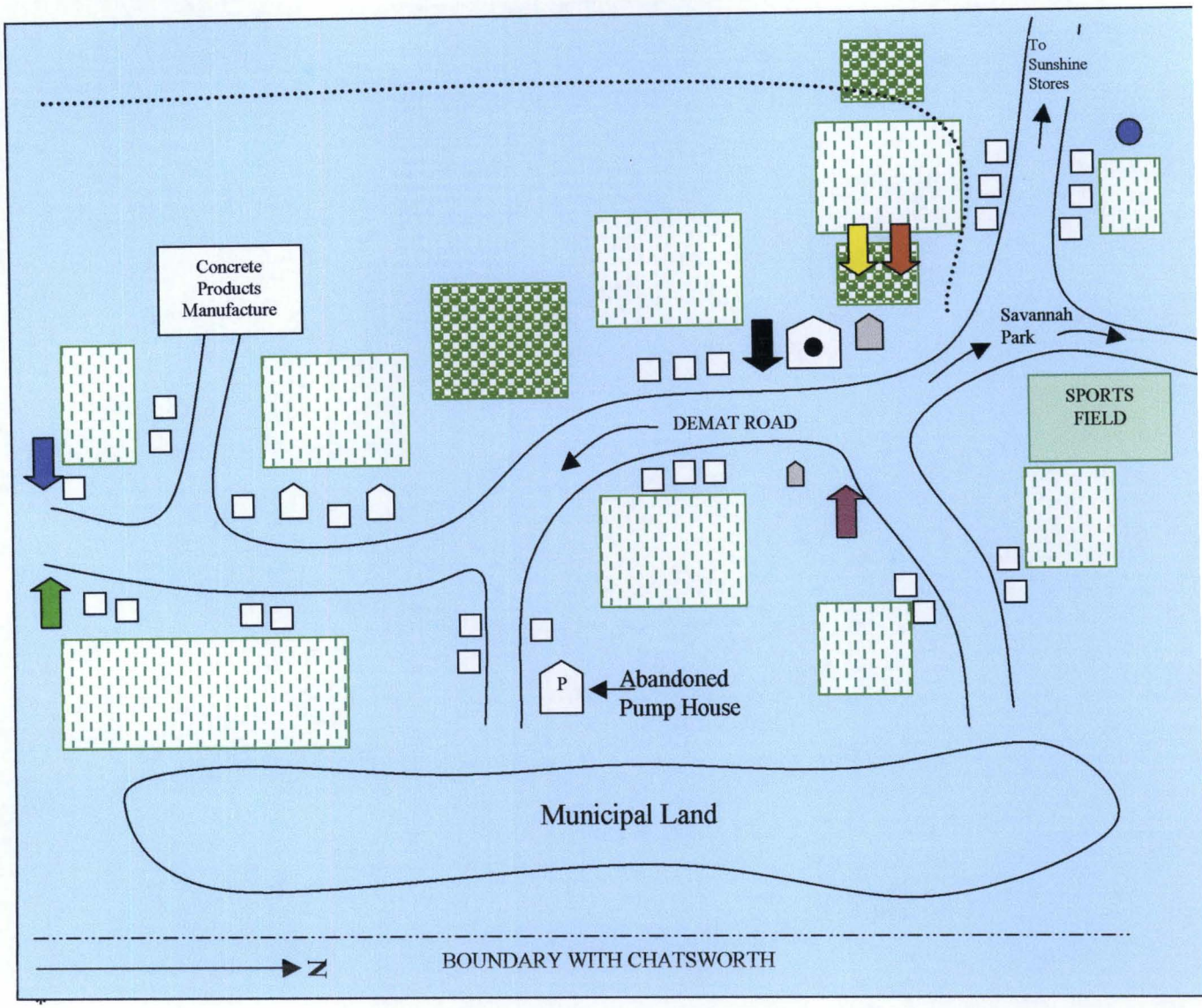
perception that there could be an outbreak of diseases, as some of the residents felt that the soap pit sewage disposal system was a potential health hazard, and therefore the need for a water borne sewage system was ranked 4.

Other specific problems raised in the questionnaire survey were also raised as concerns in this workshop. They are the need for water subsidies, fencing and fertilizer subsidies which were ranked 10, 11 and 16 respectively. Residents who wanted to grow food crops found that the lack of subsidies made such ventures costly and therefore prohibitive. These responses were derived using the semi-structured questionnaire on residents not involved in crop production.

The need for security and policing was emphasized as the residents also placed the establishment of a police station as a high priority. This was ranked 1 together with a clinic. There was a general concern that the development of new housing in the Welbedacht East area, mentioned in chapter three, could lead to increased crime levels, and further to this the nearest police station was located in Chatsworth which was 5 kilometres away. Also, public transport accessibility to the Chatsworth Police Station was low.

Many of the concerns raised above actually relate to the development of physical facilities, which were mapped by the residents concerned (See Mental Map of Demat). The other focus group workshop held at the Shallcross Primary School, presents broader perspectives on the problems facing the community of Demat.

Mental Map of Demat



Map not drawn to scale

Legend

Existing Cultural and Natural Features		Proposed by Community	
	House		Clinic
	Temple		Police Station
	School		Open-Plan Market
	Supermarket / Tuckshop		Training School
	Spring		Community Hall
	Cultivated Land		Post Office
	Trees and Bush	.....	Fencing

Focus Group Workshop 2 – Shallcross Primary School in Demat

PROBLEMS	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	o	3	4	5	1	7	8	1	1	1	1	1	1
2.	o	o	2	4	5	2	2	8	2	2	2	2	2
3.	o	o	o	5	3	3	8	3	3	3	3	3	3
4.	o	o	o	o	4	4/7	8	4	4	4	4	4	4
5.	o	o	o	o	o	5	8	5	5	5	5	5	5
6.	o	o	o	o	o	o	8	6/9	6	6	12	6	6
7.	o	o	o	o	o	o	o	8	7/9	10	7	7	7
8.	o	o	o	o	o	o	o	o	8	8	8/12	8	8
9.	o	o	o	o	o	o	o	o	o	9	12	9	9
10.	o	o	o	o	o	o	o	o	o	o	10/12	10	10
11	o	o	o	o	o	o	o	o	o	o	o	12	12
12.	o	o	o	o	o	o	o	o	o	o	o	o	12
13.	o	o	o	o	o	o	o	o	o	o	o	o	o

Key for Focus Group Workshop

1. Unemployment	7. Sexual Abuse
2. Below Bread Level	8. AIDS
3. Poverty	9. Spouse Abuse
4. Lack of Basic Foods	10. Theft
5. Shelter	11. Hijacking
6. Broken Homes	12. Academic Achievement-Low
	13. Prostitution

Focus Group Workshop 2

Scoring and Ranking Areas of Concern-Shallcross Primary School in Demat

CONCERNS	SCORE	RANK
AIDS	13	1
Lack of Basic Foods	11	2
Shelter	10	3
Below Bread Level	9	4
Poverty	8	5
Academic Achievement-Low	7	6
Unemployment	6	7
Broken Homes	5	8
Sexual Abuse	5	8
Theft	5	8
Spouse Abuse	4	11
Hijacking	0	12
Prostitution	0	12

Whereas Acquired Immune Deficiency Syndrome (AIDS) is ranked one, poverty appears to be the core problem area. Poverty, which is ranked 5, manifests itself in the associated symptoms of the lack of basic foods, lack of shelter, unemployment, broken homes and low academic achievements at school. Poverty, according to the principal of the school, is all pervasive as it fractures and disrupts family and community life. This is further exacerbated by thefts and petty offences (ranked 8) which could be symptomatic of poverty. The poor have precious little, and the loss of this through theft could precipitate conflict within and between communities. Further to this, the principal asserts that poverty is so firmly rooted in this community that it would take substantial social restructuring of all available resources to break the cycle of poverty. To this extent the school in partnership with two religious organizations, namely, The Saiva Sithantha Sungum from Westcliff, Chatsworth and the Sathy Sai Movement, regularly provide meals for school pupils.

Added to this desperate scenario is the problem of sexual abuse and broken homes, which are equally ranked 8. Both these social evils can be interrelated, as they are symptomatic of a fragmented and alienated society; although sexual abuse is not necessarily a mitigating factor in this regard. Therefore, it is imperative that substantial enabling assistance be rendered to transcend and empower the community to break this vicious cycle of social anomalies.

4.7. CONCLUSION

The study indicates that the community of Demat consists mainly of poor people, and this probably precipitates other social problems. Whereas poverty and unemployment prevails in this community, they have not sat back and waited for handouts from donors. To this extent they have used together their frugal resources in an attempt to attain food security or supplementary foods.

The different scales of urban agriculture mentioned in chapter two, shows the community's innovative response when faced with such adversities. It represents a coping mechanism to develop some form of household food security. Even where householders received waged sector incomes, as in the case of pensioners, crop production continued to provide alternative sources of income and additional food resources.

Elementary technology was used, which was commensurate with their level of production, vegetable, fruit and flower cultivation were their focus areas of agriculture. In this respect the costs of other agricultural inputs were minimized through use of waste water and organically produced fertilizers, in the case of compost heaps and animal manure. Similarly seeds were also derived from the crops on site to keep production costs at a minimum. This is an exceptional response to conditions of extreme poverty. However, farming was most severely hampered by livestock damage. The residents indicated that they only kept poultry, as pets and were not involved in any other form of animal husbandry.

Other general concerns were ranked and listed as proceedings from the two focus group workshops held. The needs of the residents in terms of the physical infrastructure requirements were mapped and are indicated as such. This community needs substantial enabling assistance from the local and central state, community organizations and non-governmental organizations to transcend and break this vicious cycle of poverty, as they have demonstrated their willingness and capabilities to do so.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1. INTRODUCTION

This study proceeded from a personal context discussed in the preamble. The need for the study was then examined in relation to rapid urbanization at the global and local levels. Within this framework the case for urban agriculture was then presented. This was followed by the literature review and the conceptual framework. The research methodology, key questions, methods and techniques used were discussed in the third chapter. The analysis of data was presented in the fourth chapter. This chapter concludes the study.

This chapter is divided into four sections:

- The first describes and explains the findings and the main concerns of the study
- The second considers the forms, process and potential benefits of urban agriculture
- The third presents the general and specific problems with recommendations
- The fourth presents the conclusion

5.2. SUMMARY OF FINDINGS AND THE MAIN CONCERNS

The socio-economic profile of people in Demat revealed that the majority of the households are poor. This emanates from the fact that the majority indicated that they were involved in urban agriculture to supplement incomes/ food security as a means to alleviate poverty. Pensioners also made up a significant number of persons involved in this form of agriculture. Further to this, the age dependency profile indicates that a substantial percentage are people who should be formally employed, that is, in waged sector employment. The situation is further exacerbated with the small formal sector income earners supporting a large youthful population.

The education level of the respondents indicated that only 8.8% received a matric qualification, which is normally considered to be a base line entry into the job market.

This poses a serious challenge to those with lesser qualifications to enter the formal employment sector. Many of the respondents also stated that they did not have the opportunity to continue their schooling as they were too poor to do so. This reflects upon the poverty situation in the past and its prevalence now. Aggravating the problem of poverty are the related social anomalies of broken homes, spouse abuse and low levels of academic achievement at school. This serves to inform the current social scenario of the implications of poverty as a social malaise.

This malaise also finds expression in accessing basic medical facilities, especially in terms of traveling costs. Therefore the establishment of a clinic was their highest priority. Financial insecurity is further expressed in the loss of income through death of the breadwinner and through divorce, which increases the financial burden of the surviving spouse and the custodian parent in the case of divorce. In the case of divorce the custodian parents were females. These constraints serve to limit the financial resources and cohesiveness of the family. This further diminishes the operational potential of the individual in the educational, work environment and in society in general. Hence, the stresses caused by unemployment, diminishing food supplies, declining living standards and meagre incomes have coalesced people into producing their own food as a livelihood strategy. The role of urban agriculture in this regard is discussed below.

5.3. FORMS, PROCESS AND POTENTIAL BENEFITS OF URBAN AGRICULTURE

Two types of urban agricultural forms were identified in the study area, relative to the scale of the production. This serves to influence the nature and extent of urban agriculture in the community of Demat. There was the minority group of small commercial producers who constituted 10% of the urban farmers. The commercial producers utilized land in excess of 500m² and they were the legal owners of the property. The majority of the urban farmers grew crops on land ranging between that which was less than 100m² and those that extended to 400m². A considerable number of properties were owned by private landowners, for which nominal rentals were paid. Some of the poor farmers grew

on land where the identity of the owners was unknown. In this instance they utilized land in access of 500m².

Crop cultivation was shaped by multiple influences, some of the primary factors being food shortages, unemployment, household labour availability and prevailing poverty. In the light of the diminishing potential to purchase foods, securing supplementary food sources through growing food crops became the focus of crop cultivation. To this extent vegetable and fruit crops formed the bulk of the produce. The poorer farmers concentrated on the production of vegetables and fruit and to a lesser extent, flowers. Salad vegetables and legumes formed the bulk of the vegetable crops, while bananas were the main fruit crops. This was to ensure that the needs of household food security were met in part, and as such it was a priority. Further to this, the physiological need to reduce hunger was a supporting motive. The poorer households have more need to consume the products they grow, and thus crop cultivation here could be classified as subsistence. The subsistence nature of production is further reinforced by the findings that only 50% of the urban farmers agreed that their nutritional status was enhanced. In the main subsistence agriculture, as a level of production, cannot meet the total human nutritional needs essential for the health and well being of the people. Thus, this needs to be viewed in the context of multiple survival strategies or income generating opportunities. Incomes derived from subsistence agriculture are utilized for purchasing other essential commodities, including food.

Although household consumption requirements were the main concerns, a portion of the produce was sold to generate supplementary incomes with the majority earning between R100-R500 per month. This could represent a trade off between achieving minimum household requirements and the need to sell produce to generate incomes to secure better lifestyles. Whereas there could have been a trade off between minimum household requirements and sales, flower cultivation, was geared specifically towards sales. There is a ready demand for flowers, especially marigolds, by the Indian community. Marigolds are used for decorative purposes for the various religious festivals held throughout the year. There seems to be a low-level capitalization in this regard, as

respondents indicated that due to the demand, the price of marigolds increased. This augured well for their otherwise frugal incomes, in respect of the poor urban farmers. Further to this, the growing of specific crops was done to reduce the impacts of diseases and pests, thereby minimizing the costs of pesticides and insecticides.

In an effort to further reduce costs family members supplied most of the labour. As such employment creation is low, even in the case of the small commercial producers who cultivate on land in excess of 500m². The commercial producers accounted for the majority of the hired labour.

Hitherto, the discussion prevailed on urban agriculture as a livelihood strategy to maximize food security. In addition supplementary incomes were generated. Given the present level of production, the prospect of employment creation appears to be negligible. The focus shifts to other potential benefits of urban agriculture.

5.3.1. Other Potential Benefits of Urban Agriculture

In this regard the ecological benefits of urban agriculture is presented as an additional support motive for urban agriculture. The modes of production were characterized by low energy inputs in terms of technology, fertilisers, water and other agricultural inputs such as seeds. In respect of technology, conventional garden tools were used for subsistence farming and in the case of the small commercial producers. These rudimentary equipment are exceptionally utilized as it removes the possibilities of air pollution, through carbon monoxide emissions as in fuel fired technology, and contamination of crops. Thus, the technology was commensurate with their level of production, ensuring sustainability.

Closely associated with this input factor was the use of organic fertilisers derived through composting and recycled animal manure, which was cited by 34% of the respondents. Wastes are therefore not removed to an external location but utilized as a resource. It was not evident, though, whether fertilisers acquired through purchases were organically

or inorganically derived. Nevertheless, that which is produced on site is cost effective and does not pose a threat of contamination to the environment.

Similarly, water resources are carefully utilized through conservation management techniques. Whereas there is a large dependency on rain fed agriculture, waste water derived as run-off from roof gutters, kitchen and bathroom wastes have been channeled to crop growing areas. However, this was only facilitated where the houses were on the same contours as the gardens, or where the cultivated plots were located down slope of the houses to facilitate gravity flow.

Other inputs such as seeds were also derived from crops on site, reducing the dependency on external suppliers as costs would significantly impact upon production. This reduces the possibility of seeds being genetically modified and the ecological ramifications thereof.

Quite clearly the above provides evidence of urban agriculture as a sustainable activity, whilst latently pursuing the goals of sustainable development. As a form of food production it is less dependent on externality costs, while maintaining constant uninterrupted energy flows and nutrient cycling. It extols the resourcefulness of the people involved and their ability to transcend limitations to provide food without fracturing the diversity and vitality of the earth's resources upon which all of humankind is dependent.

The social benefits derive from the intrinsic satisfaction that growing their own food provides relative family security and stability. It offers a sense of pride and appreciation in that the time honoured processes of nature, production, consumption, reproduction and degeneration have been efficiently managed and conserved for the mutual benefit of all life forms. However, agricultural production was limited due to a number of problems and constraints. These would be discussed below.

5.4. PROBLEMS AND CONSTRAINTS

The main problem areas arose from general needs and those specific to urban agriculture. The lack of generally basic community facilities, such as a clinic, police station, post office, a community hall and a training school formed the crux of the general needs of the community. In addition, rising unemployment, lack of shelter, sexual abuse, spouse abuse, poor academic achievements and the scourge of AIDS were significant concerns. Specific problems related to crop production are discussed below.

- **Damage by Livestock**

  A seriously limiting factor to crop production was the damage caused by livestock, especially cattle, which foraged off the crops. The non-cultivators also cited the same for not engaging in farming.

- **Lack of Fencing**

  These were primarily required to prevent livestock damage. Fencing was expensive and therefore beyond the financial capacity of both types of producers, mentioned earlier.

- **Lack of Water**

  Although waste water and in certain instances spring water was utilized for purposes of farming, piped water was expensive and therefore limited production.

- **Lack of Land**

  Land is generally a scarce resource, especially in cities. Moreover, a large portion of the land is privately owned, for which tenants pay nominal rentals. This induces insecurity as the owners could claim their land at any time. Further to this there is a concern that state-owned land may give way to other forms of development.

- **Lack of Fertilisers**

  To a certain extent fertilizer costs were reduced through composting and use of recycled animal manure. As this met part of their requirements, the purchase of fertilisers was expensive and the traveling costs to acquire the same were additionally expensive.

- **Lack of Finance**

The frugal financial resources serve as a limitation to crop production. Many of the poor urban farmers cited the lack of finance as a severe limitation to maximize production.

- **Lack of Support Services**

  Besides the lack of financial subsidies, technical and advisory services by the state and non-governmental organizations were non-existent.

5.5. RECOMMENDATIONS

The recommendations discussed below provide an indication of the general and the specific needs that are required to ameliorate the plight of the poor in the community of Demat. Substantial intervention by the state and other role players is required to assist the community for the benefit of their physical and social well-being. This is to ensure that their livelihoods are enhanced.

5.5.1. Greater Utilization of Vacant and Under-utilized Land

The lack of land in the study area was explained as a severe problem, which hindered the potential of crop production. Using under-utilized and vacant lands owned by the Durban Unicity and other private individuals could alleviate this problem. These resources could be communally shared as community gardens. Adequate protective leglislation needs to be effected to ensure that the rights of all parties, tenants and property owners be recognized to enhance co-operative responsibility. The operational mechanics of such endeavours need to be regulated through appropriate negotiation forums with all stakeholders. There may be other interest groups who have different development priorities, which could impact upon the future of urban agriculture.

5.5.2. The Role of Government

Government departments should directly support the urban poor, by supporting their agricultural initiatives. Making available resources such as tools, water, fencing and fertilisers at low costs could assist the poor urban farmers. Presently, each household

receives 6000 litres of free water per month. Such provisioning should be increased in this instance, where the people have demonstrated adequate capacity to increase their household food security.

The costs of fencing present a serious financial dilemma, as individual residential plots and adjacent open spaces to be utilized for farming would have to be closed off. It is inconceivable that the poor urban farmers would be able to afford this necessity. It is suggested that the Durban Unicity, the Provincial Government and the National Government provide the basic fencing equipment such as wire mesh, poles and cement at low costs. Low costs could be attained as bulk purchases would be made directly off the production lines, thereby eliminating the profit margins of both the wholesalers and retailers. Accessing the pool of unemployed personnel within households could reduce the costs of labour to erect fences. This facilitates the process of capacity building as the poor would not be merely seen as passive consumers of handouts.

5.5.3. Special Challenges for the Local Government and Non-Government Organisations

The local market in the surrounding areas of Chatsworth also provides competitive space for larger agricultural producers. These producers can afford to hold down prices, thus developing a monopolistic stranglehold, effectively forcing out the poor urban farmers. Institutions such as schools, workplace cafeterias, spaza shops, corner cafes and taverns are important potential markets for such products. Local government can assist in this regard by encouraging such institutions to purchase their perishables from the targeted urban producers, which can have positive impacts on their well being. Presently, there is only one formally designated market area in Chatsworth. Local government, in consultation with the indigent farmers, could assist in designating other areas, specifically for use by this target group. Non-governmental organizations could assist in this regard by championing the cause of the poor urban farmers. This could take the form of advertising in community based media networks and through other related low cost advertising techniques.

In respect of fertilisers it is argued that the farmers' present capacity for compost production should be increased. This is closely related to the problem of bushes, which poses a security risk. Instead of clearing and removing bushes to an external locality, they can be shredded on site through the municipality's motorized shredders. The debris could be deposited at convenient pick up points. The municipality could make available the same from other neighbouring residential areas. Thus, a security hazard becomes a valuable resource.

5.5.4. Need for Training and Extension Services

As most of the residents lived below the poverty line, there is an urgent need to equip people with the necessary skills to practice what they know best. Training should be an extension of what they know, and not a replacement for indigenous knowledge. The urgency of a training facility is depicted in the mental mapping exercise where the participants located a training school near the existing primary school, as both roles can be complementary.

5.5.5. General and Related Recommendations

By developing basic facilities, such as the clinic, a post office, a police station, a training school and an open plan market, savings can be made in respect of traveling costs. These savings could be utilized by the poor as supplementary investments to increase their productive capabilities. In addition there is an urgent need for adult literacy classes, coupled with the skills training mentioned earlier. An educational needs assessment must be conducted to facilitate a people based curriculum.

5.6. LIMITATIONS

This study set out to research the impacts of urban agriculture on household survival by using the case study of the Demat community in Welbedacht. The case study approach was used in this study. This involved a single area of study and the findings extrapolated cannot be reflective for the entire country. Nevertheless, it provides useful insights into the role of urban agriculture as a survival strategy, its impacts on the quality of life and the environmental impacts thereof. Other problem areas were related to the lack of

community facilities in general. Furthermore, the research did not consider the issues of power dynamics within the community and as such it fails to address this.

5.7. CONCLUSION

Whereas the dawn of a new democratic order has brought with it political emancipation, social deprivation still manifests itself in different forms. These relate to poverty, which surfaces as hunger, unemployment, lack of shelter and low levels of literacy. These problems were further exacerbated by rapid growth in the urban population through in-migration and natural population increase.

In this respect the struggle for survival assumes desperate proportions. The poor as a means to satisfy their basic physiological needs and household food security have initiated their own survival strategy. This reflects itself in the form of urban agriculture. Urban agriculture has spawned new spatial forms, in competition with industrial, residential and commercial land uses.

The literature review described the potential of urban agriculture to provide supplementary food security, and supplementary incomes within the context of sustainable development. Similarly, the ecological impacts of urban agriculture were described in the literature review and again examined in the case study. A positive attribute of this was that the natural processes of growth, maturation and decay were intact. Further to this, soil fertility did not pose as a severe problem in the study area, as it continued to sustain agricultural production.

The case for the urban poor and their practice of urban agriculture in Demat presents a *de facto* case to be transformed into a *de jure* existence. The constitution of this country legitimizes human dignity and human rights. Every citizen has a right to decent shelter, food, clothing and education. Substantial state intervention is required to invigorate these rights into action. In order for the masses to enjoy freedom and equality in the new South Africa they must be liberated from the manacles of poverty and obscurity. The

community of Demat has demonstrated, in the face of adversities, their innovative abilities to generate multiple livelihood strategies to achieve supplementary household food security. They have shown simple, creative ways to enhance their lives, for which the state is morally and legally bound to nurture and extend to alleviate poverty. In this respect the national government, the provincial government and the Durban Unicity need to garner their resources for the advancement of the poor.

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Appendix A-Structured Questionnaire

QUESTIONAIRE NO:_____

A) Background of the interviewee

	Background	Of	Household			
Member/ Household (Specify)	Sex	Age	Marital Status	Source of income	Level of Education	Employed or unemployed

Household Size:
No. in Household _____(Include Interviewee)
No. of Dependents:_____

	Male	**Female**	**Total**
Own Children			
Your Parents			
Spouse Parents			
Other Dependents:			
(Specify)			

How many years have you been living here?

<5 years	6-10 years	11-20 years	21-30 years	30-40 years	41-50 years	>50 years

How many years have you been involved in market gardening?_____

Household: Other Income Generating Activities: Indicate whether it is the respondent, respondent's son, respondent's daughter, respondent's wife, respondent's son, etc.

Type of Activity	Specify the type of job (eg. Clerk in shoe factory, garage attendant, etc.)	Whom in the Household
Formal Sector Employment		
Wages & Salary: Part-Time		
Full-Time		
Commission		
Pensions: State		
Nominal State Old Age		
Private (Insurance etc)		
Provident Fund		
Grants: Social Welfare		
Disability		
Family Grants		
Unemployment Insurance Fund		
Savings		
None		
Other (Specify)		

B.

GARDENING ACTIVITY:

1. Nature of Accesss to the Land.

1.1. Who owns the land on which gardening is practiced?

a) Interviewee	
b) State	
c) Private Landowner	
d) Family/Extended Family	
e) Unknown	

1.1.1. If by Private Landowner: Where does the landowner reside?

a) On the same property	
b) Surrounding city, town, suburb: (Specify):	

1.1.2. If property is leased or rented, state approximate amount paid per month_____

1.1.2.1. If there is no cash transfer to landowner, state how the landowner is compensated. Tick appropriate block.

a). Caring for the land	
b). Security against land invasion	
c). Exchange of goods in lieu of cash	
d). Others: (Specify)	

1.1.3. If by family/extended family: Specify the family member or relative:

_____

1.2. Is gardening activity performed? Tick the appropriate block.

a). Seasonally (Specify the season).	
b). Part – time	
c). Main activity	

2). What is your goal in producing vegetable crops? Tick the appropriate block.

a) Food For Consumption	
b) Sale For Income Generation	
c). Employment Creation	
d). Recreation/leisure/therapeutic	
e). Other (specify)	

2.1. If for sale/income generation, how do you dispose of the produce? Tick appropriate block.

a) Sell to hawkers	
b) Sell to neighbours	
c). Sell door to door in neighbouring townships	
d) Sell at local market place	
e) Agent or Association	

2.1.1. If the response is either (d) or (e) briefly specify in terms of :

2.1.1.1. When?_____.

2.1.1.2. Where?_____.

2.1.1.3. How? _____.

3) Estimate the amount of income derived from market gardening, per month

a). R100-R200	
b) R201-R300	
c). R301-R400	
d). R401-R500	
e). >R501-	

4). Does your garden activities: Tick appropriate response on right for each category.

a).Increase your income	Yes		No	
b).Reduce hunger	Yes		No	
c). Increase food	Yes		No	
d). Improve Nutrition	Yes		No	
e). Create Employment	Yes		No	

5). State the types of crops grown. Tick the appropriate block.

Vegetables		**Fruit**		**Flowers**	
Chillies		Mangoes		Marigold	
Mudumbis		Guavas		Asters	
Tomatoes		Bananas		Others: Specify	
Pumpkins		Avacado Pears			
Carrots		Lemons			
Dhania		Others: Specify			
Brinjals (Egg Plant)					
Cabbages					
Green Beans					
Peas					
Mealies					
Others: Specify					

5.1. State the reason for the cultivation of specific crops, mentioned in 5. above. Tick appropriate block.

a) Cheaper to produce	
b) Demand for goods (markets)	
c). Household Consumption Requirements	
d) Less prone to disease/pests	
e) Others: Specify	

5.2. State the size of area under cultivation. Tick appropriate block.

a) < than $100m^2$	
b) $100m^2$ to $200m^2$	
c) $200m^2$ to $300m^2$	
d) $300m^2$ to $400m^2$	
e) $>500m^2$	

6. Provisioning of water for gardening: Do you rely mainly on: Tick the appropriate block.

a) Irrigation	
b) Borehole Water	
c) Normal Garden Hose/Sprinklers	
d) Rainfall	
e) Waste water eg. Runoff from gutters, kitchen or bathroom.	
f) Others: (Specify)	

7. Do you make use of fertilizers?

Yes	
No	

7.1. If yes, specify how acquired?

a). Purchase	
b) Produced on site eg. Compost heap	
c) Recycle animal manure	

8. Seeds: How are they acquired? Tick appropriate block

a) Purchased	
b) Derived from crops on site	
c) Shared/exchanged with neighbours	

9. Implements: Do you make use of the following? .
How are they acquired? Refer to the key below:

Purchased by householder	**1**
Borrowed when needed	**2**
Communally Purchased	**3**
Gift	**4**
Other (Specify)	**5**

Insert the relevant key code in the appropriate box.

a) Tractors	
b) Normal garden implements eg, spades, hoes, rakes, shears	
c) Animal driven ploughs	
d). Other: Specify	

10. Labour: Who works on the land?
Indicate the number of persons Male/Female under the age column

AGE (In years)	*<15*		*16- 21*		*22- 60*		*>60*	
Male/Female	**M**	**F**	**M**	**F**	**M**	**F**	**M**	**F**
a) Hired labour								
b) Family members								
c) Tenants								
d) Interviewee (Personal Undertaking)								

10.1. Do you think persons listed above are sufficiently skilled for this type of activity?

Yes	
No	

If the answer is no, why?_____

_____

_____

C. SUPPORT SERVICES

1. Do you receive help/assistance from the following organizations? Tick relevant block.

a) NGOs	
b) State (Dept. of Agriculture)	
c) Land Bank	
d) Local Authorities	
e) Others: Specify	

1.1. State the nature of assistance.

a) Loans	
b) On Site Training	
c) Workshops	
d) Lectures	
e) Subsidies: Seeds/Fertilisers/Water	
f) Others: Specify	

1.2. If you did receive assistance did it meet your expectations? Tick appropriate block.

Yes	
No	

1.2.1. If no, why? _____

_____

_____

1.3. How would you like to be supported in future?

_____

_____

_____

D. SOCIO/ECONOMIC/PHYSICAL CONSTRAINTS

Rate the following problem areas using the following key. Do you feel it is very severe, severe, moderate, very slight/mild or nil.

i. VERY SEVERE
ii. SEVERE
iii. MODERATE
iv. VERY SLIGHT/MILD
v. NIL

PROBLEM AREAS	1	2	3	4	5
Price Variability					
Pest					
Lack of Labour					
Theft & Vandalism					
Lack of Knowledge					
Transport					
Climate					
Poor soil condition					
Lack of fencing					
Lack of communication					
Lack of finance					
Lack of land					
Lack of water					
Lack of fertilizer					
Damage by livestock					
Conflict					

Livestock

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

Animal	No.	Purpose Of Production					
		Eat	Sell	Milk	Labour	Lobola	Others
Cow							
Chicken							
Goat							
Sheep							
Duck							

Appendix B

SEMI – STRUCTURED
QUESTIONAIRE NO:_____

A) Background of the interviewee

	Background Of					
Member/ Household Specify	Sex	Age	Marital Status	Source of income	Level of Education	Employed or unemployed

Household Size:
No. in Household _____(Include Interviewee)
No. of Dependents:_____

	Male	Female	Total
Own Children			
Your Parents			
Spouse Parents			
Other Dependents:			
Specify			

How many years have you been living here?_____

Household: Other Income Generating Activities: Indicate whether it is the respondent, respondent's son, respondent's daughter, respondent's wife, respondent's son, etc. in the third column.

Type of Activity	Specify the type of job (eg. Clerk in shoe factory, garage attendant, etc.)	Whom in the Household
Formal Sector Employment		
Wages & Salary: Part-Time		
Full-Time		
Commission		
Pensions: State		
Nominal State Old Age		
Private (Insurance etc)		
Provident Fund		
Grants: Social Welfare		
Disability		
Family Grants		
Unemployment Insurance Fund		
Savings		
None		
Other (Specify)		

B.

A number of your neighbours are practising garden agriculture.

1). Why are you **not** involved in this type of agriculture?

_____

_____

2). Do you think there is a need to extend the areas under cultivation into the open spaces (surrounding areas)?

_____

_____

_____

3). If you were given an opportunity to practise this type of agriculture, would you participate? Y/N _____ List your reasons hereunder:

_____

_____

_____

4). What would be your main objectives, if you had to practice garden level agriculture? List your reasons hereunder:

_____

_____

_____

5). State some of the measures that you think needs to be done to improve the present conditions, under which garden level agriculture is practised.

_____

_____

_____