



# **The status of urban and peri-urban agriculture,**

**Windhoek and Oshakati,**

**Namibia**

**A SURVEY REPORT PREPARED FOR**

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## **REFERENCE**

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## LIST OF ACRONYMS

ADC	-	Agriculture Development Centre
CSO	-	Central Statistical Office
DAPP	-	Development Aid from People to People
DBC	-	Development Bridgade Corporation
EU	-	European Union
FAO	-	Food and Agricultural Organisation
FINNIDA	-	Finish Development Agency
GRN	-	Government Republic of Namibia
GTZ	-	German International Development Agency
IDRC	-	International Development and Research Centre
MAWRD	-	Ministry of Agriculture, Water and Rural Development
NCA	-	Northern Communal Areas
NGO's	-	Non-Government Organisation
NPC	-	National Planning Commission
SEAGA	-	Socioeconomic and Gender Analysis
UNDP	-	United Nations Development Programme
UNICEF	-	United Nations Children Educational Fund

## **EXECUTIVE SUMMARY**

### **Background**

Urban and peri-urban agriculture is the practices of producing vegetables and fruits within urban environments for household consumption as well as for sale to the rapidly growing urban population. In some cities in Africa like Harare the practice has advanced to the production of maize the main staple. In Namibia urbanization attained explosive rates since independence in 1990 with Windhoek recording annual growth rates in excess of 5% from 1995. This is because of rapid migration of rural people in search of employment. The net result is the ever expanding shanties in the urban areas. As the driest country in Africa, Namibia's agricultural base is weak. Consequently most vegetables and fruits sold in Windhoek and Oshakati are imported from South Africa. Despite this, there is evidence of intensive farming activities both commercial and micro scale in backyards, open spaces and along river courses. Unfortunately there is very little information on the farming practiced in the urban and peri-urban areas in the country.

Because of the paucity of data on urban and peri-urban agriculture the objectives of this study has to:-

- \* Produce a preliminary list of current farming activities in the urban and peri-urban areas of Windhoek and Oshakati;
- \* Assess the current levels of utilization of the produce;
- \* Explore the socio-cultural aspects of urban farming such as extent of poverty, food security and gender differentiation;
- \* Determine the gender specific constraints in urban and peri-urban agriculture; and
- \* Devise strategies for efficient peri-urban farming and transfer of the knowledge gained in Windhoek to other urban areas in Namibia.

### **Methodology**

The research has a detailed desk study prior to the field study which collected data in Windhoek and Oshakati using a detailed questionnaire (appendix 1). A total 244 respondents were interviewed (101 in Windhoek and 143 in Oshakati). The information collected included household demographic data, socio-economic and migratory characteristics, urban agriculture practices and the scale of the activities. In Windhoek the

sample was selected from seven north and west informal settlements while in Oshakati, the sample was selected from six areas across the whole town. The data was collected by a total of eight enumerators and two supervisors working with the three consultants. Systematic random sampling was adopted in picking respondents to the sample. Four languages were used to conduct the interviews-vis English (22), Oshiwambo (214), Rukavango (7) and Afrikaans (1). The selected sample comprises of 161 female and 83 male respondents (Windhoek 54 female, 47 male and Oshakati 107 female, 36 male). The data collected was analysed using MINITAB statistical package. Throughout the analysis, the data was differentiated into town (Windhoek and Oshakati) and gender replies.

The desk study provided detailed information about the scope and extent of urban and peri-urban agriculture in a number of urban areas in Africa and other parts of the world. These include towns like Addis Ababa, Dar es Salaam, Harare, Kampala, Khartoum, Nairobi as well as Kisangani, West Africa (Ghana, Nigeria), Botswana, South Africa, Bolivia and China. The overall findings in these studies conclude that urban farmers and their families enjoy better diets, higher incomes, employment and a combination of these benefits. They add that urban agriculture is a rational responses by the urban poor to the inability of the formal economy to provide them with sufficient real income for survival in the cities and other urban areas. The desk study also established that urban agriculture still remains unrecognised unassisted and discriminate against, when not outlawed. However the studies also revealed that many governments are creating agencies to manage urban agriculture for example Côte d' Ivoire, Ethiopia, Malawi, Kenya, Tanzania, Uganda, Nigeria, Zaire, China, Japan, Papua New Guinea, Argentina, the Phippines and Zimbabwe.

### **Key Findings**

The results of the survey show that the majority of the respondents are young people falling in the age range of 21-40 (66.3%), with 58% being single, 23.4% married and 13,5% cohabiting. The sample comprised of 78% male headed and 2% female headed. Up to 84.4% of the respondents originated from the central Northern Regions while 7.4% came from Kavango and 4.5% from the Karas Region. These figures confirm the migratory patterns in the country. In both Windhoek and Oshakati the main home language among the respondents is Oshiwambo (74%), 92% respectively. Other languages spoken are Rukavango, Damara-Nama and Lozi. As

far as shelter is concerned 2% of the respondents in Windhoek have moved recently to their plots. This confirms the high migratory rate into Windhoek in the last six years when the Municipality started to accommodate squatters due to political pressure. In Oshakati 54% of the respondents have been living in their plots prior to independence and 29% moved into their plots in the last five years. On ownership 48% of the respondents owned the houses, while 52% were found to be tenants. Windhoek respondents owned more houses (72%) than Oshakati (31%). In Windhoek 66% obtained their plots through the municipality and the remaining 34% through other means, while in Oshakati 51% acquired their plots through headmen and 47% through the Local Council.

On employment 51% and 26% of men and women respondents in Windhoek are employed. The corresponding figures for Oshakati are 36% and 26%, leaving the rest unemployed. In both Windhoek and Oshakati, not all the school going female children are in school –11% in Windhoek and 6% in Oshakati. No reasons were given for this situation, but could be attributed to either teenage pregnancy or use of girls to assist their mothers in looking after babies. The level of education of the respondents varied widely with 48% and 40% in Oshakati and Windhoek who had had no formal education. Post secondary education holders form 23% in Windhoek, but only 6% in Oshakati. The majority of respondents have no source of income (Oshakati 58%, Windhoek 35%). The main source of income is employment in private companies (48%), government 18% and self employment (17%). Up to 9% of the respondent spouses get their income from farming (urban agriculture). In Oshakati 35% of household heads are employed by government, 19% in private companies, 13% in farming (urban and peri-urban agriculture) and 8% self employed. On the other hand 6% of spouses are employed by government, 6% in private institutions and 21% in farming.

On expenditure, the study found that over 70% of all respondents spent less than N\$300-00 per month on basic needs. This points out the high level of poverty among the respondents. This is further highlighted by the large number of respondents without any savings (68%). The situation of poverty is aggravated by the fact that the majority of respondents buy their food supplies in the same supermarkets with those with higher incomes. Given this rather dismal situation, the study examined the availability of credit, which could be used to pull the respondents out of poverty. This study came up with the shocking results that 95% and 96% of respondents in

Windhoek and Oshakati respectively have no access to credit. Only 4.5% of respondents in Windhoek reported having received credit of up to N\$400-00! In Oshakati the figure is only 1.7%.

On control of produce and other household resources, the study established that in both Windhoek and Oshakati, land is controlled by men (63% and 27%), with women having a poor 17% and 9% in Windhoek and Oshakati respectively. The situation is slightly better when we look at joint ownership of land 20% and 64% tools 35% and 51% and produce 48% and 45% in Windhoek and Oshakati in that order. The study further reveals that in Windhoek men control most of the cash (39%), compared to women (16%). Unfortunately no comparative figures were obtained for Oshakati.

Having established the above parameters the investigation then wanted to see the involvement of the respondents in urban agriculture. This indicates that 72% of all respondents had had previous experience in farming. The majority produced crops (72%), but 5% had both crops and livestock. Further detailed investigation revealed that women constitute the majority of urban farmers (Windhoek 54% and Oshakati 58%). The proportion of men farming is higher in Windhoek (31%) than in Oshakati (13%). A higher proportion of other household members are involved in farming in Oshakati (29%), than in Windhoek (15%).

Most of the other farmers in Oshakati (22%) are school children who learned their gardening in school. Over 80% of the respondents pointed out that they started their gardens out of their own initiatives, without any outside influence. These respondents also had gardening experience from the rural areas before they moved to either Windhoek or Oshakati.

The main reasons for urban farming is to provide food to family members. But some respondents are in farming to generate extra income (Windhoek 13%, Oshakati 17%). In Oshakati 33% of the respondents stated that they are farming as a hobby. The farming practices adopted include land preparation, planting, weeding and harvesting. The majority of respondents stated that they produce vegetables only during the summer so as to benefit from the summer rains. (Windhoek 90%), Oshakati 72%). However, 27% of the respondents in Oshakati cultivate both in summer and winter. The main production inputs investigated are soil type, water, seeds,

tools and fertilizers. Both male and female producers in Windhoek describe their soils as stony, while those in Oshakati are described as sandy. Water has been reported to be a serious limiting factor. The main source of water to respondents in Windhoek (91%) and Oshakati (57%) is tap water. The high usage of tap water is probably because the water tariff has been fixed at a flat rate of N\$30 per month. But in the last two years the two municipalities have adopted the use of water card metres in the informal settlement areas. Consequently in Oshakati have been reported not using tap water for growing vegetables. A few farmers have suggested the use of rainwater and wastewater. Unfortunately 77% of Windhoek respondents and 43% of Oshakati perceive waste water as bad for growing crops. This may have some negative repercussions on the sale of the products.

On seeds, the study found that 85% of the gardeners in Windhoek and Oshakati source their own seeds, with 51% of those in Oshakati buying their seeds from local shops, whilst 25% get their seed from relatives and 2% from friends. In Windhoek 33% of urban gardeners buy their own seed and 53% get their seeds from various ways. Over 62% of growers in Windhoek perceive that seeds are cheap and readily available. The figure for Oshakati is 51%. The tools that farmers own include pickaxe (65,08) spades (62%,67%), handshoes (25%,85%) and rakes (6% Windhoek and 51% of Oshakati. The majority of the farmers own the tools. More people in Oshakati use fertilizers than in Windhoek (52% against 33%). The commonest fertilizer is digested manure from the Gammans Water Works. Its usage is an indication that the people do not have any health and cultural worries about this. The other sources of household waste are fresh manure and inorganic fertilizers. In Oshakati, 23% of the producers use fresh manure followed compost, household waste, inorganic manure and digested manure in that order. Examined for gender differentiation, the study established that there is no difference in the use of fertilizers between men and women. However, the study points out that more women than men use compost for urban and peri-urban agricultural production.

Pests and disease control was reported to be mainly from corn crickets, American bollworm and spiders in Windhoek, while in Oshakati, it is the American bollworm and aphids. There is not much demand for chemicals both in Windhoek (5%) and Oshakati (9%). This is because the plots are very small and pests and infected parts of plants can be controlled by picking of pest and removal of the damaged parts. The limited number of pests reported and small number of

diseases identified may be due to the fact that the farmers lack the ability to identify them.

The study found that urban and peri-urban producers grow a wide range of crops and fruit trees (table 4.11). The most common crop grown in both towns is maize (88%), followed by beans (42%), tomatoes (41%), pumpkins (26%), water melons (24%), sweet potatoes (23%), red peppers (17%). A list of favourite crops produced are consumed by household members. Some of the produce is given away to friends (Windhoek 42%, Oshakati 42%). Only 25% of the farmers in Windhoek and Oshakati reported some selling of their products to augment household income. Sales take place in the producers homes or in the bus stops.

Regarding the husbandry practices in use, 87% of respondents in Windhoek practiced intercropping. In Oshakati the figure is 90%. Intercropping is popular. This is because the plots are small and it ensures optimum use of available resources such as manure, labour and capital. All the popular crops are intercropped (Table 4.15).

### **Legal status of urban agriculture**

The study contacted the Ministry of Agriculture, Water and Rural Development but the Municipal Authorities of Windhoek and Oshakati and established that there is no policy on urban and peri-urban agriculture. When the Ministries of Health and Social Services and Environment and Tourism were approached, they informed the investigators that they do not consider urban and peri-urban agriculture as their responsibility.

### **Constraints to urban and peri-urban agriculture**

Urban and peri-urban agriculture producers are faced by numerous problems. These include shortage of water (41%, 51%) pests attacks (40%,38%), that theft of the produce (31%, 24%) for Windhoek and Oshakati respectively. Another important problem facing urban farmers is the lack of information regarding the type of crops to grow, the chemicals to use and the prices, producers would receive for their products. This is partly because of the absence of Extension Services to the producers. (Windhoek 64% and Oshakati 70%). Similarly the majority of the farmers are inward looking and do not give any assistance to other producers.

The expectations of the producers in Windhoek (67%) and Oshakati (41%) is to expand the area

under vegetables. A higher proportion of Oshakati farmers would like to increase the number of crops they are growing in their gardens. Regarding livestock and fish activities, very few urban producers are involved in keeping livestock (Windhoek 6% and Oshakati 24%). The types of livestock kept are chickens, goats and turkeys. As regards fishing this was reported to be an irregular, seasonal activity limited largely to the collection of mud fish in the iishona.

### **Socio-Economic and Gender Analysis (SEAGA)**

To supplement the information obtained from the questionnaire, the study undertook two sessions on Socio-Economic and Gender Analysis (SEAGA) in Windhoek and Oshakati with a focus on peri-urban farming groups. Because of a number of constraints, the session in Oshakati on the Tukondjeni is included in this report. The Tukondjeni project started in 1993 with the main objective to establish a vegetable garden. In 1998 the garden was established with twelve women members. The enterprises undertaken were tomatoes, spinach, sweet potatoes, chillis, maize and carrots. The study applied a number of SEAGA tools such as the Daily Activity Clock Tool and Problem Analysis chart tool. On the Daily Activity Clock Tool was applied to income generating activities, organization of social and community events for example marriages, funerals, cultural shows and religious festivals. The analysis provides an insight into how individual members of households or communities are occupied within their social milieu. Hence any development activity should understand this clearly before introducing new innovations to the communities. The study found out that while women carry both productive and reproductive activities, they are not given recognition or economic benefits. In this regard any development interventions should focus on time reduction or time spent on specific activities e.g. hammer mills – to reduce the time spent on pounding grain; a planter – to reduce the time spent on planting. Thus knowing who does what in a household is important for development planners and promoters of urban and peri-urban agriculture.

The Problem Analysis chart tool was used to identify problems experienced by participants. It provides potential for solution such as coping strategies and untapped knowledge. For example land and labour management. Here the requirement is for a systematic way of managing productive resources like Agricultural Extension Technicians advice. They go systematically on practices, and operations to make sure the recipients or participants understand the cultural practices to be followed in producing a crop eg. Cultivation methods. The Problem Analysis

Chart Tool identified Marketing as the main problem of the Tukondjeni Project.

Under others, the exercise identified other income generating activities such as traditional baskets, pottery, marula oil and the use of market gardening plots for teaching.

## **Conclusions and Recommendations**

Urban and peri-urban agriculture is practised by over 70% of the residents of Windhoek and Oshakati. Over twenty three types of vegetables and fruit trees are grown on tiny plots, but the main ones are maize, beans, tomatoes, pumpkin, watermelon, sweet potatoes and pepper. Most of the produce is consumed by the household and contribute to improvement of their nutritional status. Many producers are willing to expand their plots if they are assisted with some inputs, similarly those with no gardens have expressed interest to start vegetable gardens, if they are provided with space and initial capital. Existing marketing outlets are limited to the locality and hence not reliable. Most vegetable production takes place during the summer rains supplemented, iishona and municipal water taps which have now become very expensive. Animal production is limited to small stock and poultry, while fishing is seasonal activity.

The absence of policy on urban and peri-urban agriculture is seen as a serious constraint towards its intensification and development. It is therefore recommended that the Ministry of Agriculture, Water and Rural Development in consultation with the municipalities and the Ministries of Environment and Tourism and Regional and Local Government and Housing and other stakeholders evolve a policy on urban and peri-urban agriculture. This would ensure the development of a production system that results in the production of healthy fruits and vegetables and use of biodegradable chemicals to minimize air water and soil pollution. Furthermore it is recommended that the small growers be assisted to organize themselves into producer cooperatives so that they can break into the main market.

Finally this study has demonstrated clearly that urban and peri-urban agriculture as practiced in Oshakati and Windhoek can be viable though at a very low scale. If its potential is to be exploited to the full, government, the municipalities and the private sector should be involved. The former should evolve a policy that encourages the production of high value fruits and vegetables for the market. While the latter should inject micro loans to enable producers to purchase inputs including appropriate technology. The policy should include allocation of responsibilities amongst the concerned authorities in respect of legal recognition, guidelines on the correct husbandry practices and the protection of the environment for sustainable production.

# **CHAPTER 1**

## **BACKGROUND**

### **1.1 INTRODUCTION**

Explosive rate of urbanisation, due to the migration of people from rural areas to towns and cities in Namibia in search of employment and better economic conditions, has been taking place since independence in 1990. Though many of the migrants are unable to get jobs, they prefer to live as squatters in and around the towns, leading to the emergence and phenomenal growth of shanties and informal settlements in almost all cities and towns in Namibia viz. Windhoek, Oshakati, Ondangwa, Walvis Bay/Swakopmund, Rundu and Katima Mulilo. The problem is most severe in the municipalities of Windhoek and Oshakati. In pre-colonial days, under conditions of restricted and controlled movements of the country's population, the Windhoek's population growth rate averaged 4% per year. Since independence it has been 5.4% per year resulting in Windhoek's population increasing from 97,000 in 1988 to 182,000 in 1995. According to an assessment carried out by the City of Windhoek about 60% of the city's population are regarded as being poor as measured by income and consumption data. A similar situation also exists in Oshakati.

Being the driest country in sub Saharan Africa, the agricultural base of Namibia is very weak. As a result, most of the vegetables sold in Windhoek, Oshakati and the urban centres of Namibia are imported from South Africa. Despite this, there is evidence of farming activities, both commercial and small scale, around the peri-urban centres. For food security reasons, and even for other strategic reasons, food production in peri-urban areas should be actively promoted. This could offer means of livelihood to the jobless migrants.

There is little available information dealing with all the aspects of farming in the peri-urban areas. Some of the information gap includes the extent of cultivation, the economic aspects, the socio-cultural aspects, the technical aspects and the constraints of farming in peri-urban areas. There is, therefore, an urgent need to survey the present status of peri-urban agriculture in Namibia. This could lead to the formulation of policy options, creation of methodologies and

development of design criteria for appropriate and sustainable farming systems in the peri-urban areas. In turn, these will hopefully facilitate the promotion of agricultural production in the peri-urban areas and lead to the reduction of poverty. They can also promote food security and nutrition at household level.

## 1.2 OBJECTIVES

The main objective of this project will be to collect, synthesise and expand all available information pertaining to the issues underpinning the current status of peri-urban agricultural practices in two geographical settings in Namibia, viz. Windhoek and Oshakati. The other specific objectives are:

- 1 To produce a preliminary list of current and ongoing farming activities in the peri-urban areas of Windhoek and Oshakati, including animal and crop production.
- 2 To assess the current levels of utilization of the produce vis-à-vis the marketing opportunities and economic considerations.
- 3 To explore the socio-cultural aspects of peri-urban farming including the class and extent of poverty levels, food security strategies, and the role played by gender differentiation e.g. women's access to land, labour and other production inputs.
- 4 To determine the gender specific constraints currently faced/encountered by men and women engaged in peri-urban agriculture including agro-climatic factors such as insufficient water, lack of arable land, poor soil quality; and other factors such as access to financial resources or credit facilities to buy inputs, farming skills, organizational capabilities etc.
- 5 To devise strategies for more efficient peri-urban farming based on the information gathered (e.g. supplementary irrigation from mineralised waste water from the sewage system or other sources), and

- 6 To devise strategies for the transfer and extrapolation of the acquired knowledge to other peri-urban areas in Namibia.

### 1.3 **METHOD**

#### 1.3.1 **Desk Study**

A detailed desk study involving the collection and study of relevant literature pertaining to all the facets of peri-urban agriculture in Windhoek and Oshakati in particular and Namibia in general was carried out at the beginning of the study. The result of the desk study is presented as Chapter 2 of this report and it has also been published by the FAO (Dima and Ogunmokun, 2001).

#### 1.3.2 **Field Study**

In order to obtain an overall view of the status of urban farming in Windhoek and Oshakati, a well-structured questionnaire (Appendix) was administered to randomly chosen households between April and May 2001. The questionnaire was used to collect information on: demographic, socio-economic and migratory characteristics of the household members; involvement in urban agriculture, the type and extent of involvement; and the farming systems practiced and the problems and potentials of urban farming. A total of 244 respondents were interviewed comprising of 101 in Windhoek and 143 in Oshakati (Table 1.1). In Windhoek the sample was selected from seven areas namely: Okahandja Park, Khomasdal, Kilimanjaro, Babylon, Cimbebaia, One Nation and Ombili. While in Oshakati the sample was selected from six areas: Oshakati East, Evululuko, Okandjengedi, Oshakati West, Uupindi, and Oneshila. The sampling at Windhoek concentrated at the North West locations where all the informal settlements are located. Time and funding limitations did not allow for a wider coverage. The sampling at Oshakati was more evenly distributed over the town. Four enumerators and 2 supervisors were used at each town. After choosing a location at a town, the enumerators would count four houses on the left side of a chosen street and carry out the first interview in the house that is opposite (right side) to this house. The next interview would then be at the fourth house in the left direction from this house, and so on until the last house in that street. In cases where the occupiers of a chosen house refused to cooperate, then the next house on the same side was tried.

Table 1.1: Distribution of samples at Windhoek and Oshakati

Windhoek			Oshakati		
Location	No of Respondents	Housing Density	Location	No of respondents	Housing Density
Okahandja Park	22	High	Oshakati east	16	Low
One Nation	7	High	Evululuko	23	High
Ombili	15	High	Okandjengedi	8	High
Khomasdal	9	Medium	Oshakati west	62	Medium
Kilimanjaro	31	High	Oneshila	16	High
Babylon	13	High	Uupindi	18	High
Town	4	Low			

Four languages were used to conduct the interviews. These are English (22 respondents), Oshiwambo (214 respondents), Rukavango (7 respondents) and Afrikaans (1 respondent). The last 2 languages were used only at Windhoek. The total sample consisted of 83 male and 161 female respondents comprised of 47 male and 54 female in Windhoek and 36 male and 107 female in Oshakati.

### 1.3.3 Problems with the field study

The main problem encountered was the refusal of some household members to cooperate with the enumerators since they were not convinced of the real aims of the survey. The level of this problem was reduced in Oshakati by a radio announcement carried by the Namibian Broadcasting Corporation explaining the reason for the survey. However, another problem that was peculiar to Oshakati was that some of the questions especially those related to income and other financial issues were not properly answered. This is because most of the respondents were school children who were on holidays at the time the survey was carried out and they had difficulty in answering some of the questions especially those related to income and other financial issues.

#### 1.3.4 **Data Analysis**

At the end of each day of enumeration, all questionnaires were checked for completeness, clarity and consistency in the way the replies were recorded. The data were then coded and entered in the MINITAB statistical package which was used to analyse the data. The analyses were based on counting the number of respondents within a group and then checking if there are town and gender differentiations in the replies.

## **Chapter 2**

### **URBANISATION AND URBAN/PERI-URBAN AGRICULTURE**

#### **2.1 INTRODUCTION**

Urban and peri-urban agriculture can be defined as the process of producing agricultural commodities within demarcated urban and edges of (peri-) urban areas. Because of colonial and post colonial local authority laws, rules and regulations, urban agriculture in Africa has been practiced illegally, discreetly and without technical support of local authorities or the relevant ministries of agriculture. This report surveys the recent literature on urban and peri-urban agriculture in Africa in general, and Namibia in particular, with a view to assess its extent and contribution to the urban economy in terms of food production, employment creation, income generation, innovation creation and adoption and appropriate technologies development. The report then presents the findings from a survey carried out to provide information dealing with the present status of urban and peri-urban agriculture in two Namibian major cities: Windhoek and Oshakati. The information gathered includes the extent of cultivation, the economic aspects, the socio-cultural aspects, the technical aspects and the constraints of farming in peri-urban areas. It is the hope of the authors that the result of the survey presented in this report would lead to the formulation of policy options for the advancement of urban agriculture, creation of methodologies and development of design criteria for appropriate and sustainable farming systems in the peri-urban areas. In turn, these will hopefully facilitate the promotion of agricultural production in the peri-urban areas and lead to the reduction of poverty.

#### **2.2 Recent Literature on Urban and Peri-Urban Agriculture**

Egziabher et al. (1994) in their study of urban agriculture in East Africa defined it as:

“The growing of food crops and fruit trees; the raising of animals, poultry, fish, bees, rabbits, snakes, guinea pigs, crocodiles, cane rats or other stock considered edible locally@.

In their investigations in the four cities of Addis Ababa, Dar es Salaam, Kampala and Nairobi, they established that urban agriculture flourished in river valleys, flood plains, cliffs, quarries, public land along roads and railway lines and under high-tension pylons besides plot backyard gardens and amongst flowers in front of houses. The study further found out that urban agriculture could become an important source of income while providing essential foodstuffs to the poorest households especially those headed by women. There is growing commercialisation of certain activities such as vegetables, poultry meat and eggs. For urban agriculture to flourish, the study recommends the institution of land use regulations for both public and private land. There is need for local authorities to come up with innovative arrangements for greater access to land, crop security and credit. Studies are needed for appropriate technologies for urban agriculture, its contribution to the urban ecosystem and economy, solid and liquid re-use, risks and gender equity aspects.

A UNDP (1999) sponsored study on urban agriculture, food, jobs and sustainable cities in Africa, highlighted the activities of aquaculture, horticulture, animal husbandry and agro-forestry. Richter (1995) in examining vegetable production in peri-urban areas in the tropics points out that urban agriculture is growing more rapidly than urbanization, the population or the economy. He established a positive relationship between urban agriculture and the urban poor in terms of food, health, income and gender. The study recommends further investigations on urban agriculture with respect to the ecological, socio-economic and nutritional aspects.

Mbiba (1995) in a detailed study of urban agriculture in Zimbabwe pays attention to certain aspects of urban agriculture such as gender, environment and institutional concerns and the quest to link urban agriculture to broader issues of housing supply and the fiscal base of local authorities. The study draws attention to the ways information on urban agriculture is gathered, disseminated and used. The study raises very important challenges to the proponents of urban agriculture whether it should be practiced in its largely subsistence nature or should be commercialised so that it can contribute effectively to the local economies. The study concludes that urban agriculture can be considered as a counter productive activity as it delays the provision of adequate housing to the urban poor, while at the same time disadvantaging those who may be practicing urban agriculture by depriving them from gainful employment.

Salih (1994) on perspectives of food policies in Eastern and Southern Africa identifies the policy areas covered in this monograph including food supply and economic sustainability in urban areas in Tanzania including urban farming. Mbiba (1995) attempted to classify urban agriculture in Harare as on plot and off plot cultivation. He listed the crops grown as maize, beans, pumpkins and sweet potatoes. He collected data on plot sizes, zoning, plot patronage, distances between residences and plots, participation status and decision profile. He asserted that urban agriculture is driven by the difficult economic climate in urban Harare where urban agriculture has become an important source of food for the home and releases pressure on the family budget. He notes that cultivators, irrespective of sex ignore legal restrictions and cultivate when and where they see fit.

IDRC (1993) points out that millions of people in the growing cities of developing countries have become urban farmers in recent decades. The paper highlights recent research into urban farming in China, West Africa, Uganda, Tanzania, Ethiopia, Kenya and Bolivia. These studies established that urban farmers and their families enjoy better diets, higher income, employment or combinations of these benefits. It further indicated that urban agriculture puts marginal land to good use and absorbs wastes in the form of compost and fertilizers.

Rogerson (1992) found that urban agriculture on market gardening can contribute to attaining greater food security among urban residents one important finding on the policy debate is that urban agriculture is a rational response by the urban poor to the inability of the formal economy to provide them with sufficient real income for survival in the city. He observed that urban agriculture provides a crucial or at least useful food supplement for many urban families. In this respect he goes on to assert, “policy makers should recognize that urban cultivators are a legitimate part of the urban environment and design interventions that support the practice of urban cultivation”.

Rogerson (1993), in another article, established that the scale of urban agriculture in South Africa is small compared to that in other developing countries. This is because there are greater returns to land and labour earned from backyard shacks and alternative informal income opportunities in the cities. Informal cultivation is primarily a survival niche of the most

marginalized and most vulnerable groups in urban areas, particularly, for elderly women. The authority recommends a review of urban policies on urban agriculture in the post apartheid South Africa.

A seminar on the rural-urban interface in Africa (Baker, 1992) provides conceptual and theoretical considerations on urban development in rural context. The seminar had case studies from Botswana, Ethiopia, Ghana, Namibia, Nigeria, Somalia, Sudan, Tanzania, Uganda and Zimbabwe. The emphasis was on how some of the specific sectors, organizations, processes and actors influence and shape the functioning of small town and on linkages of small towns to both rural areas and large towns including issues relating to entrepreneurship, labour markets and urban agriculture. Maxwell and Zziwa (1992) explored the role of urban agriculture in the informal sector of the City of Kampala. They discovered that this contributed significantly to urban employment, income generation and food supply despite a hostile policy environment. It has become a survival strategy for over one third of Kampala's low and middle-income households as well as a productive use of otherwise under-utilised urban resources. The study assessed the contribution of urban agriculture to urban food supply and recommended ways to promote the productive potential of urban farming including policy review by the city authorities. In a similar study, Streiffer (1991) investigated urban agriculture in Kisangani, Zaire and came to the conclusion that urban agriculture is indispensable for many people living in African cities. It was noted that despite its importance, it has not developed beyond the point of enabling people to survive. This is because those in authority regard it with disdain or outright hostility for example

the case of Nairobi, where local government at one point ordered the destruction of spontaneous agriculture within the city boundaries. Livingstone (1989) in examining youth unemployment in urban areas in Africa recommended the evolvement of a variety of policies for absorption of the youth into the agricultural sector in urban areas.

### **2.3 Changing Official Views on Urban Agriculture**

Urban agriculture still remains unrecognised, unassisted or discriminated against, when not outlawed, even in years of food shortage! However, many governments are creating agencies to manage urban agriculture. Between 1975 and 1985, 22 countries (10 in Asia, 6 in Africa and 6 in

Latin America) were supporting urban agriculture initiatives related to the provision of land and other production inputs, technical assistance, home food production and distribution, tree crops and small animals husbandry, food imports, alternatives nutrition and food distribution storage and preservation (Wade, 1987 p 38-41). Argentina and Peru have national departments and Buenos Aires, Jakarta and Mexico cities have metropolitan agencies to promote urban agriculture. More examples of the changing image of urban agriculture follow: -

- \* In Africa, the new capital of Côte d'Ivoire, Malawi and Tanzania encourage urban agriculture (DGIP / UNDP 1992 p 25).
- \* Kinshasa's 1975 master plan included areas zoned for horticulture in the east, central and south east, central and south west sections of this multi-million people city (Pain, 1985 p 34).
- \* Many Tanzania municipalities have set aside areas for urban agriculture. The Rwanda government gave plots to urban schools to produce more food locally (Finguelievich 1986, pp 10-11).
- \* In Nigeria and Zaire as in China and Japan, Papua New Guinea and the Philippines, urban farmers have been protected and encouraged through land use regulations and tax concessions (Diallo, 1993, Lado 1990, p 257).
- \* In Daoua, Côte d'Ivoire (population 123,000 in 1988) peri urban and intra urban agriculture grew tremendously between 1954 and 1988, promoted successively by Chinese immigrants, native ethnic minorities and local authorities. An official project had 45 rice growers on government improved and acquired land in 1988. A 1989 map shows 55 poultry farms located within and on the fringes of built area, 13 pig farms 110 fishponds in the city's immediate vicinity (Delta, 1991). 121 part and full time producers tended 250 hectares of well and tank irrigated rice paddies and native and introduced vegetables on marshland within the built area; lowland cropping expanded from 52 to 624 ha between 1954 and 1983.

- \* In Harare 246 out of 298 cooperatives managed by the city council=s department of housing and community services in 1989 were agricultural cooperatives 16 in food catering, 97 women=s clubs with 2700 members and 4 youth groups under urban agriculture.

In many East African countries, recently ministries of local government and agriculture, Municipal health and nutrition agencies, associations of urban municipalities and elected urban district councillors have become more tolerant if not supportive of city farming.

## **2.4 POPULATION AND URBANISATION IN NAMIBIA**

### **2.4.1 INTRODUCTION**

From being a mainly rural continent in the 1960s, Africa's population has progressively become urbanized to the extent that over 50% of its population is expected to be urban by the year 2025. This is in comparison to an urban population of only 18.8% out of a total population of 280 million in 1960 and of 33% out of a total population of 645 million people by 1990 (UNCHS 1987, Mabogunje 1994, UNDP 1994).

Urbanisation in the Namibian context is much different from experiences elsewhere in Southern Africa. Some settlements in neighbouring countries, such as Durban, Cape Town, Johannesburg or Harare, have more local residents than Namibia's present total population of some 2 million people. Almost two thirds of the total population lives in a relatively small area in the northern communal areas (NCA) comprising the former Ovamboland (now Oshikoto, Oshana, Ohangwena and Omusati regions), and Okavango and Caprivi regions. Some of the population densities here are in excess of 100persons/km<sup>2</sup>. Fewer than 10% of the population live in the southern regions where population densities are as low as 0.5 person/km<sup>2</sup> whilst the remaining 30% or so live in the central regions (Tvedten and Mupotola, 1995).

The Local Authority Act (Government of Namibia 1992) distinguished between municipalities, towns and villages. Municipalities represent the highest level of local authority and are further subdivided into Part I (Windhoek, Swakopmund and Walvis Bay and Part II (Gobabis, Grootfontein, Karibib, Karasburg, Keetmanshoop, Mariental, Okahandja, Omaruru, Otavi, Otjiwarongo, Outjo, Tsumeb and Usakos). These inherited their statuses from the pre-independence period, but are also generally the most developed urban areas. They are by law the most autonomous urban areas both financially and administratively.

Altogether, twelve urban areas are defined as towns. Six of these (Katima Mulilo, Ondangwa, Ongwediva, Opuwo, Oshakati, and Rundu) are in the former northern communal areas and the remaining (Henties Bay, Luderitz, Okakarara, Rehoboth, Arandis and Khorixas) are located in the central and southern parts of the country. Towns are expected to grow into autonomous and proclaimed municipalities when conditions related to formalization and income permit. Finally, 17 settlements are defined as villages under the Local Authority Act. Villages are smaller settlements that represent the lowest level of local authority, and are not declared as urban areas. The remaining settlements are considered to be hamlets.

In 1991, according to statistics given in a report (Republic of Namibia, 1994), about two thirds of all Namibians live in localities of less than 2000 people, while only a tenth live in localities with more than 20 000 people. This may suggest that Namibia does not qualify to be classified as an urbanized country, but a high average rate of urban growth estimated at 4.5% per annum compared with an average population growth of 3.1% is indicative of its increasing urbanization. Moreover, the rate of increase in the population of some of the urban centres have been phenomenal e.g. Windhoek increased by 46%, Rundu by 911% and Katima Mulilo by 3000% between 1981 and 1991 (UNDP, 1998).

#### **2.4.2 WINDHOEK**

Windhoek is by far the most important urban centre in the country. Its share of Namibia's total urban population in 1995 was 35.4%. No other country in Southern Africa has such a large proportion of its urban population living in the capital (UNDP 1994).

Windhoek's net annual immigration rate is given as 3.92% compared to a natural growth rate of

1.525 (TRP, 1995). With a combined growth rate of 5.44%, TRP estimated that Windhoek's population grew from 97,000 in 1988 to 182,000 in 1995 and that it should currently be about 238,000. In pre-colonial days, under conditions of restricted and controlled movements of the country's black population, the city's population growth rate averaged less than 4% per year. The growth rate of Windhoek between 1990 (the year of independence) and 1991 was 7% compared to a 3% growth rate for the entire country (Burmeister, van Niekerk and Partners, 1992).

In TRP's survey, (TRP, 1995), it was shown that about 60% of the city's population are regarded as being poor as measured by income and consumption data. Whilst Windhoek has the best and most accessible health services in Namibia, it also has the second highest proportion of underweight children because of the large influx of migrants to the peri-urban squatter settlements (UNDP, 1998).

The poor in Windhoek live almost exclusively in Katutura the black township created to house black workers and their families in 1958 under South African apartheid rule. Migrants into Windhoek from the rural areas settle mainly in Katutura and some other formal, but mostly informal, settlements that have grown around the township. By 1995, the population of Katutura was 109,000 with about 60,000 people living in the informal settlements. It is within the informal settlements that the highest population increase had occurred. At independence, there were only about 300 squatter households in Windhoek, but by 1995, this has increased to about 7 000 households, and it is still increasing.

The unprecedented growth in Windhoek's population has placed great strains on the city's resources particularly with regard to water. Sustainable economic sources to supply the city with water have been all exploited. Meanwhile the city faces a growing water demand. Difficulties arise for the Municipal Authority in trying to supply water and sewer system to the informal settlements. Whilst planned residential areas have fully serviced plots with water and sewerage points, only an emergency provision of water via stand pipes is supplied to groups of informal houses with very limited sewerage facilities.

This has led to the inhabitants of the squatter areas to using dry riverbeds or the surrounding land for sanitary purposes with the resulting pollution problems.

The problems of employment, income and housing are also much more severe in the informal settlements. A 1995 survey indicates a formal unemployment rate of 46% among heads of household, a relatively low average income and poor conditions of housing and infrastructure (Peyroux and Graefe, 1995). The total level of unemployment in the informal settlements is estimated at about 34% (TRP, 1995). Of those employed, 55% are engaged in informal activities whilst the others are employed in low paid jobs. It is estimated that about 97% of the people living in these informal settlements earn an income less than the minimum subsistence level for Windhoek. The root cause of poverty in Windhoek is the lack of income and livelihood opportunities.

### **2.4.3 OSHAKATI**

Oshakati is the second largest city (by population) in Namibia. It is situated in the Northern Communal areas where over 60% of Namibian population lives. Like Windhoek, there is also a high degree of urbanized population living in informal settlements in the centres of the Northern communal areas. With the exception of Ongwediva, all northern towns have between half and three quarters of the inhabitants accommodated at their margins without proper services and infrastructure (Table 2.1). The major problem for the northern towns is still the lack of formal employment opportunities. The dominance of informal economic activities and associated low levels of income have contributed to a significant expansion of informal settlement areas, with inadequate provision of services including water, electricity and sewerage (Tvedten and Mupotola, 1995).

Table 2.1: Estimated proportion of Northern towns' population living in informal settlements areas in 1995 [After Tvedten and Mupotola, 1995]

Town	Total Population	Informal settlements	
		Number	Proportion
Katima Mulilo	15,952	11,964	75%
Rundu	23,094	17,321	75%
Oshakati	25,762	15,457	60%
Ondangwa	9,457	4,729	50%

The current population of Oshakati according to Tvedten and Hangula (1993) should be around 50,000 with around 60% of these people living in one of the six informal settlement areas in the town (Oneshila, Amunkambya, Sky, Uupindi, Evululuko, Kandjengedi). According to Tvedten and Mupotola (1995), the population is young with 67% being between 15 and 30 years of age and about 27% of the households in the informal settlements being headed by females. The average size of the households is 5.1, and the households are composed of a nuclear unit (one or two parents with children) living together with extended family members, distant relatives and non-relatives. Tvedten and Mupotola (1995) further stated that the unemployment problem in Oshakati is severe, with the adult population either depending on informal employment (33%) or being completely unemployed (31%). Only 20% are formally employed, often in menial low-paid jobs. The most common forms of informal employment are small scale trading and hawking. The employment rate is higher among men (29%) than among women (11%).

The informal settlements are characterized by poor housing facilities and inadequate physical infrastructure. Many houses in the formal areas are also overcrowded with 64% of the households in the informal settlement areas living in shack and many of the brick houses being in poor condition.

The urban-rural links remain an important part of people's survival strategy. As many as 73% of the population maintain parts of their households in the rural areas 88% have access to land and cultivate, and 39% own cattle. According to CSO (1994), about 2% of Namibian's urban dwellers get their main source of income from subsistence farming. The importance attached to the rural areas is part of the explanation for the lack of investments in housing, infrastructure in the urban settlements (see Tvedten and Pomuti 1994).

In general, it is noted that poverty is disproportionately found among rural people, female-headed households, youths, elderly, and disabled; and recent migrants into marginalized urban areas (Government of Namibia, 1997).

#### **2.4.4 Historical context and current policy environment for urban agriculture in Windhoek**

According to Lau and Reiner (1993), population intensive subsistence crop production with marketable surpluses in good rainy seasons existed in Namibia long before the colonial era. Commercial crop production and marketing by smallholder in urban/peri-urban areas in Klein Windhoek (a suburb of Windhoek) were reported at the turn of the century with the cultivation of maize, potatoes, asparagus, onions, radishes and a variety of fruit trees. By 1931, local vegetable production constituted almost 42% of Windhoek's fresh produce market's annual turnover. However, the South African officials cut off research input and other official supports. This resulted in the production and marketing of vegetable produce being on an *ad hoc* basis (Lau and Reiner, 1993).

Lau and Reiner (1993) further showed that events related to the planned incorporation of Namibia as a fifth province of the Republic of South Africa also result in policy shifts around 1968/70 which seriously stifled vegetable production in the urban and peri-urban areas. The new development priorities including the establishment of homelands, the creation of colonial metropolis with luxurious residential plots and the supply of water to mines and urban usage over irrigation uses, relegated vegetable production to the background. For example, Klein Windhoek shifted from being farmland to become the most prestigious locality in Windhoek. By 12<sup>th</sup> April 1973, the Director of Agriculture for the South West Africa region states that "Namibia was

approximately 90% dependent on South Africa as regards vegetables". The current situation is not much improved as Namibia still depends heavily on South Africa for 70% of its total consumption of fruits and vegetables (MAWRD, 1996).

There is currently no recognition given to urban vegetable production by the Windhoek Municipality though allowance is made for the use of mountainous areas for game farms and grazing among other uses. This could be the reason why as many as 33% of the respondents in a survey carried out in Katutura (informal settlements) in 1989 indicated that they are engaged in urban livestock farming whilst only 8% are involved in vegetable production (Cogil and Kiugu, 1990). A pre-study survey carried out by the authors revealed that up to half of the residents in the informal settlements of Windhoek were engaged in a variety of urban farming activities. Fruit trees like bitter lemon, papaws cactus, fig, banana, mangoes and even apples were seen in many households. The variety of vegetables noticed includes cabbages, sweet potatoes, spinach (actually Swiss chard), onions, tomatoes, chillies, pumpkins, sunflowers, maize, sorghum, pearl millet and beans.

#### **2.4.5 Historical context and current policy environment for urban agriculture in Oshakati**

In the North Central Regions, vegetable production was limited to wild varieties until 1968 when a canal built to supply water from the Kunene River enabled the use of irrigated farming for vegetable production. During the South Africa military occupation period, the army organized the production and marketing of vegetables to satisfy its own needs to the exclusion of the local communities. The arrival in 1975 of Angolan refugees running away from the civil war in their country resulted in the establishment of some backyard gardens in the urban centres of the North like at Oshakati, since backyard gardening are culturally important to the Angolans. The gardens are located near their houses and the production is for household consumption.

Another factor that encouraged gardening development in the North Central Regions is the arrival, just before and soon after independence in 1990, of returnees (Namibian exiles from Angola, Zambia, Zimbabwe etc) who brought new knowledge notably in fruits and vegetable gardening. Gardening techniques were spread and many households started gardens near their

home helped the and extension of the canal network. Another reason given for the increase in vegetable gardens in the north, especially those established outside the homes in bigger plots, was the need for generating extra income especially for paying children's school fees (Poulet, 1995).

#### **2.4.6 Current Policy Environment**

The South African government before independence discouraged vegetable farming, as stated in the beginning of this section. Even immediately after independence, there was little priority given by the new government to horticulture production preferring to concentrate extension services more on livestock and dryland farming. Moreover, the training of extension technicians included very little horticulture. The aridity of Namibia and the consequent scarcity of water is the reason behind the government's policy of considering water for irrigation a very low priority. However, the continued rate of urbanization and lack of income generating opportunities for recent immigrants to urban areas have resulted in a change in the way government sees horticulture. For example, one of the two initiatives that were recommended as holding the promise of meeting the expansion of crop production in Namibia is "peri-urban horticulture with supplementary irrigation" in the Northern regions (NPC, 1997). This is to be achieved by the initiation of a ... "pilot peri-urban vegetable growing project on a 30-50 ha, with supplementary irrigation, and ... once this project has demonstrated its viability (including arrangements for sustainable use of water and access to urban vegetable markets) consider expanding it further".

The new government, in its wealth redistribution policy, directs a part of the public investment to the northern region. With the objective of improving the feeding habits of the local populations and of reducing imports from South Africa, the Ministry of Agriculture, Water and Rural Development (MAWRD) through the ADC (Agriculture Development Centres, the extension services of the MAWRD in charge of the agriculture development), supports community-based gardening projects. Some para-public institutions are also involved in developing vegetable gardening activities. The NDC (Namibian Development Corporation) for instance runs a large irrigated garden whilst the DBC (Development Brigade Corporation) provided training in vegetable production mainly to “returnees”. Independence also brought in a lot of aid through international agencies (UNICEF, GTZ, EU, French Co-operation, FINNIDA, FAO) and some NGO’s (CANAMCO, DAPP, Rossing Foundation) which were used to set up a number of gardening projects more often community-based. The type and the level of assistance vary according to the different institutions. What is lacking is a clear policy on urban and peri-urban agriculture.

## CHAPTER 3

### SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

#### 3.1 Demographic Analysis

The majority of the respondents (162) are young people falling in the age range of 21-40 and this amounts to 66.3% of the total sample with 142 (58%) single, 57 (23.4%) married, 33 (13.5%) cohabiting and the rest falling in the categories of divorced (4), separated (6) and widowed (2). The most interesting characteristic here is cohabiting which sometimes means that there is a non-resident spouse. In Windhoek the sample comprised of 79 (78%) male headed and 22 (22%) female headed households, while in Oshakati, the respective figures are 90 (63%) and 53 (37%).

The origin of the households indicated that 206 (84.4%) came from four Northern Regions which was formerly known as Ovamboland i.e. Ohangwena, Omusati, Oshana and Oshikoto regions. The rest of the respondents came from Kavango (18 or 7.4%) and Karas (11 or 4.5%) Caprivi (5), Erongo (1) and Khomas (1). These figures confirm the migratory patterns in the country in which most migrants to urban areas of Namibia are from the densely populated and previously disadvantaged Northern Regions. In both Windhoek and Oshakati the main home language is Oshiwambo with 75 respondents (74%) and 131 (92%) respondents respectively. Rukavango and Damara-Nama follow this with 19 and 9 in that order. In Windhoek, five of the respondents spoke Lozi at home while the remaining three respondents spoke Afrikaans and other languages (2).

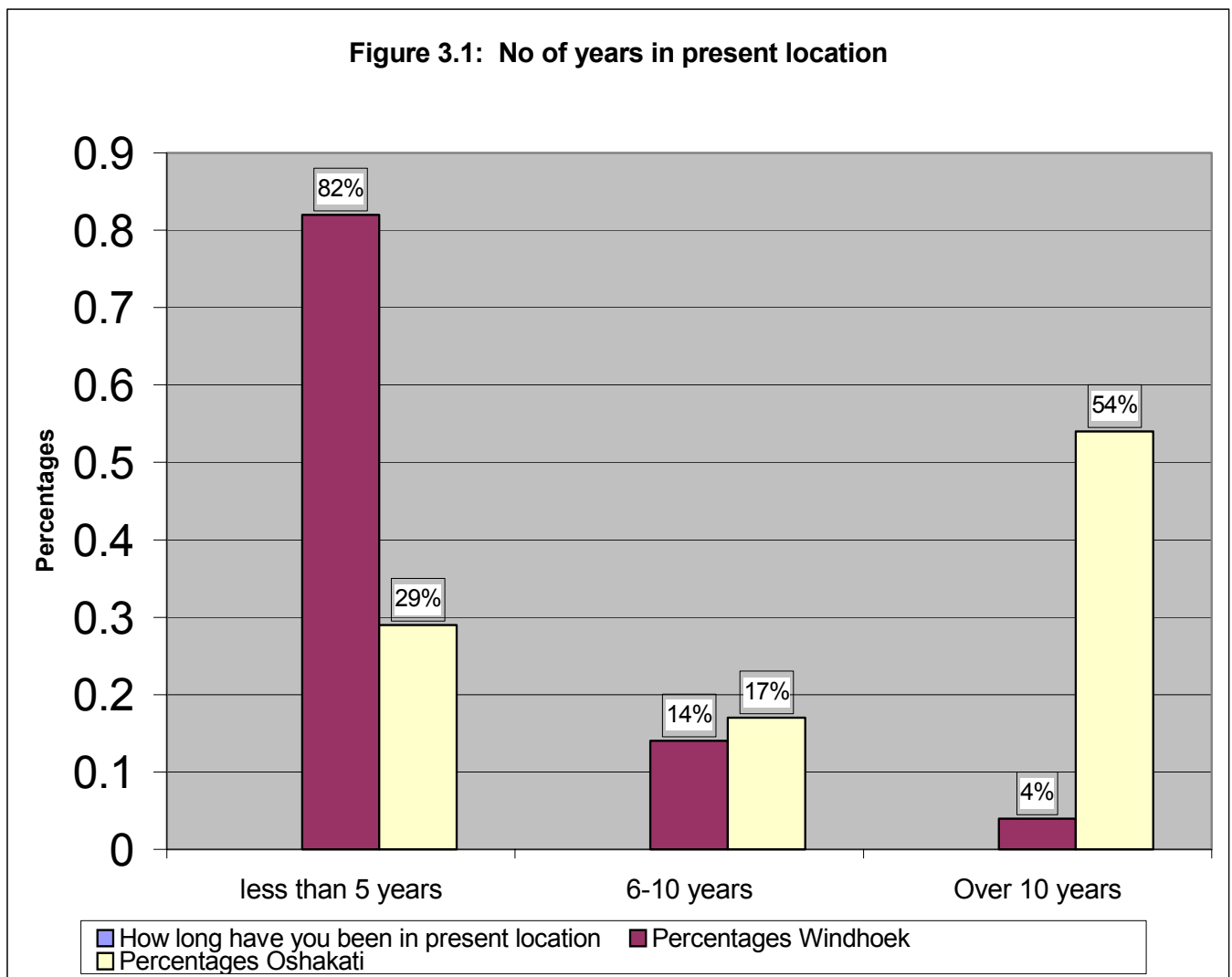
#### 3.2 Housing Characteristics (Ownership, Length of stay and Plot Acquisition Method)

Most (82%) of the respondents in Windhoek have only recently moved to their plots (Table 3.1) and only very few (4%) were living on their plots before independence. This shows an unusually high rate of migration to Windhoek that has occurred after independence and importantly since the last 5 years coinciding possibly with the time that the Windhoek Municipality started to

accommodate squatters due to political pressures. On the other hand, more than half (54%) of the respondents at Oshakati have been living in their plots before independence, and only about 29% had moved in within the last 5 years.

Table 3.1: No of years in present location

How long have you been in present location?	Windhoek	Oshakati
Less than 5 years	83 (82%)	42 (29%)
6 – 10 years	14 (14%)	24 (17%)
Over 10 years (Pre independence)	4 (4%)	77 (54%)



On house ownership, 118 (48%) respondents own the houses on the plots while 126 (52%) are tenants. Proportionally more respondents in Windhoek (72%) own the houses than in Oshakati (31%). This could be because some of the respondents in Oshakati may be distant family members from the villages who are in transit to Windhoek or other urban areas. It is well known fact that villagers in the North Central regions of Namibia use Oshakati as a bridging town before moving on to their eventual destinations. Most (90%) of the houses in Windhoek are very small with less than 5 rooms in all (including living room, kitchens, baths etc). In Oshakati, 56% of the houses have less than 5 rooms whilst 41% have between 5-10 rooms and 4 houses (3%) have more than 10 rooms. Some of the tenants could also be those who have been relocated from other urban areas to man new shops recently opened at Oshakati.

A difference in how plots were acquired can be noticed between the respondents in Windhoek and those in Oshakati (Table 3.2). In Windhoek, 66% of the respondents acquired their plots through the Municipality whilst the remaining 34% acquired them through other means which can be construed to be illegal (squatting). A different situation arises in Oshakati with more respondents (51%) acquiring their plots through headmen than those who acquired their plots through the Local Council (47%). In fact, this concurrent allocation of plots by headmen who claimed traditional authority to the land is a major bottleneck to the effective planning of Oshakati by the Local Council Authority who do not recognize the traditional authority but also could not easily dislodge the plot owners.

Table 3.2: Respondents' method of plot acquisition

<b>Plot acquired through</b>	<b>Windhoek</b>	<b>Oshakati</b>
Municipality/Council	67 (66%)	67 (47%)
Headman	0 (0%)	73 (51%)
Committee	8 (8%)	0 (0%)
Others	26 (26%)	3 (2%)

### 3.3 Age distribution of Household members

The majority of respondents have household sizes ranging from 3 to 8 persons. In Windhoek 76% of the respondents have family sizes of 3-8 persons, 22% have less than 3 persons per household and only 2% have members greater than 8. In Oshakati the respective figures are 71% with 3-8 persons, 11% with less than 3 persons and 18% with more than 8 persons living in their families.

The composition of the households investigated varied widely in terms of members and the ages of the household members. Table 3.3 summarize the data collected.

Table 3.3: Age distribution of households' members

Age group	Windhoek		Oshakati	
	Male	Female	Male	Female
<6 (pre school)	31 (35)	37 (43)	37 (48)	40 (51)
6-18 (schooling age)	20 (40)	27 (37)	64 (110)	72 (127)
18-60 (adult)	87 (145)	78 (94)	106 (233)	132 (266)
>60 (pensioner)	4 (4)	6 (10)	11 (11)	4 (4)
TOTAL	142 (224)	148 (194)	218 (402)	248 (448)

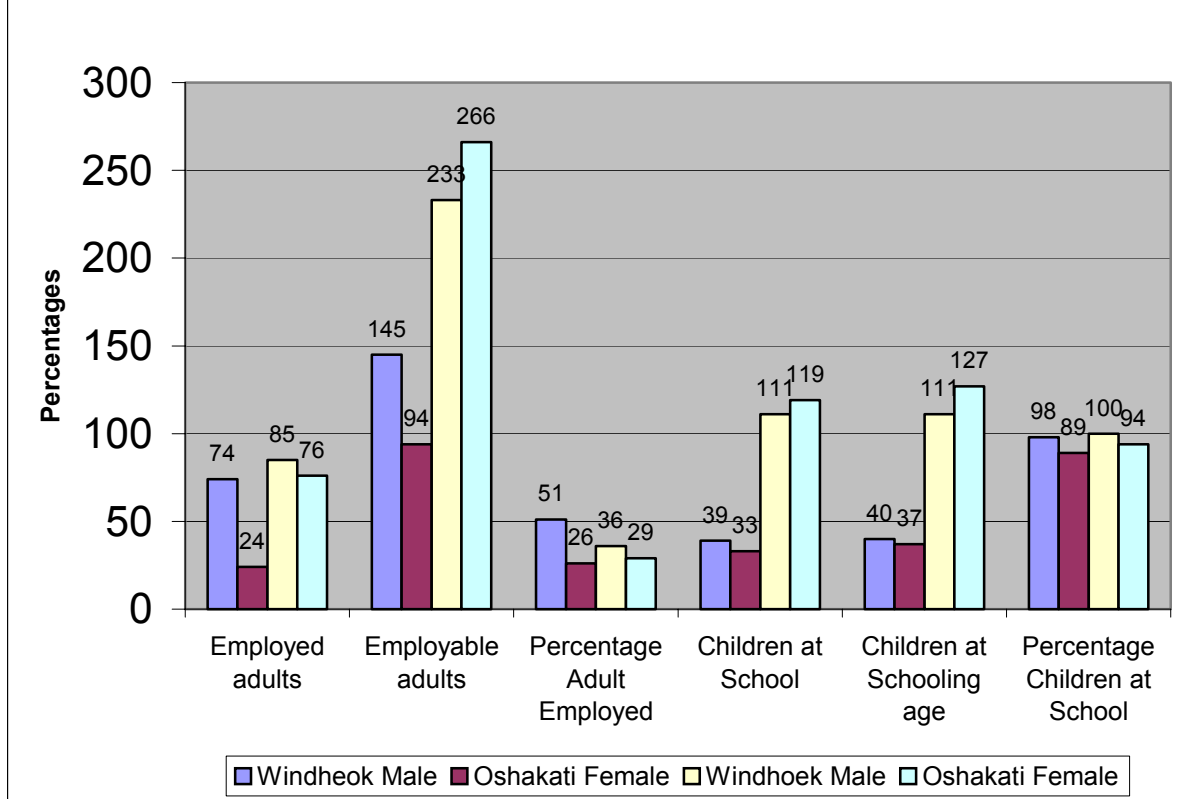
NB: The figures in brackets are the actual numbers of people in an age group, whilst the figures outside the brackets are the number of respondents with family members in that age group. For example, 31 families in Windhoek collectively have 35 sons below the age of six.

On the whole, there are more female household members (448) in Oshakati than male members (402). However, in Windhoek, there are more male members (224) than female members (194) in the households particularly in the adult age category (18-60 years). This should be expected as most men leave their wives in rural areas whilst trying to eke out a living in the urban areas.

### 3.4 Employment profiles of household members

Table 3.4 summarizes employment situation of the family members of the households with the data broken into male and female members.

**Figure 3.2: Number of household members employed or schooling**



In Windhoek 74 men (51%) out of a possible 145 are employed whilst only 26% of the women are employed. The outlook in Oshakati is more precarious with only 36% of the men and 29% of the women being employed. Nearly all the male children of schooling age are at schools in both Windhoek and Oshakati. However, not all the female children of schooling age are attending schools in both Windhoek (11% not attending) and Oshakati (6% not attending). No attempt was made to find the reasons for this in this study but it could be due to either the use of female children to help mothers with household chores or the high incidence of teenage pregnancies in Namibia that could have led to stoppage of schooling. It could be that, the belief to educate boys than girls may be valid still in some families.

### 3.5 Level of education of household heads and their spouses

Respondents were asked about the level of education of the household heads and their spouses. Table 3.5 shows the answers. In Oshakati, nearly half of the household heads and their spouses (48%) did not have any formal schooling whilst the respective value for Windhoek is 40%. This could explain why a higher proportion of Oshakati adults are unemployed. Moreover, whilst about 23% of Windhoek's household heads and their spouses have post secondary education, only 6% of Oshakati's heads and spouses have post secondary education.

Table 3.5: Highest level of education for household heads and their spouses.

Highest level of Education	No of households			
	Windhoek		Oshakati	
	Head	Spouse	Head	Spouse
No Schooling	36	45	40	97
Primary	25	24	34	19
Secondary	27	22	54	23
Post Secondary	13	10	15	4
Total	101	101	143	143

### 3.6 Source of income to household members

Respondents were asked to state their sources of income from 10 categories of income and the findings are summarized in Table 3.6.

Table 3.6: Source of income of household heads and spouses

Category	Windhoek		Oshakati	
	Head	Spouse	Head	Spouse
0. No source	7	35	8	83
1. Government job	18	6	50	9
2. Private Institution job	48	11	27	8
3. Self employment	17	10	12	5
4. Home based job	4	19	3	2
5. Farming	2	9	19	21
6. Remittances	0	0	7	1
7. Pension	3	0	4	1
8. Selling	2	3	9	11
9. Others	0	0	4	2
Total	101	101	143	143

Most spouses (mainly wives) have no sources of income in both Windhoek (35%) and Oshakati (58%). In Windhoek, the main source of income of the household heads (48%) is from employment in private institutions followed by employment in government offices (18%) and self-employment (17%). The main source of employment for spouses in Windhoek (19%) is home-based jobs (sewing, knitting etc) followed by employment in private institutions (11%) and self-employment (10%). Interestingly, 9% of the Windhoek spouses get their income from farming (urban agriculture). In Oshakati, most of the household heads are employed by the government (35%), or by private institutions (19%) whilst 13% get their income from farming (urban/peri-urban agriculture) and 8% is self-employed. Only 6% of the spouses in Oshakati are employed in government institutions with another 6% employed in private institutions. However, the highest category of source of income for women in Oshakati is farming (21%) followed by selling (8%).

### 3.7 Expenditure on various needs by household heads and spouses

Having established the sources of income, it is important to examine how the income is spent on household needs.

Table 3.7: Expenditure on various needs in Windhoek (numbers) by household heads and their spouses

Expenditure Range N\$	Food		Transport		Clothing		Rent		School fees		Entertainment	
	H	Sp	H	Sp	H	Sp	H	Sp	H	Sp	H	Sp
<100	20	90	64	87	52	77	94	97	73	94	81	89
101 – 200	22	5	25	6	15	9	2	0	5	1	13	5
201 – 300	30	5	7	2	8	4	0	0	4	4	4	2
301 – 400	10	0	3	5	6	2	1	0	4	2	1	2
401 – 500	11	1	0	1	7	2	0	0	4	0	0	0
>500	8	0	1	0	13	7	4	4	5	0	2	3

NB: H = household head; Sp = spouse

Table 3.7 presents the nature of expenditure by household heads and their spouses on six main categories of expenditure. The picture that emerged is that the majority of the respondents (over 70%) spend under three hundred dollars (N\$300) per month on the basic needs. Overall the table reveals the level of poverty of the respondents and hence the need for intervention by

government and local authorities to use urban and peri-urban agriculture to provide opportunities for surplus production for sale to generate some income. The fact that a high proportion of respondents spend less than N\$100 on food may have effects on the nutritional status of the household member. This is another good reason to encourage vegetable production. The data from Oshakati was not analysed because of the paucity of data collected on this section as most of the respondents are school kids who could not give relevant answers to how the household income is spent.

### 3.8 Savings amongst respondents

Given the apparent poverty in which the respondents live the study wanted to assess the level of savings amongst respondents. Table 3.8 confirms the plight of the informal settlement dwellers in Windhoek and Oshakati. On the average, 68.5% of those in Windhoek have no savings. These figures reinforce the meagre earnings that the respondents have. The situation is aggravated by the fact that in both Windhoek and Oshakati, all categories of income earners buy their consumer goods from super markets with the residents of Oshakati paying slightly higher prices for the same goods because of the distance covered by the suppliers between Windhoek and Oshakati.

Table 3.8: Levels of savings amongst the informal settlers in Windhoek and Oshakati

Level of savings N\$	Windhoek		Oshakati	
	Head	Spouse	Head	Spouse
No savings/no answer	62	77	127	127
<100	18	12	9	5
101 – 200	12	6	4	4
201 – 300	2	0	0	0
301 – 400	3	2	1	0
401 – 500	2	2	1	2
>500 – 600	2	2	1	5
Total	101	101	143	143

### 3.9 Availability of credit facilities

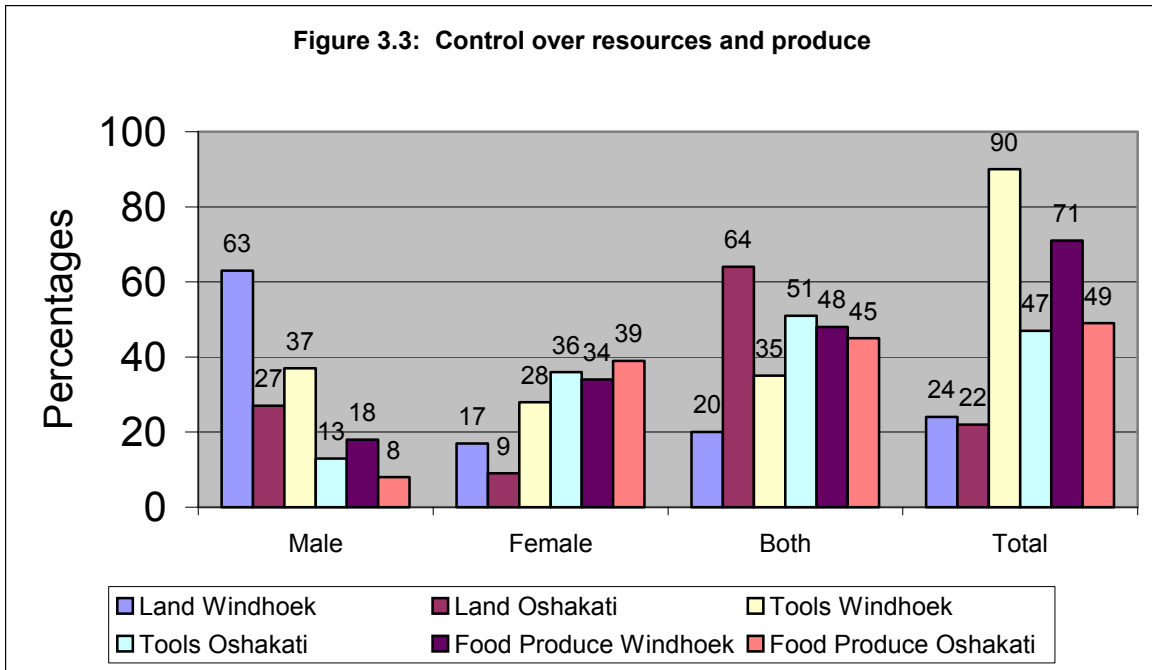
Credit is an important input into any market gardening activity or small enterprise. In both rural and urban areas micro credit is crucial for smallholders or small business enterprises. The study wanted to assess the availability of credit to the informal settlers in Windhoek and Oshakati. Table 3.9 summarises the findings. In both towns, most of the respondents have no access to credit (95% in Windhoek and 96% in Oshakati). Only 4.5% of all Windhoek's respondents reported having received some credit of up to 400 dollars, while the figure for Oshakati is 1.7%.

Table 3.9: Summary of credit availability to respondents in Windhoek and Oshakati

Amount of credit	Windhoek		Oshakati	
	Head	Spouse	Head	Spouse
No credit/ no answer	97	95	138	137
1 – 200	2	3	2	1
201 – 400	2	2	1	1
>40	0	0	2	4
Total	101	101	143	143

### 3.10 Control over Household Hold Resources and Produce

It has been alleged that men control land and other resources and deprive women from using them. In the areas investigated, respondents were asked who controls some of the resources and produce. Table 3.10 gives an insight into the answer.



The statistics indicate that in Windhoek, the men have more control over the land than the women whereas in Oshakati there is more of joint control of land by both male and female reflecting perhaps a more liberal male attitude in Oshakati than in Windhoek. It could also be explained by the fact that in Windhoek many of the respondents have their wives in the rural areas where they have come from.

Urban and peri-urban producers do not require a lot of tools, as often the land being operated is very small. Nonetheless as part of the capital input into market gardening, the study wanted to establish who has control over the farming tools. In Windhoek, men have more control over tools than women whilst the reverse is the case in Oshakati. The high level of joint controllership of tools in both towns (35% in Windhoek, 51% in Oshakati) reflects a situation in which households have a joint interest in producing vegetables for household consumption

The control of cash is often associated with the head of the household regardless of who actually generates the cash. It is clear that in Windhoek, men have more control over cash (39%) than women (16%), supporting the allegation often made by women groups that men control all the cash in the households. The same scenario would be expected in Oshakati though many respondents did not reply to this question.

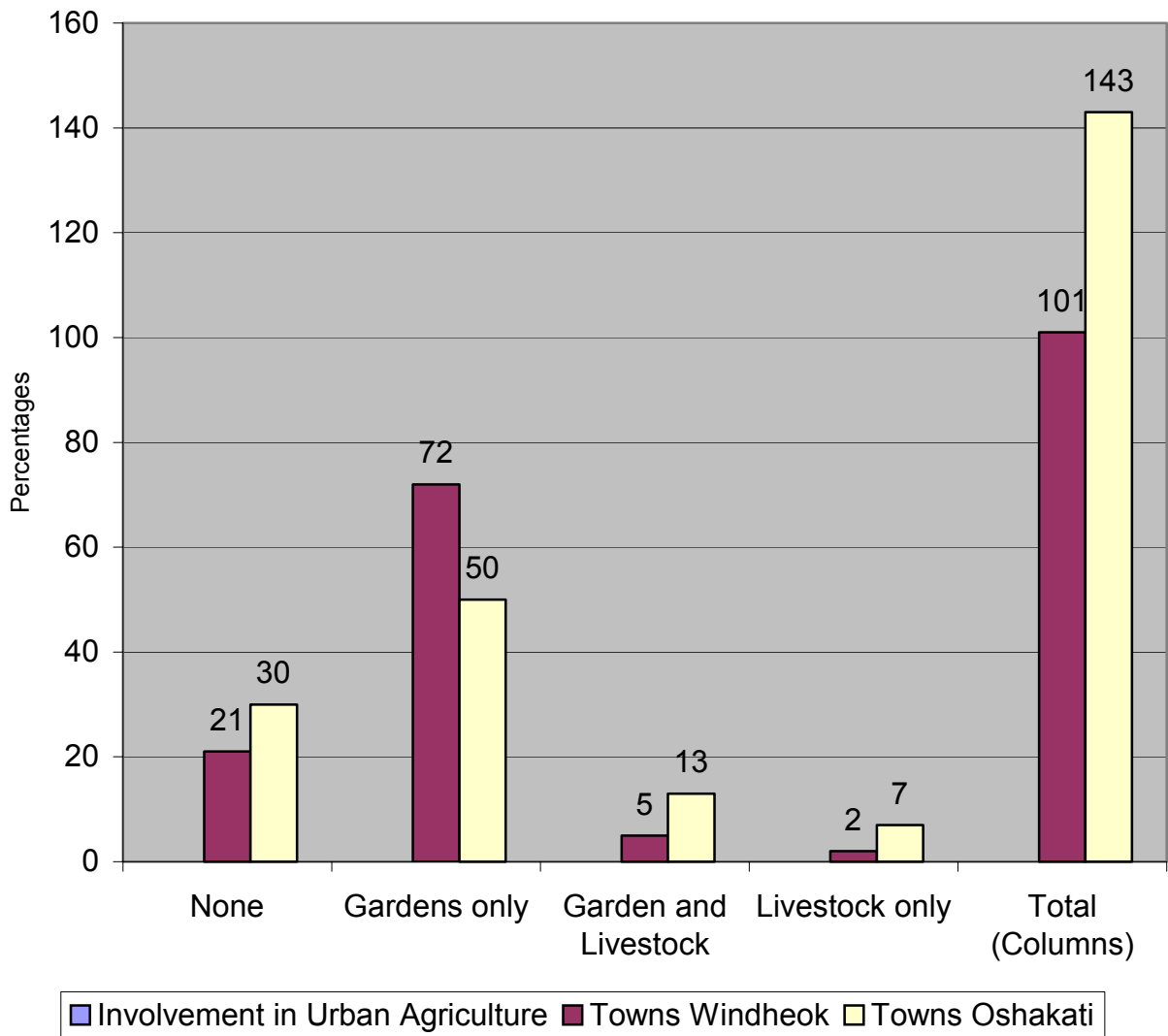
The male control of food crops is less than the female one as expected in both Windhoek and Oshakati, though the respondents claiming to have joint control are the highest for both towns.

### **3.11 Involvement in Urban agriculture and previous farming experience**

Table 3.11 shows the level of involvement in urban agriculture by town as well as the number of respondents who had farming experience before they became involved in urban agriculture. In Windhoek, 79% of all respondents are involved in urban agriculture in one form or the other whilst the respective figure is 70% for Oshakati. It should be remembered here that whilst the survey concentrated in the areas of informal settlements in Windhoek, it has a more balanced coverage in Oshakati. The high proportion of respondents involved in urban farming in Windhoek show the importance of this enterprise in informal settlements and high-density areas where the level of poverty is usually high.

Table 3.11 also shows that there is a strong correlation between gardening experience and urban agriculture. Most of the people involved in urban agriculture had previous experience of farming mainly from the rural areas. On the overall, 72% of the respondents (irrespective of towns) had farming experience before moving to the urban areas.

**Figure 3.4: Involvement in Urban Agriculture**



## **CHAPTER 4**

### **Urban and Peri-urban Agriculture in Windhoek and Oshakati**

#### **4.1.1 INTRODUCTION**

The last chapter presented the result of the survey as it concerns mainly the demographic details of all respondents. This chapter will present the analyses dealing with the respondents who are involved in urban agriculture and will focus more on the farming activities. In addition, the chapter will present an assessment of the dwellers who are not involved in urban farming at present.

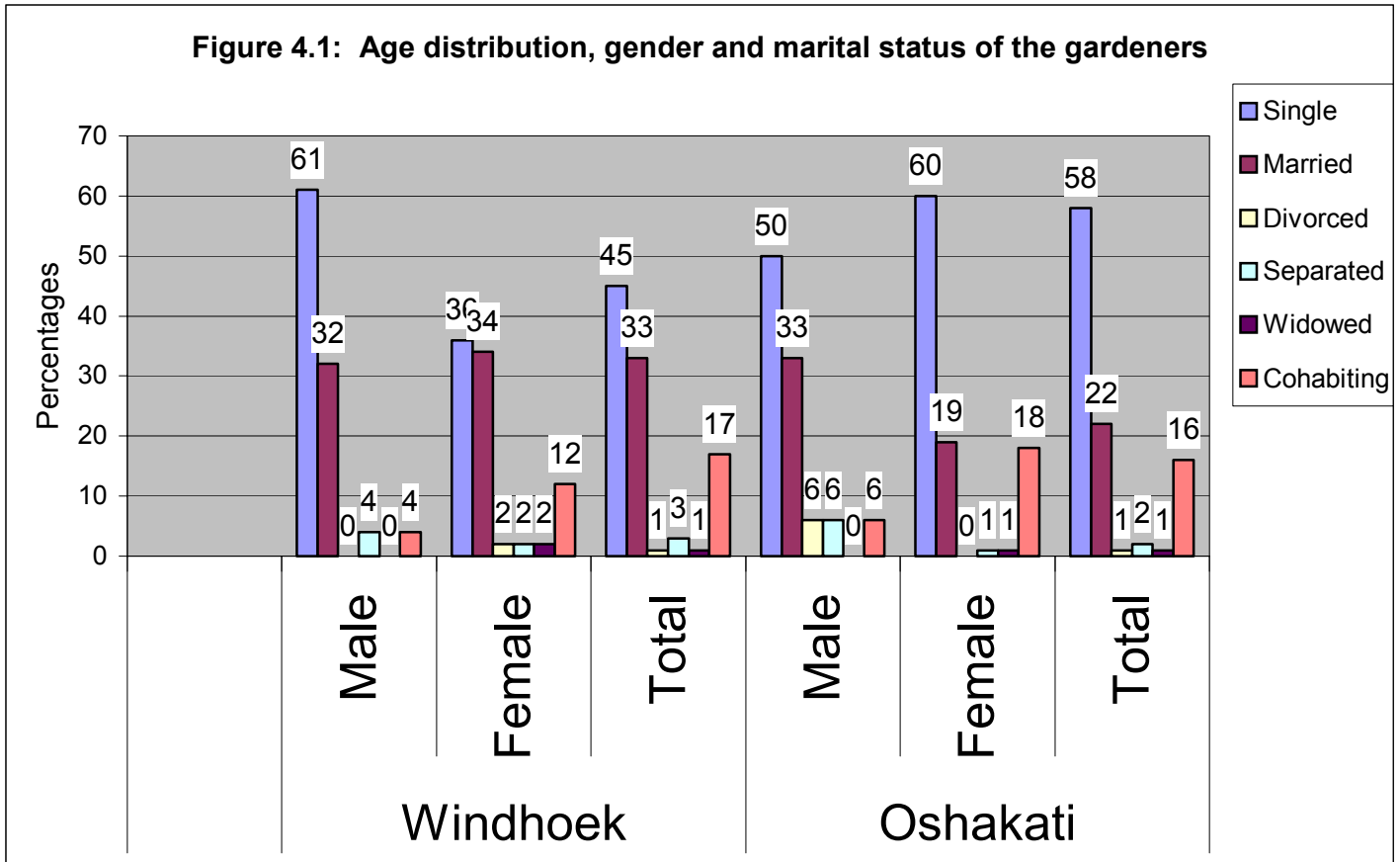
#### **4.1.1 Demographic status of the urban farmers**

Table 4.1 presents some of the demographic data on the urban farmers. Mothers constitute the majority of the urban farmers in Windhoek (54%) and Oshakati (58%). The proportion of fathers farming in Windhoek (31%) is higher than Oshakati (13%). A higher proportion (29%) of other family members in Oshakati are involved in urban agriculture than in Windhoek (15%). Most of these other farmers in Oshakati (22%) are school children that learnt their gardening from school. The majority of the urban farmers, irrespective of gender and town are single though this is more so for Oshakati (58%) than for Windhoek (45%). When asked if people from outside the household are involved in their gardens, 77% of the respondents replied in the negative (result not shown). Over 80% of the farmers irrespective of gender and town also indicated that they started the gardens on their initiative without outside influence. Over 80 percent of the male and female gardeners in Windhoek stated that they had gardening experience from the rural areas before moving to Windhoek. However, in Oshakati, 70% of the male and 60% of the female had previous farming experience. The low percentage of Oshakati female farmers with previous farming experience could have resulted from the high number of female school children who are the farmers in their households.

Table 4.1: Age distribution, gender and marital status of the gardeners

Who is the Gardener N=	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
	<b>28</b>	<b>50</b>	<b>78</b>	18	<b>72</b>	<b>90</b>
Father	86	0	<b>31</b>	67	0	<b>13</b>
Mother	0	82	<b>54</b>	0	72	<b>58</b>
Others	11	18	<b>15</b>	33	28	<b>29</b>
<b>Age Groups</b>						
6 – 18	4	4	<b>4</b>	33	19	<b>22</b>
18 – 60	96	92	<b>94</b>	44	76	<b>70</b>
>60	0	4	<b>2</b>	23	4	<b>8</b>
<b>Marital Status</b>						
Single	61	36	<b>45</b>	50	60	<b>58</b>
Married	32	34	<b>33</b>	33	19	<b>22</b>
Divorced	0	2	<b>1</b>	6	0	<b>1</b>
Separated	4	2	<b>3</b>	6	1	<b>2</b>
Widowed	0	2	<b>1</b>	0	1	<b>1</b>
Cohabiting	4	12	<b>17</b>	6	18	<b>16</b>

**Figure 4.1: Age distribution, gender and marital status of the gardeners**



#### 4.1.2 Reasons for gardening

As to be expected, all the respondents listed the provision of food for family members as the major reason for cultivating the gardens (Table 4.2). In addition, some respondents are into farming to provide them with extra income (Windhoek, 13%; Oshakati 17%) and employment (Windhoek, 9%; Oshakati 4%). A significantly high proportion of the farmers in Oshakati (33%) also indicated that their farming is a form of hobby. These would mainly be respondents from the middle and low-density areas who earn enough money to be able to provide adequately for their families.

Table 4.2: Reasons for gardening

Reasons for gardening N =	Windhoek			Oshakati		
	Male %	Female%	Total%	Male%	Female%	Total%
	28	50	<b>78</b>	18	72	90
Food	100	100	<b>100</b>	100	100	<b>100</b>
Extra Income	11	14	<b>13</b>	6	19	<b>17</b>
Employment	4	12	<b>9</b>	11	3	<b>4</b>
Hobby	18	4	<b>9</b>	44	31	<b>33</b>

## 4.2 Farming Practices

### 4.2.1 Land Preparation

Land preparation is necessary to provide a good soil tilth for planting vegetables. Farmers were asked to describe what they do for land preparation and Table 4.3 summarises their answers. The farmers in Oshakati mostly fill the soil and plant the seeds (98%). Only 1% of farmers in Oshakati mentioned that they de-stone and plant or de-stone, fill and plant. By contrast, the majority of the farmers in Windhoek (58%) had to remove stones from their land as part of their land preparation. This comprised of 23% who only removes the stones and then plant and 35% who removes the stones, before filling the soil and then plant. Only 3% of the Windhoek farmers plant directly without digging the soil.

Whilst there is no gender difference in land preparation methods in Oshakati, most men in Windhoek (54%) just fill and plant without having to remove stones but 66% of the women had to remove stones before planting. The reason for this difference could either be due to men having better plots than women or women being more thorough farmers than men.

#### 4.2.2 Weeding

The gardens are weeded by most of the farmers (45% in Windhoek, 67% in Oshakati) when necessary (Table 4.3). In Windhoek, a high proportion of the farmers claimed that they weed at least once per week. Only one urban farmer (based in Oshakati) indicated the usage of herbicide to get rid of the weeds. The remaining farmers make use of other garden tools like hoes, etc.

Table 4.3: Land preparation methods, weeding and planting seasons.

Land preparation method N=	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
	28	50	78	18	72	90
Plant directly	4	2	3	0	0	0
Dig and plant	54	32	40	94	99	98
De-stone and plant	14	28	23	0	1	1
De-stone, dig and plant	29	38	35	6	0	1
<b>Weeding</b>						
None	4	4	4	6	1	2
Once/week	43	32	36	11	14	13
Once/2 weeks	14	14	14	22	13	14
When necessary	39	48	45	56	69	67
Others	0	2	1	6	3	3
<b>When do you plant?</b>						
Summer only	96	86	90	78	71	72
Winter only	0	4	2	0	1	1
Both Summer & Winter	4	10	8	22	28	27

### 4.2.3 Planting season

Table 4.3 also shows the replies of farmers to the question of the season(s) that they normally practice gardening. Most of the Windhoek farmers (90%) plant only during the summer season. This means that they depend only on rainfall and do not cultivate during the rainless winter months. Moreover, Windhoek is prone to frost during the winter months and this could also have affected the farmers' decision not to plant during the winter. Oshakati is not prone to frost, so the decision on which season to cultivate would depend more on the availability and affordability of water. Though most (72%) of the Oshakati farmers still plant during the summer season only, a fairly high percentage of 27% cultivate during both summer and winter seasons.

### 4.2.4 Crop Production Inputs to the Gardens

#### 4.2.4.1 Soil type

Most of the respondents in Windhoek (90% of the male and 84% of the female) described their soil as being stony but good for vegetable gardening. In Oshakati, 66 % of the male respondents and 50% of the female respondents consider the soil as being sandy but good for vegetable gardening. The same proportion of men and women (11% in both cases) consider the soil as being bad whilst 22% and 39% of the male and female respondents respectively consider the soil as being average.

### 4.2.5 Water

As the most arid country in Africa south of the Sahara, water is usually the most limiting factor to farming in Namibia. The most common source of water for urban farming in Windhoek and Oshakati is tap and rain combined (73% of all farmers). In Windhoek, 91% of the urban farmers depend on tap water and rain combined whilst 5% depends on tap water alone and 4% depends on rainfall only. In Oshakati, 57% of the urban farmers depend on tap water and rain combined, 39% on rainfall alone, 3% on tap alone and a surprisingly low 1% depends on rainfall and water from the canal. It was assumed that a higher proportion of urban farmers in Oshakati would be using water from a canal carrying water from the Ruacana Dam to Oshakati since this water is

free. The high usage of tap water to supplement rainfall could be due to the low cost paid by most of the farmers for the tap water (Table 4.4).

Potable water is supplied to most informal residents in Windhoek and Oshakati through a public tap that is shared by about 4 to 10 households. The water consumption used to be paid for on a flat rate of N\$30/household irrespective of consumption but this is being replaced gradually by the use of a prepaid meter in which individual household would pay for the exact water consumed. Most of the urban farmers in Windhoek (53%) still pay the flat rate and as such are able to use as much tap water as they want for farming. Most of the urban farmers living in informal settlements in Oshakati already have prepaid meters for the tap water. This is why the highest (38%) proportion of cost is less than N\$30. The implication of this is that most urban farmers in informal settlements of Oshakati have stopped using tap water for watering their gardens. Most of the farmers paying over N\$100 for tap water are located in the medium to low density suburbs.

Table 4.4: Cost of tap water

Cost range N\$	Town		Gender	
	Windhoek (%)	Oshakati (%)	Male (%)	Female (%)
<30	34	38	37	35
30	53	10	42	33
31-100	3	19	13	7
101-200	3	15	0	11
>200	8	19	8	14
N=	74	48	38	84

Most of the urban farmers in Windhoek and Oshakati combined the use of buckets (61%) to fetch the tap water. Urban farmers in Windhoek also reported the use of jerry cans to fetch tap water with more men (29%) using them than women (16%). There was no report of jerry can usage in Oshakati.

As shown in Table 4.5, the most common method of applying water to the gardens in Windhoek is by using buckets to flood the garden (62%) with water. This is followed by the use of punctured tins (18%). The punctured tins are discarded tins of paints, tinned food etc ranging from 1 litre to 10 litres which has been punctured in the bottom with nails and which apply the tap water as if it were rain. The use of hosepipes and sprinklers, which have to be bought, is not very common. The case of Oshakati is such that the majority of the urban farmers do not use tap water because of cost. Consequently, 41% of the farmers do not have any need to apply tap water to their gardens as they depend mainly on rain. Amongst those using tap water, the majority (26%) uses buckets to flood the gardens. A higher proportion than in Windhoek uses hosepipe (23% cf. 5%) and sprinkler (7% cf. 4%). The majority of these are the urban farmers living in medium to low-density areas.

Table 4.5: Method of water application

Method of application N=	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
	28	50	78	18	72	90
None	4	6	5	44	40	41
Bucket	71	56	62	17	28	26
Watering can	4	8	6	6	0	1
Hosepipe	4	6	5	22	24	23
Sprinkler	4	4	4	11	7	8
Punctured cans	14	20	18	0	1	1

With the introduction of cost recovery for tap water supply to the informal settlements, the urban farmers were asked if they store rain water for future use and whether they make use of wastewater (Table 4.6).

Table 4.6: Use of rain and wastewater

	Windhoek (N=78)		Oshakati (N=90)	
	Yes (%)	No (%)	Yes (%)	No (%)
Do you collect rain water?	40	60	44	56
Do you need help to collect rain?	90	10	83	17
Do you use wastewater?	19	81	43	57

More farmers in Windhoek (60%) and Oshakati (56%) do not collect rain but most of them indicated that they would collect rain water if helped to do so. Most of those harvesting water from rainfall use bucket and drums. A higher proportion of farmers in Oshakati (43%) use wastewater compared to the farmers in Windhoek (19%) probably because of the high cost of tap water to Oshakati residents. Whilst there is no gender difference in the use of wastewater in Windhoek, more women farmers (46%) in Oshakati use wastewater compared to men (33%). The source of the wastewater is mainly from the kitchen only (69%) and less from the wash and kitchen together (31%). In order to gauge the general attitudes of gardeners to wastewater usage, they were asked to give their opinions about the effect of wastewater on gardens with the results as given in Table 4.7.

Table 4.7: Gardeners' perception of the effect of wastewater

Effect of wastewater N=	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
None	4	12	9	28	21	22
Good	11	12	11	11	18	17
Bad	86	72	77	50	42	43
Don't know	0	4	3	11	19	18

On the average, most of the farmers consider the wastewater as having a bad effect on gardens. This perception is more common among the Windhoek farmers (77%) than Oshakati farmers (43%). In both towns, proportionally more men than women think that using wastewater is bad for the gardens. This could be one of the challenges to come from this study, as some innovative

methods of purifying wastewater may need to be introduced to the urban farmers.

#### 4.3.3 Seed

The majority of farmers in Windhoek and Oshakati (85%) source their own seeds by themselves. The main source of seeds in Oshakati is the shop 51% of the farmers in Oshakati buying their seeds from local shops, whilst 25% get their seeds from relatives and 22% from friends. In Windhoek, less numbers of farmers (33%) buy their own seed stock than those (53%) who get their seeds through various other means (e.g. from last season's crop, from friends etc). The general perception among Windhoek farmers is that the seed is cheap to buy (62% of farmers) and readily available locally (71% of farmers). Only 51% of the farmers in Oshakati think that seed is cheap though the majority (78%) agreed that it is readily available locally.

#### 4.3.4 Tools

The most important garden tool in Windhoek is the pickaxe, which is owned by 65 respondents (Table 4.8). This is not surprising considering the stoniness of the soil in Windhoek. The other tools used by the farmers in Windhoek are spades (62), hoes (25), rakes (6) and cutlasses (2). With a more easily cultivable sandy soil, most of the farmers in Oshakati own hoes (85), spades (67) and rakes (51). Other tools mentioned by Oshakati farmers are pickaxe (8), and cutlass (4).

Table 4.8 Tools owned by farmers

<b>Tools</b>	<b>Windhoek</b>	<b>Oshakati</b>
Pickaxe	65	8
Spades	62	67
Hoes	25	85
Rakes	6	51
Cutlass	2	4

Most of the farmers in Oshakati (90%) own all the tools they use in their gardens whilst only 65% of the Windhoek farmers own the tools they use in their gardens. The remaining farmers borrow from neighbours (29%) or friends (6%).

#### 4.3.5 Fertiliser

Most of the soils in Namibia have very low inherent fertility. It is, therefore, important to find out more about farmers' use of fertilisers in their gardens (Table 4.9). More people in Oshakati (52%) use fertiliser than in Windhoek (33%). Amongst those using fertiliser in Windhoek, the most common type of fertiliser is digested manure. This is probably from Gammans Water Works which is close to the informal settlements and which is the end point of Windhoek's sewage system. The digested manure is actually from human excrement and its usage by the people shows that they harbour no health and cultural worries about this. The other sources of manure in Windhoek in order of importance are: household waste, inorganic fertilisers, fresh manure (cow dung), compost and others. Most of the farmers in Oshakati (23%) use fresh manure that they get from nearby villages or even from the many heads of cattle kraals where livestock are kept before they are slaughtered at the market usually seen roaming within the periphery of the town. This is closely followed by compost use (20%) and then household waste, inorganic fertiliser and digested manure in that order.

There is not much gender difference in the type of fertiliser used except for fresh manure that has more men than women respondents. Traditionally, men are known to have the control over cattle production and its products which may be the reason for more men using fresh manure than women. On the other hand, more women than men in both towns use compost as fertilisers. This is probably because the women are the ones who cook and, therefore, are in control of the household wastes that constitute most of the materials put in the compost heap.

Table 4.9: Use of fertilizer

Do you use fertilisers? N=	Windhoek			Oshakati		
	Male % 28	Female % 50	Total % 78	Male % 18	Female % 72	Total % 90
Yes	36	32	33	50	53	52
No	64	68	67	50	47	48
<b>Type of fertiliser</b>	Percentage respondents based on the above labels					
None	64	68	67	50	47	48
Compost	0	4	3	11	22	20
Fresh manure	7	2	4	33	21	23
Digested manure	14	12	13	0	1	1
Household waste	7	8	6	0	6	4
Inorganic fertiliser	7	6	5	6	3	3
Others	0	6	3	0	0	0
<b>Is fertiliser easily available?</b>						
Do not fertiliser	64	68	67	50	47	48
Yes	36	28	31	39	44	43
NO	0	4	3	11	8	8

Most of the farmers who use fertilisers agreed that they could easily get the stated fertilisers (Table 4.9). When asked about the frequency of fertiliser application, most of the farmers who use fertiliser replied that they apply it once a year (73%), whilst about 15% claimed to apply fertiliser as and when necessary (results not in the table).

#### **4.3.6 Pest and disease control**

The result for the pest incidence and control level among the farmers is shown in Table 4.10. The main pest problem in Windhoek is that of corn cricket as it affects half the male farmers and 62% of the female farmers. The Windhoek farmers also mentioned American bollworms and spiders. The main pest problems at Oshakati are attacks of crops by American bollworm (19%) and aphids (19%).

The use of pesticide is not common among the urban farmers. Only 5% of the urban farmers from Windhoek and 9% from Oshakati stated that they use pesticides (mainly Blue Death insect killer and DDT) when necessary. The commonest method of pest control is hand picking as practiced by 56% of the Windhoek's farmers and 14 % of Oshakati's farmers. This is understandable as the main pest of concern for Windhoek is corn cricket. An interesting result in Table 4.10 is the 5% female farmers in Oshakati who gave answers like using washing powders, ash, sunflower oil etc to control the pests. This shows a degree of innovation though the efficacy of their solution is very doubtful.

The farmers were also asked if they had noticed any disease on their crops, the severity of the disease and the control methods they used. Whilst only 3% of the total respondents agreed to have had disease problems, none of them could tell what diseases their crops had and none had tried to do anything to control the diseases. From their own observations, the enumerators noted fungal attacks on many respondents' gardens.

Table 4.10: Pest incidence and control methods

Pest Names N=	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
	28	50	78	18	72	90
None	39	26	31	44	51	50
Corn cricket	50	62	58	0	1	1
American Bollworm	4	6	5	22	18	19
Grasshopper	4	0	1	6	0	1
Spiders	4	4	4	6	4	4
Aphids	0	2	1	16	19	19
Others	0	0	0	6	6	6
<b>Pest control method</b>						
None	50	32	38	78	71	72
Hand picking/killing	50	60	56	11	15	14
Pesticide	0	8	5	11	8	9
Others	0	0	0	0	5	4

#### 4.4 Crops produced

##### 4.4.1 Common and favourite crops produced

A wide variety of crops are grown at both cities (Table 4.11). In fact if the fruit trees were to be listed one by one, then the list would even be longer. The most common crop grown in both towns is green maize (88% of all urban farmers in Windhoek and 70% in Oshakati). This is surprising considering that maize requires a minimum of about 500 mm of water, whilst the average annual rainfall for Windhoek is 280 mm and about 400 mm for Oshakati. Despite this, most of the urban farmers prefer to cultivate maize and use irrigation to supplement the rain. Maize is consumed as green maize. The other common crops for Windhoek are beans (42%), tomato (41%), pumpkin (26%), watermelon (24%), sweet potato (23%), pepper (17%) and Omutete (*Hibiscus vitiofila*).

Table 4.11 Crops commonly found in the gardens

Crops common in the Gardens	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
N=	28	50	78	18	72	90
Beans	50	46	47	44	43	43
Bambara nut	0	0	0	11	28	24
Cabbage	11	6	8	6	6	6
Carrot	7	4	5	6	3	3
Chillis	4	14	10	11	14	13
Green pepper	4	2	3	0	0	0
Groundnut	7	12	10	6	0	1
Maize	96	84	88	67	71	70
Watermelon	14	30	24	11	10	10
Hibiscus vitiifila (Omutete)	18	10	13	6	6	6
Vegetables Ombindi	7	6	6	0	3	2
Onions	4	10	8	6	4	4
Potato	0	4	3	0	0	0
Pepper	36	6	17	0	0	0
Pumpkin	32	22	26	17	14	14
Spinach	0	4	3	6	1	2
Sugar cane	0	4	3	17	17	14
Sunflower	0	2	1	0	1	1
Sweet potato	18	26	23	11	8	9
Tomatoes	36	46	41	28	29	29
Flowers general	11	2	5	11	14	13
Fruit trees	0	4	3	61	57	58

<b>Crops common in the Gardens</b>	<b>Windhoek</b>	<b>Oshakati</b>	<b>Total %</b>	<b>Male %</b>	<b>Female %</b>	<b>Total %</b>
N=	28	50	78	18	72	90
Sorghum	7	4	9	22	20	20
Millet	0	6	4	0	17	13
Cassava	0	0	0	17	3	6

In Oshakati, fruit trees come second to maize at (51%), then beans (43%), tomato (29%), shade trees (26%), bambara nut (24%), sorghum (20%), pumpkin and sugar cane (14% each).

Table 4.12 Favourite Crops

<b>Favourite Crops</b>	<b>Windhoek</b>			<b>Oshakati</b>		
	<b>Male %</b>	<b>Female %</b>	<b>Total %</b>	<b>Male %</b>	<b>Female %</b>	<b>Total %</b>
N=	28	50	78	18	72	90
Beans	46	46	46	40	25	28
Bambara nut	0	0	0	6	18	16
Cabbage	11	8	10	6	6	6
Maize	93	72	79	78	64	67
Melon (water)	7	14	12	6	1	2
Pepper	21	4	10	0	0	0
Pumpkin	14	6	9	6	5	6
Sugar cane	4	2	3	11	11	11
Sweet potato	14	16	15	6	7	7
Tomato	18	38	31	11	25	22
Fruit trees	0	2	1	28	33	32
Sorghum	7	4	9	11	13	13
Millet	0	6	4	0	17	13

The two towns have maize, beans and tomato as being the most common crops. They are also the most favourite crops (Table 4.12). However, more fruit and shade trees are grown in Oshakati than in Windhoek. Once again, this is most likely the result of the Windhoek survey being concentrated in informal settlements with most of the respondents having moved to the town within the last 5 years. That omutete is listed as a common crop in Windhoek, and not in Oshakati, is interesting. This crop is a favourite vegetable in the North (including Oshakati) where it is however not cultivated. It is allowed to grow freely amongst the cultivated crops and harvested at the end of the season. Though it was noticed growing around their homesteads, most of the farmers in Oshakati did not list it as a cultivated crop. The same applies to omboga/ombindi. Another interesting result is the cultivation of sorghum and its popularity as a favourite crop. Sorghum is used mainly as an ingredient in brewing of local beer, thus its popularity. Angola immigrants to Oshakati are the main cultivators of sugar cane and most of it is grown for sale. Both cassava and bambara nuts are only cultivated by urban farmers in Oshakati whilst green pepper, potato (Irish) and pepper are only grown by urban farmers in Windhoek. There were no serious gender differentiations in the common crops and in the favourite crops except that more women than men considered tomato as their favourite crop. This is linked to their domestic roles.

#### **4.4.2 Use of produced crops**

The main reason for producing crops for all the respondents is for household consumption. This is to improve the household food security and nutrition situation. The remaining products are either given as gifts or sold for income (Table 4.13). Fifty one per cent of the farmers in Oshakati and 42% of those at Windhoek give part of their produce away to families and friends – one way of establishing/stabilising social relationships. An equal proportion of 26% of the farmers in both Windhoek and Oshakati sell some of their products to gain extra income and for some as a temporary means of employment. As before, the major crop for sale is maize though tomato and pepper in Windhoek and fruits and sugar cane in Oshakati are also popular crops for sale. Most of those who sell do it to gain extra income. None of the respondents in Oshakati depends on urban farming as a means of employment. However, 6% of the male and 2% of the female respondents in Windhoek considered urban farming as employment. With the high proportion of jobless people in the survey area in Windhoek, there is a big opportunity to explore the

possibility of urban farming as one of the means of employment. Though not shown in the Table, most of the respondents who sell do so in their homes, whilst others go to the bus stops and some around their locations.

Table 4.13: Use of produced Crops

What do you do with your produce? N=	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
	28	50	78	18	72	90
Consume	100	100	100	100	100	100
Sell	21	28	26	28	25	26
Give away	64	30	42	44	53	51
<b>Reasons for selling.</b>						
Extra income	14	26	22	28	18	20
Employment	4	2	3	0	0	0
Others	4	0	1	0	6	4
<b>Crops Sold (Ranked in order of importance)</b>						
Groundnut	3	6				
Maize	1	1		1	2	
Omutete	2	6				
Pepper	3	3				
Sugar cane				1	3	
Sweet potato		4			5	
Tomato		1			5	
Fruits		6		1	1	
Sorghum		4			4	

### 4.4.3 Intercropping

The majority of the urban farmers in Windhoek (87%) practice intercropping whilst only about half of the Oshakati farmers do. This could have resulted of the preponderance of many new farmers in Windhoek who are still experimenting on what would do well on their soils. It could also be because the plot areas in Windhoek are on the average smaller than those in Oshakati.

Do you intercrop? N=	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
	28	50	78	18	72	90
Yes	93	84	87	44	45	44
No	7	16	13	56	55	56
Crops intercropped						
Beans	39	42	42	33	33	33
Maize	82	72	76	44	32	34
Pumpkin	14	14	14	6	3	3
Watermelon	7	8	8	0	0	0
Tomato	14	26	22	0	3	2
Fruit trees	0	0	0	6	11	10
Others	14	14	10	6	3	3

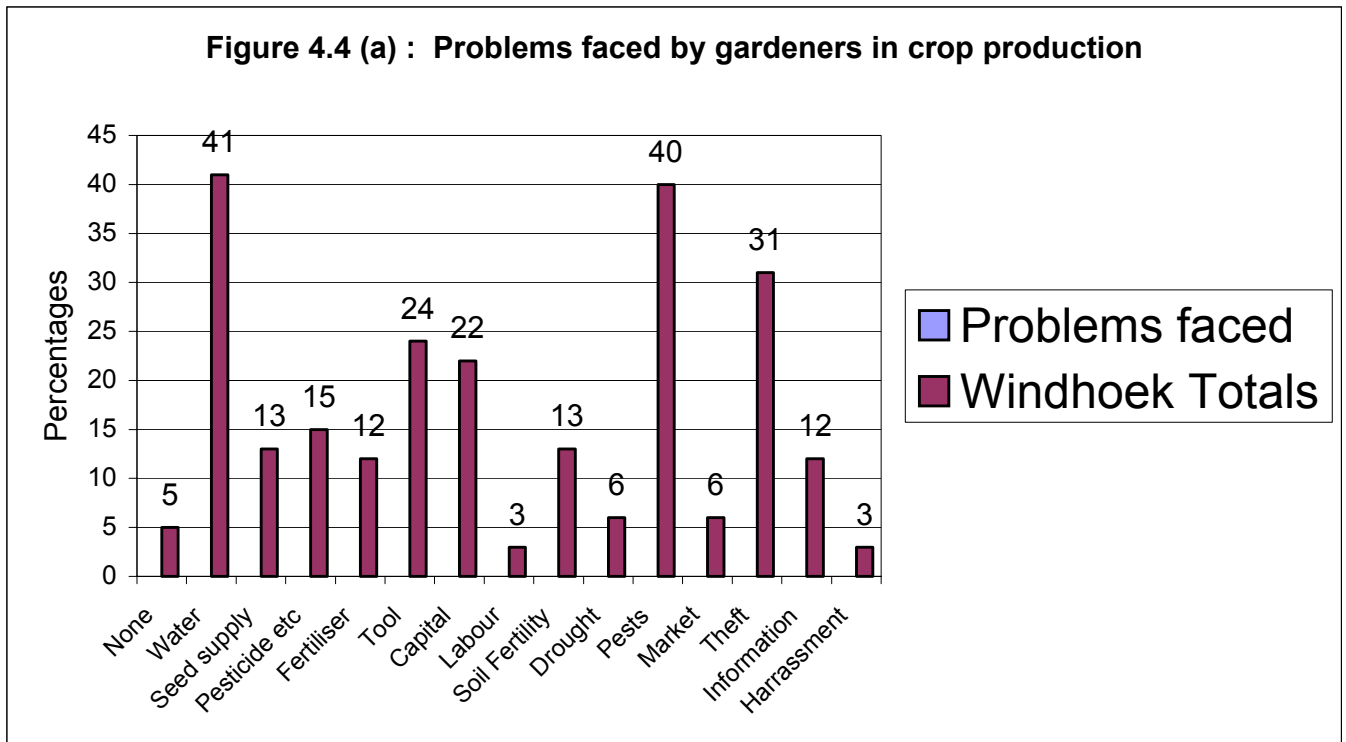
Maize and beans intercrop is the most common form of intercropping in the two towns. Maize and tomatoes, maize tomatoes and beans are the other common intercrop group in Windhoek with maize, beans and fruit trees being the other preferred intercrop group in Oshakati.

### 4.5 Problems faced by vegetable gardeners

Farmers in both towns are faced with the same three most important problems in crop cultivation (Table 4.15) and these are: shortage of water (Windhoek, 46%; Oshakati, 51%), pest attacks (Windhoek, 40%; Oshakati, 38%) and theft of produce (Windhoek, 31%; Oshakati, 24%). That water shortage is the most critical problem is not surprising considering the aridity of Namibia.

Windhoek respondents also listed lack of tools and capital as the next two important problems they face in crop production with significantly more women than men having problems with capital. Any attempt to rectify this problem may need to find ways and means of making it easy for women to have access to loans and grants probably through positive discrimination.

Problems faced N=	Windhoek			Oshakati		
	Male %	Female %	Total%	Male %	Female %	Total%
None	4	6	5	11	4	6
Water	39	42	41	56	50	51
Seed supply	11	14	13	17	7	9
Pesticides etc	14	16	15	17	13	13
Fertiliser	7	14	12	11	13	12
Tool	25	24	24	0	10	8
Capital	14	26	22	0	8	7
Labour	4	2	3	0	3	2
Soil Fertility	11	14	13	17	14	14
Drought	7	6	6	22	14	16
Pests	39	40	40	33	39	38
Market	4	8	6	11	3	4
Theft	46	22	31	22	25	24
Information	7	14	12	17	15	16
Harassment	4	2	3	6	0	1



In Oshakati, drought and lack of information are the fourth and fifth important problems faced by the farmers. The drought problem in fact highlights the water shortage problem. Whilst some women farmers in Oshakati listed lack of tool (10%) and capital (8%) as part of the problems they faced, none of their male counterparts mentioned these.

#### 4.6 Information and networking

None of the urban farmers in Windhoek and Oshakati get any help, information or advice from the extension services. When contacted, the extension officers responsible for the two towns claim that their sphere of responsibilities limited to the rural areas and not the urban areas.

From Table 4.16, it can be seen that most of the farmers (64% average in Windhoek and 70% average in Oshakati) get no help or advice. These people just rely mostly on their own previous experiences. Significantly more men (79%) than women (56%) in Windhoek receive no advice from anybody. This may be due to a macho attitude though no such situation seems to exist in

Oshakati. Those receiving help and advice rely more on neighbours and friends than on elders and relatives who are traditionally the source of advice in the African society. This breakdown in norms and values is one of the effects of urbanisation in Africa.

Most of the farmers also do not give help/advice to anybody but those who do also give help mostly to neighbours and friends. In Windhoek, most of the help/advice is given on how to start planting reflecting the newness of most of the respondents' vegetable gardens. In Oshakati, with well established gardens, most of the advice given concentrates on land husbandry.

Finally most of the farmers have been cultivating their gardens the same way without seeing any need for changes. Those who have made changes in Windhoek have mainly changed their planting methods whilst those in Oshakati have mainly tried new crops.

#### **4.7 Attitude and Expectations**

The majority of Windhoek's respondents plan to expand the area of their gardens (Table 4.17). As stated before, most of the plots in the North West location of Windhoek where the survey took place have limited spaces. Also the stoniness of the land in Windhoek means that only a small area can be cultivated at a time. The expansion of the cultivated area is also paramount amongst the Oshakati farmers (41%) especially the female farmers (46%).

Table 4.16: Information and networking

	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
N=	28	50	78	18	72	90
<b>Who do you get help/advice from?</b>						
Nobody	79	56	64	72	69	70
Elders	7	8	8	0	4	3
Neighbours	4	12	9	11	15	14
Relatives	4	8	6	6	4	4
Friends	7	16	13	11	7	8
<b>Who do you give help/advice to?</b>						
Nobody	68	50	56	67	61	62
Elders	4	2	3	0	0	0
Neighbours	21	12	15	17	28	26
Relatives	0	10	6	0	1	1
Friends	7	26	19	17	10	11
<b>What kind of advice do you give?</b>						
None	68	48	55	67	61	62
How to plant	25	40	35	17	4	7
Crop husbandry	7	12	10	0	7	6
Land husbandry	0	0	0	17	25	23
Marketing	0	0	0	0	3	2
<b>What changes have you made from your own experience?</b>						
Nothing	39	44	42	50	64	61
Planting method	29	24	26	11	6	7
Crop type	11	16	14	22	17	18
Land preparation	14	8	10	6	3	3
Crop Husbandry	4	8	6	6	8	8
Others	4	0	1	6	3	3

A high proportion of Oshakati farmers (33%) are also interested in introducing a wider variety of crops into their gardens. About five per cent of the Windhoek farmers are considering quitting mainly because the return for labour on the stony soil does not seem to justify their efforts.

Most of the respondents' neighbours think that gardening is good and encourage the respondents in their endeavours. Albeit, significantly high percentages of male gardeners in both Windhoek (21%) and Oshakati (22%) think that their neighbours are not happy with their gardens.

Since there is no extension service for the urban farmers, most of the respondents were asked if they would like to join gardeners' groups and an overwhelming majority answered in the affirmative. The majority of the respondents would like to join gardening groups to gain more experience. Other reasons are for interest sake, to earn extra income and to be employed.

Table 4.17: Attitude and expectations

	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
N=	28	50	78	18	72	90
<b>What are your future plans?</b>						
None	11	22	18	17	8	10
Expand cultivated area	68	68	67	22	46	41
More crops	7	4	5	44	31	33
Quit	7	4	5	0	1	1
Others	7	2	4	17	14	14
<b>Neighbours' reactions</b>						
Indifferent	4	4	4	6	10	9
Good	75	92	86	72	80	79
Bad	21	4	10	22	10	11
<b>Are you aware of a gardening group?</b>						
Yes	11	2	5	6	0	1
No	89	98	95	94	100	99

<b>Would you like to join a gardening group?</b>						
Yes	89	86	87	78	85	83
No	11	14	13	22	15	17
<b>Why would you like to join a group?</b>						
Experience	61	56	58	56	57	57
Interest	18	6	10	11	0	2
Extra income	4	8	6	11	17	16
Employment	7	16	13	0	11	9
Don't want to.	11	14	13	22	15	17

#### 4.8 Livestock Production

Many of the respondents claimed not to be involved in Livestock production despite some evidence to the contrary especially in Oshakati. Only five respondents in Windhoek (6%) and 26 respondents (24%) in Oshakati agreed that they keep livestock, mainly chicken, goat and turkey.

Whilst the lack of livestock among Windhoek's respondents may be genuine and it may be due to the poverty level in the selected locations, and lack of space the case of Oshakati seems to be one of people not wanting to tell the truth because of fear of prosecution.

Table 4.18: Livestock Production

Do you have livestock? N=	Windhoek			Oshakati		
	Male %	Female %	Total %	Male %	Female %	Total %
	28	50	78	18	72	90
Yes	11	4	6	39	26	24
No	89	96	94	61	74	76
<b>Types of Livestock</b>						
Chicken	11	2	5	28	13	16
Goat	0	0	0	6	0	1
Turkey	0	2	1	6	6	7
Others	0	0	0	0	1	1
<b>Livestock problems</b>						
	Male %	Female %	Total %	Male %	Female %	Total %
N=	3	2	5	7	19	26
Poor Health	100	0	60	43	63	58
Lack of Feed	33	50	40	14	56	38
Lack of Capital	33	50	40	0	26	19
Neighbour Harassment	33	100	60	0	5	4
Theft	33	50	40	0	0	0

For example, several heads of cattle were seen roaming about the streets at some locations in Oshakati yet none of the respondents claimed ownership or the knowledge of owners. Even when some pigs were seen inside a compound, the particular respondent in that house claimed that they belonged to the neighbour. These denials may be related to a drive by the Oshakati Municipality in trying to rid the city of livestock especially cattle, goats and pigs.

The major problems facing those who agreed that they keep livestock are poor animal health, lack of feed, lack of capital, harassment by neighbours and theft. Interestingly, none of the respondents listed harassment by the Municipal authorities as a problem. The animals are mostly fed on household wastes. In Windhoek, the five livestock owners allow their animals to roam about whilst in Oshakati, half of the owners allow their animals to roam about (mainly poultry)

and the remaining half keep them within their compounds. None of the respondents in Windhoek are aware of the Municipal by-laws concerning livestock but 31% of the Oshakati respondents are aware of these. Finally, only three respondents (1 in Windhoek and 2 in Oshakati) reportedly sell their livestock.

#### **4.9 Fishing**

Given the environment of the informal settlements in Windhoek and Oshakati in which the majority are unemployed, the researchers wanted to know whether some of them caught fish from the dams around Windhoek or collected fish from the Oshana (floodplain) around Oshakati during the rainy season. A tiny minority stated that they undertook fishing at times (1 in Windhoek and 6 in Oshakati). Fishing is an irregular activity and is often undertaken when opportunity arose. The amount of fish caught is very small and the household eats most of it.

#### **4.10 Urban Residents without Garden**

Most of the households without gardens are headed by males (57% in Windhoek and 67% in Oshakati (Table 4. 20). The majority of the household heads are also young (40 years or less) with 78% of the male and all female heads in Windhoek being 40 years or less. In Oshakati, 92% of the male heads and 76% of the female heads of households without garden are 40 years or less. Their youth could partly explain why they are not too keen to cultivate. Most of the household heads are single (52% in Windhoek and 64% in Oshakati). The remaining 48% of all heads in Windhoek are either married (35%) or cohabiting (13%). Of the remaining heads of household in Oshakati, 15% are married, 6% divorced, 4% separated and 11% cohabiting.

Nearly all the respondents without gardens in Windhoek moved to Windhoek only after independence. In fact most of them (80% of male headed and all the female headed households) moved to Windhoek in the last 5 years, coinciding with the period when squatter laws were deliberately not being enforced by the Windhoek Municipality because of political pressure. However, the situation in Oshakati is different. Only half of the respondents moved in to Oshakati after independence, whilst the remaining half were already in their present location. It is worth recalling that the survey in Windhoek concentrated on the poor areas of the city whilst

the survey in Oshakati spread across the whole town. As with the general situation in this survey, 61% of the respondents without garden in Windhoek acquired their plots from the Municipality whilst 39% acquired their plots through other means (literally meaning that they are squatters). Of importance in Windhoek is the gender difference in the acquisition of plots. Proportionally more female heads (80%) acquired their plots through legal means than male heads (only 56%). The trend in Oshakati also follows the general trend with nearly 50% acquiring their plots through the council (legally) and the remaining 50% through the headman (considered illegal by the local authority). There is no significant gender differentiation in the acquisition of plots in Oshakati.

### Reasons for not gardening

As shown in Table 4.21 the most stated reason for the respondents not having a garden is lack of space (39% in Windhoek and 34% in Oshakati). This is not surprising considering that most of the squatters are housed on plots measuring about 10m x 10m which is less than the 300m<sup>2</sup> which is supposed to be the minimum size for housing plot in Windhoek. A way out of this problem is to declare some opened spaces around the squatter areas as garden plots, thereby giving opportunities to those with limited space to own their own gardens.

In Windhoek, a lack of time and unsuitable soil ranked joint second (17%) as reasons for not having a garden, though the female headed households are significantly more affected by lack of time (40%) than unsuitable soil (20%). The other reasons given by Windhoek residents without gardens are lack of interest (9%), lack of capital (9%) and lack of water (9%). Lack of time also ranked as the second reason for not gardening in Oshakati (23% for all respondents) though this was stated more by men (31%) than women (6%). The third important reason for not gardening in Oshakati was given as lack of capital and this affected female headed households (41%) more than the male headed households (11%). Unsuitable soil (9%), lack of water (8%) and lack of interest (6%) are the other reasons given by Oshakati respondents. Of utmost importance here is that very few respondents consider lack of water as being their main impediment to gardening.

Table 4.21 also shows that nearly all the respondents would like to have gardens if they were to be provided with solutions to their problems such as provision of space, initial capital and improvement to the soil. As with the respondents with gardens, most of without gardens would like to have gardens for the main purpose of growing food for the family. The

proportion of those who want to have gardens so as to generate income is also fairly high especially in Oshakati (a total of 26% of the respondents).

Most of the respondents in the 2 towns would like to grow tomatoes and maize. Other crops that they would like to cultivate, if given the chance, are cabbage, fruit trees, onions, beans, sweet potato chillis, water melon and carrots.

Table 4.20: Demographic status of urban residents without gardens

Age of Household Head	Windhoek			Oshakati		
	Male	Female	Total	Male	Female	Total
	18	5	23	35	17	52
≤ 30	50	60	52	63	47	58
31 – 40	28	40	30	29	29	29
> 40	22	0	18	9	24	13
<b>Marital status</b>						
Single	50	60	52	64	65	64
Married	39	20	35	19	6	15
Divorced	-	-	-	-	18	6
Separated	-	-	-	-	6	4
Cohabiting	11	20	13	14	6	11
<b>Years in present location</b>						
≤ 5	83	100	97	43	29	38
6– 10	6	-	4	6	24	12
> 10 years	11	-	9	51	47	50
<b>Plot acquisition</b>						
Council / Municipal	56	80	61	47	53	49
Headman	-	-	-	53	47	51
Others	45	20	39	-	-	-

Table 4.21: Constraints to possibility of establishing vegetable gardens

Reasons for no garden	Windhoek			Oshakati		
	Male	Female	Total	Male	Female	Totals
Lack of space	39	40	39	33	35	34
Unsuitable soil	17	20	17	11	6	9
No interest	11	0	9	6	6	6
Lack of capital	11	0	9	11	41	21
Lack of time	11	40	17	31	6	23
No water	11	0	9	8	6	8
If help, would you start a garden						
Yes	94	100	96	94	100	96
No	6	0	4	6	0	4
Why would you like to have a garden						
Food	67	100	74	67	70	68
Hobby	17	0	13	3	0	2
Income	11	0	9	17	12	15
Food and Income	6	0	4	8	18	11

#### 4.11 Legal Status of Urban Agriculture

Formal discussions with the officials of in the Ministry of Agriculture, Water and Rural Development as well as the city of Windhoek revealed that presently there is no policy on urban and peri-urban agriculture. Both of these institutions do not consider urban agriculture to be their responsibility, though some of the official admitted that they have noticed some farming activities within the city boundaries. Similarly contacts with the Ministries of Health and Social Services and Environment and Tourism do not consider urban and peri-urban agriculture as their responsibility though they admit that it could cause water and soil pollution especially when the use of fertilizers, pesticides, herbicides fungicides and other chemicals is intensified.

## **CHAPTER 5**

### **THE APPLICATION OF SEAGA TOOLS TO A PERI-URBAN AGRICULTURE GROUP IN OSHAKATI**

#### **5.1 Rational**

In order to supplement the information obtained from the administration of questionnaires, it was important to apply other analytical tools. Hence, a session on Socio-Economic and Gender Analysis (SEAGA) was undertaken with a focus peri-urban farming group, in order to generate further essential information.

#### **5.2 Application of SEAGA as an analytical tool**

SEAGA as an analytical approach recognized that there are no simple answers towards any development interventions. Hence, it helps development planners to take a realistic look at the development challenge- looking at socio-economic patterns at different levels and for different people.

In general SEAGA shows the need to understand how development policies and programs are likely to affect the economic activities and social relationships among different groups of people in local communities. Hence it promotes the process of communication between local people and development agents, during which local people take the leading role to analyse the current situation, to plan, implement and evaluate development activities. It also reveals the different roles of men and women to understand what they do, what resources they have and control, what their needs and priorities are. Therefore, SEAGA helps us to learn about community dynamic, including the linkages among social, economic and environmental patterns. It also provides an overall framework for analysing a variety of socio-economic patterns at different levels and their impact on the livelihood strategies of women and men. These analyses are based on the following three toolkits:

- I. The Development Context Toolkit: Learning about the economic, environmental, social and institutional patterns that pose support or constraints for development.
- II. Livelihood Analysis Toolkit: Learning about the flow of activities and resources through which different people make their living. It shows how people meet their basic needs, what are women's and men's activities for subsistence and income and their relatives access to resources.
- III. *Stakeholders Priorities for Development Toolkit*: Essential for planning development activities, it focuses on learning about the current situation (what is) how to plan (what should be) for future interventions, hence, all SEAGA toolkits are designed to answer important questions.

### 5.3 Session design and agenda

Most of SEAGA tools are time consuming and therefore they have to be administered carefully to avoid boredom among participants. As a result, only two of the four analytical tools selected could be applied at Tukondjeni project about 20km from Oshakati due to time limitations. The two tools that were used are the Daily Activity Clock (from the Livelihood Analysis Toolkit) and the Problem Analysis Chart (from the Stakeholders Priorities for Development Toolkit). The other two tools that were not used are the Income and Expenditure Matrix (Livelihood Analysis Toolkit) and the Village social maps (Development Context toolkit).

At the planning stage, the facilitators visited the Tukondjeni project and agreed on the day, venue and time for the session to take place. On the appointed day, the two tools selected for the session were administered to the members of the project. The interviews and discussions were conducted in the local language (Oshiwambo) to make it easy for participants to take part freely. The sessions started with a general understanding of development as a concept, through brainstorming techniques. Participants were then introduced to the purpose and process of a Daily Activity Clock and Problem Analysis Chart, before group work and discussion on each tool. A questionnaire was also administered to participants as a focus group (see Appendix).

## 5.4 The Tukondjeni project

In 1993, some people came up with the idea to set up a project on vegetable garden and approach the headman for a piece of land. Through the Directorate of Community Development they received some fencing materials. These were, however, not enough and had to be supplemented by members' contribution. The project members consulted a worker from Ongwediva Rural Development Centre (RDC) for advice and it was from there that they bought their first sets of seeds and fertilizer. The implementation of the vegetable garden started only in 1998, with twelve female members (12), with the aim of generating income from selling products such as tomatoes, spinach, sweet potatoes, chilli, maize corn, carrots etc.

All project members are from within the same vicinity and therefore they know each other well as church members, relatives, friends and neighbours. Currently the project has only ten (10) members because two members left (relocated to other towns) and no new members have been allowed to join due to lack of space for cultivation. Two members of the project are heads of their households and the average age of the project members is 38 years. Each member pays a membership fee of N\$15.00 per year.

## 5.5 Results

### 5.5.1 Daily Activity Clock Tool

The daily activity clock tool illustrates all the different activities carried out in a day, and it reveals how the workloads are shared among different members of a household. During the application of the Daily Activity Clock, it was clear that the project members (all women) start their daily activity as early as four o'clock in the morning, and they go to bed at nine or ten o'clock in the evening. It was also evident that most of them, as with all the women in the community, participate in income generating activities and spearhead the organisation of social and community events, such as marriage, funerals, cultural shows, religious shows etc. unlike men who only grace such occasions.

The application of the Daily Activity Clock reveals the tasks performed by men, women and children (boys & girls) in a given household. As participants drew their own daily activity clock,

it was evident that most tasks are performed by the women and that they are left with little time for leisure as compared to the men. The children are either at school or working far away from home. Any development intervention should, therefore focus on how best the women's workload could be reduced.

Another revelation from the session is that women carry out both productive and reproductive roles in their households without their contributions being acknowledged and with no economic values attached to such work. It was also evident that they work for more hours than other household members, although the age, status of an individual and the size of the household members play a major part in determining exactly how long they work for. Therefore, any development interventions could focus on the reduction of time spent on specific activity. For example, planning for hammer mill to reduce time spent on pounding grains, introducing planter that can be attached to a plough so that women do not have to plant after ploughing is done. Knowing who is involved in what activity and when a specific activity is undertaken is important information to development promoters to draw their work plan accordingly in relation to the activity and time for the appropriate receivers

### **5.5.2 Problem Analysis Chart tool**

This tool was used to identify problems experienced by participants, prioritise them and work out solutions (Table 5.1). In order to identify the problems faced by the respondents, cardboards were distributed to the participants who were then asked to list their problems on the cards. Those who could not write asked the enumerators to write for them.

It was evident from this exercise that there is a high potential among community members on how solution to their problems could be found. Their participation in identifying problems and work out solution can be an effective way of development planning, because it promotes a two way flow of information between and among relevant stakeholders. It was also important to have learnt that coping strategies employed by community members could be more effective if assessed in detail and might just require little inputs. This is because such strategies came into place through experience and therefore could consist of valuable information that could also be useful in finding scientific explanation. Hence, the application of the problem analysis chart tool

reveals an enormous untapped (local) knowledge and skills among community members which are hereby documented for future references.

### **Land and Labour Management**

The project is managed through a committee that makes decision and play a leadership role. The project area of about 2700m<sup>2</sup> was obtained through the headman. The land is divided into small plots that are allocated to each member for cultivation. Project members work alone on the garden but for some help from their children when they are available.

The group's current source of knowledge is the Agricultural Extension Technicians, under the Ministry of Agriculture, Water and Rural Development. As a result, project members have improved their sowing methods, able to identify pests and disease (e.g. nematodes on tomatoes) that affect their crops. They also gained the knowledge to plant new crops and vegetable varieties according to season on their plots.

### **Soil**

The fertility of the soil within the garden can be described as poor and sandy resulting in some plants not growing well. The impact of water and wind soil erosion was visible and this is exacerbated by the location of the garden close to the oshana (flood plain) on the northern and western side of the garden. Project members apply manure (cattle, goats) that they carry from their homestead, inorganic fertilizers (bought from RDC) and practice mulching and crop rotation to improve the soil fertility. There is no coping strategy used to reduce soil erosion.

### **Cultivation methods**

The land is prepared mostly by tilling with hand hoe and the application of manure before planting. The vegetable seeds are planted on flat beds and buckets are used to collect water from the tap for watering. Project members plant beans, maize, groundnuts, bambara nuts for summer (wet season) and tomatoes, onions, cabbages, chilli, eggplant carrots, spinach sweet potatoes during winter (dry season).

### **Financial management and production**

Household members consume most of the products thereby promoting food nutrition. The surplus is then sold in order to generate income needed at the household level. The products are marketed from the garden site, from the homes and at public gathering places such as on pension days or during any other community events. Each plot owner sells her products and benefit as an individual. However, members could sell products on behalf of other members when the need arises. All members have benefited from working together because they can stand in for each other in times of need.

### **Attitude and expectation**

The attitude of the outsiders towards the vegetable garden are mixed, as some encourage project members while some feel jealous about the activities of the project and complained about it causing water shortage. Some members of the community (later adopter) want to join now, having seen how others are benefiting from the project.

Tukondjeni project's future plan is to expand the garden site. Although the space is available, project members will need fencing materials and an additional water storage tank within the garden in order for them to have access to water when needed.

### **Problems**

*Marketing:* Perishable products such as tomatoes get spoilt when not bought on time. *Theft:* Few cases of stealing sweet potatoes have been experienced. *Pest & diseases:* Pests and diseases control is not effective because it requires a lot of money to buy pesticides. Pest, diseases and flood affect the yield at times. *Inputs:* The only water tank that is available is too small to supply water for community consumption and gardening, as a result there are times when there is not enough water for the garden. The seeds and fertilizers are packed in big quantities making them very expensive (price and transport) and they are not locally available.

Table 5.1 Problem and analysis chart tool

<b>Problem</b>	<b>Causes</b>	<b>Coping Strategy</b>	<b>Opportunity</b>
Water	One water tank for the community	Walk long distance in search of water	Provision of another water tank
No hose pipe	Lack of money to buy pipes	Make use of bucket	Hose pipe for watering
Shortage of manure & fertilizer	No livestock, and fertilizer bags too big and therefore expensive	Share the cost of fertilizer & transport	Researcher to provide other sources of Fertilizer
Seeds	Lack of money for big bags	Share the cost	Small pack to be available locally
Pests	Lack of money to buy pesticides	Uproot affected plants & use local or home made herb	Biological pest control to be introduced
Garden tools	Lack of money as tools are expensive	Use of hoes and buckets	NGOs, GRN to provide garden tools and equipment

## 5.6 Other activities

Apart from vegetable growing, project members also participate in other income generating activities such as making traditional basket, pottery and marula oil. The Tukondjeni garden is also frequently used by a nearby school for teaching the school children practical lessons in the agriculture subject.

## **CHAPTER 6**

### **DISCUSSION**

#### **6.1 INTRODUCTION**

This section attempts to bring together the findings of the study in Windhoek and Oshakati with a view to make inferences on the present status of urban and peri-urban agriculture in the two municipalities. It will also show an insight into the legal environment pertaining to urban agriculture. This will then be used to assess the potential of the sub-sector in the informal settlements.

#### **6.2 Implications of the Social Characteristics of the Respondents**

From the data collected from 244 respondents in Windhoek and Oshakati that the majority of the respondents (162) were young people, in the age range of 21-40 years old. In addition 84.4% of the respondents originated from the North Central regions namely; Ohangwena, Omusati, Oshana and Oshikoto, followed by Kavango region with 7.4%.

These figures confirm the migratory patterns in the country before and after independence in which currently both male and female able bodied take part. Due to migration regulations applied before independence which regulated the movement of Africans from rural to urban areas; only 4% and 54% of the respondents in Windhoek and Oshakati respectively were living on their plots before independence. Access and ownership of a plot can play a major role in effective planning on household resource use and management. It also provides security to the occupants or residents. The findings reveal that the mode of plot acquisition in Windhoek and Oshakati differs. In Windhoek most of the respondents acquired their plots through the Municipality while others acquired their plots through other means which could be deemed illegal. While in Oshakati some plots were obtained through the local council and some through the headman (which is now also deemed to be illegal).

The age and size distribution of household members varied widely. However, more female household members were found in Oshakati than in Windhoek. This can be as a result of the previously high numbers of male – migrants from rural to urban areas.

The employment status of both male and female respondents indicated that more male respondents in Windhoek and Oshakati are employed than female respondents. However, correlating the unemployment profiles with the level of education of household – head and their spouses show that only 6% of Oshakati heads and spouses have post secondary education.

The control over household resources and produce is a very sensitive gender issue. The data collected reveal that more males have control over resource such as land or plot, cash and tools in Oshakati and Windhoek (with exception of tools in Oshakati). It is evident that in most cases the control over tools correspond with ownership of such tools and that is also linked to gender specific roles played by individuals. However, it is important to understand the difference between access and ownership of household resources. It is generally accepted that most female have access to, but have no control over or ownership of, resources which are linked to male's roles.

### **6.3 Implications of the Economic Characteristics of the Respondents**

The study reveals that the main source of income in both areas under study is the employment in private institutions followed by government job. However, most spouses have no sources of income in both Windhoek (35%) and Oshakati (58%). Moreover, the source of income of household heads, and spouses can be linked to their level of education.

Some of the respondents also generate income from farming activities especially in the case of Oshakati. Other sources of income reported were home-based job, remittance, pension and selling of final products.

Having established the source of income, it is important to examine how the income is spent on household needs. The main categories of expenditure identified were on food, transport, clothing, rent, school fees and entertainment by the head of household and their spouses. The

fact the majority of the respondents spend less than N\$100-00 on food can have some implications on the food security and nutritional status of household members and thus essential to promote vegetable gardening amongst the poor of the city. It is noted that there are few of household heads and spouses which fall in the expenditure range of more than N\$500-00 per month in both targeted area. On average the majority of respondents (90.3%) have a monthly expenditure of N\$100-00 to cover the above stated categories. This reflects the level of poverty prevailing in the areas under study in Windhoek.

Other characteristics of the households investigated in Oshakati such as level of savings, hire purchase facilities, credit, control of land and livestock, crops, cash, are in extremely low amounts, pointing out once more the reality of poverty amongst the respondents. In addition, this has resulted in inability of the respondents to have access to credit facilities due to lack of collateral as required by financial institutions and other creditors. Although the study did not assess the savings status and the availability of credit from gender perspectives, further studies may reveal a different status for male and female respondents.

Fishing is a seasonal activity practiced by a few of the respondents in Oshakati. This is largely limited to collecting fish in the iishana during the rainy season. Very few respondents reported having sold some of the fish, most of which is consumed by household members. While the statistics on the resource base of the respondents together with their access and control of production resources paint a dismal picture, the researchers are convinced that market gardening in Oshakati has a great potential because of the existence of a large population which is predominantly rural in nature with a high demand for traditional food stuffs including vegetables. In addition any development of intensive market gardening would reduce the dependence on imported vegetables and fruits which are overhauled from South Africa.

#### **6.4 Farming Practices**

Farming practices are the husbandry practices adopted by producers in the production of specific enterprises. As indicated in chapters 3 and 4 of the results, women are the main urban and peri-urban producers. The main reason for having a backyard garden or a plot along the road is to supplement household food or, to some limited extent, to generate additional income for buying

food and other necessities of life. Some respondents indicated that gardening provides employment for some of the urban unemployed (table 4.2).

The farming practices adopted are closely related to the local environment as well as the status of the producers in terms of whether they are full time employees or they are partly employed or are not employed at all. Furthermore they depend on whether the producer is male or female, for example weeding is mainly done by women both in Windhoek and Oshakati (table 4.3). The implication of this is that any intervention aimed at expanding urban and peri-urban agriculture would have to closely analyse the other activities in which women are involved to ensure that the new enterprises will not impose extra labour hours on the women.

Water is one of the most important inputs in urban and peri-urban production in Windhoek and Oshakati. In the two towns the tariff for water in most of the areas has been a flat rate of 30 Namibian dollars per month. In some of the informal settlements, the municipalities have provided communal taps free of charge. Reliance on rainwater is limited because the amount, the duration of rains and consistence of raining when it starts are unpredictable. In the last two years the two municipalities have introduced pre-paid water cards or water metres. The implication of this is that all informal settlement producers would have to pay fully for any tap water used. This might affect the number of people who would like to expand horticultural production in the urban and peri-urban areas. Similarly the use of hosepipes, jerry cans and buckets may be affected when all water consumers are subjected to the use of pre paid water cards or metres. This is because water has become expensive compared to the return to some of the enterprises that are being grown. Some producers have indicated the use of stored rainwater as an alternative. This has great potential in the settled middle to high income areas, but would require some intervention in the form of provision of plastic storage tanks in the poorer areas. The use of waste domestic water has been pointed out in both Windhoek and Oshakati. However, the majority of producers think that the use of waste water is bad (77% for Windhoek and 43% for Oshakati, table 4.6). In addition it has some implications on the quantity of the product and the perception of the consumers of any vegetables and fruits produced.

Most seeds are readily available in shops and supermarkets in Windhoek, while in Oshakati producers obtain their supply of seeds from shops, relatives and friends. There is, therefore, need

to improve the availability of seeds in Oshakati through the opening of specialized stores in the town. There is also need for the Extension service in the region to disseminate technical information to the urban gardeners on the production of vegetables and fruits.

The supply of other inputs such as fertilizers, pesticides and fungicides seem to be adequate, but few urban gardeners make use of these. The type of fertilizers reported in use include fresh animal manure, digested manure (from Gammans Water Works in Windhoek), compost and chemical fertilizers. With the restrictions on the movement of animals in the municipal areas by the municipal authorities, the use of the fresh manure is likely to reduce. This has some implications for the use of the other types of fertilizer in terms of the enterprises being grown and the response the producers have when they use these fertilizers.

A few pests and disease were reported by producers and identified by the researchers namely corn crickets, American bollworm and aphids. This small number is apparently due to the lack of knowledge of the producers and the fact that the producers have no technical assistance from the Extension Service. Moreover, in both Windhoek and Oshakati, pest ranks second among the problems faced by gardeners in crop production (Table 4.15). In this regard there is a need for intervention by both the Municipal Authorities and the Extension Service. The Municipal authorities should seek the services of the Extension Service and the Environmental Unit to ensure that producers are given the correct pesticides and fungicides that minimize the damage to the environment.

## **6.5 Enterprises Produced**

The list of crops produced in the urban and peri-urban areas of Windhoek and Oshakati is very large. These can be divided into common and favourite crops grown (table 4.11 and 4.12 respectively). The disadvantage of this large number of enterprises is that any intervention in terms of encouraging horticultural expansion in the two cities would be difficult. However, when the list of favourite crops is examined, fresh maize, beans and tomatoes stand out in terms of their popularity as food crops as well as potential cash crops. In this regard the three crops together with pumpkin, water melon and sweet potatoes should be given priority in any intervention exercise aimed at improving vegetables production. Presently most of the

vegetables and fruits grown in the urban and peri-urban areas in Windhoek and Oshakati are for household consumption. The objective in any expansion exercise should be to produce more surplus for sale. This would create employment opportunities for some of the unemployed in these areas. This would require organizing the growers into cooperatives or groups, so that the Municipal Authorities and the Extension Service institute training courses for the producers and some workers to impart skills for the production of high value vegetables and fruits. These should include intercropping, rotation and use of biodegradable chemicals to minimize the pollution of the urban and peri-urban environment.

Besides vegetables and fruits, the results indicate that some respondents keep goats, sheep, chickens and turkeys in their back yards. Because of the absence of Veterinary Extension services in the urban areas, these animals suffer from poor health. In addition the two municipalities have laws prohibiting the rearing of small stock and poultry in the urban areas. While this is understandable from health grounds, some areas located on the peri-urban parts of Windhoek and Oshakati could be designated for the production of eggs, broilers and small stock for feeding the urban populations. This is particularly important for poultry and poultry products where Namibia still imports up to 75% of its requirements from South Africa. What is important is that prior to the setting up of any poultry production units a comprehensive environmental impact assessment should be undertaken to assess the negative impacts of such a venture. These should then be tackled through a mitigation programme.

## **6.6 Constraints to Production**

This study identified shortage of water, incidences of pests and diseases, lack of capital, frequent droughts, lack of information, markets and theft of produce as some of the major constraints hampering the growth and development of horticultural production in Windhoek and Oshakati. Shortage of water was reported by 46% and 51% of all respondents in Windhoek and Oshakati respectively (table 4.15). The implication of this is that many producers would be discouraged from venturing into vegetable and fruit production unless they are assured of a reliable and cheap source of water given the type and scale of production of most of the backyard gardens. The implication here points to the need to identify other means of providing water to the backyard gardens. This could be through the use of water harvesting method,

recycled waste water or other soil moisture retention methods. Another way of solving the water problem may be to encourage gardeners to grow high value crops which they can sell for cash so that they can break even after paying for water and other inputs.

Closely linked with the enterprises identified is the need to investigate the market for local produce. At the moment most of the markets for vegetables and fruits are controlled by South African chains of supermarkets. Moreover there is an apparent psychological preference for imported products by Namibian business people and consumers. A change of this will require an aggressive and systematic campaign to encourage people to consume Namibian grown fresh fruits and vegetables. These should be backed by a well planned stage by stage access into the markets of specific products.

While the process of producing and entering the market is going on, effective scientific research on further identification of production constraints should be embarked on, together with a provision of urban and peri-urban Extension Service. The former is to gather more facts on the science of horticultural production in the environment of Namibia, while the latter is to quickly disseminate the knowledge obtained to the producers. In between scientific research and an effective Extension Service, a comprehensive economic assessment should be made on each vegetable and fruit to determine the cost of production, price trends and the return to the producer at various levels of outputs and seasons so that producers make rational choices on which crop to produce, when to produce it, how to produce it and where to market it so that they can maximize returns to their limited resources.

Capital has been pointed out as a constraint to the production of horticultural produce in Windhoek and Oshakati (Table 4.15). This is because both the producers and the Agribank and some of the commercial banks in the country do not have the market information on returns to various enterprises. There is therefore need to assess the demand for micro loans within each urban and peri-urban areas with a view to provide information on what activities they should go into and the level of micro capital loan required to undertake each enterprise. There should then be an awareness campaign to disseminate this information through the urban and peri-urban Extension Services as already outlined in the paragraph on marketing above.

Related to the problem of lack of information is the frequency of droughts in the country. Some of the droughts are so severe that ground water sources reduce supplies to very critical levels. If such a situation occurs, it would put urban producers at risk as in most cases the municipalities will react by imposing restrictions to water usage. A knowledge on the frequency of drought would therefore be vital for planning the development of the horticultural sector in urban areas in terms of developing irrigation dams or valley tanks to take care of water shortages during severe drought periods.

### **6.7 Legal Status of Urban Agriculture**

The practice of urban agriculture has no legal backing in Windhoek and Oshakati. There is no policy on urban agriculture which can be used as a guideline for both urban – farmers and relevant institutions. Hence, various Ministries and Departments namely MAWRD, Ministry of Health and Social Welfare, Local Council and Municipal Authorities do not view urban and peri-urban agriculture as their responsibility. In addition, these institutions do not recognise urban and peri-urban farming and farmers in their own right.

As a result, the lack of such an appreciation led to lack of technical advice and support provision to the farmers. Meanwhile, this study has shown importance of urban farming to the well being of urban residents especially those who are poor.

### **6.8 Urban Residents without Gardens**

The residents without gardens are generally young, males and single. Most of them are recent immigrants to their current locations.

The main reason given for not gardening is the lack of space followed by a lack of time and unsuitable soil. Other reasons are lack of interest, lack of capital and lack of water. It is interesting to note that water shortage, which is given as the most important constraints to vegetable production by the gardeners ranks relatively low among the reasons for not having a garden. Availability of space can then be considered to be the deciding factor in the decision to start a vegetable garden though the availability of water decides whether the gardeners will

continue and their ability to expand further.

Despite the above stated reasons, respondents have shown willingness to participate in gardening when assistance in terms of space, skills, initial capital and improvement to the available land are provided.

#### **6.9 Case study of a Peri-Urban Agriculture Groups in Oshakati**

A case study of a peri-urban farming group – the Tukondjeni project was carried out using the SEAGA tool. The group is different from the individual farmers in that they benefit from doing things collectively. Being located in a peri-urban area, they do not have space problems and they have easy access to extension services.

Members of the project plant in both wet and dry seasons. They plant beans, maize, groundnuts and bambara nuts during the summer (wet season) and tomatoes, onions, cabbage, chill, eggplants etc. during the winter (dry season). Most of the crops are consumed by household members and the surplus are sold in and around the peri-urban areas. Very few of the products get to the near by Oshakati market because of lack of transport. Therefore, perishable products such as tomatoes get spoilt when not bought on time. Other problems faced by the project members are shortage of water and other inputs.

On the average, the gardening group is thriving though they need some help to improve on their productivity.

## CHAPTER 7

### CONCLUSIONS AND RECOMMENDATIONS

#### 7.1 Status of urban and peri-urban agriculture in Windhoek and Oshakati

From the mass of data collected from 244 respondents the major finding is that urban and peri-urban agriculture is practiced by 79 % of the respondents in Windhoek and 70% in Oshakati.

The main crops enterprises produced include vegetables, fruits and poultry. There are at least 23 different types of vegetables grown but the most common ones are maize, beans, tomatoes, pumpkin, watermelon, sweet potato and pepper. Production takes place on tiny pieces of land around the dwellings.

Most of the crops produced are for eating and this contributes a lot to improving the nutritional status of the households. About 22% of farmers, sell their, surplus produce mainly maize and tomato. Many producers are willing to expand their plots of vegetables if they are assisted with some inputs, while those who presently have no gardens are ready to start vegetable gardens if they can be provided with space and the starting capital. Currently , the existing market outlets for surplus vegetables and fruits are limited to the localities where the products are produced. In most cases this means selling in front of the house when customers come or on the roadside when people are attracted by what is displayed when they are passing by. This kind of market however, is not reliable and does not lend itself to substantial sector of urban and peri-urban agriculture to benefit the producers as well as the consumers.

Most production of vegetables in particular takes place during the rainy season with rainwater supplemented with water from iishana and municipal water taps. Water was given by the majority of respondents as the most serious constraints to vegetable and fruits production especially during the dry season. Water as a resource is expensive and the Municipal Authorities tariffs are expensive for the informal settlers. The installation of meters for tap water and the system of pre-paid cards has resulted in restricting the amount of water that can be fetched for watering the gardens and hence acts as a serious constraint to vegetable production during the

dry season.

Animal production was limited mainly to small stock and poultry in both towns. Fishing is a seasonal activity practiced by a few of the respondents in Oshakati. This is largely limited to collecting fish in the Oshana during the rainy season. Very few respondents reported having sold some of the fish, most of which is consumed by the household members.

In conclusion, urban agriculture is evident and thriving in the two cities. What apparently is lacking is the absence of legislation that recognizes the existence of urban and peri-urban agriculture by the central and municipal authorities

## 7.2 **Policy intervention and environmental quality protection**

The absence of a policy on urban and peri-urban agriculture implies that producers do not get the correct technical advice in carrying out the husbandry practices for the production of various vegetables and fruits. Knowledge of the chemicals and the quantities to be applied to various vegetables is limited and this may result in the use of the wrong chemicals as well as over dose. Once applied, information on the chemical process that might occur together with the resultant runoff is essential to assessing the impacts of the chemicals on water and soil. These might influence the kind of water treatment to be adopted over time.

The absence of policy on urban and peri-urban agriculture is seen as a constraint towards its intensification and development. The evolvement of a policy on urban and peri-urban agriculture requires consultations by the Ministry of Agriculture, Water and Rural Development with all stakeholders including the Ministries of Environment and Tourism, Regional and Local Government and Housing, Municipalities, residents in the urban areas as well as the dwellers in the informal settlements. The absence of policy has meant the production of vegetables and fruits fit for human consumption cannot be assured. The use of biodegradable chemicals to ensure that the pollution of air water and soils is minimized is subject to the producers' expectation on the prices they are likely to receive for their products. This situation causes suspicion in the minds of dealers and consumers that is why most dealers prefer to do business

with large and established companies so that they can assure their customers of the quality and continuous supply of product they are dealing with. The net result is that there is limited demand for locally produced vegetables and fruits from super markets and grocery stores.

This study has demonstrated clearly that urban and peri-urban agriculture as practiced to day – in Windhoek and Oshakati, though wide in extent, is of limited scale and the output is mainly consumed by household. If the full potential of urban and peri-urban agriculture is to be realized, there is need for government, the municipalities and the private sector to be involved. The government and the municipalities can provide policy intervention that encourages and create a conducive environment for the producers to grow high value vegetables, fruits, poultry and small stock using sustainable and environmentally friendly technologies. The private sector can inject some micro loans to enable the producers to purchase inputs including affordable technology for application of husbandry practices and water at cost effective rates. The policy should embody an allocation of responsibilities amongst the concerned authorities in respect to legal recognition of urban and peri-urban agriculture, guidelines on the correct husbandry practices as well as the protection of the environment for sustainable production.

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