FACILITATING THE EFFECTIVE PRODUCTION AND MARKETING OF PROCESSED FOOD PRODUCTS BY SMALL-SCALE PRODUCERS IN ZIMBABWE [PROJECT R7485]*

OUTPUT 1: LITERATURE REVIEW

Proctor, S., Henson, S., Loader, R., Masakure, O., Brouder, A.,
Bhila, L. and Sigauke, N.

September 2000

Dept. of Agricultural and Food Economics
The University of Reading
4 Earley Gate,
Whiteknights Road
PO Box 237,
Reading RG6 6AR
UK

ITDG Southern Africa
3rd Floor Coal House
17 Nelson Mandela Ave/Corner Leopold
Takawira Street
PO Box 1744
Harare
Zimbabwe

*This paper is an output from a research project funded by the United Kingdom Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID [R7485 Crop Post Harvest Programme].

CONTENTS

4. Small-scale Processing Enterprises in Zimbabwe

5. The Supply and Distribution System within the Horticultural Subsector

6. The Potential Benefits of Production and Processing of Horticultural Crops

List of Tables

List of Figures

Appendices

1. INTRODUCTION

1.1 Background to the study

In spite of the widely publicised 'success' stories about Zimbabwe in the 1980s, 50% of the population continues to live in poverty. There is still food insecurity, extreme poverty, hunger and child malnutrition at the household level in Communal Areas, among commercial farming labourers and low income urban families, especially those which are female-headed. Jayne, Chivso and Rukinin (1994) point out that Zimbabwe's food situation is characterised by a disturbing paradox of chronic food security amid abundance. This is in spite of the fact that Zimbabwe experienced a 300% increase in grain sales to the Grain Marketing Board in the 1980s and early 1990s. Recent research demonstrates that poverty levels in Zimbabwe are high. According to the Zimbabwe Human Development Report about 75% of all Zimbabweans are classified as poor and about 47% are classified as very poor (UNDP, Poverty Reduction Forum and IDS, 1998). The Poverty Assessment Study suggests that in 1995, 61% of Zimbabwe's total population were living within households where income per person was insufficient to provide for basic needs. About 45% of households were living below the Food Poverty Line; i.e. they were unable to meet their basic nutritional requirements (Ministry of Public Service, Labour and Social Welfare, 1997).

Land pressure is increasing in Communal Areas of Zimbabwe, since growth in population has not been matched by a corresponding increase in the amount of land available for cultivation. The government-appointed Land Tenure Commission, found "an untenable state of affairs which was approaching anarchy in some areas" (Rukuni, 1994). Rural households in Zimbabwe's Ecological Regions IV and V hardly produce above their subsistence levels owing to poor soil and low rainfall patterns (See Figure 1 for location of Ecological Regions). For example, around 55% of farmers in Ecological Region IV and 82% of those in Region V reported food shortages in 1993, which was a year of reasonably good harvests (Moyo, 1995). As a result, it is becoming increasingly apparent that small-scale farming on its own rarely provides a sufficient means of survival in many areas of rural Zimbabwe. Indeed, most rural households depend on a diverse portfolio of activities and income sources. Further, households are looking towards activities such as processing as a means to enhance the livelihood they can achieve from a limited area of land (Simalenga, 1996).

In 1998, there were 860,000 small-scale enterprises in Zimbabwe (USAID, 1998), the majority of which were involved in food processing. Collectively, these enterprises employed an estimated 1.65 million people, the majority of them being women. It is clear that income and employment, as well as nutrition and food safety, can be enhanced by the application of effective food processing technologies. Evidence suggests that there is a real potential to enhance the livelihoods of poor small-scale producers of horticultural products through processing activities, but that a number of factors currently prevent the development of such activities. Many of these factors are production-related, especially with respect to size of operation and lack of key resources (for example fixed and working capital). They also face marketing problems however, due to seasonality of production, poor access to markets, and lack of marketing resources (for example transportation). Small-scale producers however, with reasonable access to markets (e.g. those in peri-urban areas) may be able to overcome some of these problems by tapping demand in urban areas. Urban populations are growing at 5% per year, increasing the demand for food in these areas. The majority of urban dwellers

rely on purchased food products to meet their food needs. The effective supply of urban markets is of huge developmental importance. There has been a decline in urban nutrition levels in Zimbabwe, since, for example, the younger unemployed are often overlooked by government and donor programmes (Department for International Development, 1999).

The problems detailed above are particularly acute in the case of, for example, horticultural products. At the current time, losses of horticultural products due to spoilage are significant and as a result small-scale producers typically have limited access to higher value markets in urban areas. Odunfa observed losses as high as 60% in fruits and vegetables, between 40-50% for roots and tubers, and losses of 20% for grains (Odunfa, 1995). Further, even in circumstances where small-scale producers can access markets, returns on unprocessed products are typically low. Processing of horticultural products using appropriate technologies is seen as a mechanism to reduce spoilage and add value and, in turn, to enhance the livelihood of poor small-scale producers. Additionally, given the rise in popularity of convenience and snack foods in urban areas, demand must be met, and can provide opportunities for peri-urban-based poor people to benefit from using processing technologies to satisfy these demands.

It has been demonstrated that agro-processing activities are an effective way of eliminating poverty and improving the quality of life of marginalised people (Richter, Basler and Frazen, 1996; McPherson, 1991). Agro-processing activities can contribute to sustainable livelihoods through improved incomes, employment, food availability, nutrition and social and cultural well-being. The Food and Agriculture Organisation (1995) has highlighted that value added through marketing and processing raw products can be much greater than the value of primary production itself. More than 60% of the labour force of sub-Saharan Africa finds work in small-scale food processing and between one and two thirds of value added in manufacturing is based on agricultural raw materials (SMALLFOOD, 1999 citing CTA, 1997).

It is increasingly recognised that appropriate small-scale agro-processing responds to local needs, builds on local knowledge and skills and in most cases uses local resources (Simalenga, 1996; Richter *et al*., 1996). By combining well-established principles, appropriate equipment and good standards of quality and hygiene, small-scale agro-processing enterprises are able to make high quality marketable products. Small-scale agro-processing is particularly suited to poverty elimination since it can be owned, managed and maintained locally. Agro-processing is predominantly a female activity, practised on a daily basis by the majority of women. With additional skills and initial external support, daily activities can be expanded to generate income. Evidence suggests that when women have a role in the decision-making processes in the home, they are more likely than men to spend any extra income on education, nutrition and health (SMALLFOOD, 1999a; 1999d). Further, small-scale food processing is a valuable mechanism to empower women in rural and peri-urban areas (Machete, Reardon and Mead, 1997).

1.2 Research outline

The proposed research will highlight the importance of horticultural production to small-scale producers, and the possibilities for the processing of such products. The processing of food products represents an important potential source of livelihood for the poorest people in sub-Saharan Africa. This project aims to identify the constraints that face small-scale producers and processors of horticultural products, and to suggest ways of overcoming these constraints. The project will investigate problems relating to backward and forward linkages of processing operations, including access to credit, technological capability, supply and demand, quality control, management, social factors and environmental impacts. The project will also address other marketing issues, such as helping to overcome the inherent seasonality and perishability of horticultural crops. The outcome of the project will be solutions to some of these constraints and uptake pathways reflecting the dual roles of the public and private sectors. The purpose of the project is to validate improved processing technologies which increase the value of crops of poor farmers, through improving shelf-life, adding value and thus yielding higher returns, and overcoming seasonal and perishability constraints.

1.3 Objectives

The specific objectives of the research are:

- To identify opportunities for small-scale processing of horticultural products in peri-urban areas of Zimbabwe.

- To identify and, where possible, quantify the market for processed horticultural and/or fruit crop products based on existing and potential consumer demand.

- To estimate the potential additional return to small-scale producers of manufacturing and marketing processed horticultural and/or fruit crop products.

- To identify the knowledge and infrastructural requirements to enable small-scale producers to access potential markets for processed horticultural and/or fruit crop products.

- To identify constraints to the effective manufacture and marketing of processed horticultural and/or fruit crop products by small-scale producers.

- To identify potential mechanisms to overcome such constraints.

- To communicate the above knowledge base to small-scale producers, processors, policy-makers and NGOs.

- To contribute to the improvement of the horticultural supply system - improve the range and accessibility of safe processed horticultural and/or fruit crop products to peri-urban consumers, and increasing incomes and employment for producers and intermediaries.

1.4 Outline of research activities

Phases of Research	
Phase 1: Literature review and sub-sector analysis of horticultural sector	
1	Literature review
2	Consultation with key informants
2.1	*Selection of study sites*
3	Identification of key horticultural products in the regions under study
3.1	*Selection of study products*
4	Sub-sector analysis of marketing chains for study products
Phase 2: Empirical data collection	
5	Identification of potential market for processed products
5.1	*Survey of products on market*
5.2	*Urban/peri-urban consumer survey*
6	Requirements to access potential market for processed products
6.1	*Case studies with small-scale producers/processors*
6.2	*Producer/processor survey*
7	Identification of potential solutions
7.1	*Interviews with providers of technical assistance, policy-makers, producer/processor organisations*
8	Validation of potential solutions
8.1	*Interviews with sub-sample of producers/processors*
9	Policy recommendations

1.5 Location of the study

The project will be undertaken in Zimbabwe, in areas that are mostly peri-urban, although the project will aim to assess the nature of the marketing chain for processed products, which will entail some assessment of rural suppliers. The commodity base will be fruit and vegetables. The research will cover horticultural products that are potentially income-generating in their processed form (for example mufushwa, soups, jams, fruit juice, dried fruits, snack products). Two broad types of processed horticultural products will be selected and these shall remain the focus of the study throughout.

The research will be carried out in areas where there is a significant potential for small-scale processing of horticultural products. Candidate areas include Chivi, Mutoko and Mudzi (Mashonaland East Province) and Mutare (Manicaland Province). The project shall focus on domestic or other near-markets (such as cross border trade with Mozambique or Zambia). It is felt that smallholders in such regions are likely to benefit more from increasing the value of the products they market locally than in striving for the export trade. However, evidence from export success stories involving smallholders can be instructive. In particular, institutional factors, such as the way producers are organised, can be of importance in determining whether an initiative will be successful (see for example Loader, 1997; Marsden, 1990). Marsden (1990) also notes that, although African entrepreneurs appear to be efficient, the informal sector may not be especially dynamic, with respect to institutions and organisation, and that training of workers (in simple management, processing, and marketing techniques) in this sector is of paramount importance in mobilising resources successfully.

1.6 Organisation of literature review

What follows, is a summary of the existing literature on the horticultural sector in Zimbabwe and small-scale processing in particular. Chapter 2 gives a brief introduction to the agricultural sector in Zimbabwe. This is followed by a look at the nature of horticultural production and the main production systems involved (Chapter 3). Chapter 4 looks at the growth of small-scale enterprises in Zimbabwe and the nature of small-scale processing industries. It discusses the techniques used by small-scale enterprises to process horticultural products. Chapter 5 looks at the horticultural sub-sector, tracing the path from production to marketing of produce, highlighting the key functions, technologies and participants involved. Chapter 6 discusses the potential socio-economic benefits to small-scale processing of horticultural products. Chapter 7 discusses some of the macro and micro constraints faced by small-scale producers and processors. Chapter 8 presents some conclusions.

2. ZIMBABWE'S AGRICULTURAL SECTOR

2. 1 The role of agriculture in the Zimbabwean economy

Agriculture dominates Zimbabwe's economy despite the fact that its contribution to Gross Domestic Product (GDP) is less than 20%. Agriculture provides an income to about 75% of the country's 12.5 million population, approximately 70% of which reside in rural areas[1] (Ministry of Public Service, Labour and Social Welfare, Social Development Fund Unit, 1997). As Table 1 shows the agricultural sector accounted for 48% of exports in 1985, and 51% of exports in 1996 (Muir, 1994 citing CSO, 1990; CSO, 1998). Export earnings from agriculture and food products were estimated at Z$1.55 million in 1990, increasing to Z$10.7 million by 1996 (CSO, 1998). Agriculture provided around 27% of formal employment opportunities in 1995.

Table 1. Percentage share of major economic sectors in selected years

	GDP				**Exports***				**Employment+**				**Investment**	
Sector	*1980*	*1985*	*1990*	*1995*	*1980*	*1985*	*1990*	*1996*	*1980*	*1985*	*1990*	*1995*	*1980*	*1985*
Agriculture	14	16	14.8	14.0	37	48	42	51	32	26	24.3	26.9	12	7
Distribution	14	10	15.2	16.5	2	3	2	3	7	7	8.0	8.1	3	6
Manufacturing	25	24	20.5	16.7	19	14	30	22	16	16	16.5	15.0	19	15
Mining	9	8	3.9	14.0	39	30	1	2	7	5	4.3	4.8	13	3
Public#	16	22	14.1	12.6	-	-	-	-	13	19	19.0	17.6	15	25

Source: Muir, 1994, quoting CSO, 1990; Reserve Bank, 1991 (for 1980 and 1985 figures); CSO, 1998 (for 1990 and 1995/6 figures)

**Calculated from SITC classified Table 12.3, CSO, 1989 and Table 12.2, CSO, 1998 (excludes gold)*

Distribution reflects Tourism as a percentage of exports. Iron, steel and ingots account for over 70% of manufactured exports. Agricultural exports include wattle extract and poles.

+Formal sector employment

#Non-material production made up primarily of wages includes Health, Education, Defence and Public Administration

2.2 Zimbabwe's agro-ecological regions

Zimbabwe's agricultural sector is characterised by five agro-ecological regions, as shown in Table 2 below. The main criterion used to determine these regions is rainfall, as it is the main factor conditioning agricultural production in Zimbabwe. The regions are numbered in descending order of agricultural productivity. Natural Regions I and II represent prime agricultural land, which receives high rainfall. By comparison Natural Region V is non-arable and average annual rainfall is below 500 mm (Muir, 1994).

Natural Region I contributes significantly to large and informal markets of fruits and vegetables (especially tomatoes and bananas) and also the production of tea. While maize dominates Region II, cotton, groundnuts and vegetables are also widely produced. Natural Region III is dominated by maize, though cotton, groundnuts and sunflower are also important. Natural Regions IV and V are too dry for successful crop production without the

[1]Approximately 90% of the rural population still depend on agriculture for all or part of their livelihood. However, a large proportion of rural inhabitants (between 50-75%) also participate in rural non-farm activities to supplement their agricultural earnings.

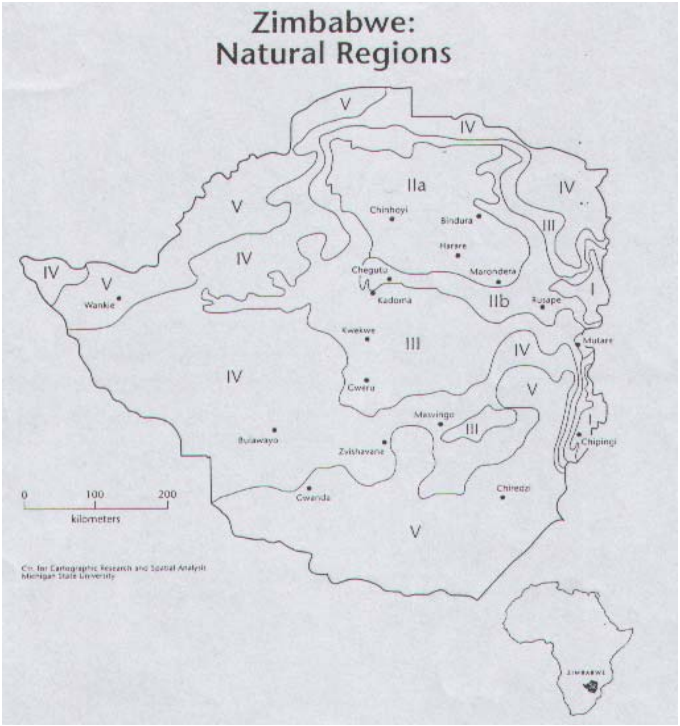
aid of irrigation.[2] Small grains (especially millet) are the major crop, though yields tend to be low (Shumba, 1992; Muir, 1994). The geographical location of the regions is shown in Figure 1 below.

Table 2. Natural Regions of Zimbabwe

Natural Region	Land Area (ha.)	As % of Total Land	Characteristics
I	613,233	1.56%	1050mm plus of rainfall per year, some rain in all months. Relatively low temperatures.
II	7,343,059	18.68%	700-1,050mm of rainfall per year, with rainfall confined to summer. Region IIa has generally reliable rainfall and is suitable for intensive farming. Region IIb, rainfall is less reliable with more risk of mid-season dry spells.
III	6,854,958	17.43%	500-700mm of rainfall per year with relatively high temperatures and infrequent, heavy falls of rain. Subject to seasonal droughts.
IV	13,010,036	33.03%	450-600mm of rainfall per annum. Subject to frequent seasonal droughts.
V	10,288,036	26.2%	Normally less than 500mm of rainfall per year. Very erratic rainfall. Northern lowveld may have more rain but topography and soils are poor.
Remainder	1,220,254	3.1%	Unsuitable for any form of agricultural use.

Source: Muir, 1994; Jackson, Turner and Matanda (Eds.), 1997; CSO, 1998

Figure 1. Map of Zimbabwe showing Natural Regions



Source: Rukuni and Eicher (ed.), 1994, provided by the Centre for Cartographic Research and Spatial Analysis, Michigan State University

In addition to the above classification, Zimbabwe is broadly divided into three physiographic regions distinguished primarily by altitude: Highveld, 1,200-1,700m; Middleveld, 900m-

[2] It is worth noting that smallholder (communal areas and resettlement schemes) irrigation covers a mere 5% of the total irrigated land area in Zimbabwe, estimated at 150,000 ha (Manzungu and van der Zaag, 1996 citing IFAD, 1994). See Chapter 7, Table 35 for distribution of irrigation development by landholding category.

1,200m; and Lowveld, up to 900m. These regions represent 25%, 40% and 35% of the country's total land area respectively (Muir, 1994).

2.3 Zimbabwe's dual agrarian structure: Large-scale commercial versus small-scale farming sector

An important characteristic of Zimbabwe's agricultural sector is that it is made up of two major sub-sectors; namely the large-scale commercial and the small-scale farming sector (Rukuni, 1994; Muir, 1994). The former comprises about 4,500 large farms on approximately 11 million ha of land (See Table 3 below). Farms average 2,500 ha in size, are normally held under freehold title, and generally occupy the highly productive agricultural land (Rukuni, 1994; Mabaya, 1998; Muir, 1994).[3]

For example, the mostly white commercial farmers own approximately 64% of land in Natural Region I and 77% in Natural Region II (Mabaya, 1998). In terms of production levels, the sector accounts for approximately 86% of agricultural produce (Muir and Blackie, 1994, citing African Economic Digest, 1990). Small-scale farmers and the Agricultural and Rural Development Authority (ARDA)[4] account for the rest (Turner and Chivinge, 1999 citing Rukovo, 1991). The large-scale sector produces for both local and international markets.

Table 3. The share of large-scale and small-scale farms in agriculture (1990)

	Small-scale farms*	**Large-scale farms**
Land (ha.)	20,893,700	11,213,386
Population	4,662,000	1,713,000#
Total Production	Z$ 551,000,000	Z$ 1,335,000,000
Marketing Board Purchases	Z$ 225,000,000	Z$ 1,200,000,000

*Small-scale includes small-scale commercial, communal and resettlement
#Rural Council 1982 census updated. Includes any people on resettlement schemes in these areas prior to 1982.
Source: Muir, 1994, citing Central Statistics Office unpublished Agricultural Production Accounts

The smallholder sector on the other hand, is made up of three sub-sectors, namely small-scale commercial farms, resettlements areas and communal lands. The size of small-scale farms varies (usually between 1-5 ha.) depending on the land tenure system in question (Turner and Chivinge, 1999).

Resettlement areas are a product of the government's land distribution programme, established on land purchased from the large-scale commercial farming sector after independence. A variety of land tenure exists in this sector, including individual ownership,

[3] The number and area of large-scale commercial farms has been decreasing since 1980, mainly due to the government's land distribution programme (CSO, 1998).
[4] ARDA is a parastatal, which plans, co-ordinates, implements and promotes agricultural and rural development in Zimbabwe, through various schemes dedicated to the development and utilisation of specific state lands (CSO, 1998).

co-operatives, leaseholds and the right to 'avail'.[5] By 1997, approximately 247 resettlement schemes had been set up, occupying 8.6% of all land. Farms average 5 ha in size, but settlers are also given access to communal grazing land. (CSO, 1998).

Also included in the small-scale sector are approximately 9,650 small-scale commercial farms (held under freehold title) totalling 1.5 million ha of land or 4% of the total land area. Farms average 148 ha in size (Ibid.). The small-scale commercial farming sector is situated in the former African Purchase Areas (Whingwiri, 1992).

The communal lands are characterised by poor rural indigenous households whose main activity is subsistence farming, though some do supply local markets. Communal Areas are home to the majority of small-scale farmers, where land is held under traditional and communal ownership.[6] By 1997, approximately 5.4 million farming households lived in these areas, occupying 16 million ha of land, or 42% of the total land area. However, the majority of this land is largely marginal land (CSO, 1998). Typically communal farms in Zimbabwe average 23 ha in size, of which only 1.89 ha is arable land and the rest non-arable (CSO, 1999a). Communal farmers represent 51.4% of Zimbabwe's total population (See Table 4).

Table 4. Distribution of population by land sector (1992)

Land Sector	Proportion of Total Population (%)
Communal Lands	51.4
Large-scale Commercial Farms	11.3
Small-scale Commercial Farms	1.6
Resettlement Areas	4.1
State land	0.4
Urban areas	31.2

Source: UNDP, Poverty Reduction Forum and IDS, 1998
citing CSO, 1994, Census 1992 National Report

Some small-scale producers are also incorporated under the Agricultural Technical and Extension Services (Agritex)[7] who run communal irrigation schemes exclusively for smallholders and advise them on the appropriate cropping programme to follow (Rukovo, 1991). Agritex provides supportive and logistical facilities to horticultural producers in the Communal Areas, though little has been done in promotion of this sector. Great potential exists however, for the small-scale sector to supply domestic markets. In 1991, there were an estimated 8,460 ha under smallholder irrigation schemes where farmers cultivated between 0.1 and 2 ha of land, over 90% of which was under horticultural crops (Utete, 1995).

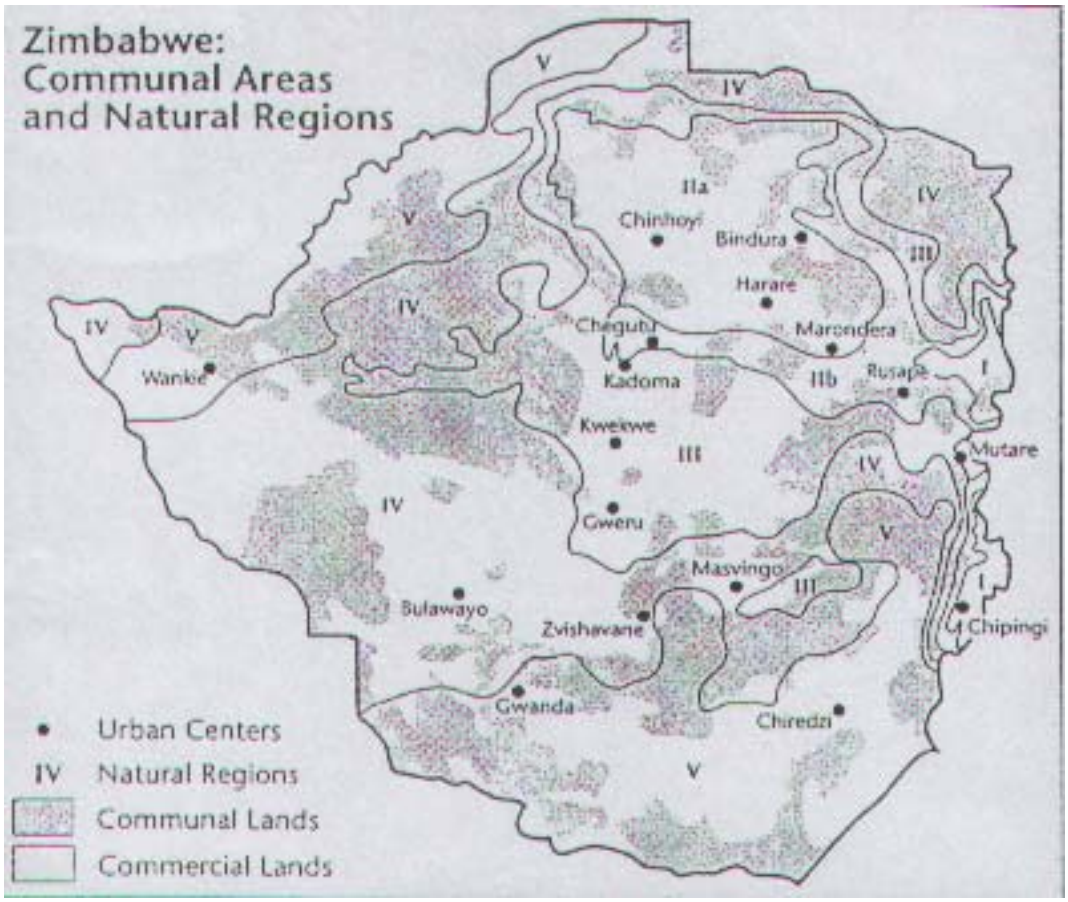
[5] The right to 'avail' includes the right to have land for cultivation, the use of natural resources on the land, and the right to have a site on which to build a home. It also includes the right to graze livestock on communally held areas (Whingwiri, 1992:3).

[6] Communal ownership confers individual rights to plots for houses, gardens and fields, with shared but 'unlimited' access to grazing land. The land belongs to the state, and consequently, the farmer does not have full rights of ownership under this agreement. The farmer may not sell the land, nor may the usufruct rights be sold. The right of allocation of plots rests with local government authorities. (Muir, 1994; Whingwiri, 1992).

[7] Agritex (within Ministry of Agriculture) implements government policies relating to agricultural development, and to improving the dissemination of existing and new knowledge resulting from research. One of Agritex's activities involves the development of smallholder irrigation throughout the country (CSO, 1998).

In contrast to large-scale commercial farms, small-scale production units tend to be located in regions of low agricultural potential, with low or erratic rainfall (Rukuni, 1992). For example, 89% of small-scale farms are located in Natural Regions III, IV and V, where cropping is not well suited to local agro-ecological conditions (Chasi and Shamudzarira, 1992). 70% of the communal lands and 44% of small-scale commercial farms are located in the least productive agro-ecological zones (NR IV and V), with little infrastructure, traditional management and low output (Rukuni, 1994; CSO, 1998; Whingwiri, 1992). Communal farmers merely occupy 20% of the land area in NRI and 21% of NRII (Rukuni, 1994). In terms of resettlement schemes however, most people have been resettled in NR II (Whingwiri, 1992). The following map shows the distribution of commercial and communal lands across the five agro-ecological zones (as recorded in 1992).

Figure 2. Zimbabwe: Communal Areas and Natural Regions



Source: Whingwiri *et al*. (ed.), 1992

3. ZIMBABWE'S HORTICULTURAL SECTOR

Up until the early 1990s, horticultural production was mainly practised on large-scale commercial (LSC) farms and was dominated by fruits and vegetables. With the liberalisation of markets since 1991[8] however, there have been significant changes in the structure of horticultural production systems and the geographical scope of the sector, to incorporate not only new producers but also new varieties of produce.

3.1 Geographical location of horticultural production in Zimbabwe

Horticulture[9] is a specialised form of farming that demands a fairly wet climate, good soils, relatively low temperatures and a consistent water supply throughout the year (Muir, 1994). The production of horticultural crops (on both large and small-scale farms) tends therefore to be concentrated in Natural Regions I, II and III, which receive in excess of 500mm of rainfall per year (See Table 2). It is estimated that about 20,000 ha of land in Zimbabwe is under *vlei* vegetable production. V*lei* land tends to become waterlogged in the wet season. However, this land can retain moisture well into the following dry season, and hence it has always been a popular focus for cultivation[10].

Horticultural production is usually located near major urban centres, along intercity roads that connect urban settlements, and along the main feeder roads linking rural areas to urban markets. This is largely due to the fact that production favours greater proximity to markets for ease of supply of inputs and extension services and ultimately for transportation and marketing of perishable produce (Bhila, Personal Communication).

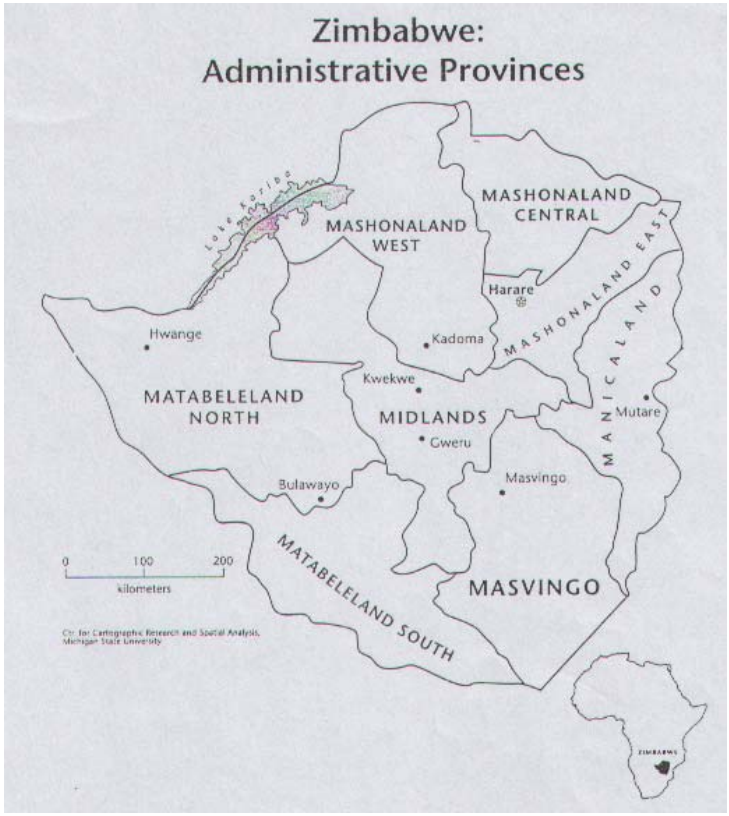
Extensive research carried out across Zimbabwe suggests that the most prominent small-scale horticultural regions are those close to Harare in the Mashonaland East Province, and also around Mutare in Manicaland Province (Shumba, 1992; Makhado, 1992; Rukuni and Makhado, 1994; Manzungu and van der Zaag, 1996; Bolding, 1996; Bolding, Manzungu and van der Zaag, 1996; Matsika, 1996; Turner *et al,* 1997; and Turner and Chivinge, 1999). Figure 3, which follows, shows the location of the various provinces. In Mashonaland East the main horticultural areas are Mutoko, Uzumba Maramba Pfungwe, Murehwa, Marondera, Domboshava and Mahusekwa. In the Eastern Highlands where the climate is conducive to diversified and specialised farming, horticultural farmers are located in the Honde Valley, Nyanga, the Rusitu Valley and Nyanyadzi. Bulawayo and Gweru have a dry to moderate climate and do not support a significant horticultural sector. In these and other dry areas like Masvingo, horticulture production is difficult without the aid of irrigation from wells, dams or boreholes (Turner and Chivinge, 1999).

[8] A consequence of the programme of economic policy reform adopted by the Government of Zimbabwe.

[9] 'Horticulture' is usually taken to refer to the cultivation of vegetables, but it also includes fruit, flowers, mushrooms, and roots and tubers (FAO², year unknown). 'Horticultural product' refers to dried, fresh or processed flowers, fruit and vegetables or any product or by-product (whether processed or not) that results from horticulture or the processing of flowers, fruit and vegetables.

[10] However, growing crops on *vlei* land is forbidden by current national environmental protection legislation (Bowyer-Bower and Tengbeh, 1997).

Figure 3. Administrative Provinces of Zimbabwe



Source: Rukuni and Eicher (ed.), 1994

The location of LSC horticultural farms is more defined. They are mainly located within a radius of 50km from the main urban centres, especially around Harare, which dominates national demand for horticultural produce (Poole, Kydd, Loader, Poulton and Wilkin, 1999). Proximity to urban areas ensures access to infrastructure facilitating ease of transportation of produce to national markets but also to international markets via airfreight. The main determining factor for the location of small-scale horticulture is not the market however, but the availability of water for irrigation purposes. Although access to water supply is also important for the LSC sector, this sector has the advantage of being overwhelmingly located in Natural Regions I and II with higher levels of rainfall. Many large-scale farms have access to water supplies via dams. Small-scale horticultural production tends to be scattered across the countryside depending on the availability of water and soil type present (Jackson, Turner and Matanda, 1997).

3.2 Types of produce cultivated

Zimbabwe produces a wide range of fruits and vegetables. Table 5 shows the diversity of vegetables grown during the dry and rainy season (tomatoes, cabbage, rape, onion, beans, gemsquash, cucumbers, okra, and carrot among other crops). The majority of vegetables can be cultivated all year round (either in full or erratic supply). Sugar snaps and mealies are the only products that have a supply period of less than 6 months of the year. Table 6 shows the range of fruits available throughout the year. The seasonal availability of fruit is more skewed than that of vegetables. Blueberries, guava, lychees, papaya, peaches, plums, quinces,

raspberries and youngberries have relatively short supply periods of between 2 and 4 months per year.

Table 5. Vegetable crop calendar for Zimbabwe

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Asparagus												
Baby corn												
Beans												
Broccoli												
Butternut												
Cabbage(Chinese)												
Carrots												
Cauliflower												
Celery												
Chillies												
Courgettes												
Cucumber												
Fennel												
Garlic												
Gemsquash												
Ginger												
Herbs Mixed												
Hubbardsquash												
Kholrabi												
Leeks												
Lettuce												
Mange tout												
Mealies												
Mint												
Mushrooms												
Okra												
Onions												
Parsley												
Parsnips												
Patipan												
Peas												
Peppers(Sweet)												
Pumpkins												
Radish												
Rape												
Spinach												
Spring onions												
Sugar snaps												
Sweet corn												
Sweet potatoes												
Tomato Cherry*												

Source: Horticultural Promotion Council of Zimbabwe, 1998, *Grown specifically for the export market

	Full Supply
	Erratic
	None

Table 6. Fruit crop calendar for Zimbabwe

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Apples Zim												
Apricots												
Avocados												
Bananas												
Blue Berries												
Easy Peelers												
Grapefruit												
Guava												
Kiwi fruit												
Lemons												
Lychees												
Mangoes												
Melons Sweet												
Nectarines												
Oranges												
Passion Fruit												
Papaya												
Peaches												
Pears												
Physalliz												
Pineapples												
Plums												
Quinces												
Raspberries												
Rhubarb												
Strawberries												
Tangelos												
Youngberries												

Source: Horticultural Promotion Council of Zimbabwe, 1998

	Full Supply
	Erratic
	None

The interrelationship between climate and crop characteristics essentially dictates the type and variety of crops that can be grown. Some areas are not suitable for particular crops. For example, tomatoes and potatoes cannot be grown in Mutoko because of winter frosts. In Mashonaland East, tomato is the most predominant produce save for the resettlement areas of Mutoko and Murehwa where rape is equally important. In addition, climatic conditions have a bearing on optimum yield potential for each crop grown in an area. Research has indicated that input levels and management variables are generally more favourable for crop production in large-scale than small-scale farming sectors. Consequently, yields tend to be much higher on LSC farms (Shumba, 1989; 1992; Chasi and Shamudzarira, 1992; Rukuni and Makhado, 1994).

3.3 Growth of the horticultural sector in Zimbabwe

Since independence in 1980 and the subsequent lifting of sanctions, the horticultural sector has opened up quite dramatically to the external market and there has been a rapid expansion in horticultural production (Rukovo, 1991). Since the establishment of the Zimbabwe Export Processing Zones Authority (ZEPZA)[11] in 1995, the horticultural sector has witnessed a substantial upsurge in foreign direct investment in the areas of agricultural production, agro-food processing and the distribution and marketing chain. Horticulture represents one of the fastest growing sub-sectors in agriculture in Zimbabwe, after tobacco.

The expansion of LSC horticulture in particular has been explosive, benefiting from research and information flows between large-scale farmer organisations such as the Commercial Farmers Union, commercial input suppliers, and food processing industries and export companies. Data provided by the Horticultural Promotion Council suggests that during the last decade, large-scale horticultural production for the export market has grown rapidly. In the 1986/87 season, 6,000 tonnes of horticultural produce were exported at a value of US$6 million. By the 1996/97 agricultural season however, exports of horticultural produce had increased dramatically to 54,000 tonnes, worth a total value of US$103 million (Horticultural Promotion Council, 1998). In Sub-Saharan Africa in general, horticultural exports had increased by 150% in value terms between 1989 and 1997 (Dolan and Humphrey, 2000). Changes in European dietary habits and increased demand for convenience foods for example, have led to a growing consumption of fresh fruit and vegetables in the EU[12] (Ibid.).

Zimbabwe's horticultural sector has been able to remain internationally competitive owing to adherence of specifications on product quality. The industry is currently formalising a national Code of Practice which sets out to standardise practices and assure consumers of high quality produce which meets food safety standards and hygiene requirements, among other criteria (Horticultural Promotion Council, 1998). According to the Horticultural Promotion Council, this Code of Practice will ensure that produce is cultivated with the necessary precautions being taken to protect consumers, workers and the environment (Ibid.).

The extent of smallholder participation in the horticultural sector is not clear. The numbers of producers involved in horticultural production are constantly fluctuating. Furthermore, data is lacking as few studies have focused on small-scale horticultural production in particular (Turner and Chivinge, 1999). Evidence would seem to suggest however, that small-scale farmers are making an increasingly important contribution to the horticultural sub-sector in Zimbabwe. This is especially true across the 141 smallholder irrigation schemes, totalling 8,460 ha of land (Utete, 1995). It is estimated that over 90% of this land is under horticultural crops. The main vegetables grown on irrigation schemes include tomatoes, cabbages, rape, onions, carrots and potatoes. Fruit production has been recently introduced with particular interest being shown to citrus production.

[11] Export Processing Zones are a very new feature in Zimbabwe. A large number of companies that export agricultural and horticultural produce were already doing so before the advent of the EPZ authority. The EPZ is a designated area where the factories can operate from, though many of the big companies are outside these areas. The EPZ which is a parastatal, has experienced problems however, and companies such as ZIMFREEZ in Ruwa have already closed and auctioned its equipment.

[12] The UK market accounts for over 50% of horticultural exports from Zimbabwe (Horticultural Promotion Council, 1998).

Even though horticulture may be considered a secondary activity to field crop production, it appears to be an important activity for many smallholder farmers across the country, especially in Mashonaland East Province. In their study there, Turner and Chivinge (1999) found that 22% of farmers reported that they give horticulture first priority; 68% and 10% reported that they give it second and third priority respectively. Smallholder horticultural production has become increasingly important, not only in terms of household food security and household income but also in terms of the diversification of agriculture.

One of the reasons for increased participation of smallholders (especially those on irrigation schemes) in the horticultural sector relates to the declining profitability of maize production. This relates to rising input prices and the implementation of policies by the government to restrain the maize producer price. This has led to agricultural diversification by many LSC producers and smallholders, from maize to horticultural production (Poole *et al*, 1999:77).

The growth in sub-contracting arrangements between farmers and agro-food processors, wholesalers, hotels and schools for example, represents another area of growth in horticultural production. This process may be linked to an increase in the production of fruits and vegetables for the international market, but furthermore to the growth in national (particularly urban) demand for such products (See section 3.6).

3.4 The main horticultural production systems

3.4.1 Large-scale commercial production

The large-scale horticultural sector is diverse. It includes fresh produce, mainly vegetables but also fruits and flowers. While large-scale production of horticultural produce is mainly directed at the export market, the sector also supplies local supermarkets (TM, SPAR, OK and Bon Marché) and agro-food processing companies.[13]

In terms of LSC fruit production, exports include citrus, sub-tropical and deciduous fruits. Citrus (oranges, easy peelers, grapefruit and lemons) have a commanding position in terms of export volumes. Production takes place around the Beitbridge area and currently exports are in the order of 8,000 tonnes (Muchena, 1994). Sub-tropical fruit exports include bananas, passion fruit (available all year round) and seasonal fruits such as kiwi, lychees, mangoes, pineapple, melon and papaya. Deciduous fruits (peaches, nectarines, apricots, plums, apples, pears, stonefruit, strawberry and grapes) are mostly grown in the Eastern Highlands where the climate is more temperate.

With respect to vegetables, traditional best sellers include mange tout, baby corn, sugarsnap peas, fine beans and runner beans (Horticultural Promotion Council, 1998). Potatoes, cherry tomatoes, sweet corn and chillies are also exported. Farmers contracted to HORTCIO[14] and Selby Enterprises[15] grow baby corn and chillies (Chivinge and Turner, 1999; Farming World, 1998). New lines of produce are being added to the export market, including baby exotics

[13] Such as CAIRNS Holdings, Selby Enterprises, Blue Ribbon Foods, Lever Brothers, National Foods, Heinz, Valley Canners Pvt Ltd, Harvest Foods, Fresca Holdings, Marlon Foods and Four Seasons Pvt Ltd, Utopia Fresh Exports Pvt Ltd, Irvin and Johnson, Lyons Zimbabwe Pvt Ltd, Headlands Fruit Pvt Ltd (Horticulture Zimbabwe Directory 1997-1998, ARA Techtop Consultants Harare 1998).
[14] A company that produces and packages vegetables for the export market.
[15] Export company that produces and packages fruit and vegetables.

(baby marrow, baby squash, baby carrots), paprika, chillies and salad onions. According to the Horticultural Promotion Council (1998), new variations of presentation and processing of fresh produce are a focal point of the rapidly expanding export market. These include mixed vegetable packs, pre-washed vegetables, or (washed, sliced and diced) vegetables, which are ready to cook.

Table 7 below shows the quantities of fruit and vegetable products exported during 1997 and 1998. Fresh and dried fruits and nuts represented the greatest quantities of exports during this period. Despite the large quantities of fruit and vegetable products exported, it is interesting to note that Zimbabwe also imports large quantities of horticultural produce.

Table 7. Imports and exports of selected fruit and vegetable products, 1997/98

Export Description	Export Quantity (1997)	Export Quantity (1998)	% Growth Exports (1997/98)	Import Value Z$000 (1997)	Import Value Z$000 (1998)
Fruits and nuts (except oil nuts): fresh or dried	28,794,559	48,379,997	68.02%	66,052	55,834
Fruit and vegetable juices: unfermented without spices	1,229,848	1,034,141	-15.91%	34,003	29,463
Fruit, preserved and fruit preparations	1,090,449	712,777	-34.64%	8,053	3,156
Vegetables: fresh, chilled, frozen or preserved and dried	9,429,571	8,107,376	-14.02%	46,646	64,348
Vegetables, roots and tubers: prepared or preserved	2,014,438	2,050,289	1.78%	25,204	18,789
Total	42,558,449	60,284,580	41.65%	179,958	171,590

Source: SMALLFOOD, 1999a citing ZIMTRADE, 1999 and World Bank, 1998/99

Flower exports (the pioneering commodity of the country's horticultural export industry) are carried out under the Export Flower Growers Association. In 1998, it was estimated that producers earned a total of US$70 million from 17,000 tonnes of produce (Horticultural Promotion Council, 1998). The main flowers grown for the export market include roses, asters, chrysanthemums, astromelia, and ammi majus (Muchena, 1994). Due to of the high capital investment required for floriculture (e.g. $2.5M/ha for roses), there is little prospect that smallholder farmers may become actively involved in this sector (Utete, 1995). However, Utete suggests that smallholders may be able to participate in outgrower schemes, for example in the case of cultivating ammi majus (Ibid.).

3.4.2 Small-scale production

In Zimbabwe nearly every homestead (both urban and rural) cultivates a dryland vegetable plot or dambo (wetland), at least for its own food production during May to September. The predominant cropping patterns are maize or cotton in summer, followed by beans and vegetables in winter. Maize remains the most important crop however, and its importance increases particularly during drought periods (Shumba 1992; Makhado, 1992; Rukuni and Makadho, 1994). Inter-cropping is common, particularly of field crops and horticultural crops, e.g. maize and pumpkin, maize and beans, or cow peas and maize or sorghum. Multiple cropping makes more efficient use of land and water resources than single cropping, and it also reduces food insecurity during crop failure and/or market failures (e.g. a glut in the market). Research conducted by Nzima (1997) in the Lowveld indicates that farmers can realise higher productivity and incomes from 0.1 ha under multiple cropping than they can from employment on other farms. The other advantage of inter-cropping or multiple-cropping is that it promotes crop rotation, reducing the incidence of disease and pests, e.g. red spider mites in tomatoes and maize streak virus in green mealies (Poulton *et al,* 1999).

Small-scale horticultural producers are divided between those who produce principally for household consumption and those who produce mainly for the market.[16] It seems that whether the farm produces for consumption only or also sells on the market is largely determined by the availability of water, especially during the dry season. Farmers who enjoy close proximity to irrigation sources or whom have adequate water supplies during the dry season have greater potential to produce for the market throughout the year.

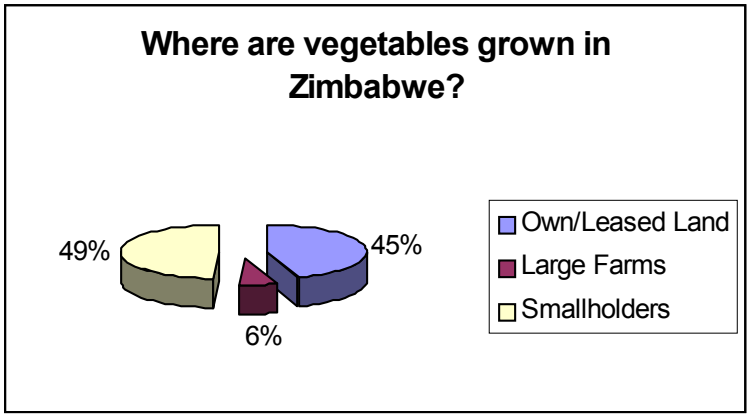
The diversity of produce that may be grown is great as highlighted previously in Tables 5 and 6. While some crops are largely produced for home consumption (cabbage, rape and onion for example), others such as baby corn, baby marrow and mange tout are specifically for direct sale on the national market (traditional urban wholesale and retail markets), or produced on a contract basis for the export market (CIIFAD, 1999:36, citing Kandiwa). Dolan and Humphrey (2000) suggest however, that small producers and exporters are largely excluded from the fresh fruit and vegetable export market chain. Although there are cases in Kenya where small-scale farmers have participated in the export market on a co-operative basis, to date there has been few such examples in Zimbabwe. Although trials by export companies with communal farmers in Mutoko, Murehwa, Musana and some irrigation schemes yielded good production results, the quality of the product tended to deteriorate as it passed through the distribution chain due to poor infrastructure (Sena, 1997). Small-scale farmers however, are experimenting with new crop varieties, such as new tomato cultivars like Heinz and Florade, for example in Mutoko, Murehwa, Goromonzi and Uzumba Maramba Pfungwe regions (Turner and Chivinge, 1999).

It is estimated that Z$75 million worth of horticultural trade may be happening on domestic markets (Sena, 1997). Smallholder farmers supply approximately 40% of all fruit and vegetables consumed in urban areas, most of which is sold through the informal sector. About 1% of produce from smallholder farmers goes through formal markets, a very small percentage of which ends up on the export market (Utete, 1995; Poole *et al*, 1999 citing Gordon, 1997).
Makaya (1994) suggests that in as much as politicians, agricultural economists, extension agents and research personnel alike, would like to see communal farmers participating in the

[16] Most small-scale farmers however, consume at least part of their harvest.

export market, very few appreciate the latter's situation. Among other factors, communal farmers are constrained by poor infrastructure, and lack up to date market information and extension services (Makaya, 1994; Poole *et al*, 1999). Makaya (1994) argues that unless there are deliberate efforts to create a strong foundation on which small-scale farmers may build up their participation, the hope of involving them in lucrative markets will remain meaningless.

Figure 4. Where are vegetables grown in Zimbabwe?



Source: Dolan and Humphrey, 2000

3.4.3 Sub-contracting arrangements

While independent large and small-scale production of horticultural crops represents the main production systems present, another relates to contract farming. Producing under contract is usually associated with significantly higher incomes compared to selling on local urban markets. Contract farming consists of an agreement usually between a farmer and a wholesaler or food processing company. Contract farming is very prominent especially for crops such as cotton, paprika, sorghum, millet, beans, mange tout peas, baby corn, passion fruit and flowers (Turner and Chivinge, 1999). The main companies involved in contract farming include the Cotton Company of Zimbabwe; Paprika Zimbabwe; Chibuku Breweries (for sorghum); CAIRNS Food[17], HORTICO, Hyveldt Horticulture Zimbabwe[18], Nutresco[19] and Selby Enterprises (vegetables). Oceanic and Outspan[20], FRUPAC[21], FAVCO[22], Interfresh and Wholesale Fruiterers[23] have contract arrangements with small-scale fruit producers.

[17] One of the largest food processing companies in Zimbabwe listed on the stock exchange.
[18] A fruit growers consortium which specialises in citrus and other sub tropical fruit. Also works in fruit tree nursery development.
[19] Communal Area farmers were supplying dried vegetables to Nutresco (large food processing company), which processed the vegetables into packaged consumer products such as dried packet soups and TVP relishes (Murphy, 1996:35). CA farmers were also supplying fresh fruit to Go Green Products (a drying company). Also case of CA farmers supplying sun-dried peppers to a number of commercial farmers in Rusape who were involved in the export market (Ibid, citing Chipika, 1990).
[20] Specialises in the packaging and exporting of fruits especially citrus.
[21] An exporter.
[22] Supplies grocery stores and supermarkets.
[23] Wholesale Fruiterers is a division of Interfresh.

Highveld Seed Co subcontracts large-scale farmers to grow paprika and marigold flowers, providing them with seeds and extension services; it does not usually have subcontracting relations with small-scale farmers.[24] Smallholders may also develop contracts to supply chain stores (e.g. OK and Bon Marché), schools, hospitals and hotel and restaurant chains that may demand particular quantities of certain horticultural products at specified periods (Turner and Chivinge, 1999). The following series of case studies discuss some of the types of sub-contracting arrangements which exist in more detail.

3.4.3.1 Case studies of sub-contracting arrangements

Case Study 1: Example of contractual agreement between small-scale producers and large-scale food processor, i.e. CAIRNS Food

CAIRNS Food is involved in contract arrangements directly with small-scale farmers in Manicaland Province. The organisation has worked with farmers in the province for over 20 years. Table 8 shows the various crops grown under contract in the different areas.

The small-scale producers who are contracted to CAIRNS work in clubs of between 20 to 50 farmers, where each club has a committee structure. CAIRNS Food deals directly with the committee rather than with each individual farmer within the club. Producers typically crop one hectare of land under contract with the company. The clubs are crucial not only when negotiating crop prices with CAIRNS for example, but also when buying agricultural inputs like fertiliser, as it allows they to buy in bulk. CAIRNS makes an agreement with the committee to buy produce from the farmers provided it meets the quality standards laid down. It may provide farmers with seeds, fertiliser, chemicals and transportation in order to ensure that the produce reaches CAIRNS as fresh as possible. In order to ensure that crops are grown in strict adherence to the required standards, extension officers (from CAIRNS Food) work closely with farmers providing them with necessary technical assistance at each and every stage of the production process (Bhila, Personal Communication with CAIRNS Food).

[24] A1 Seeds is another retail outlet but it does not set up sub-contracting agreements. It merely sells seeds to small-scale farmers across horticultural producing areas such as Murehwa, Mutoko and Uzumba Maramba Pfungwe districts (Turner and Chivinge, 1999).

Table 8. Crops produced by small-scale farmers in Manicaland Province under contract to CAIRNS

Area of Manicaland	Number of small-scale farmers	Crops grown
Mutambara	400	• Tomatoes • Peas • Beans
Nyanyadzi	250	• Tomatoes • Sugar beans • Peas
Maunganidze	150	• Tomatoes • Beans • Peas
Taona	200	• Beans • Tomatoes
Mutema	300	• Navy beans
Tonhorai	100	• Tomatoes
Musikavanhu	300	• Tomatoes • Sugar beans

Source: Bhila, Personal Communication with CAIRNS Food, Mutare

In spite of their contractual agreements with CAIRNS Food, some small-scale farmers have subsequently sold their crops to the fresh produce markets of Mutare and Harare. This was due to the fact that farmers negotiated higher prices on such markets.

Case Study 2: Example of contractual agreement between irrigation scheme and food processing company- OLIVINE Industries

In the past Olivine Industries had contractual agreements with small-scale farmers in the Communal Areas, but have since ceased such agreements for the following reasons.

- Farmers were dispersed and therefore logistical support, such as provision of seed and seedlings, was difficult.
- Small-scale farmers were too disjointed. Olivine Industries found it difficult to have any control over farmers' actions.
- Produce was often sold to other buyers without any regard for contract obligations. Farmers cited various reasons for defaulting on contracts, such as lack of adequate rains, destruction of crops by animals, lack of capital for inputs like fertilisers, insecticides and irrigation.
- The majority of farmers practised rain fed production in the Communal Areas. Supply of produce was therefore unreliable.

In response to this situation, Olivine Industries switched their attention to irrigation schemes during the 1994/95 season. Small-scale farmers were formed into groups of between 10-100 producers. Each group had its own elected committee, which represented the farmers before Olivine Industries. Olivine Industries currently works with four irrigation schemes at Chibuwe in Chipinge. See Table 9 below for details of the schemes.

Table 9. Details of irrigation schemes working with Olivine Industries

Name of Scheme	Number of small-scale Farmers	Produce grown
Schemes in Chibuwe, Chipinge		
Chibuwe	880	Michigan Pea, Navy Bean
Mutovhoti	(included in above figure)	Michigan Pea, Navy Bean
Musikavanhu	(included in above figure)	Michigan Pea, Navy Bean
Mutema	127	Michigan Pea, Navy Bean
Other schemes		
Nyakomba irrigation scheme Nyama, Nyamaropa	120	Navy Bean for Olivine industries
Ngondoma, Empress Nickel Mine, near Kadoma.	50	Tomatoes and Navy bean for Olivine Industries, which goes to Chegutu Cannery.
Sanyati Irrigation scheme (managed by ARDA)- fairly new scheme.	Rough estimate 100	Scheme is being targeted for tomato production to service the Chegutu Cannery. Olivine Industries provides tomato seedlings to producers.

Source: Bhila, Personal Communication with Olivine Industries
Note: The Navy Bean was developed in America and was used for feeding sailors.

In spite of contract relationships with producers, Olivine Industries' core business is food processing, especially oil processing, bean canning and tomato paste production. The processing of beans takes place at Chegutu Canners, which is owned by Olivine Industries. The plant depends on a grower's base of small-scale farmers. The plant consists of a bean cleaning plant, a processing plant for tomato paste and a canning section.

Olivine Industries supplies producers with seed packs (in the case of beans for example)[25], seedlings (for tomatoes), packaging, extension advice from agronomists and field officers, manuals on bean and tomato production and it provides the farmer with a market for his produce. All the schemes mentioned use the flood irrigation method.

Case Study 3: Example of contractual agreement between small-scale producers (on irrigation schemes) and Wholesale Frutierers Trading (Pvt) Ltd

Interfresh is a holding company with 7 Business Operating Units, each specialising in one core business activity[26]. These include:

- Wholesale Fruiterers Trading (Pvt) Ltd
- Fresca Pvt Ltd
- Mazowe Citrus Estates
- Interspan (Pvt) Ltd
- Interfreight (Pvt) Ltd
- Freshex (Pvt) Ltd
- Mazowe Flowers (Pvt) Ltd

[25] Olivine Industries provides farmers with seeds in order to ensure high quality seeds are planted. Further, it can maintain uniform standards by providing homogenous seeds.
[26] See Appendix 1 for details of activities of the other six Business Operating Units.

There are approximately 500 small-scale farmers who benefit from the out-grower scheme run by Interfresh. Many small-scale farmers access the Interfresh Market through buyers from Mbare Musika market, through other growers who have schedules with Interfresh (but have inadequate supplies to meet their quotas), and through transporters. Approximately 100 small-scale farmers produce directly for Interfresh through the out-growers scheme, working in close liaison with Agritex officials. Between 20-25% of the total tonnage of Interfresh supply requirements comes from the small-scale sector (majority from irrigation schemes, but some from Communal Area farmers). The other 75-80% is sourced from large-scale commercial farms. The advantage of dealing with large-scale producers is that Interfresh can negotiate discounts on overripe or damaged produce, or discounts on unspecified produce. Small-scale farmers usually experience discounts due to their need to be paid immediately upon delivery of the produce. In monetary terms, Interfresh's gross monthly turnover ranges between Z$48–50,000,000. Table 10 below shows the range of products, which are supplied to Interfresh under contract farming arrangements, with small and large-scale producers.

Table 10. Product mix supplied to Interfresh by small and large-scale producers

Small-scale sector	Large-scale sector
Baby marrow	Apples
Brinjals or egg plants	Baby corn
Butternuts	Bananas
Cucumbers	Beans (runners)
Ginger (Tsangamidzi)	Broccoli
Green peppers	Cabbages
Jam squashes	Carrots
Mufushwa (Nyemba)	Cauliflower
Boiled/dried cowpea leaves	
Rape	Cucumbers
Sweet potatoes	Lettuce
Yams (madhumbe)	Mange tout (thin bean)
	Onions
	Oranges / nartijies (citrus)
	Potatoes
	Sweet corn
	Tomatoes
	Water melons

Source: Bhila, Personal Communication with Wholesale Fruiteres Harare

Wholesale Fruiterers (Pvt) Ltd (one of Interfresh's seven Business Operating Units) concentrates on the local market for both fruits and vegetables. The following table highlights the various groups with which Wholesale Fruiterers Ltd enjoys exclusive contract arrangements for the supply of fresh fruits and vegetables (supplied by large scale and small-scale farmers).

Table 11. Organisations which Wholesale Fruiterers (Pvt) Ltd supplies with produce

Supermarkets	TM Supermarkets (80 branches nation wide)
	Spar group supermarkets
	Farm and city supermarkets
Wholesale contracts	P & P wholesalers
	Honey Dew
	Katope (formerly FAVCO)
Hotels and hotel groups	The Innscor Group of companies (Chicken Inn etc)
	Zimbabwe Sun Hotel (Zimsun)
	Meikles Hotel
	Harare Sheraton
	Crowneplaza Monomotapa
	Holiday Inn
	Cresta Hotel Group
	The Bronte
Government Bodies (Interfresh)	Government schools (primary, secondary and tertiary Colleges)
	Hospitals
	The Army
	The Police

Source: Bhila, Personal Communication with Wholesale Fruiterers Harare

Due to the nature of demand for fruits and vegetables throughout the year, Wholesale Fruiterers sub-contracts or schedules both small-scale and large-scale farmers to supply produce. Scheduling specifies the quantities of produce to be supplied and how regularly. Demand and supply on the market however, determine prices for produce at the point of sale. The advantage to the small-scale farmer is that if he is not happy with the price offered by Wholesale Fruiterers Ltd, he is free to sell his produce elsewhere. Wholesale Fruiterers Ltd gives priority to scheduled growers who have the option to accept or not, the price on offer. Lack of co-ordination among farmers means that they do not benefit from negotiating with Wholesale Fruiterers as a group, agreeing on a favourable price for example.

However, there are several advantages to farmers in selling their crop to Interfresh. Interfresh may purchase large volumes of produce and prices are generally stable. Interfresh offers a single and direct point of sale, as opposed to having to deal with various wholesalers dotted around the city. Produce can be delivered with ease to Interfresh as there is usually no congestion at the acceptance point. The alternative for farmers is to sell their produce on Mbare Musika market, which exhibits several disadvantages. Prices may fluctuate markedly from day to day, and even within any given day. Cash payments may not be guaranteed to producers. As various middlemen exist within the supply chain, which each want a 'cut' of the cake; producers often have to bargain with middlemen in order to receive acceptable returns to their production.

Interfresh has 3 main methods of payment to out-growers:

- Cash upon delivery of produce, less 8% early settlement discount
- Cash payment after 14 days, less 5% early settlement discount
- Cash or cheque payable on the 22nd of the following month after delivery, i.e. normal 30 days. Full payment of invoice is made without a deduction or discount.

While most small-scale growers opt for cash payments upon delivery of their produce, the majority of commercial or larger-scale growers are able to wait for payment being made in

the month following the sale. Small-scale farmers are restrained in their access to capital and cannot afford to wait such long periods before payment.

3.4.4 Nature of contractual agreements

Contracts are often by word of mouth, and are seldom written up as formal agreements. HORTICO[27] for example has formal and legally binding contracts with small-scale farmers. However, Selby Enterprises and Hyveld Seed supply farmers with seed for crops, such as baby corn, mange tout, peas, paprika and passion fruit; with the understanding that they will buy the crops if producers meet the quality criteria laid down (Turner and Chivinge, 1999). Farmers may also receive other inputs and extension advice from company personnel who are specialised in the production of certain crops such as mange tout and beans (HORTICO) and paprika (Hyveld Seed) for example. Access to seeds and other inputs through contract relationships enables farmers to plant early, at a time when they would otherwise be cash-strapped (Ibid.). This is one of the fundamental reasons for success in small-scale commercial agriculture, especially in the drought prone areas, as many farmers diminish their crop potential due to planting late (Farming World, 1990).

The fact that large-scale companies contract smallholders to grow produce and entrust them with their inputs, and the fact that many small-scale producers are meeting the standards and quotas laid down, is indicative of the latter's productive potential when provided with inputs and technical support. This is particularly the case with labour intensive crops such as beans, mange tout, baby marrow and tomatoes, and also speciality produce of export quality, such as sweet corn and evening primrose (Sena, 1997).

Contract farming may offer new opportunities to small-scale farmers. Sub-contracting arrangements usually mean that farmers incur lower transaction costs. Contracts may breed competition between farmers and encourage the production of high quality produce and may also serve as an incentive to scale up production in order to meet set quotas and stay in business (Turner and Chivinge, 1999). Turner and Chivinge (1999:33) suggest that farmers involved in sub-contracting in Mutoko and Murehwa tended to produce and market larger quantities of crops than those farmers not involved in such agreements. However, due to the fact that there are few alternative domestic markets for lucrative export crops (baby corn, baby squash, paprika, carrots and passion fruit), disruptions on international markets can be financially disastrous for small-scale farmers. In such instances, small-scale farmers may find themselves with produce for which demand on local markets is relatively low (CIIFAD, 1999 citing Kandiwa).

[27] HORTICO currently has contracts with approximately 1,700 smallholder farmers (Turner and Chivinge, 1999, citing Chollet, 1997). HORTICO provides communal farmers with seeds, chemicals and fertilisers for the production of particular crops, usually baby corn and mange tout peas. HORTICO extension personnel provide technical advice to producers. Payments are made to farmers after deducting the cost of inputs supplied.

3.5 Peri-urban horticultural production

Aragrande (1997) points out that urban and peri-urban agriculture is a phenomenon typical of African cities. For urban and peri-urban farmers this activity provides both employment and income while for consumers it offers access to a relatively cheap produce that represents an important nutritional contribution to the diet.

3.5.1 Peri-urban agriculture: A definition

> The definition of a peri-urban area is imprecise: it is … the area under the influence of the city. The distance this influence stretches may vary, mainly depending on the demographic size of the city and the activities carried on there. In small countries the supply zone for the capital may even be congruent with the national territory (Aragrande, 1997:41 citing Franqueville, 1996)

While there is not yet a universally agreed-upon definition of Urban and Peri-Urban Agriculture (UPA), it is understood by the majority as agricultural practices within and around cities, which compete for resources (land, water, energy, labour) which could also serve other purposes to satisfy the requirements of the urban population. Important sectors of UPA include horticulture, livestock, fodder and milk production, aquaculture and forestry (FAO², year unknown). The main function of peri-urban agriculture however, is to cultivate green produce and supply it to urban populations through formal channels at a reasonable price (Aragrande, 1997 citing Franqueville, 1996)

Mbiba (1994) defines urban agriculture as the production of crops on land that is administratively and legally zoned for urban use. This may be land that has been flagged for future development, or recreational land, or environmentally delicate land that has been set aside or protected. Urban agriculture therefore defines cultivation which takes place within built up zones of a town or city, or at the periphery of urban areas, i.e. on land which is likely to be re-zoned from agriculture to urban land, i.e. the peri-urban areas (Ibid, 190).

Aragrande (1999:41) points out however, that "cities are spaces that are often hard to define, either because their limits are constantly changing or because they cannot be viewed in a purely physical manner." The territory included within official city boundaries varies enormously across countries and can be more or less built-up (FAO², year unknown). Likewise the 'peri-urban' area may range from being densely to sparsely populated. The distinction between 'urban' and 'peri-urban' may depend on the density, type, and patterns of land use, which determine the constraints and opportunities for agriculture (Ibid.).

In terms of the research proposed, the definition of 'urban' horticulture which will be adopted, will refer to small areas within urban boundaries (e.g. vacant plots, gardens, verges, balconies, containers) which are used for growing crops for own-consumption or sale in neighbouring markets. Small-scale 'peri-urban' horticultural production on the other hand, shall refer to intensive semi or fully commercial farms (which lie beyond the urban boundary) that grow fruits and vegetables and which supply these to urban areas, i.e. towns or cities[28] (adapted from FAO², year unknown).

[28] Urban centres are defined as those with 2500 inhabitants or more.

In Zimbabwe, the Department of Urban Planning defines peri-urban areas as those semi-rural areas on the fringes of cities and towns. The main indicator used to determine these areas is the nature of activities, which take place (semi-urban) and not the distance from the city (Bhila, Personal Communication with Mr Mbiba, Department of Rural and Urban Planning). Peri-urban areas although peripheral, are in most ways integrated with the city itself, for example, in terms of employment and service provision among other factors. In the context of our research, peri-urban horticultural producers/processors will be defined as those individuals who supply urban markets with horticultural produce.

3.5.2 On-plot versus off-plot agricultural production

A further element, which may be of importance when considering peri-urban production in Zimbabwe, relates to the issue of land access. In his study of urban agriculture in Harare, Mbiba (1994, 1995a, 1995b) made a clear distinction between 'on-plot' and 'off-plot' production (and Smith and Tevera, 1997). 'On-plot' production refers to agricultural practices on residential stands by the owner or his/her tenants. 'Off-plot' agriculture on the other hand, takes place on land which is perceived as 'public' land, which potentially anyone can use without claiming individual title ownership to the land, i.e. road reserves, riverbanks etc. In legal terms however, such land belongs to the urban authority, though producers may request permits from authorities to cultivate in some of these areas, i.e. on non-environmentally sensitive land. If permits are not sought for off-plot production, essentially this constitutes illegal urban agriculture.

Smith and Tevera (1997) conducted a survey with 390 urban food producers across nine locations in Harare during 1995. A summary of the main characteristics of these two production systems, i.e. on-plot and off-plot production, is presented in Table 12. The evidence would seem to suggest that while on-plot production is a traditional activity carried out in order to provide for household consumption needs (often looked upon as an extension of household reproduction), off-plot production tends to be more market-oriented and utilises more capital inputs. Although these findings refer specifically to urban cultivation, they may also be of importance when considering peri-urban production. For example, crop production along roadsides leading to urban centres and on public hinterland surrounding urban areas is not uncommon. Land access is also likely to influence the nature of production in peri-urban areas.

Table 12. Characteristics of on-plot and off-plot cultivation

	On-plot cultivation	Off-plot (illegal) cultivation
Location of plot	61% of respondents were involved in on-plot cultivation, mostly in their gardens. Some domestic servants occupying rooms in high-income suburbs had garden space made available to them by their employers.	88% of plots were located in the same suburb in which the respondent resided.
Size of plot	43% of the garden plots were under 14m², 30% were more than 25m².	60% of primary plots (some producers were operating two or more plots) were over 50m². Larger plots tended to be in more peripheral of the low-income suburbs.
How long cultivated	59% of gardens had been cultivated for 15 years.	70% of the plots had been cultivated for less than five years.
Labour input	Domestic task, head of household or spouse providing most of labour input.	70% relied on household labour. 15% did hire in some labour.
Method of irrigation	Relies on piped municipal water supplies.	Depends almost entirely on rainfall.
Use of agro-chemicals	Almost all cultivators used some form of fertiliser, but for the most part this was organic manure. 13% applied chemical fertilisers, 40% used pesticides.	80% of off-plot cultivators used chemical, rather than organic, fertilisers. Few cultivators used pesticides (9%) and even fewer herbicides.
Crops grown	Maize was grown in many gardens. Most popular crops produced for consumption by cultivators were leafy vegetables (especially variety known as 'rape'), tomatoes and cabbages.	Maize was most important crop. Leafy vegetables, tomatoes and pulses were also grown (though not on large scale) and there was a tendency to sell this produce.
Household consumption or commercialisation	Most crops were for household consumption or given away to family or friends. 22% of households sold some produce, mostly from their home.	One third of respondents sold some of their produce. Maize was by far the leading crop sold.
Problems perceived	Many people trying to sell surplus garden vegetables so market prices for produce were generally low.	Crops slashed by municipal officials, crop theft. Transportation was most important concern.

Source: Smith and Tevera, 1997.

3.5.3 Urban and peri-urban cultivators: Who are they?

Sanyal points out that urban cultivation is most frequent between the poorest households for whom agriculture represents a vital survival strategy in the city (Rogerson, 1992 citing Sanyal, 1987). Rogerson (1992) relates this to the inability of the formal economy to provide households with sufficient real income for survival in the city. Sanyal maintains that the post 1980 upsurge in cultivation by the urban poor is "an innovative response from below" to the decline of formal urban economies across Africa (Rogerson, 1992 citing Sanyal, 1987). This contrasts with findings by FAO, which suggest that urban cultivation is not typically practised by the poorest residents nor by recently arrived rural-urban migrants as is often maintained. Rather, evidence would suggest that urban production is practised by those households which have lived long enough in the city to secure access to land and water (FAO², year unknown). Furthermore it is characteristic of households that have become familiar with the market channels for selling surpluses (Ibid.).

Research conducted by Eberhard in South Africa suggests that urban agriculture is particularly important for unemployed and elderly women (Rogerson, 1992 citing Eberhard, 1989). In his study in Harare, Mbiba (1995a) found that women dominated urban agriculture, where 63% of cultivators were female (n=194). Radoki found that urban agriculture was an important survival niche for groups of low-income women in Zambia, in particular for those women who had limited schooling or marketable skills in the formal economy (Rogerson, 1992 citing Radoki, 1988). Work done by FAO suggests that women, who can combine food production activities with child-care and other household responsibilities, often carry out urban agriculture on a part-time basis (FAO[2], year unknown).

Traditionally women have had an active role in horticultural production in Communal Areas as they were expected to grow specific food crops (vegetables for relishes for example) on their allotted plots of land in order to feed the family. In the post-colonial era however, women do not have direct access to land and are dependent on husbands and male kinfolk for such access, therefore impeding their agricultural activities. In resettlement areas, women have only a derivative right to reside in the resettlement area as permits for settlement, cultivation and grazing are given to the male head of household (Chidzonga, 1993).

In the peri-urban context, Mazambani suggests that the peri-urban cultivation taking place around Harare is primarily conducted by low-income families who grow food crops for domestic consumption and sale (Rogerson, 1992 citing Mazambani, 1986). The production and processing of horticultural crops has become an increasingly important source of income for low-income households, and women and children in particular. The latter are not only involved in the production of crops, but furthermore in the sale of fruits and vegetables at roadside stalls, via door-to-door sales or within informal urban markets (Horn, 1997; Mbiba, 1994). In spite of the active participation of women in the production and processing of horticultural produce, this does not resolve the basic problems of women's inadequate access to land, skills, education, wage employment, and more lucrative opportunities for self-employment (Rogerson 1992 citing Rakodi 1985).

3.6 National consumer demand for horticultural produce

Although the export market represents the major force behind the recent growth in production of fruits and vegetables in Zimbabwe—supplying fresh produce to international markets during their winter season, local demand for produce is also important.

3.6.1 Urban population growth

Between 1982 and 1992, annual population growth in Zimbabwe averaged 3.14% (CSO, 1994). Since 1992 however, the annual growth rate has fallen to about 2.1% owing to the use of birth control methods by 40% of the Zimbabwean population, and the impact of the AIDS epidemic. According to the Economic Intelligence Unit (1997/98) Zimbabwe's population is unlikely to grow over the next 20 year period, and may even contract due to the impact of AIDS.[29]

Table 13. Population growth in Zimbabwe, 1951-2000

Year	Population (000s)	Growth rate (%)
1951	2,828	3.5
1961	3,969	3.3
1969	5,134	3.0
1982	7,608	3.0
1992	10,400*	3.1*
1995	11,480#	3.0#
1996	11,800#	3.0#
1997	12,140#	2.1#
1998	11,000#	1.5#
1999	11,200#	1.2#
2000	11,200[a]	1.2[a]

Source: CSO, 1998; Economic Intelligence Unit (EIU) 1998d
*CSO 1992 population figures
#EIU population figures 1995-9999
[a]EIU First Quarter 2000

Although total population growth may be stagnant or declining, the case of urban population growth is somewhat different. While the urban population represented 23% of total population in 1982, by mid-1997 there were 3.7 million urban inhabitants, representing 32% of the total population. Zimbabwe's urban population had been growing at over 5% per year between 1982 and 1997 (EIU, 1998d; CSO, 1994). Harare's population has grown by more than 6% per year since 1982; by 1998 it had totalled approximately 2 million inhabitants (including Harare's Chitungwiza town). Although Harare continues to grow, it is likely that much of Zimbabwe's future urban growth will take place in secondary cities, rather than the Primate City (CSO, 1998). Table 14 below indicates estimates of population growth among Zimbabwe's main urban centres between 1992 and 1997.

[29] By the end of 1998, it was estimated that between 300 and 700 people were dying of AIDS each week (Economic Intelligence Unit, 1997/98 citing Blair Research Institute, 1998), and the figure may even be rising. It is estimated that 25.84% of Zimbabwe's adult population (15-49 years) has HIV/AIDS (Population Reference Bureau, 2000).

Table 14. Population growth among Zimbabwe's main urban centres

City	1992#	1997*
Harare	1,189,103	1,600,000
Bulawayo	621,742	790,000
Chitungwiza	274,912	365,000
Gweru	128,037	160,000
Kwekwe	75,425	95,000
Mutare	131,367	185,000
Kadoma	67,750	85,000
Masvingo	51,743	65,000

Source: CSO, 1994; EIU, 1998d
Census 1994 *EIU, 1998d, estimates

The rapid growth rate of the urban population is attributable to three factors: natural growth as the urban population reproduces, rural to urban migration, and the redefinition of previously rural centres as urban. According to the 1992 Population Census, 31% of Zimbabwe's population lived in urban areas. The definition of an urban area was based on the following criteria: that the location constituted a 'designated urban area', or it was a place which had the following characteristics: 2500 inhabitants or more, compact settlement, and the majority of employed persons engaged in non-agricultural occupations (CSO, 1994). By adopting such a definition, a total of 80 urban settlements were recorded across Zimbabwe during 1992 (Ibid.). By comparison, the 1982 census recorded 26% of Zimbabwe's population as urban. In 1982 however, an urban area was defined as a town or place with 2500 or more people, irrespective of the amenities available within that delimited area.

3.6.2 Urbanisation: Changing consumption patterns

Consumer demand for processed food products in developing countries such as Zimbabwe has been rapidly expanding (Richter *et al*, 1996; SMALLFOOD, 1999a). In some cases these products are manufactured equivalents of products that were traditionally produced by large-scale manufacturers, such as cassava starch or maize meal. In others they are non-traditional and typically more highly processed products, for example snack products that are either imported or produced domestically.

In the case of Zimbabwe, precise data on small-scale food processing enterprises, and on small-scale fruit and vegetable processing in particular, is scarce. Often such information is embraced within the food and beverage sector in general and therefore it is difficult to get a clear picture of the size and performance of small-scale enterprises which process horticultural produce. Murphy (1996) suggests however, that large-scale urban based commercial companies control over 90% of the commercially marketed agro-industrial produce in Zimbabwe, including products such as maize meal, edible oils, canned fruit and vegetables, canned, frozen and preserved fish, canned and preserved meat, peanut butter and other products. The rural-based informal sector of food processing enterprises mainly caters for subsistence production and supply of local informal markets. This can be related to the structure of consumer demand in Zimbabwe. Consumer demand for food products may be divided into two broad categories. There is a small high-income market segment and a large market segment with low disposable income. The Communal Areas for example, receive very

small quantities of processed foods from large-scale producers, as the majority of rural inhabitants cannot afford to buy products processed by large firms. Such households exhibit low purchasing power and generally consume foodstuffs that have been processed at the household or local level (Murphy, 1996). Murphy found that only small quantities of food processed by rural small-scale enterprises were sold outside local areas (Ibid.).

Urban population growth shall no doubt impact upon consumption patterns in Zimbabwe, as a growing percentage of the population is unlikely to have access to agricultural land to provide for subsistence needs. Research carried out by Dia (1997) in West Africa suggests that urbanisation and demographic change will have significant effects on both the quality and quantity of food demand. For example, it is likely to mean an increase in the proportion of meals taken outside the home, and therefore to a rise in the demand for catering, convenience and snack foods, as those at work are unable to return for midday meals (Dia, 1997; Wiggins, Otieno, Proctor and Upton, forthcoming). Consumption of ready-made items, whether at home, in the street, at the workplace or in school, or in small restaurants, has become a common feature of consumption patterns in urban areas (Dia, 1997). The need to commute to distant work places has stimulated a strong reliance on street food (FAO, 1999).[30] Research suggests that street foods are a growing sector of the processed foods market (Natural Resources International, 2000).

Changes in the urban way of life may lead to an increase in the number of women who participate in the labour market (FAO, 1999), and who have correspondingly less time to spend preparing foodstuffs for household consumption. Convenience foods and/or processed foods are likely to be preferred which usually require less preparation time compared to fresh produce. In the case of horticultural produce this may mean an increase in the demand for convenience products such as frozen (washed and sliced or diced), pre-packed (and ready to cook) or pre-cooked vegetables, pre-prepared soup mixtures, fruit juices and jams for example.

Although relatively little is known about the specific changes in urban food demand in developing countries, evidence would seem to suggest that the composition of food demand is likely to change. Factors encouraging increased horticultural production for the domestic market in Zimbabwe include increased urban demand as a result of increasing urbanisation, a rise in incomes for a section of the urban population and related changes in consumer tastes (Poole *et al*, 1999). Economic growth may lead to increased demand for higher value products. Changes in diet owing in large part to a rise in incomes can be striking, as seen below for the case of Taiwan (Figure 5.). As incomes rise, consumers may switch some of their consumption from staples to higher-value products such as livestock and dairy products.

[30] Urban households often incur substantial travel costs (time and money), since transportation and communication systems in most cities are poor and inefficient. This imposes limitations on home consumption of meals (Wiggins *et al*, forthcoming).

Figure 5. Taiwan's changing diet (kg/person/year)

Period	Rice	Wheat	Sweet Potato	Meat	Fish	Fruit
1949-51	133	7	66	13	12	16
1969-71	136	25	24	25	33	43
1989-91	68	29	2	62	45	108

Source: Wiggins *et al*, forthcoming citing Huang and Bouis, 1996

Between the early 1970s and the 1990s, Taiwan saw rapid economic growth. Incomes a head rose by more than five times during this twenty-year period. Average annual consumption a head for staples such as rice and sweet potato, fell to half or less of previous levels. However, consumption of livestock products and fruit more than doubled, and intakes of fish rose by one third. Consumption patterns were also differentiated across location. In 1991, urban households consumed 18kg less rice a person than those living in rural areas. However, they ate 14kg more meat, 10 kg more fish, and 30kg more fruit. Even more marked contrasts could be found between farming households and those not engaged in agriculture. Farm households ate 28kg a person more rice, but consumed 11kg less meat, 12kg less fish, and 43kg less fruit than their non-farm counterparts.

Evidence from Bangladesh suggests that there does not appear to be such a strong, latent demand for vegetables as there is for animal and fish products, as income increases (Quisumbing, 2000). Quisumbing suggests that this is due to lack of consumer motivation and that it is necessary to educate and inform consumers and convince them of the benefits of pro-vitamin fruit and vegetable consumption and provide knowledge of sources (Ibid.). Evidence from Zimbabwe however, suggests that food habits and tastes are changing fast, pressurising producers to change their cropping patterns (Sena, 1997). Sena relates this to the growth of the middle class in Zimbabwe. Some households have switched from the conventional fresh greens (rape, cabbage, spinach and green beans) and starchy staples (sadza), to a diet with a higher consumption of non-traditional foods such as cauliflower, broccoli, squashes, mange tout, baby marrow and fresh fruit (Ibid.). Urban consumers, especially middle-class consumers, may also be prepared to pay for food of a higher quality, as well as for food that passes more stringent norms of hygiene and safety (Dia, 1997; Wiggins *et al*, forthcoming). As food habits change, the type of products requested by consumers and the ways in which they are purchased also changes (Aragrande, 1997). Such changes usually affect markets, in this context the geographical spaces that are dedicated to the trading of produce, their number, size, specialisation and their location (Ibid.).

3.6.3 The impact of ESAP on consumption patterns

A further element worth mentioning in terms of food demand in Zimbabwe relates to the impact of ESAP upon consumption patterns. In most African towns and cities, structural adjustment policies and devaluation have accentuated the incidence of poverty (Dia, 1997). With the adoption of these policies, there was a dramatic removal of subsidies on basic food items, resulting in massive hikes in food prices and the cost of non-food items. The withdrawal of food subsidies had a dramatic effect upon consumption patterns, the exception being the overall consumption of grain (Ministry of Public Service, Labour and Social Welfare, 1997).

Table 15. Average annual increases in prices from 1991 to 1999

	1991	1992[a]	1993[a]	1994[a]	1995[a]	1996[a]	1997	1998	1999
High income urban		171.2	215.3	266.2	323.6	393.2			
(1990=100) % change		38.7	25.7	23.6	21.6	21.5			
Low income, urban		180.0	239.4	294.2	366.5	454.3			
(1990=100) % change		46.8	33.0	22.9	24.6	24.0			
Consumer Price Index	123.3	175.2	223.6	273.4	335.1	406.9	483.6	636.9	1 009.6
(1990=100) % change	23.3	42.1	27.6	22.2	22.6	21.4	18.8	31.7	58.5
Food (1990=100)	122.6	192.7	267.4	336.8	429.3	544.8	640.5	893.2	1500.1
% change		57.1	38.7	25.9	27.5	26.9	17.6	39.5	67.9

Source: EIU, 1998a, CSO-Stats-Flash, 2000b.
Calculated by the EIU using 1980 weights

Research into the effects of ESAP in Zimbabwe, carried out by the Ministry of Public Service and Social Welfare (1997) between 1992-1997, considered the causes of poverty at household and community levels and their dynamics in relation to ESAP. Dietary habits were considered within the surveys, in particular the diversity and volumes of food consumption and nutritional levels. During 1997 the consumption of protein and vitamin rich foods was high in both rural (96% and 97% respectively) and urban areas (98% consumed vitamin and protein foods). Almost all households, both urban and rural, consumed vegetables; 81% of urban households consumed vegetables between 4 and 7 days per week, compared to 79% of rural households. Fruits were consumed by 27% of urban households for 4 to 7 days a week and by 34% of rural households. However, the overall proportion of urban households consuming fruits was slightly higher than that of rural households.

However, the EIU (1998d) expressed concern that the continued increase in food prices would hit the poorest sections of the population hardest, and predicted that although the reintroduction of price controls on maize would maintain the price of the main staple, consumer prices would remain on an upward trend (Ibid.20).

Throughout the 1990s, Zimbabwe's inflation rate has never fallen below the two-digit level. Food was one of the major components of the CPI to have the highest December year-on-year increases between 1997 and 1998, at 62.9% (See Table 16 below). Drink and tobacco was the only subgroup to have a higher year-on-year increase than the food subgroup, at 66.6%. Increases in the different food groups ranged from 38.7% (condiments and confectionery) to 95.6% (oils and fats). Fruit and vegetables showed one of the highest increases, 85.7% between December 1997 and 1998 (CSO, 2000a).

Table 16. CPI Food group and sub-group indices, December 1998

							Contribution to overall change in the CPI (%)	
Food Subgroup	**Weights**	**Oct-98**	**Nov-98**	**Dec-98**	**Month-on % change**	**Year-on % change**	**Month-on**	**Year-on**
Food	29.2	910.4	1000.3	1072.1	7.2	62.9	2.9	23.4
Bread, cereals	8.3	968.2	1080.8	1095.3	1.3	56.1	0.2	6.3
Meat	7.6	820.3	921.7	1013.6	10.0	58.5	1.0	5.5
Fish	0.7	659.3	731.7	821.6	12.3	77.3	0.1	0.5
Milk, cheese, eggs	2.9	862.9	925.6	989.6	6.9	54.2	0.3	1.9
Oils, fats	1.7	815.9	918.5	1073.6	16.9	95.6	0.4	1.7
Fruits, vegetables	4.8	1167.9	1238.3	1370.1	10.6	85.7	0.9	5.9
Coffee, tea	0.4	543.0	554.5	586.9	5.8	70.8	0.0	0.2
Condiments, confectionery	2.3	793.6	853.5	896.6	5.0	38.7	0.1	1.1
Other foods	0.5	622.7	690.7	724.7	4.9	46.0	0.0	0.2

Source: CSO, 2000a

Note: The first two columns of percentages relate to price changes for the different groups over the previous month and twelve months respectively. The last two columns of percentages show the major group and group contributions to the month-on and year-on-year overall inflation rates respectively.

Although wages have risen over time, compensating for escalating inflation and increasing commodity prices, such increases have generally been below the rate of inflation. Between April and June 1998, wage increases averaging 34-40% were negotiated across all industries affiliated to the Zimbabwe Congress of Trade Unions (representing one-third of Zimbabwe's total workforce). Most workers had not received major pay increases since 1995-1996, despite rising consumer prices (EIU, 1998c:19).

Table 17. Average wages by sector (Z$), 1985-1995 employment surveys

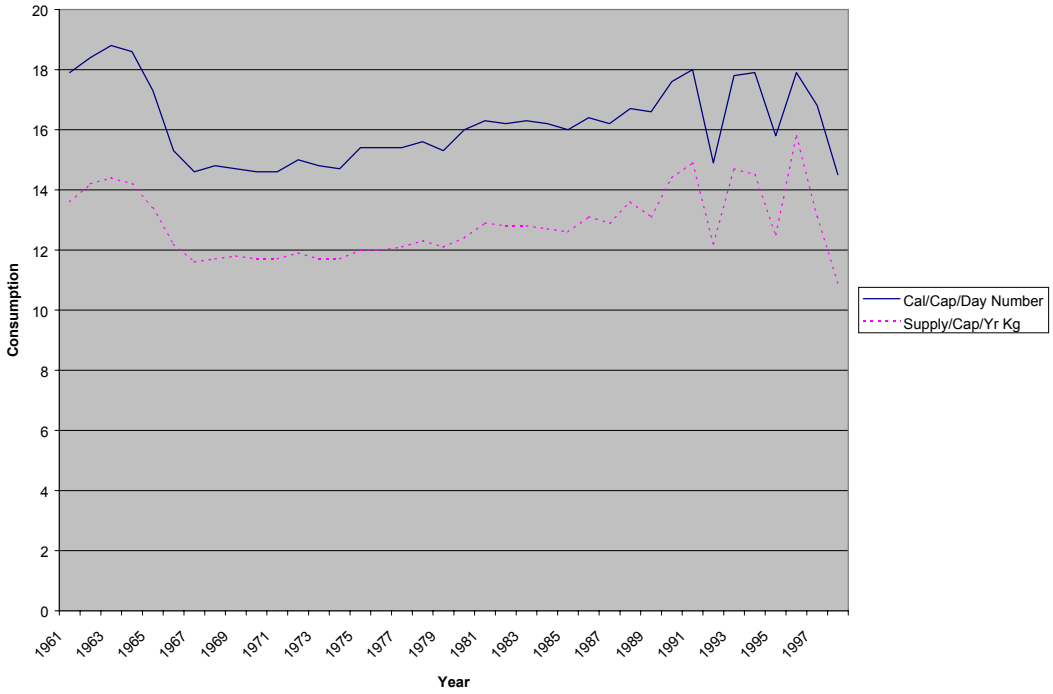
Sector	**1986**	**1988**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
Agriculture	115	138	183	203	172	244	287	296
Mining	370	460	622	738	1,027	1,122	1,317	1,619
Manufacturing	471	590	796	928	1,123	1,339	1,558	1,914
Electricity and Water	666	871	1,122	1,569	1,651	1,651	2,787	3,993
Construction	318	361	439	523	561	603	714	988
Finance, Insurance	996	1,287	1,797	2,225	3,006	3,835	4,078	5,563
Distribution, Hotels & Restaurants	455	544	691	828	1,009	1,146	1,295	1,671
Transport & Communications	614	767	1,141	1,211	1,471	1,839	2,105	2,382
Public Administration	429	532	686	756	819	864	1,090	1,405
Education	536	715	1,007	1,261	1,384	1,469	1,634	1,817
Health	479	598	880	1,038	1,164	1,256	1,491	1,839
Private Domestic	109	128	150	156	156	156	156	156
Other	370	439	616	687	825	973	1,151	1,415

Source: CSO, 1998:54

Note: There has been a steady rise in the wages of all Zimbabwean industries, with the greatest increase taking place after independence.

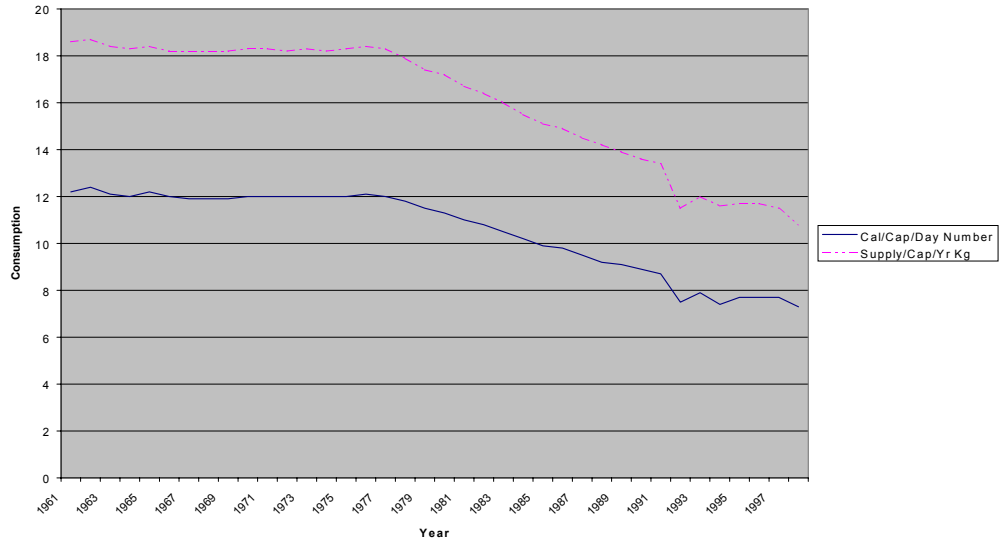
Research conducted by Dia (1997:13) in French-speaking West Africa suggests however, that when the purchasing power of households' falls, meat and fish are sacrificed before staple vegetables and cereals. Nevertheless, when we look at the consumption of fruit and vegetables in Zimbabwe from 1961 to 1998—average annual consumption per capita (Kg) and daily consumption per capita (Kcal), some interesting observations can be made. Although annual (Kgs per capita) and daily consumption (Kcal per capita) of fruit has generally increased since the mid-1960s, consumption patterns have fluctuated since 1991 (Figure 6).

Figure 6. Consumption of fruit in Zimbabwe (1961-1998)
Source: FAOSTAT, 1998



As for vegetables (See Figure 7), consumption levels—annual (Kg) and daily consumption levels (Kcal.), have been on a general decline since the late 1970s. The consumption of horticultural produce has been somewhat erratic since 1991. This is due to a number of factors. Zimbabwe experienced a severe drought in 1991-92. Drought conditions were also evidenced during 1994-95 and 1997-98. Furthermore, it is likely that ESAP has impacted upon the dietary habits of households in Zimbabwe, in terms of increased food prices, a fall in real wages and a general decline in household purchasing power.

Figure 7. Consumption of vegetables in Zimbabwe (1961-1998)



Source: FAOSTAT, 1998

In general terms, rural households assign a larger share of their total household expenditure to food than urban households (See Table 18). Urban households are on average better off and therefore expenses on food tend to make up a smaller proportion of total household expenditure. If gifts and subsistence production are added to household consumption, food accounts for 39% of household consumption in rural areas and 47% of household consumption in resettlement areas. This compares with 22% for urban households.

Table 18. Average annual household food expenditure as a percentage of household budget and food consumption as a percentage of total household consumption by sector, Zimbabwe ICES, 1990/91

	Large-scale Commercial Farming	**Small-scale Commercial Farming**	**Communal Areas**	**Resettlement Schemes**	**Total Rural**	**Urban**	**Total**
Food as % of total household expenditure	38	30	35	39	36	23	27
Food as % of total household consumption[1]	36	36	40	47	39	22	29

Source: Murphy, 1996:10 citing GoZ, 1994a

[1]Note: Imputed values of consumption in kind are added to household consumption expenditures.

When we look at how food expenditure is divided between the various food groups, we see that the mean share of household expenditure spent on the various broad food groups is greater for rural than urban households, except in the case of expenditure on fruit (See Table 19 below). In the urban case, fruits and vegetables represent the two food groups with highest expenditures.

Table 19. Mean shares of total food expenditure of own consumption, gift transfers and payments in kind by broad food group

	Mean share of total food expenditure on each broad group for own consumption		
Broad Food Group	**All Zimbabwe (%)**	**Rural (%)**	**Urban (%)**
Breads and Cereals	13.4	20.9	0.8
Meat	16.2	26.7	0.4
Fish	3.4	5.1	0.4
Fruit	26.0	0.8	4.6
Vegetables	37.4	51.9	12.2
Dairy	11.7	20.2	0.2
Fats and Oils	0.6	1.0	0.0
Nuts	51.4	62.1	0.9
Tubers	15.2	30.1	2.4

Source: Gemini Report (1995//96) Incomes, Consumption and Expenditure Survey Annex quoted in Poverty in Zimbabwe, 1998:92

4. SMALL-SCALE PROCESSING ENTERPRISES IN ZIMBABWE

4.1 Introduction: Definition of small and medium enterprises

The term 'small and medium scale enterprise' (SME) provokes different meanings depending on the locality and purpose for which the definition is sought (McPherson, 1991; Daniels, 1994; Mead, 1994; Mead and Liedholm, 1998). The Government of Zimbabwe has defined SMEs as shown in Table 20 below.

Table 20. Definition of small and medium enterprises

Enterprise Type	Definition of Size
Cottage enterprises	Family labour
Micro-enterprises	Up to 5 workers
Small enterprises	5-20 workers
Medium enterprises	20 employees or more. Capital base below $2 million, fixed assets below $3 million, annual turnover up to $15 million per year (CZI, 1998)

Source: McPherson, 1991; GoZ, 1994

The largest subgroup of the SME sector is the informal sector including cottage and micro-enterprises. Cottage enterprises are usually run by family members and are not legally registered businesses. Currently it is estimated that there are over 10,000 informal cottage enterprises in Zimbabwe (CZI, 1998; Mead and Liedholm, 1998).

4.2 Employment growth in small-scale enterprises in Zimbabwe

In Zimbabwe, population growth and growth of the labour force surpasses the number of job openings in large-scale enterprises. The growth of employment in the public sector has been sharply restricted, partly due to the impact of Structural Adjustment Programmes. The absorptive capacity of the agricultural sector is also limited. In the aftermath of SAP, agricultural policies have done little to transfer the Communal Areas into small-scale commercial farming areas. Poverty and food insecurity remains rife and subsistence farming predominates. Labour migration to towns is widespread throughout Zimbabwe, though its importance has lessened due to the growth of non-agricultural rural employment opportunities (Berkvens, 1997). A large number of job seekers have turned to small-scale enterprises as a source of livelihood (Mead, 1994).

GEMINI surveys suggest that while the corporate sector has been shedding employees, micro and small-scale enterprises (MSEs) have become a leading job creator in Zimbabwe. Micro and small-scale enterprises have proven to be an appropriate instrument for generating employment in Zimbabwe (McPherson, 1991; Daniels, 1994; USAID, 1998) and increasing income and income distribution to the poor (Machete, 1997). The base line survey carried out by McPherson (1991) revealed that there were over 845,000 micro-enterprises in Zimbabwe, providing regular employment for 1.56 million people, i.e. just over 25% of the adult population. Between 1991 and 1993 the growth in employment by small-scale enterprises

outstripped population growth, with most of the increases occurring in rural areas (more than two thirds of MSEs are located in rural areas). By 1998, there were 860,000 small-scale enterprises (USAID, 1998) employing 1.65 million people (McPherson, 1991; USAID, 1998).

Small-scale industries, in contrast to large ones, have proven to be the most appropriate instrument for enhancing livelihoods and improving income distributions, helping contain and utilise scarce local resources and upgrading skills (Machete, 1997). MSEs contribute significantly to socio-economic development by enhancing the position of low-income, vulnerable and marginalized groups, especially women (Troparg, 1997; SMALLFOOD, 1999a). A study conducted with 108 households in Central and Eastern Mutoko Communal Area (150km north-east of Harare), suggested that women performed 50% of all informal jobs; their non-agricultural labour was concentrated in beer brewing, tailoring and small-scale trade (SMALLFOOD, 199a citing ILO, 1993; Scott, 1995).

4.3 Dynamics of small-scale enterprises in developing countries

Mead and Liedholm (1998) considered survey data of enterprises engaged in non-primary activities engaging up to 50 workers, in Botswana, Kenya, Lesotho, Malawi, Swaziland, Zimbabwe, South Africa and Dominican Republic. They found that between 17-27% of the population of working age were employed in MSEs (Table 21 below). The majority of MSEs however, consisted of only one-person enterprises, therefore offering only self-employment opportunities. Those enterprises with between 10 and 50 workers made up less than 2% of all businesses, in virtually all the survey countries in Africa. Few enterprises hired labour, only in Botswana and Dominican Republic did hired labour make up 20% or more of the MSE labour force.

The majority of MSEs consisted of vendors, small traders and small manufacturing activities and was found to operate above all in rural areas. Enterprises consisting of textiles and wearing apparel, food and beverages and wood and forest products made up 90% of the manufacturing enterprises in rural areas.

In most countries, the majority of MSEs are owned and operated by women (many working proprietors). They are more likely to be home-based MSEs, and involve such activities as beer brewing, knitting, dressmaking, crocheting, cane work and retail trading. Women's participation in MSEs is often overlooked, hence Mead and Liedholm's term of 'invisible entrepreneurs' (1998). They suggest that there is a need to increase the supply of working capital available to women operating enterprises, in order that they may move into activities with better returns. One-person enterprises generate the lowest returns hence the majority of female-owned enterprises are marginal. Even very small increases in the size of an enterprise are associated with substantial increases in economic efficiency.

Table 21. Characteristics of micro- and small-scale enterprises

	Botswana	*Kenya*	*Lesotho*	*Malawi*	*Swaziland*	*Zimbabwe*	*South Africa*	*Dominican Republic*
MSE employment/ population age 15-64 (%)	17%	18%	17%	23%	26%	27%	NAv[1]	19%
MSE employment per 1,000 persons in population	71	83	84	92	118	127	81	109
Share of MSEs that are one-person enterprises (%)	65	47	79	61	69	69	47	22
Share of MSEs with 10-50 workers (%)	3	2	1	1	2	2	1	18
Share of hired workers (%)	39	24	10	18	15	16	19	36
Locational breakdown of MSE employment (%)								
Urban areas	24	15	18	12	25	30	NAp[2]	46
Rural towns	28	7	10	4	10	6	NAp	18
Rural areas	48	78	72	84	65	64	NAp	36
Sectoral breakdown of enterprises: Urban areas only (%)								
Manufacturing	15	18	35	29	33	64	17	21
Commerce	71	74	41	62	56	30	70	63
Sectoral breakdown of enterprises: Rural areas only (%)								
Manufacturing	34	27	62	36	70	75	NAp	15
Commerce	64	66	27	60	24	16	NAp	75
Share of enterprises owned by females (%)	75	46	73	46	84	66	62	46
Share of all workers that are females (%)	67	40	76	40	78	57	78	38

Source: Mead and Liedholm 1998:63 Note that in the sectoral breakdown, the remainder of enterprises are in services.
[1]NAv= not available
[2]NAp= not applicable

4.3.1 Employment growth in MSEs in the developing world

Evidence suggests that the overall employment level among MSEs is growing. Informal sector micro-enterprises and artisan industries are a major source of rural employment. At least one third of new entrants to the labour force finds work in micro and small enterprises. However, the general growth of employment in the sector hides various underlying issues.

Mead (1994) considered the magnitude and patterns of employment in small-scale enterprises in 5 countries of sub-Saharan Africa (Botswana, Kenya, Malawi, Swaziland and Zimbabwe). Surveys were conducted with a random sample of 26,900 enterprises (in non-primary activities engaging 50 or fewer workers, where at least half the output was marketed). More than 75% of the enterprises were located in rural areas, and 60% were one-person enterprises.

Of all enterprises sampled, 45% were engaged in manufacturing, 50% in trade, and the rest in construction, transport and other services (Ibid.).

Mead (1994) hypothesises that when then the overall macro economy is doing well, employment growth through expansion of existing small enterprises is also high. Enterprises grow as entrepreneurs respond to market opportunities. Such growth is 'demand-driven', or a sign of development. When the economy is stagnant however, expansion growth is more limited, but this would be counterbalanced by a more rapid growth in new start-up enterprises. Such start-up enterprises however, are 'supply driven', consisting of people searching for ways of survival during harsh economic times, when the economy fails to develop in ways which provide better levels of welfare for the majority of inhabitants. Therefore, very small enterprises that don't expand are seen as 'survival type activities', or poverty alleviation strategies of the poor. In general however, most enterprises grow by only a small amount. Only 1% of the small-scale enterprises surveyed had grown substantially (Ibid.). The growth of small enterprises is not only a rare occurrence, but furthermore their growth in substantial magnitudes is even more unusual.

In Malawi, Swaziland and Zimbabwe, the separation between demand and supply-driven enterprises was found to be approximately equal between the two categories. In Malawi, evidence suggested that there was very little growth through enterprise expansion. However, a high proportion of new enterprises was found to be supply-driven, in line with Malawi's low levels of growth of income. In Swaziland and Zimbabwe a high share of the growth in the labour force found work in small-scale enterprises. However, as in the case of Malawi, a high proportion of this growth appeared to reflect supply-driven forces. In Swaziland, 'supply-driven' forces accounted for 30% of jobs in urban areas, but over 60% in rural areas, suggesting that the slow growth of agriculture is associated with less dynamic growth of rural small-scale enterprises. In terms of growth of new job sources, Swaziland was high on expansions, but Zimbabwe was low. In Zimbabwe, the majority of new entrants to the labour force found work in small-scale enterprises, but many of these were due to 'supply-driven' forces. In Botswana, Kenya and Zimbabwe, evidence suggested that rural small-scale enterprises equal or outperform their urban counterparts.

Table 22. Income levels and rates of growth in survey countries

	GNP/capita, 1991 (US$)	Rates of growth of GNP/capita: annual average, 1980-91	Rates of growth of agricultural production/ capita: annual average, 1980-91	Rates of growth of food production/ capita: annual average, 1980-91
Botswana	2,530	+5.6%	-0.5%	-3.7%
Kenya	340	+0.3%	-0.6%	+0.5%
Malawi	230	+0.1%	-0.9%	-2.7%
Swaziland	1,050	+3.1%	-1.7%	-0.9%
Zimbabwe	650	-0.2%	-1.2%	-1.0%

Source: Mead, 1994

4.4 Small-scale agro-processing enterprises

There exists a considerable interest in the establishment of small-scale food processing facilities in many developing countries. This can be related to the pace of urban population growth, rising incomes and welfare and the continued prevalence of droughts and famines that still lead to critical food shortages. The development of new techniques to process foodstuffs (including fruits and vegetables) is now more urgent than ever.

The evidence would seem to suggest that there are ample opportunities for setting up small food-processing enterprises in rural areas, however, the potential for adding value to local resources through processing depends very much on the locality (Price Waterhouse 1998; Murphy, 1996). Peri-urban small-scale enterprises however, may be at an advantage, as they are often well linked to urban areas, where the greatest potential for (domestic) marketing of food products exists.

The demand for such products has led to a growth in the number of small-scale agro-processing enterprises in Zimbabwe (McPherson, 1991, USAID, 1998). Spore (1996) suggests that between 60-70% of the labour force of Sub-Saharan Africa find work and income in small-scale food processing, the majority of them being women.

4.4.1 The main techniques employed for processing horticultural produce

Processing revolves around the application of scientific principles for the preservation or modification of foods to make high quality, safe and appealing products for the consumer. In general, developing countries, Zimbabwe included, have developed many more techniques and technologies for processing cereals than horticultural produce for example. Furthermore, primary processing techniques[31] are much more predominant in Zimbabwe and neighbouring countries, than secondary processing activities.[32]

The methods used to process fruits and vegetables differ given the fact that the latter are low acid products. Fruits are generally acidic and commonly referred to as "high acid foods" (UNIFEM, 1988). Acidity controls the type of micro-organisms that can grow in fruit products. The maintenance of acidity levels in fruit prevents the growth of food poisoning bacteria and helps to maintain colour and flavour of the produce (ITDG Technical briefs, year unknown). Fruits often require a higher degree of control over hygiene, and humidity for example. The spoilage micro-organisms likely to be found in fruit products are yeast and moulds, which rarely cause illness if consumed, but cause rapid deterioration in the quality of the product. Vegetables on the other hand are generally referred to as "low acid products" (UNIFEM, 1988). Many food poisoning organisms thrive well in "low acid products" and hence great care has to be exercised in the processing of vegetables in particular.

The main techniques adopted in processing fresh fruits and vegetables are listed in Table 24 that follows. The chart gives a general outline of some of the traditional and basic ways in which produce is processed. By and large horticultural produce processing in LCDs, and in

[31] Primary processing includes cleaning, grading, hulling, pounding, milling, grinding, tempering, soaking, parboiling, drying and sieving the produce.
[32] Secondary processing constitutes baking, frying, extruding, blending, fermenting and roasting.

Zimbabwe in particular, is not traditional in its totality but has more to do with the use of simple technologies, most of which is imported from developed countries.

4.4.2 Technologies used in small-scale horticultural processing enterprises

According to CTA's 1997 Annual report, nearly 40-60% of the manufacturing added value in Africa is created within the food-processing sector. The bulk of the food is processed in the informal sector by micro-enterprises and artisan industries. Despite the importance of the sector however, indigenous food processing technologies have remained almost static over the years (Spore, 1996). Small-scale processing of fruit and vegetables in Zimbabwe, like in other developing countries, is largely done using simple and affordable technologies. It is important that technologies designed for small-scale farmers are efficient, durable, and capable of being made and repaired in the areas where they are to be adopted, and using simple tools and limited resources.

Table 23. Technology adopted for horticultural processing by enterprise type

	Enterprise Type			
Processing Operation	**Cottage**	**Micro-enterprise**	**Small-scale Enterprise**	**Industry**
Washing/cleaning Trimming Peeling Slicing Drying Packing	Hand operation	Hand operation	Machine operation	Machine operation Refrigeration

Source: Bhila, Personal Communication, interviews with small-scale processors, and training institutions e.g. Ranch House College

Figure 8. Tomato processing in Zimbabwe

Tomato processing is common among small-scale producers in Zimbabwe. It is a relatively simple task, especially when carried out on a small-scale. Usually tomatoes are either sun-dried (sliced and spread to dry) or pulped. In the case of pulping, tomatoes are selected according to ripeness, and then washed. They are then pulped in an electrically driven mechanical pulper which separates the pulp from seeds and skins. The juice is then heated in a stainless steel pan at up to 90^0C over an open gas fired stove. The juice is checked for acidity, which should be below pH4.5. The juice can then be graded to meet various standards before being treated with preservatives, e.g. sodium metabisulphite. The extract is then packed in tins or drums, and stored at a temperature between 25-30^0C, ready for consumption.

Source: ITDG Technical Brief, Tomato processing

Table 24. Main processing techniques adopted by small-scale enterprises

	Reason for particular technique	Method of processing	Examples of produce	Additional information
Size reduction	First stage in vegetable and fruit processing is size reduction- speeds up rate of the drying, heating or cooling process.	Chopping, cutting, slicing, shredding and dicing. Pulping in the case of juice extraction.	Cabbages, rape, tomatoes	Fruit juice or pulp are the starting materials for manufacture of soft drinks, preserves etc.
Heating	One of the most important methods used in food processing. Improves eating quality and digestibility of some foods. Preserves food by destroying enzymes, micro-organisms, insects and parasites. May also destroy the anti-nutritional components of some foods.	Involved in canning process, baking and roasting (some vegetables), frying (banana chips), pasteurisation (fruit juice), blanching (see below) and concentration processes (jam, fruit drinks for dilution, tomato or garlic pastes etc.).	Groundnuts, tomatoes	Profitable to add value to basic raw materials (in the case of frying for example) by processing them into snack foods.
Blanching	Not intended to preserve food. A pre-treatment process before drying (solar or sun drying), used to destroy micro-organisms in vegetables and some fruits, that would otherwise not be eliminated during drying or freezing process. If food is not blanched, enzymes can lead to loss of flavour, colour, and nutritional value during storage period (DTC, 1989).	Foods are quickly heated in boiling water or steam and then quickly cooled to near room temperature.	Rape, cabbage, mangoes, paw-paw	
Drying	Oldest traditional, food preservation method. Main purpose of drying is to preserve foods by removing water that is needed for microbial growth and enzyme activity.	Traditional drying methods include drying by direct sunlight or for example in the case of small amounts of food, drying over a kitchen fire. Some techniques involve use of solar dryers. Osmotic drying and crystallising- fruit is heated in sugar syrup to extract moisture before drying in air- common in SA. Fruit leathers are produced by drying a puree of fruit or fruit mixture	Rape, cabbage, onions, spinach, tomatoes, pumpkin leaves, cow-pea leaves, okra, choumoellier and spices (chillies, ginger, paprika). Leafy vegetables dried into musoni, masawu.	Sun-drying of vegetables is usually carried out in August, September and October, as rainfall is expected from November to March.

	Reason for particular technique	Method of processing	Examples of produce	Additional information
Salting	Often combined with drying process. Salting reduces spoilage due to a build up of bacteria.	Vegetables are blanched and salted before being dried.	Most popular salted vegetables include okra, rape cabbage	
Smoking	The preservation effect of smoking is partly due to the drying and heating effect, but also due to the deposits of natural chemicals from the wood smoke onto the food, which inhibit bacterial growth.	Vegetables are smoked either by: 'cold smoking' process where temperatures are not so high as to cook the food, or by 'hot smoking' where temperatures are sufficient to cook the food (e.g. onions are placed on inside roof of a kitchen to dry slowly over a period of time).	Onion, okra and leafy vegetables can be smoked.	
Frying	Deep frying in oil.		Uses surplus banana to make salted deep fried chips for example.	Commonly practised in many Caribbean islands.
Pickling and fermentation	Fermentation by acids, salt and/or sugar is the main method for pickles and fermented foods, although some are also pasteurised.	Sweet pickles- fermentation is often by fermentation of sugars to acids although unfermented sweet pickles are also made. In sour pickles, vegetables may be fermented in a similar way or acids may be added.		
Pounding	Enables produce to be stored for quite a substantial period.	Most produce to be pound is dried first of all. Produce is ground into a powder.	Tomato, groundnuts, chillies.	

Sources: Fellows (Ed.), 1997; UN, 1998; Turner and Chivinge, 1999; Murphy, 1996

4.5 Large-scale processing enterprises

Major firms involved in fruit and vegetable processing in Zimbabwe are Lever Brothers (which incorporate Lemco), CAIRNS Foods and Heinz. According to the Export Directory of Zimbabwe the companies are grouped into three categories namely Fresh and dried fruit companies, fruit and vegetable juice companies and companies that preserve fruit and vegetables (ZIMTRADE, 1999). The majority of these firms also carry out the canning or bottling of their products.

Table 25. Companies involved in processing fruit and vegetables in Zimbabwe

Fresh fruit or dried fruit Companies	Fruit and Vegetable Juices Companies	Fruit and Vegetable Preserved Companies
Bateleur Ventures Pvt Ltd	Harvest Foods Pvt Ltd	CAIRNS Foods
Bembororo Farming Pvt Ltd	Lyons Zimbabwe Pvt Ltd	Cuthbert Industries and Timber Merchants Pvt Ltd
Broyton Pvt Ltd	Marlon Trading Pvt Ltd	Lyons Zimbabwe Pvt Ltd
Chiparawo Pvt Ltd	Schweppes Zimbabwe Ltd	Olivine Industries Pvt Ltd
Claremont Orchards Pvt Ltd	Valley Cannors Pvt Ltd t/a Exotican	P Krambergar
Freshex Produce Export		Selby Enterprises
Galloway Estate Mvurwi Pvt		
Gomango Pvt Ltd		
Highveld Horticulture Pvt Ltd		
Horti-Pride Pvt Ltd		
Hortico Produce Pvt Ltd		
Industrial and Commercial Buyers Pvt Ltd		
M.A. Murray Pvt Ltd		
Manflora Pvt Ltd		
Mazoe Citrus Estates		
Nottingham Estate Pvt Ltd		
P. Kramborgar Selby Enterprises Pvt Ltd		
Pombi Chase Pvt Ltd		
Transfruit		
Zimcor Ltd		

Source: Bhila, Personal Communication with representatives of the named companies

4.6 Examples of small-scale processing of fruit and vegetables

Turner and Chivinge (1999) have found that although almost every household grows various fruit crops (e.g. guavas, mangoes and oranges) around the homestead, few households process fruits into jams or other products. Given that many households have access to one or other variety of produce virtually all year around, they do not see the need to process part of the crop. Essentially it is those households that produce an excess of fruit sufficient to justify sale on the market that get involved in processing activities. If processing cannot be justified economically excess produce is left to rot. The main varieties of fruit processed by small-scale enterprises in Zimbabwe include peaches, apples, pineapples, mangoes, granadillas and bananas. Table 26 shows a list of a more general list of fruit commodities, which are processed, and examples of their end products.

Table 26. Types of fruits and vegetables processed in Zimbabwe, and examples of end-products

Classification	Product	Processing Technique	Technology used	End products	Market Where?
Sub-tropical	Orange	Juicing and concentration	Juice Extractor	Juice	Local, Export
	Lemon	Juicing and concentration	Juice Extractor	Juice	Local, Export
Tropical	Pineapple	Juicing and concentration/ Drying	Juice Extractor Cutter	Juice Jam Dried fruit	Local, Export
	Mango	Drying Canning	Canner	Dried fruit Canned mango	Local
	Banana	Some drying		Dried fruit	Local
	Passion fruit	Juicing	Juice Extractor	Juice	Local
	Paw paw	Some concentration and drying of fruit		Dried fruit Jam	Local
	Guava			Jam	Local
Temperate	Apple			Jam Dried fruit	Local
	Peach	Some drying		Dried fruit	Local
	Apricot	Some drying		Dried fruit	Local
	Sugarcane	Juice extraction	Sugar Diffuser Concentration	Sugar	Local, Export
Vegetable fruits	Tomatoes	Drying Pulped and preserved		Sun-dried tomatoes Tomato paste	Local, Export
Leaf vegetables	Rape			Musoni Masawu	Local Local
	Covo	Drying		Dried	Local, Export
	Cabbage	Drying		Dried	Local, Export

Source: Bhila, Personal Communication

Whether on a small or large-scale enterprise, fruit and vegetables are sorted and washed before being processed, in order to exclude produce that exhibits excessive bruising, and/or insect damage. The main processing techniques adopted usually involve the use of manual or powered equipment.

4.6.1 Drying of fruit and vegetables

The drying process represents one of the earliest techniques used to process fruit and vegetables. In fact the drying of foodstuffs, in order that they be stored for use in times of need, is the oldest food preservation method known. The traditional technologies used to dry foodstuffs are based on climate: sun, shade, low humidity, airflow and sometimes fire (UNIFEM/ITDG, 1993). Drying is possibly the most appropriate way of preserving many fruits and vegetables in rural areas, as it is a low-cost practice.

However, the need to ensure food self-sufficiency in rural areas and developing countries in general has led to the development of more advanced drying methods such as the use of artificial dryers. Artificial dryers enjoy independence from weather conditions, ensure a greater degree of control over the drying process, have a greater drying capacity and enable a wider range of products to be dried. However, there are also some disadvantages to artificial dryers. Artificial drying requires greater capital investment, as production costs are higher owing to costs on fuel, equipment, spares and maintenance. Furthermore the skills needed to maintain such equipment may not be available locally. Mechanised techniques are usually more applicable for use in urban and peri-urban areas due to better access to fuel.

The Development Technology Centre at the University of Zimbabwe in collaboration with Agritex designs local food processing technologies. In 1989 they developed a simple and affordable solar vegetable drier suitable for communal farmers engaged in horticultural production.[33] Solar dryers have the advantage of creating higher temperatures and movement of air that increases the rate of drying, therefore reducing the risk of spoilage by micro-organisms. Food is enclosed in the drier keeping contamination (by dust, insects and animals for example) at a minimum. The higher drying rate enables a greater quantity of produce to be dried in a relatively small space. However, there are also some drawbacks to solar drying. For example, the benefits of solar drying do not seen to be reflected in an increase in the value of the produce (ITDG Technical brief, Drying of foods). A further drawback is that solar and mechanical dryers demand a greater labour input than traditional methods, e.g. loading and unloading of trays of produce.

When carried out correctly, the nutritional quality, colour, flavour and texture of rehydrated foods are only slightly less than fresh foods. If drying is carried out incorrectly however, it can causes losses in the nutritional content and quality of the produce, and in more serious cases may lead to a risk of microbial spoilage even food poisoning (ITDG, Technical Brief, Drying of foods).

It is interesting to note that many farmers cite unfamiliarity or distaste for dried fruits (Table 27), and lack of knowledge of processing techniques, as reasons as to why they do not process fresh fruit into such products. Research on fruit and vegetable drying in Zimbabwe suggests that dried fruit (including confectionery and products containing dried fruit) was mainly purchased by high-income consumers in up-market retail outlets (Murphy, 1996). Such products were unfamiliar to most Zimbabweans, who preferred to eat fresh fruit.

[33] The DTC solar drier is capable of drying 12kg of leafy greens or cabbages in 1.5-2 days. However, drying time is reduced to 1 day for a capacity of 4kg of produce. The drier consists of a rectangular framework raised 300mm above the ground. The base is covered with perforated shaded cloth and is supported so that it should not sag from the weight of the vegetables. Another shade cloth is placed on top, 200mm above the layer of vegetables to cover the whole drier and keep out flies and dirt (DTC, December, 1989).

Table 27. Familiarity of consumer income-groups with dried fruit and vegetable products in Zimbabwe

	Low-income rural consumer	Low-income urban consumer	Low-to-middle income urban consumer with rural background	High-income urban/rural consumer	Tourist
Dried Fruit					
Indigenous	Y	N	Y	N	N
Exotic	N	N	N	Y	Y
Dried fruit confectionery	N	N	N	Y	Y
Dried Vegetables					
Indigenous	Y	N	Y	N	N
Exotic	N	N	N	N	N

Source: Murphy, 1996
Note: Y = familiar, N = unfamiliar

4.6.2 Production of jam and fruit juices

The production of jam, jellies, marmalade and fruit juice[34] is largely concentrated in large-scale commercial farms (LSCF), but there is also great potential in the small-scale sector in Communal Areas.[35] The preservation principles of jam, jelly and marmalade are quite complex, but in essence involve the correct combination of acidity, sugar level and pectin content. All three must be correct in to obtain a satisfactory product. Products such as guava, mango, pineapple and apple for example are made into jams.

The manufacture of fruit juice[36] (non-alcoholic beverage) is a relatively simple process and can easily be carried out on a small-scale using a hand processor for example (See Table 28 below for example of equipment used). The fruit is selected, prepared and juice extracted. This is then sieved or strained before other ingredients are added to the juice. This is then boiled, pasteurised and packaged so the final product is ready for the market. 'Rose' fruits like mango and guava require pulping; after pulping the stone is removed and the flesh of the fruit is pushed through a perforated metal plate in order to extract the juice. The following table shows a breakdown of some of the equipment which is used by small-scale processors of horticultural produce.

[34] For detailed technology and production notes see ITDG, 'Fruit juice processing' and 'Manufacture of mixed fruit juice at small- scale' Technical Briefs.
[35] Cottage processed food products like jams, jellies and fruit juices dominate the urban upmarket in Harare. See Murphy, 1996.
[36] Fruit juice can be classified into pure fruit juice (with nothing added), fruit nectar (contain at least 30% fruit solids) and fruit squash (contain at least 25% fruit pulp mixed with sugar pulp)

Table 28. Technologies used and where they are sourced

Process	Equipment	Manufacturer of Equipment	Source
Juice extraction	Juice extractor	Kenwood ltd	UK
		Mitchell & Co. ltd	UK
		Narange Corp	India
Canning	Giant Canning machine	Lenham Hardware	USA
	Canning Machine		Mexico

Source: Bhila, Personal Communication with representatives of large-scale horticultural processing companies in Harare

The manufacture of fermented fruit products (wines and vinegars) is not uncommon in rural areas in Zimbabwe. Fruits are used to prepare wines (*tototo*), which contain high levels of alcohol. However, the sale of such products on the market is illegal. Local fruits and vegetables are usually mixed with other ingredients such as cereals and subsequently fermented with yeast before being converted into *tototo*.[37] The process uses basic equipment such as metal drums, cast iron pots etc.

4.6.3 Canning and bottling of fruit and vegetable products

The canning of fruits and vegetables by small-scale enterprises is not common in Zimbabwe. This is mainly due to the fact that the canning process requires considerable capital investment, experienced staff, regular maintenance of equipment, and comparatively high operating costs. Despite these hurdles small-scale processing initiatives that include canning and bottling of horticultural produce, have been launched in various parts of the country. These include the Chimanimani Jam Canners enterprise which is run by women and supported by a number of donors. A group of women in Chinamhora Communal Area, and small-scale processors in Mutoko, Murehwa and Masvingo are also involved in canning of fruit and vegetable products.[38] The latter source capital through Small Enterprise Development Corporation (SEDCO) and Zimbabwe Development Bank (ZDB) and obtain training and technical assistance in fruit and vegetable processing from agencies like ITDG. The canning process adopted by these small-scale enterprises is relatively straightforward and the only notable sophisticated equipment used is a tin sealer. The fruit is selected and prepared, and the pasteurised fruit is placed in simple cast iron pots, which are then sealed.

[37] Tototo is also common in other African countries.

[38] Small-scale processors in Chinamhora, Masvingo and Mutoko have also embarked on fruit and vegetable drying in Communal Areas.

5. THE SUPPLY AND DISTRIBUTION SYSTEM WITHIN THE HORTICULTURAL SUB-SECTOR

The aim of this section is to gain an awareness of the key functions, technologies and participants involved in the horticultural sub-sector in Zimbabwe. The subsector approach is referred to as the 'network of agents that supply raw materials, transform them and distribute finished goods to the eventual market' (Boomgaard *et al*, 1991; Liedholm and Mead, 1991; McPherson and Parker, 1993; Kilmer, 1993). In the case of the horticultural sub-sector, our emphasis is on the various functions involved from the production and processing of fruit and vegetables, until they are made available to the consumer. The aim is to provide a schematic overview of the channels, technologies and product flows within the supply chain of processed horticultural products.

It is important to point out that our focus is on peri-urban producers and processors, who supply urban markets with fruit and vegetable products. The main channels through which urban food supply is met include rural markets, urban wholesale markets, large retail markets, secondary markets, small neighbourhood markets, local shops and supermarkets. The main activities involved in bringing food into and distributing it within urban areas are: assembling, handling, sorting, packaging, storing, transporting, processing, wholesaling, retailing and cooking for sale as street food (FAO, 1999b).

5.1 Sub-sector functions

Murphy (1996) provides an instructive example of the sub-sector approach in the dried fruit and vegetables sub-sector in Zimbabwe. Table 29 below highlights the main functions within this sub-sector. The following section aims to highlight some of the key functions in the horticultural sub-sector for processed food products.

Table 29. Main functions in the dried fruit and vegetable sub-sector

Function
• Input supply
• Crop production
• Fruit and vegetable drying
• Storage and transport
• Processing and packaging
• Wholesaling
• Retailing
• Exporting

Source: Murphy, 1996:27
Note: Support organisations may also be involved in research, training, credit provision and representation.

5.1.1 Crop production: Harvesting methods

Although the harvesting of produce is not a post-harvest operation *per se*, it is perhaps one of the activities that have a heavy bearing on the quality and price of horticultural produce on the market. The timing of the harvest is crucial as producers aim to take the produce to market at optimum ripeness. Farmers must also strive to harvest their crop during early morning or late afternoon to avoid heating by the midday sun (Sena, 1997; Farming World, 1998; Turner and Chivinge, 1999).

5.1.2 Grading

The grading of produce is important, as it can add value and bring higher market returns to the producer. The indices which farmers use to grade produce may follow a single criterion or a combination of criteria relating to the maturity and quality of the crop, including size, colour, freshness and ripeness (Turner and Chivinge, 1999:23). For example, smallholder farmers grade tomatoes according to size and colour, and leafy vegetables like rape and cabbage according to leaf size (and leaf colour and turgidity) and head size respectively. Fruits such as mango however, are graded according to their size and degree of ripeness (Ibid.).

Although Mbare Musika represents a largely informal market, Sena (1997) points out that product quality has assumed a significant importance there. This is due to the fact that some large-scale farmers dump produce, which was initially intended for the international market (but which failed to meet the quality standards laid down), on the Mbare Musika market. Although this produce may be of inferior quality for the international market it may be of higher quality than that which is marketed locally. While this may boost competition among farmers to produce higher quality products for the domestic market, 'less dynamic' farmers may fail to meet the informal standards laid down and hence may not find an easy outlet for their poorer quality produce (Turner and Chivinge, 1999). However, standard grades on the domestic market may help to promote uniform prices for products of similar quality.

5.1.3 Processing of horticultural produce

Processing may add value, generate an income, increase the shelf life and palatability of a product, and furthermore it may offset seasonal glut and scarcities within the market itself. In view of the possible pre- and post-harvest losses which small-scale farmers may incur, it makes economic sense to process produce for future consumption or sale on the market. A survey carried out by Turner and Chivinge (1999) in Mutoko, Murehwa,Uzumba Maramba Pfungwe and Goromonzi showed that most smallholder horticultural farmers process some of their crops in one way or another. The main processing techniques adopted by small-scale horticultural processors include drying (sun or solar), smoking, salting and pounding (See Table 4, Chapter 4). Some types of produce may be processed in a variety of ways and some products may involve a series of stages of processing before achieving the end product. Lack of knowledge of processing techniques, distaste for processed products and supply of fresh produce all year round, were found to be the main reasons as to why certain farmers did not process any of their crops (Turner and Chivinge, 1999; Murphy, 1996).

5.1.4 Packaging

Packaging can be defined as a means of providing protection to a product, in order to ensure it's safe delivery to the point of sale. The main functions of packaging are protection of the content from physical, chemical and biological damage during transportation, storage, distribution and display. Packaging can also play a role in promoting sales. Each type and category of fresh or processed product calls for specific packaging conditions (See Table 30 below).

Table 30. Most common types of packaging for fresh and preserved products

Product	Type of packaging
Fresh fruit and vegetables	Crates, bags, sacks, paper/ paper-board boxes and cartons
Preserved fruits and vegetables	Metal cans, glass bottles and jars
Semi-processed products for further industrial use	Bulk containers, drums etc.

Source: UN, 1998; Turner and Chivinge, 1999

5.1.5 Storage

The storage of fruits and vegetables and their processed products plays a significant role in food security, given the perishable nature of such produce. In their study in Mashonaland East Province, Turner and Chivinge (1999) found that most people use mainly traditional facilities for storing produce such as their kitchen, granary, bedroom, open air shed, shed and traditional pit. Dried vegetables represent a major component of the daily diet especially during the dry season; dried leafy vegetables for example can be stored for up to 12 months. Sweet potatoes are mainly stored in a traditional pit called *pfimbi* where the use of ashes can prevent insect pest attack for periods of up to six months. Onions are mainly stored in an open shed, kitchen or granary for up to 12 months. Farmers use preservatives and protectants (such as *shumba)*, ant killer, vinegar and soda to curb insect attack especially against dried beans and vegetables (Ibid, 1999). Rodents are the main cause of damage in products stored in the kitchen and granary and sprouting problems are common in onions and sweet potatoes. In all, Turner and Chivinge found that few farmers had storage facilities such as holding sheds for their produce, and only one of the 393 farmers interviewed had access to a temperature-controlled cold room in which to store produce (Ibid.)

5.1.6 Transportation of produce

Many farmers face the problem of high transaction costs, due to erratic and expensive transportation, and payment for marketing bays at Mbare Musika to Harare City Council in order to market their produce. A lack of alternative markets makes this situation all the more difficult. Often produce is left to waste in gardens for lack of an efficient and speedy transport network (Jaure, 1997; Turner and Chivinge, 1999).

Various forms of transport are used to transport produce depending on the nature and quantity of the crop and distance to the market. Carts, bicycles and wheelbarrows are relatively cheap and reliable means of transportation, especially when the quantities of produce are small and only transported over short distances to local markets (Turner and Chivinge, 1999). In the case of transport to urban markets, crops are often brought to the roadside from where they are ferried by bus, truck or lorry to the market destination (Ibid.). Buses are commonly used

to transport crops. In most cases the farmer personally takes the produce to the market to ensure its safety in transit (Ibid.). However, buses are unable to service all routes, and breakdowns are not uncommon. Often farmers face great problems in finding alternative transportation at short notice. Furthermore buses are at times selective in their route, as some areas become inaccessible during the rainy season. This is particularly the case in the Eastern Highlands, where low bridges get swept during heavy rains. Furthermore farmers are often restricted on the quantities of produce they may carry on board by bus operators (Sena, 1997; Poverty Alleviation Study, 1997; Turner and Chivinge, 1999).

Trucks and lorries are a common mode of transportation. Commodity brokers may travel to smallholder farms to buy produce at the farm gate, which is then sold to urban markets. Some individuals provide a transport service to farmers for an agreed fee (Turner and Chivinge, 1999).

Some farmers (in Mutoko, Murehwa and Mahusekwa) have benefited from the ARDA scheme, which sought to provide farmers with a transportation service and also marketing information. Since 1987 ARDA has been running an EU-funded smallholder transportation project that is aimed at assisting farmers by enhancing the efficiency of transport networks. Farmers register onto the scheme through ARDA offices, after which they can have their crops (mainly tomatoes and rape) ferried by ARDA trucks to the Mbare market. ARDA records the amount of each individual's produce and markets it. Basically, the system is of assembly markets.[39] The ARDA trucking scheme usually only carries goods leaving producers to take buses to the market destination and wait upon the arrival of their produce. Once at Mbare, farmers usually market their own crops.[40] In 1999, farmers were charged $3.50 a crate/box and $50 per bag of produce for transportation. Sena (1997) estimates that ARDA transports over 4000 tonnes of produce per year. In order to ensure the equitable use of the transportation facility, ARDA allocates each farmer a specific day when they can market their crops. This disadvantages some farmers as they may be forced to sell their produce on days that are not good for business causing animosity among producers. Furthermore routes covered by single trucks are often long resulting that trucks are full to capacity before they have completed their entire route. Damage to produce on route is not uncommon as trucks are packed to capacity. In Mutoko for example, one such route is 84 km by gravel and a further 154 km by tarred road to Harare (Sena, 1997). The ARDA[41] scheme has been crucial to farmers however, in terms of getting access to markets at the right time.

[39] According to Jaure (1997) ARDA introduced this innovative system of assembly markets to allow smallholder farmers to penetrate the up market, benefit from economies of scale (through bulking up produce) and collective bargaining during price negotiations and allow marketing specialisation by the association development. It is copying a similar strategy used by large-scale farmers. Large-scale farmers operate assembly markets e.g. FAVCO and Hortico. However he admits that the assembly markets are far from efficient and profitable.

[40] In some cases however, ARDA markets the produce on behalf of the farmer, who is paid by cheque from ARDA a few days after the marketing transaction takes place (Karimanzira and Jaure, 1997; Jaure, 1997; Sena, 1997 and Turner and Chivinge, 1999).

[41] ARDA is a parastatal. It also operates estates and is now a large-scale producer of cotton, wheat, soya bean, tea, coffee, rice, groundnuts, tobacco, sorghum, sunflower, milk and beef.

5.1.7 Wholesaling, retailing and exporting produce

Whilst some farmers may produce, process, transport and market their own produce, there are usually a series of agents involved in the marketing chain. According to Sena (1997), the horticultural marketing system in Zimbabwe follows a myriad of channels both formal and informal, large-scale and small-scale depending on the commodity in question and the season of production (demand and supply response). The number of links in the marketing chain may differ by location (depending on access to markets and production patterns) and season (depending on patterns of supply and demand in other locations) (Magrath, 1992). Marketing is done on local (rural and urban), regional (South Africa, Egypt, Mauritius etc), and international markets (EU: Britain, Belgium, Italy, The Netherlands, Germany, France; USA; and Middle and Far East, in that order) (Horticultural Promotion Council, 1998). Different types of marketing chains display different relationships between traders.

Two of the main functions within the supply chain include wholesaling and retailing. Wholesaling refers to the bulk distribution (buying and selling) of commodities. Wholesalers may purchase produce directly from the farmer or through rural buyers. This is then sold in bulk to food processing companies, marketing agencies, domestic retail outlets or to importing companies within the international market for example. Retailing refers to the sale of produce to the consumer, usually in small quantities. Wholesalers and retailers play an increasingly important role in setting production, packing and distribution standards (UN, 1998).

5.1.7.1 Formal versus informal marketing channels

The main distinction between the formal and informal market is that the former lays much emphasis on quality and is demand driven, while the informal market lays emphasis on quantity and is supply driven. Formal and informal marketing channels tend to have different distribution systems, carry a different range and mix of produce and tend to use different pricing and promotion strategies. Seemingly the literature on the extent and nature of informal marketing systems in Zimbabwe is scarce. Informal marketing of agricultural produce in Zimbabwe does not seem to take place at such pronounced levels as in other African countries, where black markets handle copious amounts of agricultural produce equal to or greater than that handled by formal or official markets. However, evidence would suggest that informal marketing is quite prevalent in small-scale farming areas (Kupfuma *et al,* 1992; Jayne *et al*, 1994), stimulated of late by the introduction of the structural adjustment programme, and the consequent trends of trade liberalisation, increasing commodity prices and food scarcities.

Prior to the adoption of ESAP in 1991, Zimbabwe's informal market was less pronounced than the formal, largely because of government pricing policies that were effected through various statutory marketing boards. The marketing boards had the physical function to purchase controlled products from producers and sell them to processors. They also had a monopoly on importing and exporting produce, impeding both local and long-distance trade of grain for example.

Informal markets usually assume a form of exchange in cash or kind between individuals and tend to be quite prevalent during the drought years. For instance Jayne *et al* (1994) and Kupfuma *et al* (1992) found that in a drought situation, food crops like maize, sorghum,

millet, groundnuts are exchanged for consumption purposes and rapoko and millet for beer brewing.

5.2 Sub-sector participants

As Murphy (1996) points out in the case of the dried fruit and vegetable sub-sector, there are various participants involved in the marketing and supply chain of horticultural produce (Table 31). What follows is a brief discussion of the participants in the sub-sector for horticultural processed foods. The following section overlooks the participation of horticultural producers, given that ample discussion of the horticultural production systems has taken place in Sections 2 and 3. However, it is important to point out that some farmers produce, process and market their own produce. Others may assemble produce from inaccessible areas, transport it to rural growth points or along main roads, where it is subsequently sold to commodity brokers from urban areas. Some farmers may even market produce as street vendors in urban residential or sell it directly to wholesalers in Mbare market (Matanda and Mataviri, 1997; Turner and Chivinge, 1999). Others may set up agreements with local boarding schools and hospitals, undertaking to supply these institutions with particular crops (such as leafy vegetables and dried beans) at particular times of the year (Matanda and Mataviri, 1997). Such arrangements largely depend on the farmers proximity to them and furthermore the scale of production (Turner and Chivinge, 1999).

Table 31. Main participants in the dried fruit and vegetable sub-sector

Sub-sector participants
• Input suppliers
• Communal Area farmers
• Large-scale Commercial farmers
• Small-scale Commercial farmers
• Fruit and vegetable drying companies
• Large-scale food processors
• Wholesalers
• Bulk buyers of fruit and vegetables: LSCF, relief agencies, GoZ, etc.
• Formal retail outlets (supermarkets etc.)
• Informal market traders

Source: Murphy, 1996:28

5.2.1 Transporters and commodity brokers

Transporters move produce between production areas and markets. They are usually paid for the service once the produce is loaded or upon arrival at the market destination (Turner and Chivinge, 1999; Sena, 1997; Jaure, 1997). Brokers however buy produce at the farm gate, and transport it to urban areas particularly in Harare for sale to urban consumers (Turner and Chivinge, 1999).

5.2.2 Wholesalers

In Zimbabwe rural buyers also involve wholesalers. For instance large-scale horticultural marketing companies like Interfresh[42], Outspan and Favco employ their own buyers to go to rural areas and purchase commodities. These wholesalers then sell to national retail outlets like OK, Bon Marché, Spar and TM Supermarkets and also export to international markets (Sena, 1997; Farming World, 1998). Wholesalers are essentially involved in speculative and arbitrage behaviour taking advantage of gluts and scarcities on the market, especially the international market due to differences in seasonal production; supplying produce to Europe for example during the winter season (Farming World, 1998).

5.2.3 Commission agencies

There are also some commission agents and brokers involved in the supply chain. A good example is ARDA's Mashonaland Fruit and Vegetable Project, which operates two marketing channels for the farmers—as a middleman and furthermore as a transporter of produce. The middleman handles the produce, grades and packs it before marketing it on behalf of the farmer for a commission of 2-3% of the total revenue—still leaving farmers with a small profitable margin. The transporter however, merely moves produce to the market destination, leaving the farmer to sell his produce (Sena, 1997; Jaure and Karimanzira, 1997; Jaure, 1997; Matanda and Mataviri, 1997)[43]. Commission agents and brokers are more dominant in the grain sector, under ZIMACE, bringing potential local and international buyers together by using its intimate knowledge of supply requirements and prices in varying markets.

5.2.4 Large and small-scale food processing companies

Food processing companies are also involved in the supply channel of processed horticultural products. While large-scale processing companies may dominate the sub-sector, small-scale processors are increasing their market share of processing activities. (See Table 25, for a list of large-scale processing companies that are active in Zimbabwe).

Commercial food processors are often supplied their raw materials directly from farmers themselves. According to Makhado (1994), Mutema and Tawona irrigation schemes provided approximately 50% of CAIRNS Holdings Ltd tomato requirements for its Mutare factory. Processors such as Hortico and Selby Enterprises contract farmers in Mutoko, Murehwa to grow chillies that are then processed in their plants (Turner and Chivinge, 1999). In Marondera one company buys fruits— in particular guavas, from Murehwa, for the manufacture of wine (Ibid.). Other large-scale processors have access to raw material from Mbare wholesalers (Ibid.). Large-scale commercial farmers however, tend to process *in situ* with produce cultivated on their farms (Farming World, 1998).

[42] Between 20-25% of the total tonnage of Interfresh's supply requirements comes from the small-scale sector (majority from irrigation schemes, but also some from Communal Area farmers).

[43] The role played by ARDA in transport is important. In spite of the problems highlighted above, the provision of a reliable and affordable transport system has had a major improvement on production. This is evidenced by the increased volumes of produce delivered to Mbare market since the project started and improved net returns to farmers participating in the project (Sena, 1997; Jaure and Karimanzira, 1997; Jaure, 1997; Matanda and Mataviri, 1997).

Figure 9. Harare's Mbare Market

In Zimbabwe as in other developing and sub-Saharan African countries, the town market is the scene and hub of direct transactions between producers, wholesalers and consumers. The central market in Zimbabwe is in Harare at Mbare Musika, which is divided into a producers and a wholesale market. Sena (1997) estimates that over Z$75million worth of horticultural trade per year, happens on the domestic market. Mbare Musika handles up to 40,000 tonnes of produce per year from large-scale commercial farms and smallholders; smallholders supply about 5-7% of this (Sena, 1997). Jaure (1997) suggests that Mbare accounts for 40% of the volume of produce delivered to Harare and Chitungwiza. About 5% is exported to Europe and the Middle East and up to 40% goes into local and interregional trade.
Jaure (1997) suggests that the customer composition for Mbare Market is as follows:
52% retailers operating from city council market stalls,
28% hawkers operating form street corners,
9% middlemen, popularly known as 'Makoronyera' who operate as small-scale wholesalers; and 11% other customers including the public.

In addition there are over 20 independent wholesalers (Poulton *et al.* 1999, citing van Santen, 1996). These serve the upper end of the market-supermarkets, hotels and fast food outlets located elsewhere in Harare (Farming World, 1998; Poulton *et al*, 1999).

Local and international trade is fiercely competitive, with activities at Mbare reflecting the daily supply and demand situation. Prices at Mbare fluctuate wildly from day to day, and even within a given day and also intra-seasonally (Poulton *et al*, 1999).

In Mbare, small-scale and of late large-scale farmers converge to trade products of varying quantities and standards. Each producer (not using an agent of some sort) accepts full responsibility for ferrying his produce, advertising it, finding customers and in some cases obtaining information to guide him in bargaining over his price. It therefore implies that access to information in both Mbare and by producers at the farm level is critical. Access to such information is not uniform however, with large-scale farmers having accessing information with greater ease, than smallholders and remote farmers. Agritex tries to collect current market information, but distribution in time is a big constraint.

Source: Poulton *et al*, 1999; Sena, 1997; Jaure, 1997; Farming World, 1998

5.2.5 Large and small-scale retailers

The last line in the marketing chain is of retailers, both large and small-scale. Large-scale retailers obtain supplies from wholesalers such as Interfresh, FAVCO, Sunspan and Selby Enterprises, among others. Instead of buying from various wholesalers and/or producers, large-scale retailers tend to set up contracts with specific wholesalers, as they need to monitor the flow and uniformity of their supplies quite closely. For example OK and Bon Marché are supplied by FAVCO, SPAR and TM supermarkets are supplied by Interfresh. Large-scale retailers must be able to offer the consumer consistent and quality supplies of produce. Small and individually owned supermarkets usually source supplies from smallholders however, or they purchase produce on the wholesale market at Mbare Musika (Jaure, 1997; and Sena, 1997). Small informal retailers may actually cultivate their own produce, purchase it from neighbouring farmers or on the wholesale market. The advent of structural adjustment has seen the emergence of vegetable traders who go to farms to buy produce that is then sold in urban residential areas and around major shopping areas. These people conveniently offer varied and affordable fresh produce to urban consumers, at cheaper rates than those offered by reputable supermarkets like OK Zimbabwe, Bon Marché, TM and Spar supermarkets.

5.2.6 Role of private and government agencies

In horticulture like in the grain and tobacco sectors, there are marketing agencies who offer an array of services especially for large-scale commercial farmers and co-operative small-scale farmers. For example marketing agencies like HORTICO (Turner and Chivinge, 1999), Interfresh, FAVCO, OUTSPAN, (Sena, 1997) and processors like CAIRNS Foods and Heinz, operate simultaneously in various capacities as producers, buyers, wholesalers and distributors.

There are also independent individual marketing agencies, rural businessmen, itinerant traders, who either sub-contract farmers or take advantage of their proximity and association with them to buy produce ahead of larger companies.

The interaction among the market participants mentioned above is considerable, to the extent that there is no one channel for any given product from the producer to the ultimate consumer. A farmer may market produce direct to the consumer or may sell it to a wholesaler, retailer or other intermediary. Similarly the commercial food processors may buy from farm gate (through contracts or out-growers schemes), rural assembly markets or urban wholesale markets (Turner and Chivinge, 1999:37-78).

5.3 Technology used by sub-sector participants

Murphy (1996) revealed in her study of the dried fruit and vegetable sub-sector, that a wide range of technologies is used throughout the supply chain (See Table 32). The degree of technological innovation used across crop production systems differs across scales of production and access of producer to capital for example. Technology gaps may also be present in the processing methods used within the horticultural sub-sector. For example, commercial processors and commercial farmers who process *in situ,* deal with large volumes of produce that ultimately require sophisticated processing technologies. The technologies used to process small quantities of produce however, are often traditional, manual and labour intensive. This is due to the fact that the volume of produce processed is unlikely to cover the

costs associated with the adoption of sophisticated technological inputs. This may also be true for packaging technologies, storage methods, and transportation for example.

Table 32. Characteristics of technology used by participants in dried fruit and vegetable sub-sector

	Communal Area farmers	**Commercial farmers**	**Fruit and vegetable drying companies**	**Large-scale food processors**	**Retail outlets**	**Informal market traders**
Crop Production Methods	Mainly extensive	Intensive				
Drying Technology	Open-air sun-drying	Own-design technology, using electric dryers	Range of technologies, own-design to sophisticated technologies	Mainly high-technology food processing		
Packaging		Low-technology	Low-tech to high-tech	Sophisticated packaging		
Storage Facilities	Limited facilities	Own facilities	Own facilities	Own facilities	Own facilities	Few have facilities
Transport	Public transport, some transport provided by horticultural associations	Own	Own	Own	Own	Public transport often used

Source: Murphy, 1996:29

6. THE POTENTIAL BENEFITS OF PRODUCTION AND PROCESSING OF HORTICULTURAL CROPS

6.1 Distribution of poverty in Zimbabwe

According to the most recent national poverty assessment study (conducted in 1995, published 1997), approximately 61% of Zimbabwe's total population live below the Poverty Datum Line (PDL) (GoZ, 1995). However, 45% of households live below the Food Poverty Line (FPL) and therefore experience conditions of extreme poverty, i.e. they are unable to meet their basic nutritional requirements. Poverty is particularly prevalent in rural areas, 75% of rural households live in the total poor category (i.e. they live below the PDL), compared to 39% of urban households (15% of Harare's urban population live in poverty). The distribution of poverty varies widely across the rural environment— 84% of the population living in communal areas are said to be poor, compared to 70% of small-scale commercial farmers and those in resettlement areas, and 57% of the population in large-scale commercial farms. In regional terms, the incidence of poverty is greatest in Manicaland (49% of the population are said to be poor) and Mashonaland East Provinces. As the national poverty assessment points out however, poverty also has a gender dimension. The majority of 'poor' and 'extremely poor' households are female-headed.

6.2 Household consumption and nutrition

Access to agriculture plays a significant role in alleviating extreme poverty and improving the population's nutritional status, especially in rural areas where child malnutrition is fuelled by limited access to food as a result of crop failure (Jayne *et al,* 1994).[44] Horticultural crops can contribute greatly to household food security, especially where there is a shortage of food sources from animal protein. Horticultural crops add variety and essential vitamins, proteins, minerals, sugars and fibre to the diet (Matanda and Mataviri, 1997; Turner and Chivinge, 1999).

In their study of Mashonaland East Province, Turner and Chivinge (1999) found that the majority of households produced fruits and vegetables for consumption and for sale on the market. Quantities consumed vary form household to household, and seasonally due to fluctuations in their availability. However, on average a household (of six consumers) consumed per week, up to:

- 18kg of rape,
- four cabbages,
- 5kg of okra (available during the summer),
- 6kg of dried beans,
- 10kg of tomatoes,
- 7kg of onions (enhance flavour as well as nutritional value),
- 28kg of butternuts (May to August),
- 28kg of sweet potato (April to August),

[44] Malnutrition is sub-divided into 'transitory' malnutrition and 'chronic' malnutrition, the latter caused by inadequate food intake. Little information is available on adult malnutrition levels. However, lower birth weights (an indicator of maternal nutritional status) are greater in the dry regions of Zimbabwe, especially during drought periods. For further reading on the food security paradox see Jayne *et al,* 1994.

- 10 kg of gemsquash (relatively new crop to rural areas, not very popular like babymarrow),
- 40kg of mangoes (consumed as snacks),
- 25kg of guavas (consumed as snacks),
- 15 kg of cucumbers (consumed as snacks).

Several other types of fruits were consumed as snacks- peaches, paw paws, mulberries, avocados, sweet oranges, passion fruit and grapes. Indeed households consumed quite a diverse range of fruits and vegetables that made an important contribution to food consumption and household nutrition levels.

In terms of household food security, Turner and Chivinge (1999) found that quite a number of producer households processed food during periods when surplus produce was available. This meant greater access to food for numerous households during the dry season (April to November), when field crops like maize were not available (Ibid.). Some farmers also staggered the planting of crops such as tomato, to ensure that there was a supply of such produce virtually all year round.

Peri-urban commercial horticultural production and processing may be promoted as a poverty mitigation strategy that has the potential to enable peri-urban households to receive enhanced and regular incomes. Income generated from sales of fruit and vegetables (and their products) may also enable households to gain access to a wider range of foodstuffs.

6.3 Peri-urban food security

Peri-urban horticulture is not only important in terms of improving the health and nutrition standards of producer households (as mentioned above). It is also important in terms of improving the situation of the urban poor, by providing them with cheap sources of fresh produce and a range of processed horticultural products of nutritional value. The potential benefits of peri-urban agriculture include easing household budgets, 50-70% of which is usually spent on food in the case of urban households (Rogerson, 1992 citing World Commission on Environment and Development, 1987; Bowyer-Bower and Tengbeh, 1997 citing Drakakis-Smith and Kivell, 1990).

A significant advantage of peri-urban horticultural production is that storage, refrigeration and transportation of produce is less problematic due to greater proximity to large urban settlements (i.e. sources of demand), than in the case of rural crop production (FAO, urban and peri-urban agriculture). Proximity to urban markets reduces transport costs and therefore presumably provides cheaper produce to urban consumers. UPA also enhances the freshness of perishable foods reaching the market (FAO², year unknown). Furthermore, urban proximity facilitates information about the market, and enables small-scale producers and processors to be more informed about consumer demand, and any changes regarding this that may take place.

Rogerson (1992:229) suggests that one of the most significant issues that decision-makers must address in Africa in order to move towards "sustainable urbanisation", concerns the question of urban food supply. This is necessary due to continued population growth, escalating levels of urbanisation in particular, and a declining ability of many African countries to feed themselves. He suggests that two possible solutions to attain greater urban

food security are to stimulate hinterland food-carrying capacity and furthermore encourage gardening and food production within urban and peri- urban areas themselves.

6.4 Employment and incomes

Poverty ranking surveys have shown that agricultural incomes (particularly in marginal regions) are insufficient for household reproduction, forcing greater dependency by rural households on remittances from family members in urban centres for example. Shumba (1992) suggests that total farm incomes in Mangwende (NR II) are about three times those in Chivi (NR IV). While approximately 74% of incomes in Mangwende come from agriculture, only 45% of total household income in Chivi relate to agriculture. Diversified agricultural production through improved farming, food processing techniques and storage methods has the capacity to increase returns to farming.

Horticulture in Zimbabwe is a viable and important economic activity (Jackson, 1997; Horn, 1997; Horticultural Promotion Council, 1998). As the horticultural sector is highly labour intensive, it therefore acts as a major source of employment and income generation for the rural population, more particularly for the small-scale rural farmers who constitute 70% of the country's population. The horticultural sector is not only an important employer in terms of (rural, peri-urban) labour demand on large and small-scale farms, but it also provides employment in terms of the upward and downward linkages to other industries. For example, it creates employment in those industries involved in input provision (e.g. seed and agro-chemicals), agro-processing, and in the marketing and distribution of produce to local, regional and international markets. Essentially such employment opportunities tend to be located in the peri-urban sector, due to the advantages for large-scale commercial industries locating there. Small-scale processing enterprises however, are more likely to provide employment opportunities in peri-urban areas, even if only to household members. Manyame (1997) points out that it is important for the government and private sector to realise the full potential, which the horticultural sector represents.

6.5 Improving female livelihoods

Women make up a larger percentage of Zimbabwe's rural population.[45] They partake in a large proportion of farming activities either as *de facto* household heads[46] or as wives or daughters under male-headed households (Muchena, 1994). Sub-Saharan Africa has been described as a region of female farming *par excellence* (Boserup, 1970) where women are the major providers of agricultural labour for both consumption and market-oriented production. However, there is still limited official recognition of women as food producers. Women have indirect access to land through male members of the family (except for females as household heads), limited access to farm inputs, credit and technology. As a result, women and children are more vulnerable in poverty, health, nutrition and food security (Muchena, 1994). The potential for Zimbabwe's growing horticultural sector to improve women's livelihoods is therefore important, particularly with respect to female-headed households.

As Turner and Chivinge (1999) witnessed in Mashonaland East Province, women do most of the preparation and cooking, as well as processing of fruits and vegetables. Due to the high level of female participation in small-scale food processing enterprises, the sector is

[45] Women constitute about 56% of the rural population (Poverty Assessment Study, 1997; Kay, 1994).
[46] Households where the male is temporarily absent from the farm.

acknowledged to be vital for enhancing the economic status of women (Richter *et al*, 1996). This is particularly the case in terms of informal sector enterprises which usually only employ family labour. The predominant role of women in small-scale food processing enterprises can be attributed to the lack of need for formal education, the lack of competition from men, and the fact that women can often combine household chores with running a food processing enterprise, (Ibid.). Although women are predominantly found in lower income small-scale food processing enterprises, they have a critical role in helping their families to survive (Soetan, 1997). Products manufactured on a small-scale serve twin purposes, they are a value-adding mechanism by which the livelihoods of poor small-scale producers can be enhanced. They can also be a major contributor to both the nutritional and the employment status of the poor (Richter *et al*, 1996).

6.6 The advantages of peri-urban production

The advantage of intensive horticultural production however, is that it can be practised on relatively small plots, making efficient use of limited water and land resources. Horticultural species have a considerable yield potential and can provide up to 50kg of fresh produce per m² per year depending upon the technology applied. Peri-urban households can therefore potentially produce a sizeable yield on a relatively small area of land. A further advantage of horticultural produce is that it has a relatively short production cycle. Several species of crops can be harvested 60 to 90 days after planting, and therefore producers may achieve up to 3 harvests per year (Poulton *et al*, 1999, See Table 34 below). The FAO suggests that productivity can be as much as 15 times the output per acre of rural agriculture (FAO² year unknown). Horticulture may therefore provide a quick response to emergency needs for food.

Table 33. Crop growth duration and production periods of selected crops

Crop	Days to Maturity	Time of Sowing	Type of Sowing
Baby corn	85-100	Dec	Direct
Beans	50-60	Feb-Apr	Direct
Butternut	120	All year	Direct
Cabbage	110-140	All year	Seed bed
Carrot	100-110	Feb-Mar	Direct
Cauliflower	100-130	Feb-Mar	Seed bed
Chillies	70-75	Aug-Nov	Seed bed
Cucumber	75-120	All year	Direct
Eggplant	80-90	Aug-Dec	Seed bed
Garlic	200-220	Mar-Apr	Direct
Gem squash	85-90	Aug-Dec	Direct
Lettuce	50-60	All year	Seed bed
Marrow baby	85-90	Mar-Sep	Direct
Mealies green	130	Aug	Direct
Okra	55-60	Aug-Dec	Direct
Onion	190-220	Mar-Apr	Seed bed
Peas	70-80	Feb-Jul	Direct
Peppers	70-80	Aug-Dec	Seed bed
Potato	90-120	Feb-Mar, Jul-Aug	Direct
Tomato	100-120	All year	Seed bed
Rape	60-90	All year	Seed bed
Spinach	55-60	Apr-Nov	Direct
Sweet corn	85-100	Sept	Direct

Source: Poulton *et al*, 1999:17, Refers to crops grown in Mudzi,
*Plants raised in a seed bed need an additional 4-6 weeks before they are ready for transplanting
*Warm season crops are grown all year round in frost-free areas.

6.7 Processing may overcome production constraints

Without some sort of processing, much fresh produce would perish and go to waste before it could be consumed or sold. Odunfa (1995) observed that up to 60% losses had been recorded for fruits and vegetables in Africa, 40-50% for roots and tubers and 20% for grains (cited by SMALLFOOD, 1999d). Further, seasonal surpluses of fruits and vegetables in Zimbabwe's Communal Areas often lead to depressed market prices and wastage (Murphy, 1996). As long as long-term storage facilities remain inadequate in Zimbabwe, farmers must look to processing as a means of overcoming gluts on markets that drive prices low (SMALLFOOD, 1999d citing Odunfa, 1995). Furthermore, processing improves the capability of produce to be transported over long distances, reducing losses within the supply chain. Lack or inadequacy of means of transportation and poor infrastructure in particular, represent a severe handicap to small-scale farmers in terms of marketing their produce.

The processing of foods, whether by dehydration, canning or freezing for example, has the added benefit (in many cases) of rendering a raw food microbiologically safe (UN, 1998). Suitable packaging prevents reintroduction of pathogenic organisms and chemical contaminants to the produce (Ibid.). Food safety issues are therefore generally well addressed by processing.

Fruit and vegetable processing increases the shelf life of the product. This is not only beneficial in terms of overcoming seasonal gluts on the market, but furthermore processing

may help offset seasonal shortages of certain produce, common in the dry season for example. This may allow for greater diet diversity during the dry season. In some cases it is possible to convert normally unacceptable fruits and vegetables (over ripe or spoiled produce deemed unfit for the market) into products which are palatable and safe. Although processing may lower the nutritional value of some foods, a nutritional gain is achieved simply by making more (and a wider range of) food sources available throughout the year (UN, 1998). In addition, most processing techniques add significantly to the value of produce, enabling farmers to receive higher returns to production. Processing therefore has the potential to raise peri-urban incomes. By converting raw materials into ready-to-use foods, farmers not only receive higher incomes but they may also improve the quality and flavour of food products (Carr, 1989).

7. CONSTRAINTS TO THE PRODUCTION AND MARKETING OF PROCESSED HORTICULTURAL PRODUCTS BY SMALL-SCALE PRODUCERS

7.1 Introduction

Kay (1994) reports that even though small-scale farmers in Natural Regions I and II are becoming increasingly commercialised, total specialisation is unusual, even in the lucrative horticulture, maize, cotton and tobacco sub-sectors. For example, Jaffee (1999) notes that citrus production yielded higher returns than other major field crops (especially those for which prices and marketing channels are closely controlled by the government) in Zimbabwe. However, constraints to the development of citrus (and other higher value products such as cut flowers) discouraged farmers from getting involved in the production and marketing of such crops.

The evidence would seem to suggest that rural farmers in Zimbabwe do not specialise for food security reasons. Farmers continue to give first priority to field crops such as maize, sorghum and cotton. Horticultural crops tend to compete with field crops for labour, equipment and agricultural inputs, which often leads to poor management and low yields (Sena, 1997; Shambare 1997). Sena (1997) suggests that the lack of adequate information to make sound and informed decisions means farmers tend to be sceptical about adopting new farming methods and cultivating non-traditional crops.

The constraints faced by horticultural producers vary according to the production system in question. Large-scale commercial farmers have been constrained by the scarcity of foreign currency needed to finance capital equipment and other inputs, and by inadequate air transport capacity to export markets (Turner and Chivinge, 1999, quoting Rukovo, 1991). Smallholder farmers on the other hand face a wider range of problems. Low yields, low rainfall, lack of appropriate and improved technologies, lack of extension advice, inadequate transport facilities and lack of access to capital, and alternative marketing channels, are just some of the major hurdles which small-scale horticultural producers face (Shumba, 1992; Blackie, 1994; Turner & Chivinge, 1999). Some of these constraints are also likely to impact upon small-scale processors. However, in terms of processing, the specific constraints faced include lack of key resources and the size of operation, among others. The following sections discuss some of these issues in more detail.

7.2 Constraints to smallholder horticultural production

7.2.1 Agro-ecological constraints within Communal Area lands

One of the most important issues in the smallholder sector is how farmers can manage their small and often poor lands profitably. Limited access to land and the location of small-scale farming to dry and remote parts of the country poses a severe constraint to developing horticultural production within the sector. It is worth noting that the Communal Lands hold 51.4% of Zimbabwe's population (UNDP, 1998 citing CSO, 1994). However, around 70% of Communal Area lands lie in the least productive agro-ecological regions of the country (Natural Regions IV and V as shown in Table 2). These areas receive erratic rainfall (less than 700mm per annum) and are prone to frequent droughts. In addition, soils are inherently weak and interrupted by poor terrain and rock outcrops. Approximately 65% of all rock

outcrops in Zimbabwe are in the Communal Areas. Not only do these rocks reduce the arable area but their steep slopes and terrain promote run-off and erosion (Rukuni, 1994; Mehretu, 1994; Chasi and Shamudzarira, 1992). In fact, one third of the 55 Communal lands are severely affected by erosion, on 12% or more of their land (Mehretu, 1994). As perhaps expected, the proportion of households that report food deficits and are engaged in non-farm work is inversely related to land potential. Mehretu (1994), Rukuni (1994), Chasi and Shamudzarira (1992) and Bratton (1994) have analysed the socio-economic profile of communal households and conclude that the increasing concentration of communal people within a poor and declining natural resource base, with low input-technology, poses a serious constraint to small-scale agricultural production.

Chasi and Shamudzarira (1992) argue however, that even under high input and management levels in maize production, 90% of small-scale farmers are unlikely to achieve yields greater than 3.8t/ha. They argue that in Natural Region IV the constraint yield of maize is reduced by up to 50% due to severe mid-season drought, giving an expected yield of between 1.3 and 2.6 t/ha. By contrast most of Natural Region IIa is suitable for maize production and yields of 7.5t/ha are not unknown. Natural Regions have a large bearing on cropping patterns and yield potential (Ibid.). The location of smallholder farms therefore represents a distinct disadvantage to the sector's production potential.

Due to the intensive nature of horticulture—its heavy demands on the use of irrigation water or wetlands, and chemicals and fertilisers, the need to conserve the environment (land and water resources in particular) even on the smallest scale cannot be overemphasised. Sustainable horticultural production therefore will necessitate more elaborate soil and water conservation systems, as well as the growing of high yielding crops to compensate for the shortage of land, which will also demand capital inputs. There is a need to continuously expose smallholders to improved appropriate technology if crop productivity and viability are to be maintained.

7.2.2 Lack of irrigation networks

Access to irrigation is crucial to smallholders, given that the majority of land which they farm, consists of poor soils that receive inadequate rainfall. Although irrigation has the potential to increase peasant farmer production (Chidzonga, 1993), it is poorly developed (See Table 34). Smallholder irrigation (on Communal and resettlement areas) covers merely 5% of the total irrigated area in Zimbabwe estimated at 150,000 ha (Manzungu and van der Zaag, 1996, citing Rukuni, 1988; IFAD, 1994).

Table 34. Irrigation development in Zimbabwe according to landholding category

Landholding category	Command area (ha)	As percentage of total area irrigated
Large-scale commercial	126,000	83.8%
Parastatal estates	13,500	8.9%
Small-scale settler ('outgrowers')	3,600	2.4%
Communal and resettlement	7,200	4.8%
Total	150,300	100%

Source: Manzungu and van der Zaag, 1996 citing IFAD, 1994:2

Utete (1995) suggests that lack of water for irrigation is the major factor restricting smallholders from diversifying into higher value crops. Rainfall in most Communal Areas is both low and poorly distributed. Without an adequate water supply, commercial production of fruits and vegetables is somewhat difficult. Irrigation networks are important if farmers are to avoid producing lower quality fruit and vegetables. Horticultural crop production is therefore limited to irrigation schemes, *vlei* areas and Natural Region I.

Irrigation has given Zimbabwe's arid areas, additional production potential. This has been evidenced in the case of wheat, tobacco and sugarcane production. Comprehensive research carried out by Rukuni and Makhado (1994) between 1989-1992 suggests that all wheat, sugarcane, 70% of coffee, 55% of tea and 45% of cotton production were irrigated. Considerable areas under citrus and other fruits, vegetables, flowers, maize and soybean were also irrigated. However, the average area of vegetables under irrigation (during 1980-1990) was 7,501 ha per annum, compared to an average of 33,659 ha of wheat, 32,711ha of sugar cane and 19,817 ha of cotton under irrigation during the same period (Ibid; Makhado, 1992).

Irrigation is crucial for the expansion and sustainability of Zimbabwe's small-scale horticultural sector especially in the face of increasingly unreliable rainfall due to changing climatic conditions. The overall potential of the sector is subdued due to the fact that Zimbabwe lacks an overall national irrigation strategy. Irrigation plans have largely benefited the large-scale commercial sector. Within the smallholder sector, benefits have been unequal. While some well-resourced individuals and co-operative farmers have gained access to irrigation facilities, the majority of small-scale farmers continue to use the bucket and the furrow system, which is very tedious and inefficient, especially on larger plots. Small-scale farmers are generally far from main water supplies, which make the construction and maintenance of irrigation schemes costly (Rukuni and Makhado, 1994). Poor environmental management and financial incapacity threaten the sustainability of schemes. In general terms, farmers have become dependent on donors and government and this has crippled their willingness to reinvest in irrigation projects (Poulton *et al,* 1999). Although Agritex was running 70 smallholder irrigation schemes by 1994, with a total of 4775 ha of land under irrigation, due to limited resources, most schemes were only developed to about 25% of their potential. The same is true for those schemes under ARDA.

Rukuni (1994) suggests that a master plan must be put in place if Zimbabwe is to improve the utilisation and management of scarce water resources (also Turner and Chivinge, 1999). The need for further development of irrigation schemes for smallholders is essential if farmers are to diversify production and improve their returns to farming. For example, water-harvesting techniques should be adopted in order that efficient use is made of all surface water available.

More research is needed in the area of management and economics of irrigated food production (Makhado, 1992).

7.2.3 Non-flexible cropping patterns

Poole *et al* (1999) suggest that non-flexible cropping patterns present problems in terms of finding markets for produce. They suggest that farmers need to become more flexible and diversify production and thus avoid flooding markets with produce. Product diversification will enable farmers to penetrate more lucrative markets and gain higher returns to production. They suggest that farmers need to plan cropping patterns properly taking into consideration such issues as plot size, water supply, capital inputs, production skills, marketing channels and seasonality of production.

Poulton *et al* (1999) found that size of plots constrained farmers in terms of which crop to grow and also in terms of specialising in a particular crop. Access to irrigation networks however, means farmers can grow a broad range of crops. Mixed cropping patterns can raise the land's productivity. In their study of resettlement farmers in Mutoko, Murehwa and Uzumba Maramba Pfungwe, Turner and Chivinge (1999) identified inter-cropping of cotton and okra and found that it not only made intensive use of the land, but also made insect control very effective. This is due to the fact that the two crops belong to the same family and share common pests which meant that farmers could spray them simultaneously.

7.2.4 Problems faced in contract farming

Sub-contracting agreements are not without problems. In some cases contracts lack 'transparency.' However, Chivinge and Turner (1999) point out that while the contracts may lack 'transparency' the major problems relate to farmers who join schemes with high expectations, without the full knowledge of its *modus operandi*. More often than not they fail to meet and maintain quality standards and yield levels. Farmers may find themselves penalised for failing to meet specified quotas. As a consequence their profits are lower than anticipated, and they often feel they are being cheated (Ibid.).

Turner and Chivinge (1999) found that many contract farmers feel that they are being short changed as the prices which wholesalers subsequently receive on local and international markets, are much higher than that paid to farmers. Some companies suggest that when they try to subcontract farmers, few farmers are prepared to negotiate fixed rates on produce. Farmers are reluctant to do this as they are therefore unable to take advantage of other market opportunities as they were bound to contracts, unless they produce in excess of the agreed quota. Farmers are used to market speculation due to seasonal fluctuations in prices.

On the other hand, it is common practice particularly among individual and small buyers, to downgrade the produce to justify paying farmers lower prices. Payments may also be tardy, straining farmers' cash flow. While contract farmers may benefit from a guaranteed market, they are forced to attain high quality standards.

Many farmers fail to get involved in subcontracting, as they are unfamiliar with the conditions of such arrangements. Some farmers may have been discouraged by the experiences of other farmers. Others produce low volumes of crops that do not justify their participation in subcontracting arrangements. Alternatively, some producers can make greater profits by marketing their own produce independently.

Furthermore, contractual arrangements may have a lot of hidden costs. Some companies do not have binding contracts and can renege on their obligations. Smallholders are unable to seek recourse for such actions due to their lack of knowledge of the legal system and often they lack evidence of the contract being made in the first place, as contracts are seldom written up as formal arrangements. Wholesalers may not wish to bind themselves to written contracts in case farmers fail to meet the standards laid down. An example of this is where farmers are provided with inputs by middlemen or directly by contracting companies in order to grow the product with the promise of a lucrative and guaranteed market. However, if upon harvesting, the company fails to purchase the crop, this leaves farmers stranded without a market for their produce. Contractors either renege on the agreement since some of the contractual agreements are not binding and/ or farmers fail to meet some requirements (e.g. the ASTA requirements in paprika). Middlemen have also cheated farmers by not paying them after the delivery of the produce. This has discouraged many farmers from experimenting with new crops that come onto the market (Machakaire, Personal communication).[47]

A further constraint to sub-contracting is the absence of record keeping on the part of smallholders. This has been viewed as a major hindrance to the development of initiatives between commercial processors and small-scale producers. This is particularly the case in terms of the stringent requirements laid down for the international market. Large-scale processors require information regarding the quality of water used to irrigate crops, the use of chemical sprays and reasons for their use etc. (ITDG, Personal communication). Seldom do farmers keep such records.

7.2.5 Access to credit

A further constraint that most smallholders face is lack of, or restricted access to, capital and financial resources. This is in spite of the fact that organisations such as the Zimbabwe Horticulture Promotion operate a revolving fund scheme for small-scale farmers. The fund is currently at Z$2million, and provides loan facilities to smallholders. According to HPC, the money is given out to the established exporters who then identify the farmers. The loan is normally distributed to farmers in the form of inputs to production such as agrochemicals, seeds and capital equipment. Alternatively the HPC distributes money to micro-finance schemes that in turn identify farmers to receive capital. In order to be eligible for the scheme however, farmers must have collateral security and have to be affiliated to exporters. This poses problems for most smallholders as often they do not possess the title deeds over the land they farm. However, the scheme has benefited about 3500 small-scale farmers so far (Yuber, Personal communication).[48]

[47] Victoria Machakaire, CIIIFAD Programme manager on smallholder horticulture in Zimbabwe, Department of Crop Science, University of Zimbabwe.
[48] Mr Yuber is in charge of the Smallholder Horticulture project at the Horticultural Promotion Council, Harare.

7.2.6 Capital equipment and appropriate technologies

The small-scale farming sector is characterised by the use of traditional equipment such as the plough and hoe. Though the use and range of capital equipment used is increasing (such as tractors for example), access is limited due to the high capital investment required. High annual operating costs, availability of power, lack of adequate knowledge, and lack of extension services to support the use of such equipment are further constraints. Moyo *et al* (1992) suggest that most dealers in such machinery or equipment lack commitment to service the small-scale sector as it is less profitable than the large-scale sector.

Smallholders therefore employ the use of simple farming methods, agricultural tasks are usually carried out using hoes or draught power.[49] While this may have some benefits, for example when hoes are used instead of herbicides and therefore have less adverse environmental impacts; Muchena (1994) suggests that technological improvement is the only way Zimbabwean producers can establish and retain a competitive advantage in international markets. Although the adoption of technology is critical for the export sector, competition to serve the growing domestic market is also likely to see an increase in demand for capital equipment among small-scale farmers. The introduction of new crops—the foundation of Zimbabwe's agricultural industry, is also likely to see the demand for technology increase (Muchena, 1994).

The implementation of appropriate technologies is a further consideration. Shumba (1992) discusses the appropriateness of technology at two levels—at the national and at farmer level. At the national level, Zimbabwe has a long history of agricultural research and extension. Communal farmers have adopted (intensive) methods handed down by government extension agents such as Agritex and ARDA among others. However such methods tend to benefit farmers in the better Natural Regions most. For example, 80% of marketed maize from smallholders comes from Natural Regions II and III. Although farmers in Mangwende (NR II) and Chivi (NR IV) receive the same type of extension and advice, farmers in Mangwende achieve better production levels than those in Chivi (Shumba, 1992). This is supported by Jayne *et al* (1994) who argue that while Zimbabwe achieved high growth in agriculture during the first decade after independence, the 300% increase in grain production was highly concentrated among smallholders in high-rainfall areas. At the local level, small-scale farmers are differentiated by their access to irrigation water, which effects production levels. However, it is necessary that smallholders receive extension advice and technologies which respond to local conditions.

[49] Before the devastating drought of 1991/92, a large percentage of smallholders owned draught animals. In actual fact between 73-90% of primary cultivation in Zimbabwe was carried out using cattle. The 1991-1992 drought however, resulted in a massive loss of cattle, forcing most Communal farmers to revert to the use of hoes for primary tillage. This obviously makes cultivation more labour intensive.

7.2.7 Lack of extension services

There is also a general argument that extension experience in the horticultural sector in particular is weak. Staff have often been trained in field crops such as maize and cotton, and have little direct experience with horticultural crops. In some cases, technical expertise in some crops is unavailable. It is therefore imperative that institutions such as Agritex continuously train staff members to become specialised in particular fields.

Since independence there has been a widespread use of new high yielding and disease tolerant cultivars (such as onion, tomato, cabbage, and other vegetables and temperate and tropical fruits) particularly among the more commercially oriented small-scale farmers. Farmers have reported a good market for these new varieties (Turner and Chivinge, 1999). However, in terms of the production of non-traditional crops such as mange tout, baby corn and snap peas for example, information is not readily available to small-scale farmers via extension staff, as often such information is guarded as 'trade secret' by large-scale exporting companies (Utete, 1995).

7.2.8 Input supply

Shortage of good quality planting material restricts farmers who would like to venture into new crops. For example, deciduous fruit trees such as apples, peaches and nectarines are in short supply. The development of private nurseries needs to be encouraged, as government nurseries have limited budgets and cannot meet increasing levels of demand. Although there is no serious shortage of fruit trees, the same cannot be said of other inputs like seeds. There is a lack of appropriate seeds for crops such as tomato and vegetable cultivars. This is further hampered by the high cost element, such that farmers can end up using seeds from their crops (Machakaire, Personal communication).

7.2.9 Disease and pest management

Small-scale farmers may be further constrained by disease and pest control and the high costs that this involves. Disease management is particularly difficult because farmers are less conversant in prevention and control of disease. Lack of proper training, limited access to chemicals and their inappropriate use, poses problems. Furthermore chemicals are expensive and thus farmers often resort to shortcuts, which may have devastating effects on crop productivity for example. Additionally, crop resistance to chemicals has developed due to the continuous use of *dimethoate* for example which may threaten the productive potential of crops. Farmers need to be trained in production practices, disease and pest identification and control, proper and safe use of pesticides, rotational methods and local protectants, in order that they may control disease outbreaks and increase productivity and furthermore improve their quality standards (Turner and Chivinge, 1999).

7.2.10 Crop quality

One of the main constraints to smallholder participation in lucrative markets is produce quality. Quality standards are determined by the cultivars, irrigation and production methods, pest control, exposure to sun and timely harvesting, and the homogeneity of produce in terms of its size and quality. Small-scale farmers need to be advised on the right cultivars for their particular agro-ecological conditions in order to avoid losses. Irregular water supplies, lack of sunshine and overexposure to cold weather for example may limit the growth of produce.

This emphasises the need for appropriate extension services in order that farmers are trained about what crops to grow at particular times of the year (Farming World, November 1999).

Consumer demand on the international and regional markets can be quite challenging, as the producer is obliged to constantly improve his standards to match and exceed the consumer's expectations. Farmers are therefore required to provide a quality product, which is well packaged and has a good shelf life (obviously depends on the product). Consumers also demand diversity in the range of products available. While this can be done relatively easily by the large-scale commercial sector, small-scale growers often face problems in meeting such demands (Farming World, Nov 1998).

7.2.11 Inappropriate harvesting techniques

Harvesting techniques and timing of the harvest have been found to have a large bearing on the quality and shelf life of horticultural crops (Hicks *et al*, 1997). It is necessary that harvesting commences at the maturity stage of the crop. While farmers may be aware of appropriate harvesting methods, some resort to shortcuts due to shortage of capital and labour. For example, trees are shaken and fruit allowed to drop on to the ground compromising quality. Shaking also causes premature fruits to fall, reducing the yield (Farming World Nov 1998; Sena, 1997; Hicks *et al*, 1997). Farmers have also been found to harvest crops prematurely in order to take advantage of forthcoming transport, access to an immediate buyer, the need for cash or instant rise in crop prices. Hence farmers compromise on the quality, price and shelf life of their produce (Farming World, Nov 1998). By comparison, some producers have left crops to over-ripen for lack of transport facilities, resulting in the dumping of produce at inferior markets for lower prices (Sena, 1997). The Horticulture Promotion Council suggests that many farmers fail to adhere to advice regarding the most appropriate planting and harvesting seasons for particular crops.

7.2.12 Grading

Research conducted by Poulton *et al* (1999*)* in Mutoko suggested that, while farmers graded their produce before going to market, this was not up to the standards required by the up-market outlets. For instance, they highlight the experience of Kudzwe farmers who were asked to re-grade tomatoes (by FAVCO), that they thought they had already graded adequately. The main problem is that farmers are usually not familiar with the particular standards required by the market. Information on market criteria, and quality standards is thus important. The poor appreciation of required standards by farmers is often due to a lack of resources rather than an outright disregard for such requirements.

7.2.13 Post harvest handling

Pre and post- harvest handling of crops has a large bearing on the market price. Handling and tossing of the produce causes bruising and poor product quality. Packaging direct from harvest reduces the steps between harvesting and marketing. The mixing of crops during transportation is problematic because some crops are sensitive to chill injury (which results from storage at the wrong temperatures), while other crops such as onions and garlic can spread odours to other produce. This poses particular problems to small-scale producers who want to economise on transport costs. Further, produce is often transported in overloaded conditions with people sitting on top of the produce, causing further spoilage. This has been a major finding across small-scale horticultural farms (Farming World, Nov 1998).

7.2.14 Poor infrastructure

A further constraint that many farmers face and one that is often beyond their control, relates to the transportation of commodities from the farm to the market. Poor infrastructure and inadequate transport channels pose great problems for smallholders who lack their own means of transport. An example of this is taken from the Rusitu valley, where pineapples grow successfully under rain fed conditions but end up rotting on fields due to inaccessible roads during the rainy season (Manzou, forthcoming).

Furthermore, farmers bear high transaction costs due largely to the bulky and perishable nature of horticultural produce. Sena (1997) points out that poor transport increases marketing costs substantially. The use of buses for example to transport produce to market presents hidden costs; buses seldom go directly to markets. In some cases transport fees charged exceeded the value of produce (SMALLFOOD, 1999a citing FAKT, 1995; P.W., 1998; ZEPZA, 1998). Farmers must find other transport arrangements in order to access lucrative markets such as specialised green groceries, supermarkets or hotels. The majority of farmers however, have no option but go to Mbare market, where they must try and sell their produce within one day, as an additional day would mean stand and storage fees, and food and accommodation expenses (Sena, 1997).

This brings up the issue of decentralisation of marketing. Currently Mbare Musika market handles 40% of the volume of produce delivered to Harare and Chitungwiza (Jaure, 1997). Decentralisation of marketing channels would go some way to easing the situation for farmers, especially in terms of transporting fresh produce to the market.

Infrastructure however, not only relates to transport systems, but also storage and cooling facilities and communication systems (Karimanzira and Jaure, 1997). In some areas, the lack of cooling facilities and access to transport, means that farmers often have to store their crops for a day or two before transporting it to market. Lack of storage facilities can mean spoilage of the crop. Sena (1997) points out however, that in spite of the fact that the Mashonaland East Fruit and Vegetable Project installed cooling facilities at various centres, very few farmers used them. This was due to the fact that the cold rooms accommodated small volumes of produce, and were often distant from the loading places, and furthermore there was great mistrust among the members of the project to store produce there, for fear of theft.

A viable communication system is necessary if farmers are to receive up-to-date market and price information for example. This is important due to the seasonality of production, and the

fact that many smallholders are scattered across rural settlements with low road densities (Karimanzira and Jaure, 1997).

7.2.15 Lack of market information

The marketing of produce may prove problematic. This may be related to poor infrastructure as highlighted above. In their study in Mudzi and Mutoko Poulton *et al* (1999) found that smallholders have limited access to phones and few listen to the price information broadcasts on the radio for example, either because they are unaware of the broadcast or are busy with other activities at this particular time. Many farmers rely on information received through Agritex and ARDA extension officers who are limited in number. Poulton *et al* (1999) suggest that marketing information would enable farmers to access alternative and better paying marketing channels, especially with independent wholesalers in Harare. Access to market information would also enable farmers to plan their cropping patterns so as not to glut the market.

However, Poulton *et al* (1999) acknowledge that farmers face stiff competition at Mbare from farmers in Chinamhora, Seke, and large-scale commercial operations. For example, when commercial farmers send produce to the market it tends to depress the prices obtained by small-scale producers for that product on that particular day. The result is a very volatile market with highly fluctuating prices.

Poulton *et al* (1999) suggest that improved information flows are critical to the successful development of agriculture in sub-Saharan Africa. They point out that horticultural farmers lack adequate advisory services and access to information concerning prices, pest management, irrigation systems, credit facilities and post harvest handling and storage. The information that farmers currently receive is often too technical and furthermore it is seldom received on time. It is essential that farmers become more informed about market openings through improved market intelligence.

7.2.16 Distrust of middlemen

Even though many organisations have striven to empower farmers by forming links with them, many organisations felt that middlemen still reap the majority of benefits. Middlemen will normally negotiate higher prices with processor organisations and lower prices with farmers. In the end, middlemen benefit at the expense of the small-scale producer (ITDG, Personal communication). Unscrupulous middlemen are also a problem. Mbare market is associated with the theft of the produce and cash especially on busy days; many farmers have incurred heavy losses due to such problems (Poulton *et al*, 1999).

7.2.17 Labour availability

Family labour contributes significantly to the smallholder horticulture sub-sector (Poverty Assessment Study 1997, Muchena 1994, Shambare 1997, Turner and Chivinge 1999). Turner and Chivinge (1999) found that while most households rely primarily on household labour horticultural crop production, some households do hire in labour at particular times of the year, for example for land preparation, sowing, irrigation and the harvest. In fact their study in Mutoko, Murehwa, suggested that 61% of the total labour employed in agriculture consisted of household labour and 39% was hired labour (Turner and Chivinge, 1999). This is in contrast to the popular belief that labour is abundant in the communal areas and small-scale farming relies entirely on household labour. It has been found that there is a positive correlation between labour input (household and/or hired) and agricultural productivity. Blackie (1994) and Shambare (1997) suggest that households that are unable to provide timely and adequate labour often achieve lower yields.

Male out-migration (particularly of household heads) may leave many rural households lacking labour. Even though migrants return seasonally to participate in farming activities, households may suffer a labour shortage during the peak agriculture seasons from October to December and April to May (Shumba 1992). The former period is of particular concern as evidence would suggest that timely planting has a significant bearing on crop yields. In the absence of males, females may have to take on the added responsibility of commercial crop production.[50] This may impact upon their labour input to field crops that have traditionally been the female domain. Many households have difficulties in meeting labour requirements, particularly those female headed households without sufficient cash to rent draught animals and /or paid labour.

7.2.18 Lack of farmer initiative and heavy reliance on donors

Many organisations and institutions working with small-scale farmers and trying to form linkages with them lamented the absence of long term planning on the part of farmers. Some noted the heavy reliance on donor initiatives (NGOs for example). Most organisations that promoted small-scale farmers felt that farmers do not normally take the initiative to get involved in new adventures (for example grow new crops) without extension assistance and supervision. Where there are no or few donors, not much activity takes place regardless of the fact that farmers may have access to productive soils and dams to provide irrigation water (ITDG, Personal communication). All in all there are various factors (such as literacy rates, access to information and cultural norms among others) that may influence a farmer's willingness to participate in new activities or marketing arrangements (Poverty Alleviation Study, 1997; Sena, 1997).

7.2.19 Summary of constraints faced by producers

[50] There has been a long and often acrimonious debate on the role of cash crops in the African smallholder economies. Frequently the opposition to cash cropping arises from a concern that it encourages farmers to neglect food production to the detriment of nutrition and welfare of their families. Nevertheless, the evidence from Southern and Eastern Africa strongly suggests otherwise. Communal farmers in Zimbabwe who sold oilseeds had a grain surplus. The rapid increase in smallholder cotton production in Zimbabwe, for instance is illustrative of how the prime movers can be put in place to assist smallholder farmers and should be an essential component of Zimbabwe's smallholder agriculture strategy. For further reading, see Blackie (1994).

Nzima (1995) summarises the main problems that beset smallholder horticultural farmers in Zimbabwe. These include:

- The absence of growers' associations and poor linkages among stakeholders to articulate local problems and solutions
- A lack of knowledge and clear understanding of markets, market facilities, marketing, as well as absence of market intelligence information
- The lack of appropriate technical information
- Poor knowledge on availability and costs of inputs (planting materials, pesticides and disease control chemicals, fertilizers) and their importance
- Limited information on sources, availability and high interest rates on capital
- Ignorance of product processing and utilization (value adding)

All these constraints make it difficult for smallholders to enter or participate in horticulture production (and processing).

7.3 Constraints to processing of horticultural products by small-scale enterprises

The constraints faced by small-scale processing enterprises can be divided up into macro and micro level constraints. Although small-scale enterprises have limited control over macro level constraints, they may exercise some control over micro level constraints (SMALLFOOD, 1999d). Table 36 looks at some of the potential macro and micro level constraints which small-scale food processing enterprises may face in Zimbabwe. Below however, are some constraints that are particular to the horticultural sub-sector (Table 35).

Table 35. Processing constraints in the horticultural sub-sector

Primary processing			**Secondary processing**		
Process	**Product**	**Problems**	**Process**	**Product**	**Problems**
Washing Trimming Peeling Slicing Drying Grading Packaging	Unpacked and packed fresh vegetables Dried vegetables	A, B, D, E, F, G, H	Dehydration Juice extraction, squashing, canning	Dried vegetables Pure and concentrated juices	A, B, D, E, G, H, I, J

Source: SMALLFOOD, 1999a, citing USAID, 1998:49-50
Note: A- Spoilage waste, B- Health hazard, C- Licensing, D- Raw material supply, E- Marketing, F- Credit, G- Capacity, H- Education and training, I- Packaging, J- Transport

Table 36. Potential constraints to small-scale enterprises in Zimbabwe

MACRO LEVEL CONSTRAINTS	
Overall performance of the economy	Mead (1994) suggests when overall macro economy doing well, employment growth through expansion of existing small enterprises is high. Growth is demand-driven. When economy stagnant, rapid growth in new start up enterprises. However, these are supply-driven, consist of survival strategies in harsh economic times. Increasing competition when new firms start up as few barriers to entry exist. Drives returns down. Furthermore Rama noted a downturn in investment in food processing industries in developing countries generally, as global investment in food and drink industries is focused on OECD countries (SMALLFOOD, 1999d).
Impact of ESAP	Supply side problems- affordability of imports, tools and equipment. Demand side-prices rise but salaries stay the same. Therefore purchasing power of population decreases and demand for goods becomes stagnated. With economic liberalisation and push to produce for export market, some products promoted for export result in less or lower quality products available for domestic market (SMALLFOOD, 19999d). Further, as produce which fails to meet export standards gets dumped on local markets, this pushes domestic prices down.
Internal barriers of a political nature	Lack of strong political will to develop the food processing sector and small-scale processors in particular (level (SMALLFOOD, 1999d citing Mosha, 1983). Overall policy environment discriminates against the small-scale sector. Inadequate policies and limited support schemes targeted to small-scale sector. Lack of credit schemes etc. Inadequate information systems at government level (SMALLFOOD, 1999d citing Mosha, 1983). Policy instability and misallocation of resources.
Residual market controls	Costs associated with government regulations such as registration and licensing of small-scale enterprises (SMALLFOOD, 1999d citing Meier and Pilgrim, 1994). Few enterprises are registered and enforcement is minimal. Sanitary and fitosanitary concerns on produce effects participation in export market. Indirect costs involved in record keeping, tax compliance etc, increasing marketing costs and transaction costs. Limited access to information and limited management capabilities.
Provision of public utilities and infrastructure	Poor roads, storage and cooling facilities, irrigation networks. Lack of research on small-scale processing enterprises etc.
MICRO LEVEL CONSTRAINTS	
Lack of market information	Many farmers have stated that they prefer to sell fresh than dried produce as they lacked knowledge about processing techniques (Murphy, 1996). Also said that distaste for such products. Farmers need to become informed about consumer demand. Lack knowledge of access to markets, market niches. Rapid changes in scale and sophistication of markets due to trade liberalisation policies, deregulated trading places etc. Processors (and

	producers) must become well informed about these changes, product specifications, quality standards etc. if they are to gain access to the market (SMALLFOOD, 1999a).
Size of operation	Size of operation may limit potential to process for market.
Access to credit	Difficult for small-scale enterprises to accumulate capital. They lack of collateral to qualify for loans, credit etc. Small-scale enterprises face capital and market constraints in their efforts to expand (Odunfa, 1995)
Supply of key resources	Lack of raw materials and their erratic supply (Mosha, 1983). Unreliable supply networks with variable quality of produce. Processing enterprises not operating to full capacity due to low supply and yield lag. Furthermore may depend on additional inputs being imported. For example, food ingredients such as colourings, flavourings and preservatives are often imported. Need to source them locally.
Technological capability and appropriate technology	Limited technological capability-lack of capital for technological inputs. Lack of appropriate technologies- often depend on imported technologies which are not adapted to local conditions-water and electricity shortages etc. High operating costs (SMALLFOOD, 1999d citing Mosha, 1983). Difficult to access spare parts for imported equipment or find someone who knows how to fix equipment if it breaks down (Odunfa, 1995). Personnel may not be properly trained in the use of such technologies. Barnett (1995) suggests that unless small-scale enterprises can access technological inputs, then the gap between the modern sector and the traditional sector will widen (cited in SMALLFOOD, 1999d).
Quality control and standardisation	A further problem which small-scale processors is face is poor crop quality. Poor handling, poor or inadequate storage conditions and lack of ventilation cause post-harvest disease problems. At the formal level however, quality instruments are too expensive to be implemented by most small-scale industries. Poor hygiene means distrust of food by consumers (Odunfa, 1995). Related to this is issue of packaging. It is often unattractive, poorly designed or of low quality. It is often too expensive for small-scale enterprises. If not packaged properly food rapidly deteriorates and spoils. Latter also related to access to storage facilities.
Lack of education, training and business management	Lack of training, management know-how effects ability to adopt new technologies, become involved in new innovations. Improved business management, training and technological update is hindered by lack of access to information, often through word of mouth and informal information networks such as the market place for example (SMALLFOOD, 1999a). Farmers need basic education in order to enhance their exposure to and understanding of new technologies, technical and managerial skills. A much larger percentage of women than men have no formal education**.** This is important when we consider that women are the predominant group involved in food processing, particularly in vegetable and spice drying (SMALLFOOD 1999a, citing Mutambirwa, 1995). Although some may have benefited from night school programmes and advice offered from Agritex, ARDA and other private extension agents, this does not compensate for the lack of formal education needed to enable them to access information etc. Women (traditionally those involved in food processing) often see themselves pushed out once activity becomes market-oriented (UNIFEM, 1994). The adoption of mechanised technologies in food processing may also mean that such activities are subsequently taken over by men. Education is a vital component in terms of empowering women.

8. CONCLUSIONS

> *"The potential of horticultural crops in Zimbabwe's smallholder sector (urban and rural) is being limited by the absence of clearly defined and organised institutional structures to influence policy, research and development, production, marketing and consumption of horticultural commodities" (Nzima, 1995:25).*

Chapter 3 suggests that smallholder farmers in Zimbabwe are diversifying into high value crops such as horticultural produce. Little is know however, about the pace at which this is happening. Research has shown, that a number of factors may constrain the ability of small-scale farmers to produce horticultural crops and effectively manufacture and market processed food products from these crops. Although some constraints are directly related to access to natural resources (especially land and water as highlighted in Chapter 2), numerous other constraints exist at the macro and micro level. On a macro level, many policies implemented by the government have served to hinder the development of small-scale industries (Dawson, 1994; Simalenga, 1996). At the firm level, limited access to credit (Jones 1996; Chakwea, 1996), appropriate technologies (McPherson, 1991; Mugova, 1996), supply of raw materials (Mosha, 1983), lack of management know-how (Odunfa, 1995), and poor quality control (Jaffee, 1993) among other factors, have served to constrain the development of small-scale enterprises. A detailed account of these problems is provided in Chapter 7.

The key to the promotion of processing activities by small-scale producers is the identification of solutions to these problems that are appropriate in the specific economic and geographical context of the producer (Odunfa, 1995; Sandels, 1987). This suggests that no single solution can be implemented that will be effective in removing constraints to processing activities in all situations, not only in the context of Zimbabwe, but developing countries as a whole (SMALLFOOD, 1999a; 1999d).

The Zimbabwe Export Processing Zones Authority (ZEPZA) acknowledges that addressing the problems of small-scale agro-processing enterprises is an important task (ZEPZA, 1998). Better conditions will improve employment opportunities and incomes for enterprise owners and their employees. This is essential as the evidence summarised in Chapter 4 would seem to suggest that a large section of the EAP (and therefore numerous households) depend on small-scale enterprises for their livelihoods. As Chapter 6 points out, the production of fruit and vegetables is likely to improve household nutrition levels and food security in general. Furthermore, the relatively short production cycle of many horticultural crops and the diversity of crops, which can potentially be grown in Zimbabwe, is encouraging. Additionally the processing of crops may also enhance access to food during the dry season for example.

Agricultural diversification however, must be related to market demand. Small-scale enterprises operate within the context of a dynamic local and global economy. While export demand for horticultural crops has increased dramatically over the decades, less is know about national demand for such products. It is clear from Chapter 3 that more research is needed on the food demands of urban consumers, and particularly with respect to their growing demand for processed foods This is essential given that urban populations are estimated to grow rapidly over the next 25 years. Furthermore, as urban (and in some cases

peri-urban) access to agricultural land declines, steps need to be taken to ensure the food needs of the urban populations are met.

It has been widely recognised that there is a need to develop an institutional environment that is conducive to small-scale enterprise development (SMALLFOOD, 199a citing Bhalla, 1993; FAO, 1996; GoZ, 1994; Simalenga, 1996). In Zimbabwe there has been no shortage of programmes for promoting MSEs, especially within agro-processing (Mrema, 1997). However, small-scale fruit and vegetable processing in Zimbabwe continues to be largely subsistence oriented. There are relatively few success stories of small-scale commercial processing enterprises. Even those horticultural processing projects conceived in government development plans, or promoted by bilateral aid have been characterised by a high rate of failure. An evaluation of the macro and micro environment in which agro processing enterprises do or do not take advantage of the different avenues of assistance that may exist, needs to take place.

Men and women have been involved in the gathering, production, processing and or preparation of food for thousands of years. This was done in an effort to meet their most basic need (Iikkaracan *et al*, 1994). The simple and traditional processing techniques used may seem unconventional, but are often logical in terms of local needs. However, small-scale commercial processors continually have to compete with the prestigious, sophisticatedly packaged, imported goods and foodstuffs from large-scale, formal production units (Carr, 1989:4). In some instances traditional techniques or technologies are no longer sufficiently productive to provide a satisfactory return to processing (Carr, 1989:4). It is important that ways to make traditional processing techniques more efficient and take consideration of local conditions and local or domestic demand are promoted.

Women have been excluded in most technical and economic considerations when implementing food-processing projects. It is imperative for policy makers to consider the roles played by women in the processing of fruits and vegetables. Women are often overlooked even though they are active participants in processing traditional foods. In the harsh economic environment of ESAP, and with a shrinking public sector, MSEs are expected to become more important particularly for women since they are disadvantaged in terms of access to education, land, capital and credit (SMALLFOOD, 1999a). Female entrepreneurs play a crucial role in family survival. However, female entrepreneurs tend to have more problems than men with finance, marketing and inputs (Table 37 below). This may be due to the fact that they often occupy less profit making enterprises with slow growth (SMALLFOOD, 1999a citing USAID, 1998).

Table 37. Marketing, finance and input problems according to gender of proprietor

Gender of proprietor	Marketing, finance and input problems by gender of proprietor %		
	Marketing	Finance	Inputs
Female	64.6%	58.7%	63.1%
Male	27.2%	24.4%	25.3%
Jointly owned	8.2%	16.9%	11.6%
Total	100%	100%	100%

Source: SMALLFOOD, 1999a

Food processing, if carried out appropriately, should have a positive environmental impact, given that it can reduce wastage and spoilage of produce in rural areas by increasing shelf life. However, increased raw material demand for processing may induce greater intensification of agricultural production, including greater pesticide and herbicide usage. Furthermore, food-processing operations may compete for scarce energy and water resources with consequences for the development of other economic activities. Additionally wastage from such activities can result in environmental degradation (Richter *et al*., 1996). Hence mechanisms must be found whereby small-scale food processing operations can be developed in a manner which is sustainable with the local physical, economic and social environment.

References

Aragrande, M. (1997) Methodological approaches to analysis of food supply and distribution systems. Food into Cities Collection, Rome: FAO.

Aragrande, M. (1999) Studying food supply and distribution systems to cities in developing countries: Methodological and operational guide. Food into Cities Collection, Rome: FAO.

Berkvens, R.J.A. (1997) Backing two horses: Interaction of agricultural and non-agricultural activities in a Zimbabwean Communal Area. Working Paper Vol. 24. Leiden: African Studies Centre.

Blackie, M. (1994) Realising smallholder agriculture potential. In Rukuni, M. and Eicher, C.K. (eds.) Zimbabwe's agricultural revolution. pp.335-347. Harare, Zimbabwe: University of Zimbabwe Publications.

Bolding, A. (1996) Wielding water in unwilling works; Negotiated management of water scarcity in Nyanyadzi irrigation scheme, winter 1995. In Manzungu, E. and van der Zaag, P. (eds.) The practice of smallholder irrigation: Case studies from Zimbabwe. pp.69-101. Harare: University of Zimbabwe Publications.

Bolding, A., Manzungu, E. and van der Zaag, P. (1996) Farmer-initiated irrigation furrows: Observations from the Eastern Highlands. In Manzungu, E. and van der Zaag, P. (eds.) The practice of smallholder irrigation: Case studies from Zimbabwe. pp.191-218. Harare: University of Zimbabwe Publications.

Boomgard, J.J., Davies, .P., Haggblade, S.J. and Mead, D.C. (1991) A Sub-sector approach to small enterprise promotion and research. GEMINI Working Paper No. 10. Bethesda, MA: GEMINI.

Boserup, E. (1970) Woman's role in economic development. London: Earthscan Publications Ltd.

Bowyer-Bowyer, T.A.S. and Tengbeh, G.T. (1997) Environmental implications of (illegal) urban agriculture in Harare: A preliminary report of field research (1994/95). Geographical Journal of Zimbabwe. (Special Issues on Urban Agriculture), 28, pp.7-24.

Bratton, M (1994) Land redistribution 1980-1990. In Rukuni, M. and Eicher, C.K (eds.) Zimbabwe's agricultural revolution. pp.70-88. Harare, Zimbabwe: University of Zimbabwe Publications.

Carr, M. (1989) Women and the food cycle. London: Intermediate Technology Publications.

Central Statistical Office (2000a) Consumer Price Index. Harare, Zimbabwe: CSO.
Central Statistical Office (2000b) Stats-Flash, Issue No. 11. Harare, Zimbabwe: CSO.

Central Statistical Office (April 1999) Agriculture and Livestock Survey in Communal Lands in Zimbabwe, 1998. Harare, Zimbabwe: CSO.

Central Statistical Office (June 1999) ARDA (Agricultural and Rural Development Authority) Estates (Excluding Middle Sabi Operating Division and Nijo Produce) 1994-1998. Harare, Zimbabwe: CSO.

Central Statistics Office (1998) Quarterly digest of statistics. Zimbabwe: GOZ.

Central Statistical Office (1998) Statistical Yearbook of Zimbabwe 1997. Harare, Zimbabwe: CSO.

Central Statistical Office (November 1997) Crop production census on large scale commercial farms 1996. Harare, Zimbabwe: CSO.

Central Statistical Office (November 1994) Census 1992: Zimbabwe Main Report. Harare, Zimbabwe: CSO.

Chakwera, N.B. (1996). Financing small-scale agro-industry. Paper presented at conference 'Small-scale Decentralised Agro-industry Seminar', Harare, Zimbabwe.

Chasi, M. and Shamudzarira, Z. (1992) Agro-ecologies of the small-scale farming areas of Zimbabwe. In Whingwiri, E.E., Rukuni, M., Mashingaidze, K. and Matanyaire, C.M. (eds.) Small-scale agriculture in Zimbabwe: Farming systems, policy and infrastructural development. pp.7-15. Harare: Rockwood Publishers.

Chidzonga, M. (1993) The situation of women in agriculture in the communal areas of Zimbabwe. In Mkandawire, R. and Matlosa, K. (eds.) Food policy and agriculture in Southern Africa. Harare: Sapes Books.

Chipika, S. (1992). Poverty, food insecurity and child malnutrition in Zimbabwe. Rugby, UK: ITDG.

Chipika, S. (1994) Decentralised agro-industries: The case of Zimbabwe. Harare, Zimbabwe: Intermediate Technology Development Group.

Chipika, S. (1994). Potential for decentralised agro-industries in Zimbabwe. Harare, Zimbabwe: ITDG.

Chonzi Mulenga, M. (1995) Peri-urban agriculture: A case of small-scale peasant cultivation in and around Zambian towns and cities with special reference to Lusaka. Eastern and Southern Africa Geographical Journal. 6(1), 1-16.

CIIFAD (1999) Sustainable smallholder horticultural production. Annual Report 1998-1999. Ithaca, NY: Cornell International Institute for Food, Agriculture and Development (CIIFAD).

Cole, D. and Cole, J.S. (1994) Tobacco research and development. In Rukuni, M. and Eicher, C.K (eds.) Zimbabwe's Agricultural Revolution. pp.234-244. Harare, Zimbabwe: University of Zimbabwe Publications.

Cullinan, C. (1997) Legal aspects of urban food marketing supply and distribution. Food into Cities Collection, Rome: FAO.

CZI (1998) Small business linkages programme. Harare, Zimbabwe.

Daniels, L. (1994) Changes in the small-scale enterprise sector from 1991-1993: Results of a second nationwide survey in Zimbabwe. GEMINI Technical Report 71.

Dawson, J. (1994) Responses to adjustment: the marginalisation of small enterprises in Nigeria. Small Enterprise Development. 5, pp.2-21.

De Nigris, M. (1997) Urbanization and food demand in Africa. Food into Cities Collection, Rome: FAO.

Delgado, C.L. () Sources of growth in smallholder agriculture in Sub-Saharan Africa: the role of vertical integration of smallholders with processors and marketers of high value-added items. Agrekon. 38(Special Issue), pp.165-189.

Department for International Development (DFID) (1999) Zimbabwe: Country Strategy Paper 1999. UK: Department for International Development.

Development Technology Centre (DTC) (1989) Improvement and Expansion of Horticulture in Communal Areas of Zimbabwe. Project ZIM/86/021.Progress Report for 31 December. University of Zimbabwe.

Development Technology Centre (1991) Improvement and Expansion of Horticulture in Communal Areas of Zimbabwe. Project ZIM/86/021, Report for May. University of Zimbabwe.

Dia, I. (1997) African urban consumers and food supply and distribution systems. Food into Cities Collection, Rome: FAO

Dolan, C., Humphrey, J. and Harris-Pascal, C. (1999) Horticulture commodity chains: The impact of the UK market on African fresh vegetable industry. IDS Working Papers - 96. Sussex, UK: Institute of Development Studies.

Dolan, C. and Humphrey, J. (2000) Who gains from the boom in African fresh vegetable exports? [online]. Available from: www.id21.org/insights33/art5.htm [Accessed 15 June 2000].

Economic Intelligence Unit (1996) Zimbabwe Country Report: 2nd Quarter 1996. Harare: EIU
EIU (1997a) Zimbabwe Country Report: 1st Quarter 1997. Harare: EIU
EIU (1997b) Zimbabwe Country Report: 2nd Quarter 1997. Harare: EIU
EIU (1997/98) Zimbabwe Country Profile. Harare: EIU
EIU (1998a) Zimbabwe Country Report: 1st Quarter 1998. Harare: EIU
EIU (1998b) Zimbabwe Country Report: 2nd Quarter 1998. Harare: EIU
EIU (1998c) Zimbabwe Country Report: 3rd Quarter 1998. Harare: EIU
EIU (1998d) Zimbabwe Country Report. 4th Quarter 1998. Harare: EIU

Eicher, C.K. and Rukuni, M. (1994) Zimbabwe's agricultural revolution: Lessons for Southern Africa. In Eicher, C.K. and Rukuni, M. (eds.) Zimbabwe's Agricultural Revolution. Harare: University of Zimbabwe Publications.

Ellis, F. and Sumberg, J. (1998) Food production, urban areas and policy responses. World Development. 26(2), 213-225

Fellows, P. (1997) Traditional Food Processing for Profit. London: Intermediate Technology Publications.

FAKT (1996). Strengthening Small-scale Food Processing: Strategies of NGOs and the Future to Improve their Effectiveness. Stuttgart: FoodNet/RESAA.

FAO (1995) Food for consumers: Marketing, processing and distribution. Rome: FAO.

FAO (1999) Feeding the cities. Background paper submitted by the Food and Agriculture Organisation of the United Nations. 101st Inter-Parliamentary Conference, Brussels, Belgium, 12-16 April 1999.

FAO/UNDP (1986) Benchmark survey parameters for improving and expanding horticultural crop production in selected Communal Areas around three pilot sites in Zimbabwe: Preliminary results of a sub-sample survey. Horticultural Occasional Paper 1. Harare: FAO/UNDP Zim/86/021.

FAO (1999a) Issues in urban agriculture [online]. Available from: www.fao.org/WAICENT/FAOINFO/AGRICULT/magazine/9901sp2.htm [Accessed 15 June 2000]

FAO (1999b) Urban food marketing [online]. www.fao.org/WAICENT/FAOINFO/AGRICULT/magazine/9906sp1.htm [Accessed 15 June 2000]

FAO[1] (unknown) Horticultural Crops [online]. www.fao.org/WAICENT/FAOINFO/AGRICULT/AGP/AGPC/doc/hort/hortic.htm [Accessed 15 June 2000]

FAO[2] (unknown) Urban and peri-urban agriculture [online]. www.fao.org/unfao/bodies/COAG/COAG15/x0076e.htm [Accessed 15 June 2000]

Farming World (1998) 24(11), November 1998.

Farming World (1999) 25(4), April 1999.

Farming World (1999) 25(11), November 1999.

Guvheya, G. (2000) Spatial market integration among urban smallholder horticultural markets. Unpublished MSc Thesis, University of Cornell, USA.

Hicks, J.R., Hicks, E.R., Malusalila, P. and Nenguwo, N. (1997) Post harvest handling of fruits and vegetables by small-scale Zimbabwean growers. In Jackson, J.E., Turner, A., and Matanda, M. (eds.) Smallholder Horticulture in Zimbabwe. pp.39. Harare: University of Zimbabwe Publications.

Horn, N.E. (1997) Horticultural production and marketing among smallholders in Zimbabwe. In Jackson, J.E., Turner, A., and Matanda. M (eds.) Smallholder Horticulture in Zimbabwe. pp.122-142. Harare: University of Zimbabwe Publications.

Horticultural Promotion Council (1998) Bountiful Zimbabwe. Harare: Horticultural Promotion Council.

Huang, J. and Bouis, H. (1996) Structural changes in the demand for food in Asia. Washington DC: IFPRI.

Hugon, P. (1997) Multi-channel food supply systems to Francophone African towns. Food into Cities Collection. Rome: FAO.

Iikkaracan, I. *et al* (1994) Women's roles in the innovations of food. Food Cycle Technology Source Book, No. 11. London: UNIFEM.

Intermediate Technology Development Group (ITDG) (1997) Market for Dried Fruit and Vegetables in Zimbabwe. Harare: ITDG.
ITDG (undated) Drying of Foods. Technical Briefs. Rugby, UK: Technical Enquiry Unit.
ITDG (undated) Fruit Juice Processing. Technical Briefs. Rugby, UK: Technical Enquiry Unit.
ITDG (undated) Jams, Jellies and Marmalade Production. Technical Briefs. Rugby, UK: Technical Enquiry Unit.
ITDG (undated) Manufacture of Strawberry Flavoured Jam at Small-scale. Technical Briefs. Rugby, UK: Technical Enquiry Unit.
ITDG(undated) Manufacture of Mixed Fruit Juice at Small scale. Technical Briefs. Rugby, UK: Technical Enquiry Unit.
ITDG (undated) Packaging Materials for Food. Technical Briefs. Rugby, UK: Technical Enquiry Unit.
ITDG (undated) Processing of Pepper (Piper Nigrum). Technical Briefs. Rugby, UK: Technical Enquiry Unit.
ITDG (undated) Tomato Processing. Technical Briefs. Rugby, UK: Technical Enquiry Unit.
ITDG (undated) Tray driers. Technical Briefs. Rugby, UK: Technical Enquiry Unit.

Interministerial Committee on SDA Monitoring (1996) Sentinel Surveillance for SDA Monitoring: Results from the Sixth Round. Harare: Ministry of Public Service, Labour and Social Welfare/UNICEF.

Interministerial Committee on SDA Monitoring (1997) Sentinel Surveillance for SDA Monitoring: Results from the Seventh Round. Harare: Ministry of Public Service, Labour and Social Welfare/UNICEF.

Interministerial Committee on SDA Monitoring (1994) Sentinel Surveillance for SDA Monitoring: Report of the Fourth Round. Harare: Ministry of Public Service, Labour and Social Welfare/UNICEF.

Interministerial Committee on SDA Monitoring (1996) Social Trends under Structural Adjustment: Results from Sentinel Surveillance. Harare: Ministry of Public Service, Labour and Social Welfare/UNICEF.

Jackson, J.E. (1997) Vegetable Crop Production in Communal Areas in Mashonaland East and Mashonaland West: Results of a survey in 1988. In Jackson. J.E., Turner, A., and Matanda, M. (eds.) Smallholder Horticulture in Zimbabwe. pp-3-9. Harare: University of Zimbabwe Publications.

Jackson, J.E., Turner, A., and Matanda, M. (1997) (eds.) Smallholder Horticulture in Zimbabwe. Harare: University of Zimbabwe Publications.

Jaffee, S. (1993). Exporting High-value Food Commodities: Success Stories from Developing Countries. Washington DC: World Bank.

Jaffee, S. (1999) Southern African Agribusiness: Gaining Through Regional Collaboration. Washington DC: World Bank.

Japan International Cooperation Agency/Ministry of Industry and Commerce, Zimbabwe (1998) The Master Plan Study on the Promotion of Small and Medium Scale Enterprises in the Republic of Zimbabwe: Final Report. The Materials Process Technology Centre (SOKEIZAI Centre) and Syes Co, Ltd.

Jaure, A. (1997) Marketing systems for smallholders: A comparison of assembly markets in areas of production with farmer marketing at Mbare Musika in Harare. In Jackson, J.E., Turner, A., and Matanda, M. (eds.) Smallholder Horticulture in Zimbabwe. pp91-103. Harare: University of Zimbabwe Publications.

Jayne, T.S., Chisvo, M. and Rukuni, M. (1994) Zimbabwe's food security paradox: Hunger amid abundance. In Rukuni, M. and Eicher, C.K. (eds.) Zimbabwe's Agricultural Revolution. pp.289-303. Harare: University of Zimbabwe Publications.

Karimanzira, C. and Jaure, A. (1997) The cost and role of transport in smallholder horticultural production: experiences from the Mashonaland East Fruit and Vegetable Project. In Jackson, J.E., Turner, A. and Matanda. M (eds.) Smallholder Horticulture in Zimbabwe. pp78-90. Harare: University of Zimbabwe Publications.

Kilmer, G.D. (1993) Application of the GEMINI Methodology for Sub-Sector Analysis to MSE Export Activities: A Case Study in Ecuador. Working Paper 39, Bethesda, MA: GEMINI Series.

Kujinga, Z. and Makoni, K. (1997) Poverty in the ESAP: A comparative, participatory assessment of poverty trends and people coping strategies in Zimbabwe: The Case of a Communal Area in Region 5. Harare: Silveira House.

Kupfuma, B., Nyengerai, A., Mupawose, R.M. and Ncube, H. (1992) Marketing and contribution of field crops to the national economy. In Whingwiri, E.E., Rukuni, M., Mashingaidze, K. and Matanyaire, C.M. (eds.) Small-scale Agriculture in Zimbabwe: Farming Systems, Policy and Infrastructural Development. Harare: Rockwood Publishers.

Liedholm, C. and Mead, D.C. (1991). Dynamics of Microenterprises: Research Issues and Approaches. Working Paper 12. Bethesda, MA: GEMINI Series.

Liedholm, C., McPherson, M. and Chuta, E. (1994). Small enterprise employment growth in rural Africa. American Journal of Agricultural Economics. 76, pp.1177-1182.

Loader, R.J. (1997). Assessing transaction costs to describe supply chain relationships in agri-food systems. Supply Chain Management. 2(1), 12-22.

Mabaya, E. (1998) Smallholder horticultural markets in Zmbabwe: Market organisation and price movements. Unpublished MSc thesis, University of Cornell, USA.

Machete, C. L., Reardon, T. and Mead, D.C. (1997). Promoting farm /non-farm linkages for employment of the poor in South Africa: A research agenda focused on small-scale farms and agro-industry. Development Southern Africa. 14(3) 377-394.

Magrath, P. (1992) Methodologies for Studying Agricultural Markets in Developing Countries. Marketing Series Volume 2. UK: Natural Resources Institute.

Makaya, P.R. (1994) The communal farmer on the export scene. Horticultural Quarterly Review. 4(4), 4-15.

Makhado (1992) Smallholder irrigation in Communal Areas. In Whingwiri, E.E., Rukuni, M., Mashingaidze, K. and Matanyaire, C.M. (eds.) Small-scale Agriculture in Zimbabwe: Farming Systems, Policy and Infrastructural Development. pp. 50-63. Harare: Rockwood Publishers.

Manyame (1997) Socio-cultural issues affecting women horticulturalists in Macheke Resettlement Scheme and Mudzi and Mutoko Districts. In Jackson, J.E., Turner, A., and Matanda. M (eds.) Smallholder Horticulture in Zimbabwe. pp. 177-185. Harare: University of Zimbabwe.

Manzou, C. (forthcoming 2000) Fruit and vegetable processing in Rusitu Valley 1980-1999. B.A. Honours in Economic History. Department of Economic History, University of Zimbabwe.

Manzungu, E. and van der Zaag, P. (1996) Continuity and controversy in smallholder irrigation. In Manzungu, E. and van der Zaag, P. (eds.) The Practice of Smallholder Irrigation: Case Studies from Zimbabwe. pp. 1-28. Harare: University of Zimbabwe Publications.

Mariga, I.K. (1994) Cotton research and development. In Rukuni, M. and Eicher, C.K. (eds.) Zimbabwe's Agricultural Revolution. pp219-233. Harare: University of Zimbabwe Publications.

Marsden, K. (1990) African Entrepreneurs: Pioneers of Development. Washington DC: International Finance Corporation.

Mashingaize, K. (1994) Maize research and development. In Rukuni, M. and Eicher, C.K. (eds.) Zimbabwe's Agricultural Revolution. pp208-218. Harare: University of Zimbabwe Publications.

Matanda, M.L. and Mataviri, T. (1997) Competitive marketing strategies for smallholder horticultural produce growers in Greater Harare. In Jackson, J.E., Turner, A. and Matanda. M

(eds.) Smallholder Horticulture in Zimbabwe. pp.104-121. Harare: University of Zimbabwe Publications.

Matsika, N. (1996) Challenges of independence: Managing technical and social worlds in a farmer-managed irrigation scheme. In Manzungu, E. and van der Zaag, P. (eds.) The Practice of Smallholder Irrigation: Case Studies from Zimbabwe. pp.29-46. Harare: University of Zimbabwe Publications.

Mbiba, B. (1994) Institutional responses to uncontrolled urban cultivation in Harare: Prohibitive or accommodative? Environment and Urbanization, 6(1), 188-202.

Mbiba, B. (1995a) Classification and description of urban agriculture in Harare. Development Southern Africa. 12(1), 75-86.

Mbiba, B. (1995b) Urban Agriculture Zimbabwe: Implications for Urban management and poverty. UK: Avebury, Ashgate Publishing Limited

McPherson, M. (1991) Micro and Small-Scale Enterprises in Zimbabwe: Results of a Country-wide Survey. GEMINI Technical Report 25. Bethesda, MA: GEMINI.

McPherson, M.A. and Parker, J.C. (1993) A Manual for Conducting Baseline Surveys of Micro- and Small-Scale Enterprises. Bethesda, MA: GEMINI.

Mead, D. (1994) The contribution of small enterprises to employment growth in Southern and Eastern Africa. World Development. 22(12), 1881-1894.

Mead, D. and Liedholm, C. (1998) The dynamics of micro and small enterprises in developing countries. World Development. 26(1), 61-74.

Mehretu, A. (1994) Social poverty profile of Communal Areas. In Rukuni, M. and Eicher, C.K. (Eds.) Zimbabwe's Agricultural Revolution. pp56-69. Harare: University of Zimbabwe Publications.

Ministry of Public Service, Labour and Social Welfare (Social Development Fund Unit) (1997) 1995 Poverty Assessment Study Survey: Main Report. Harare: Ministry of Public Service, Labour and Social Welfare.

Mosha, A.C. (1983) Integrated Food Processing Industry Development in Africa: Constraints and Promotional Measures. Export Group Meeting on Measures and Forms in Promoting Integrated Development of the Vegetable Oils and Fats Industry with the Food Processing Industry, Alexandria, Egypt.

Moyo, S. (1995) The Land Question in Zimbabwe. SAPES.

Mrema, G. (1997) Strengthening Africa's Capacity for Agricultural Development Policy Analysis. In: CTA annual Report 1997. Germany: CTA.

Msangi, J., and Kandagor, D. R. (1997) Horticultural crop production and rural development in the drylands of Kenya: Loboi plains/Njemps flats, Baringo District. IFRA-les Cahiers. Sept-Dec (7-8), 7-28.

Msika, L.R. (1998) Onion cultivar trials in Communal Areas. Farming World, 24(11), pp.21.

Mtebe, K. (1996) Village level processing and preservation of vegetables and fruits in Eastern/Southern Africa: Tanzania. Workshop on improving supplies and nutrition through household and village level processing and preservation of vegetables and fruits in Eastern and Southern Africa, Harare, Zimbabwe, 12-16 February 1996.

Muchena, O. N. (1994) Changing Perceptions of Women in Agriculture. In Rukuni, M. and Eicher, C.K. (Eds.) Zimbabwe's Agricultural Revolution. pp348-360. Harare: University of Zimbabwe Publications.

Muchena, S. C. (1995) Possible options for the smallholder farming sector in crop diversification. In Zimbabwe Farmers Union/Friedrich Ebert Foundation (eds.) Options for Diversification for Sustainable Food Security within the Smallholder Farming Sector. Harare International Conference Centre, November 10, 1995, pp.7-11.

Muchena, S. C. (1994) Diversification of the Agricultural Resource Base. In Rukuni, M. and Eicher, C.K. (Eds.) Zimbabwe's Agricultural Revolution. pp.361-373. Harare: University of Zimbabwe Publications.

Mugova, A. (1996) The Policy Environment for the Creation and Growth of Small-Scale Decentralised Agro-Processing Industries. Paper presented at conference Small-Scale Decentralised Agro-Industry Seminar, Harare.

Muir, K. (1994) Agriculture in Zimbabwe. In Rukuni, M. and Eicher, C.K. (eds.) Zimbabwe's Agricultural Revolution. pp.40-55. Harare: University of Zimbabwe Publications.

Muir, K. and Blackie, M. (1994) The commercialisation of Agriculture. In Rukuni, M. and Eicher, C.K. (eds.) Zimbabwe's Agricultural Revolution. pp.195-207. Harare: University of Zimbabwe Publications.

Murphy, A. (1996) Fruit and Vegetable Drying: Opportunities for Micro-enterprise Development in the Communal Areas. Draft sub-sector report, Department of Food Economics, University College Cork, Ireland.

Natural Resources International (2000) Renewable Natural Resources Research Strategy: DFID Crop Post-Harvest Programme Annual Report 1999-2000. Kent, UK: Natural Resources International Limited.

Ndlovu, L. (1994) Livestock research and development. In Rukuni, M. and Eicher, C.K. (Eds.) Zimbabwe's Agricultural Revolution. pp.245-257. Harare: University of Zimbabwe Publications.

Nzima, M.S.D. (1997/98) An overview of technological developments and technical constraints in horticultural research in Zimbabwe. Horticulture Directory, 1997-1998. Horticultural Promotion Council.

Nzima, M.S.D. (1997) Opportunities for increasing land and crop productivity among Zimbabwe's small-scale irrigation schemes. In Jackson. J.E., Turner, A. and Matanda, M.

(eds.) Smallholder Horticulture in Zimbabwe. pp-19-26. Harare: University of Zimbabwe Publications.

Nzima, M.S.D. (1995) Possible strategies for quick entry into the horticultural market scene by smallholder farming sector. In Zimbabwe Farmers Union/Friedrich Ebert Foundation (eds.) Options for Diversification for Sustainable Food Security within the Smallholder Farming Sector. Harare International Conference Centre, November 10, 1995, pp. 25-27.

Odunfa, A. (1995) Structure, potential and constraints of small-scale food processing in Africa. In Richter, J., Basler, A. and Franzen, H. (eds.) Small-scale Food Processing Contributing to Food Security. Food and Agriculture Development Centre (ZEL/ATSAF/DSE)

Padilla, M. (1997) Food Security in African Cities: The Role of Food Supply and Distribution Systems. Food into Cities Collection, Rome: FAO.

Poole, N., Kydd, J., Loader, R., Lynch, K., Poulton, C. and Wilkin, K. (1999) Overcoming informational constraints: Improving horticultural marketing and technical information flows to smallholders. Literature Review for Project R7151 Crop Post Harvest Research Programme. Kent, UK: Wye College.

Population Reference Bureau (2000) 2000 World Population Data Sheet. Washington, DC: Population Reference Bureau.

Poulton, C., Mukwereza, L., Chaonwa, W., Loader, R., Mariga, K., Masanganise, P. and Sanyatwe, D. (1999) Overcoming informational constraints: Improving horticultural marketing and technical information flows to smallholders. Zimbabwe Country Report: Project R7151 Crop Post Harvest Research Programme. Kent: University of London, Wye College.

Price Waterhouse (1998) Report of the study on transportation conditions and requirements for the Mashonaland East Fruit and Vegetable Project. Final report prepared for ARDA.

Quisumbing, A. (22 May 2000) Re: Commercial vegetable and polyculture fish production in Bangladesh: Their impacts on income, food consumption and nutrition food-based strategies to reduce/eliminate micronutrient malnutrition, Project brief [online]. Available from: development-gender@mailbase.ac.uk [Accessed 23 June 2000].

Richter, J., Basler, A. and H. Franzen (eds) (1996) Small-Scale Food Processing Contributing to Food Security. Food and Agriculture Development Centre (ZEL/ATSAF/DSE).

Riley, H.M. and Staatz, J.M. (1993) Food System Organisation in Developing Countries. In: Abbott, J. (ed.) Agricultural and Food Marketing in Developing Countries: Selected Readings. Wallingford: CAB International.

Rogerson (1992) Feeding Africa's cities: The role and potential of urban agriculture. Africa Insight. 22(4), 229-234.

Rugube, L. (1991) Horticultural marketing in Zimbabwe. In Carr, S. (ed.) Horticultural Marketing: Proceedings of the Second Regional Workshop on Horticultural Marketing.

pp.15-29. Harare: Network and Centre for Agricultural Marketing Training in Eastern and Southern Africa.

Rukovo, A. (1991) The development of the horticultural industry in Zimbabwe and future prospects. In Carr, S. (ed.) Horticultural Marketing: Proceedings of the Second Regional Workshop on Horticultural Marketing. pp.10-14. Harare: Network and Centre for Agricultural Marketing Training in Eastern and Southern Africa.

Rukuni, M and Eicher, C.K. (1994) (eds.) Zimbabwe's Agricultural Revolution. Harare: University of Zimbabwe Publications.

Rukuni, M. and Makhado, J. (1994) Irrigation development. In Rukuni, M and Eicher, C.K. (eds.) Zimbabwe's Agricultural Revolution. pp127-139. Harare: University of Zimbabwe Publications.

Rukuni, S. (1994). Land Tenure Commission Report. Harare: Government of Zimbabwe.

Sandels, A. (1989) The Potential for Food Processing Projects in the Rural Areas of Zimbabwe. Harare: ITDG.

Schippers, R. (2000) Opportunities and constraints in the subsistence production and marketing of indigenous vegetables in East and Central Africa. Report on market and production surveys, DFID Project A0699.

Scott, G.T. (1995) Prices, Products and People: Analysing Agricultural Markets in Developing Countries. Rienner.

Sena, M.I. (1997) Horticultural marketing in Zimbabwe: Problems met by smallholders and experience of the Mashonaland East Fruit and Vegetable Project in addressing these schemes. In Jackson, J.E., Turner, A., and Matanda, M. (eds.) Smallholder Horticulture in Zimbabwe. pp.65-77. Harare: University of Zimbabwe Publications.

Shambare, C. (1997) Resource use and environmental sustainability: Horticulture in relation to other forms of land, water and human-resource usage and impact on water and soil erosion. In Jackson, J.E., Turner, A., and Matanda, M. (eds.) Smallholder Horticulture in Zimbabwe. pp.10-18. Harare: University of Zimbabwe Publications.

Shumba, E.M. (1989) An agronomic study of appropriate maize (Zea mays) tillage and weed control technologies in a Communal Area of Zimbabwe. D. Phil. Thesis. Faculty of Agriculture, University of Zimbabwe.

Shumba, E.M. (1992) The farming system. In Whingwiri, E.E., Rukuni, M., Mashingaidze, K. and Matanyaire, C.M. (eds.) Small-scale Agriculture in Zimbabwe: Farming Systems, Policy and Infrastructural Development. pp. 16-30. Harare: Rockwood Publishers.

Simalenga, T.E. (1996) Small-Scale Decentralised Agro-Processing. Paper presented at Small-Scale Decentralised Agro-Industry Seminar, Harare.

SMALLFOOD (1999a) Removing Constraints to the Development of Small-Scale Food Processing Enterprises in Sub-Saharan Africa: Country Profile and Local Literature (Zimbabwe). The University of Reading, UK.

SMALLFOOD (1999b) Removing Constraints to the Development of Small-Scale Food Processing Enterprises in Sub-Saharan Africa: Country Profile and Local Literature (Cameroon). The University of Reading, UK.

SMALLFOOD (1999c) Removing Constraints to the Development of Small-Scale Food Processing Enterprises in Sub-Saharan Africa: Country Profile and Local Literature (Kenya). The University of Reading, UK.

SMALLFOOD (1999d) Removing Constraints to the Development of Small-Scale Food Processing Enterprises in Sub-Saharan Africa: Literature Review (General). The University of Reading, UK.

Smith, D.W. and Tevera, D.S. (1997) Socio-economic context for the householder of urban agriculture in Harare, Zimbabwe. Geographical Journal of Zimbabwe. (Special Issue on Urban Agriculture) 28, pp.25-38.

Soetan, F. (1997) Entrepreneurship and Nigerian Women: Is there any Meeting Point? Small Enterprise Development. 8(1).

SPORE (1996) Small-scale food processing in rural development. CTA 65(September-October), 35-41.

Terpend, N. and Kouyaté, K. (1997) The constraints on food supply and distribution systems to African towns: The viewpoints of FSDS actors. Food into Cities Collection, Rome: FAO.

Tollens, E. (1997) Wholesale markets in African cities: Diagnosis, role, advantages and elemnets for further study and development. Food into Cities Collection, Rome: FAO.

Troparg (1997) Manufacturing Sector Study: Foodstuffs. Troparg Consultancy Services.

Turner, A. and Chivinge, O. (1999) Production and Marketing of Horticultural Crops in Zimbabwe: A survey of Smallholder Farmers in the Mashonaland East Province. Ithaca: Cornell International Institute for Food, Agriculture and Development (CIIFAD).

UN (1998) International Market Access Information Horticulture Sector. Geneva: UN.

UNDP, Poverty Reduction Forum and IDS (1998) Human Development Report 1998 Zimbabwe. Harare: UNDP, Poverty Reduction Forum and Institute of Development Studies.

UNIFEM (1988) Fruit and vegetables processing. Food Cycle Technology Source Book, No.2. UK: IT Publications in Association with UNIFEM

UNIFEM/ITDG (1993) Food Cycle Technology Source Book, No.6. UK: UNIFEM/ITDG

USAID (1998) Potential for Small-Scale Food Processing in Zimbabwe. Harare: USAID.

Utete, D. (1995) Smallholder Crop Diversification Adoption Rate: Experience and Prospects. Paper presented at Workshop on Options for Diversification for Subsistence Food Security within the Smallholder Farming Sector.

Utete, D. and Tembo, E. (1996) Production and processing of vegetables and fruits in Zimbabwe: Trends and status. Workshop on improving supplies and nutrition through household and village level processing and preservation of vegetables and fruits in Eastern and Southern Africa, Harare, Zimbabwe, 12-16 Februrary, 1996.

Whingwiri, E.E. (1992) Introduction. In Whingwiri, E.E., K. Mashingaidze and M. Rukuni (Eds.) Small-scale Agriculture in Zimbabwe: Book 2, Field Crop Production. pp. 3-6. Harare: Rockwood Publishers.

Whingwiri, E.E., Mashingaidze, K. and Rukuni, M. (eds.) (1992) Small-scale Agriculture in Zimbabwe: Book 2, Field Crop Production. Harare: Rockwood Publishers.

Whingwiri, E.E., Rukuni, M., Mashingaidze, K., and Matanyaire, C.M. (eds.) (1992) Small-scale Agriculture in Zimbabwe: Book 1, Farming Systems, Policy and Infrastructural Development. Harare: Rockwood Publishers.

Wien, H.C., Feldman, S. and Minja, R. (1997) Smallholder vegetable production in Northern Tanzania: Constraints and opportunities. In Jackson. J.E., Turner, A., and Matanda, M. (eds.) Smallholder Horticulture in Zimbabwe. pp.40-55. Harare: University of Zimbabwe Publications.

Wiggins, S., Otieno, O.L., Proctor, S., and Upton, M. (forthcoming 2000) Population, migration and rural diversification: The implications for the crop post-harvest sector. Strategy paper for the Crop Post-harvest Programme.

Wilhelm, L. (1997) Food Supply and Distribution Networks and How Markets Work in Africa. Food into Cities Collection, Rome: FAO.

Wilhelm, L. (1997) Food Transport and Intermarket Supplies in African Towns: Unknown Services to Users, Traders and Consumers. Food into Cities Collection, Rome: FAO.

ZEPZA (1998) Promotion of Integrated Rural Based Export Oriented Project. Harare: Zimbabwe Export Processing Zones Authority.

Zimbabwe Congress of Trade Unions (1996) Beyond ESAP: Framework for a Long-term Development Strategy in Zimbabwe beyond the Economic Structural Adjustment Programme. Harare: Zimbabwe Congress of Trade Unions.

ZIMTRADE (1999) Horticultural Products ZIMTRADE. Harare: Zimtrade.

ZIMTRADE (1999) Export Directory of Zimbabwe. Harare: Zimtrade.

Appendix 1: Details of Activities of Interfresh Business Operating Units

Business Operating Unit	Activities	Market	Other Details
FRESCA (Pvt) Ltd	Processes vegetables for export market- dehydrated vegetables for use as ingredients in soup making: cabbages, onions, cauliflower and sweet corn.	USA and the EU countries.	A 50/50 joint venture operation with Dutch Company called FOODTECH. Based at Export Processing Zone (EPZ) at Mt Hampden.
MAZOWE CITRUS ESTATES	Production of mange tout peas, sugar snap peas, baby corn, fine beans, oranges and lemons on Mazowe Citrus Estates. Crops are mainly for export, any excess is consumed on local market or if the grade is inferior. A substantial quantity of oranges is sent for squeezing into orange concentrates and this end product has a very attractive export market.	Export market	When Mazowe Estates was acquired by Interfresh, the package included Simona and Glenara Estates. Latter estates have now been disposed of as did not fit into the company's product mix.
INTERSPAN (PVT) LTD	Citrus marketing. Co-ordinates the procurement of citrus fruits throughout the country including citrus fruits from Mazowe.	Markets through Outspan International to benefit from economies of scale. Outspan has markets all over the world. The Company is bringing in a lot of foreign exchange earnings.	Joint venture with Outspan International (UK)
INTERFREIGHT (PVT) LTD	Co-ordinates export of the group's fruit and vegetables. Also exports produce of other independent growers. Specialises in the export of flowers.		Based at Harare Airport.
FRESHEX (PVT) LTD (1997-JUNE 2000)	Involved in the production, packaging and exporting of certain crops: mange tout, sweet corn, baby corn, granadillas, fine beans and runner beans. Company worked in close liaison with small-scale out-growers from: Mutoko, Murehwa and Mhondoro.		Company ceased operations in June 2000 due to various problems which pushed production costs beyond manageable/profitable levels: - Excessive rains resulted in disturbances to planting - Farm invasions by war veterans - Changes in external market requirements e.g. biodegradable packaging which is very expensive
MAZOWE FLOWERS (PVT) LTD	Fairly new venture, which concentrates on the growing of roses for export.	Export market	It is a joint venture operation with a Dutch Company. The Dutch parent company handles the export market and therefore assures MAZOWE FLOWERS a ready market overseas.

Source: ITDG, Personal communication