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Facilitating the effective production and marketing of processed food products by small-scale producers in Zimbabwe (Project R7485)

Output 4.1: Report on Producer/Processor Case Studies

Collaborative Study:

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The University of Reading, UK

Development Technology Centre,
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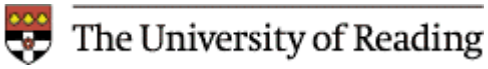

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Output 4.1: Report on Producer/Processor Case Studies

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CONTENTS

List of Tables

List of Figures

List of Appendices

1. Introduction

1.1 Background

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. Recent research demonstrates that up to 70% of rural households are living in absolute poverty and between 75% and 90% are below the Government of Zimbabwe's official poverty lines (Chipika, 1992).

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. Rural households in Zimbabwe's Natural Regions IV and V hardly produce above their subsistence levels owing to poor soil and low rainfall patterns. For example, around 55% of farmers in Natural Region IV and 82% of those in Region V reported food shortages in 1993, which was a year of reasonably good harvests (Moyo, 1995).

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. Some 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).

Previous research suggests that small-scale food processing activities represent a potential source of livelihood for the poorest people in Sub-Saharan Africa. Food processing may increase the value of crops to poor farmers, through improving shelf-life, adding value and thus yielding higher returns, and furthermore overcoming seasonal and perishability constraints for example. Value-addition via the adoption of improved and validated processing technologies, may help small-scale horticultural producers overcome some of the problems experienced in the fresh produce market, such as lack of market information and market integration, reliance on spot markets, transport constraints and wastage. By processing some or their entire crop, producers have an alternative or additional means of marketing their produce. This is important given that losses of horticultural crops due to spoilage are significant, and as a result limit smallholder access to higher value markets in urban areas. Even in circumstances where small-scale producers can access such markets, returns on unprocessed products are typically low.

Richter, Basler and Franzen (1996) and McPherson (1991) suggest that agro-processing activities are an effective way of eliminating poverty and improving the quality of life of marginalised people. The processing of horticultural products using appropriate technologies may be seen as a mechanism to reduce spoilage and add value. In some cases value added through marketing and processing raw products can be much greater than the value of primary production itself. In turn, agro-processing activities can enhance the livelihoods of small-scale producers through improved incomes, employment, food availability, nutrition and social and cultural well-being.

Micro- and small-scale enterprises (MSEs) are leading employment creators in Zimbabwe (McPherson, 1991; Daniels, 1994; USAID, 1998). Between 1991 and 1993 the growth in employment by small-scale enterprises outstripped population growth, with most of the increases occurring in rural areas. By 1998, there were 860,000 small-scale enterprises (USAID, 1998) employing 1.65 million people. Research suggests that 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). 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 activities may thus contribute to socio-economic development by enhancing the position of low income, vulnerable and marginalised groups (Troparg, 1997). It 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. The predominant role of women in small-scale food processing activities can be attributed to the lack of a requirement for formal education, the fact that women can combine household chores and running a food processing enterprise, and the lack of competition from men (Richter *et al*, 1996). With a few additional skills and initial external support, daily activities can be utilised by women to generate income. Women are particularly predominant within the informal sector, which essentially consists of units which usually employ family members (the majority with no formal training in food processing), and which are not legally registered as businesses. Given the high level of female participation in small-scale food processing enterprises, the sector is widely acknowledged to be a valuable mechanism to empower women in rural and peri-urban areas and enhance their economic status (Richter *et al*, 1996; Machete, 1997). Even though women are predominantly found in lower income small-scale food processing enterprises, they have a critical role in helping families to survive (Soetan, 1997).

Research has shown, however, that a number of factors may constrain the ability of small-scale enterprises to effectively manufacture and market processed food products. On a macro level, many policies implemented by governments 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) and appropriate technologies (McPherson, 1991; Mugova, 1996), a lack of technological capability, the unreliable supply of raw materials (Mosha, 1983), a lack of management know-how (Odunfa, 1995), and poor quality control (Jaffee, 1993), amongst other things, have served to constrain the development of small-scale industries. These problems apply in many areas, and are particularly applicable in the case of Zimbabwe.

In Zimbabwe there has been no shortage of programmes promoting SMEs, especially within agro-processing (Mrema, 1997). The Zimbabwe Export Processing Zones Authority, for example, recognises that meeting the problems of small-scale food processing enterprises is crucial for development planning (ZEPZA, 1998). This reflects the number of enterprises and level of employment accounted for by this sector. Likewise, the establishment of an institutional environment that supports SMEs has been recognised (Bhalla, 1993; Simalenga, 1996). It is

acknowledged, however, that key to the promotion of processing activities by small-scale producers is the identification of solutions to the constraints that agro-processing enterprises face. Furthermore, the solutions which are sought must be sensitive to the specific economic and geographical context of the producer/processor (Odunfa, 1995; Sandels, 1989). 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; 1999b).

1.2 Focus of the case study research

The case study research was undertaken with producers/processors of horticultural crops (the majority operating at a small-scale), in order to gain a fuller understanding of the requirements for small-scale producers to effectively manufacture and market processed products. The main areas of interest included considering the constraints which processors face in terms of producing or procuring raw materials, processing horticultural crops, and accessing a market for their end product(s).

A total of 26 case studies were conducted throughout eastern areas of Zimbabwe, in particular, in Mashonaland East and Manicaland Provinces. The producers/processors who participated in the case studies processed at least one product from the three product categories chosen—dried fruits, dried vegetables, and fruit jams/jelly/marmalades. A total of 15 of the processors interviewed processed jam/jelly/marmalade, five processed dried fruits and 14 were involved in vegetable drying. In some cases, the processors interviewed also manufactured other products, for example, sauces, chutneys, piccalilli, relishes, pickles and lemon curd.

1.3 Objectives of the case study research

The objectives of the case studies were:

1. ***To identify the necessary requirements for small-scale producers to effectively manufacture and market processed products based on horticultural and/or fruit crops, and hence access the potential market for processed products***

This was assessed through examining the specific requirements of a number of existing small-scale producer/processors in two provinces of Zimbabwe. Effectiveness in this context was assessed in terms of, amongst other things, economic returns, food safety and environmental sustainability. The requirements to be considered included appropriate processing technologies, quality control procedures, market information, marketing effort, etc.

2. ***To identify the potential externalities associated with the processing of horticultural products in the study areas***

These included potential impacts on the environment, food safety, social and gender impacts etc.

3. ***To assess the potential returns to small-scale producers from manufacturing and marketing processed products based on horticultural and/or fruit crops***

This was based on estimates of current returns to producers from sales of unprocessed products, costs of production and the potential sales price of processed products. This stage of the research provided some indication of the potential benefit to small-scale producers in terms of enhanced livelihood.

4. ***To identify constraints that might prevent small-scale producers of horticultural and/or fruit crops from manufacturing and marketing processed products effectively***

Constraints to be addressed include:

- Technical
- Financial
- Infrastructural
- Institutional
- Social
- Informational.

This stage considered whether certain problems were gender-related, i.e. if women were more badly affected by certain constraints than their male counterparts.

5. ***To provide background information in order to draw up a survey instrument, which will be used to assess whether the above findings are generally applicable to small-scale horticultural producers/processors in Zimbabwe***

This will involve a survey (n=300) of producers/processors, featuring different geographical locations, levels of infra-structural development, etc.

1.4 Methodology

The case studies were carried out in areas with different geophysical characteristics, degrees of infra-structural development and social dimensions etc. It was anticipated that the use of case studies would allow the project team to not simply collect a series of facts and figures regarding small-scale agro-processing enterprises but more crucially to discover and understand the dynamics of these enterprises and their activities.

The case studies involved in-depth interviews with horticultural producers/processors, the majority of whose processing operations were small-scale in character. The interviews were conducted using a standard interview guide and checklist (See Appendix 1), which was developed on the basis of results from previous research, carried out under the project. Extensive field notes were compiled for each interview. Field researchers were also asked to record any

additional information regarding the enterprise that they considered of interest. Photos of the different enterprises and their processing equipment were also taken where possible.

The project team highlighted four possible types of processors that would be included in the study. These are highlighted in Table 1 below. Only eight of the case study enterprises had received any formal training in food processing techniques.

Table 1. Potential case study participants

Received training in processing techniques?	**Producer/Processor**	**Processor**
YES	Produces and processes horticultural crops and has received formal training in processing techniques	Processes (but does **NOT** produce) horticultural crops and has received formal training in processing techniques.
NO	Produces and processes horticultural crops but has **NOT** received formal training in processing techniques.	Processes (but does **NOT** produce) horticultural crops and has **NOT** received formal training in processing techniques.

1.5 Organisation of the report

The report is divided into nine sections. Section two gives a brief introduction to the case study regions of Mashonaland East and Manicaland Provinces. Section three discusses the characteristics of the entrepreneurs, processing experience acquired, training and/or other forms of support received. Section four describes the nature of the processing activities adopted, the different types of technology and equipment used to manufacture the products, and the range of end products processed.

Section five discusses the main ways in which processors access inputs and raw materials for their enterprise and how this affects the nature and scale of their activities. Section six considers whether processors are sensitive to concerns of food safety, quality control, hygiene and appropriate packaging materials, among other concerns. Section seven summaries the main markets through which small-scale processors channel processed products and their access to consumer and market information. Section eight considers the returns to agro-processing activities on the part of small-scale producers, the nature and degree of enterprise growth currently being experienced within the small-scale agro-processing sector, and the degree of competition and linkages among enterprises. Finally, section nine summarises and classifies the main constraints currently being experienced by small-scale enterprises within the horticultural sector, and the short- and long-term solutions being adopted to overcome such constraints.

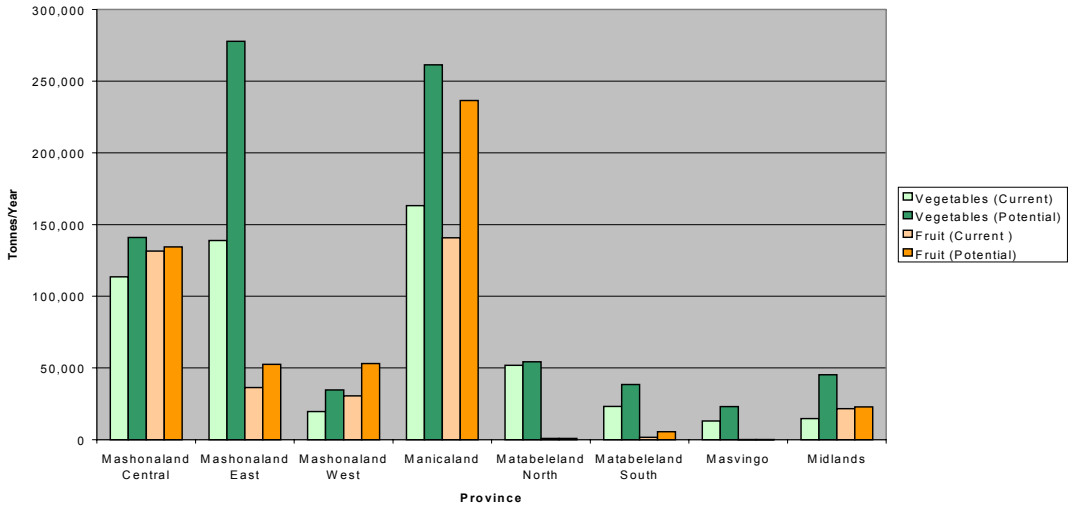
2. Geophysical location of the case study enterprises

2.1 Introduction

A total of seven case studies were carried out in Mashonaland East Province, in the districts of Murehwa (5 cases), Marondera (1 case) and Mudzi (1 case). The remaining 19 cases were compiled in Manicaland Province across the districts of Nyanga (12 cases), Makoni (1), Chimanimani (4) and Chipinge (2).

Of Zimbabwe's provinces, Manicaland province was cited as the largest producer of fruits and vegetables in 1998 (in terms of volumes), with production of 163,167 tonnes of vegetables and 140,731 tonnes of fruit.[5] Mashonaland East province in terms of vegetable production (138,865 tonnes) and Mashonaland Central in terms of fruit production (131,591 tonnes), closely followed it. According to Agritex (1998), Manicaland province shows greatest potential for horticultural production generally, although Mashonaland East shows greatest potential for vegetables (Figure 1).

Figure 1. Fruit and vegetable production in Zimbabwe by province (tonnes/year)



Note: Across all provinces, data on commercial area production was unavailable in some districts.
Data includes wild and indigenous fruits such as masawu, baobab and loquat-mazhanje.
See Appendix 2 for actual production figures.
Source: Troparg, 1999:70 citing Agritex, 1998

[5] Please note that across all provinces, data on commercial area production was unavailable in some districts (Troparg, 1999 citing Agritex, 1998).

2.2 Mashonaland East Province

Mashonaland East Province has quite a long tradition in horticulture, longer than that of the Eastern Highlands for example. More than half the province lies in Natural Region II (the rest mainly in regions III and IV) and therefore has adequate rainfall and/or water for horticultural crop production. Temperatures range from 5˚C to 25˚C. The main areas for horticultural production are Mutoko (Natural Regions II, III and IV), Murehwa (Regions IIa and b), Goromonzi (Region IIa), and Seke (Region IIb). Most farmers produce some horticultural crops for commercial purposes, often travelling between 30-150km to Mbare Musika to market their produce. Although many farmers cultivate fruit, this tends to be less significant than vegetable production (Table 2). Case studies were conducted in the districts of Mudzi, Murewha and Marondera (which are highlighted in Table 2 below).

Table 2. Fruit and vegetable production in Mashonaland East Province (tonnes/year)

District	Vegetables		Fruit	
	Current	Potential	Current	Potential
Mutoko*	37,675	81,849	5,710	9,504
Mudzi*	885	1,361	8,811	8,811
Murehwa*	15,941	31,007	7,018	16,988
Wedza	3,608	5,771	14,482	15,156
Goromonzi	27,596	50,097	75	370
Macheke*	332	668	164	386
Marondera*	165	233	86	1,298
Seke	51,011	103,458		
Chikomba*	1,679	3,358	2	4
Total	138,865	277,802	36,348	52,517

Note: Case studies were conducted in the districts highlighted.
*No data on commercial area production was available.
Source: Troparg, 1999:70, citing Agritex, 1998

Although a wide variety of horticultural crops are produced in the province, Troparg (1999) suggests that tomatoes and mangoes constitute approximately 50% of all produce grown. The main crops marketed by smallholders include rape, onion, covo, sweet potato and cucumber. The minor crops cultivated are green pepper, egg plant, baby marrow, hot chillies, gem squash and butternut squash (Regional Agritex Officer, Mashonaland East Provice, 1999, personal communication). Some smallholders are involved in horticultural production for export markets—farmers in Murehwa and Uzumba Maramba Pfungwe produce baby corn, sweet corn, mange tout peas, fine beans and butternut squash through out-grower schemes with Hortico Agrisystems, which exports horticultural produce to Europe.[6]

To some extent, a degree of specialisation is taking place in terms of smallholder horticultural production, particularly in Murehwa and Mutoko districts. Gem squash, butternut squash,

[6] In February 2001, Hortico had 2500 small-scale farmers involved in their scheme—including communal area farmers, farmers on irrigation schemes and small-scale commercial farmers. During this time, approximately 8-10% of volumes received by Hortico were sourced from communal area farmers (Hortico Agrisystems, 2001, personal communication).

eggplant and green pepper are examples of crops with which some farmers have quite a lot of experience (Regional Agritex Officer, Mashonaland East Province, 1999, personal communication).

Fruit production, which occurs mainly during the rainy season (See fruit and vegetable production calendars for some case study producer/processors interviewed in Appendix 3), is dominated by mango (traditional fibrous variety) in Mutoko and Murehwa districts. The majority of mango is sold fresh. Transport and marketing constraints and pest management problems mean that significant quantities of mango go to waste (Regional Agritex Officer, Mashonaland East Province, 1999, personal communication).[7] Banana production although significant in the province, is heavily confined to Mudzi district. The cultivation of oranges is largely confined to Wedza district.

The majority of processing activities carried out in Mashonaland East Province primarily involves vegetable drying. Vegetables suitable for drying include munyemba, pumpkin leaves, and garden leafy vegetables such as cabbage, rape and covo. One enterprise visited in the region during the study—The Murehwa Food Processors' Association, has diversified into dried fruits (particularly mango) which it sells on the export market.

2.3 Manicaland Province

Manicaland Province stretches across Natural Regions I to V. However, most of the province lies in Natural Regions I and II, which have high rainfall and a cool climate and therefore have high potential for horticultural production. Temperatures range from 3˚C to 28˚C, though there is some probability of frosts in winter along the mountain regions (Troparg, 1999). In the Eastern highlands, where the climate is conducive to diversified and specialised farming, horticulture is predominant in Chimanimani district {including Nyanyadzi (Regions I, IIb and III), Rusitu Valley (Region I) and Cashel Valley (Region I)}, the district of Mutare (including the Honde Valley—Regions I and II) and Nyanga district. As Table 3 suggests, Mutare is one of the most significant areas of horticultural production in the province at present (Agritex, 1998).

Small-scale farmers in Manicaland province grow quite a wide variety of fruits and vegetables. Predominant fruit crops include mango, banana, pineapple, naartjie and orange—in terms of volumes produced. Tomato, leafy vegetables, sweet potato, onion and avocado are the main vegetables cultivated by smallholder farmers in the area.

The majority of case studies conducted in the province were situated in Nyanga district (12 in all), along the Nyanga belt including the areas around Juliasdale (Region I) and Troutbeck (Region I). Nyanga is a mountainous area stretching across Natural Regions I and II with peaks of approximately 2600m. The area experiences in excess of 700mm of rainfall per annum. Given the characteristic cooler climate of the upper reaches of the Eastern Highlands, the production of deciduous fruits (e.g. apple, peach, gooseberries and plums) is predominant in the region

[7] There is also significant wastage of the tomato crop and leafy greens, due to the lack of transport and furthermore rising costs to transportation (Regional Agritex Officer, Mashonaland East Province, 1999, personal communication).

(Representative, Nyanga Experiment Station, 1999, personal communication). In fact, Nyanga is one of the main deciduous fruit producing regions in Zimbabwe. Although deciduous fruit production is significantly more predominant on large-scale commercial farms, smallholders have become active in deciduous fruit cultivation in recent years (Ibid.). Deciduous fruit plantations cultivating apple, plum, peach, strawberry, gooseberry, youngberry, figs and apricot dominate Juliasdale—located approximately 20km from Nyanga. Troutbeck is another fruit producing area within the region, situated about 35 km from Juliasdale.

Table 3. Fruit and vegetable production in Manicaland Province (tonnes/year)

District	Vegetables		Fruit	
	Current	Potential	Current	Potential
Makoni	9,215	14,469	761	1,252
Nyanga*	4,537	8,539	882	1,188
Mutasa*	3,530	6,075	588	588
Mutare	104,908	143,259	17,172	19,786
Chimanimani*	13,407	31,410	29,627	118,764
Chipinge*	22,210	35,861	27,201	29,790
Buhera*	5,180	18,125	15,000**	15,000**
			49,500***	49,500***
Total	163,167	261,393	91,231	186,956
			49,500***	49,500***

Note: Case studies were conducted in the districts highlighted.
*No data on commercial area production
**Mangoes
***Indigenous wild fruit (*baobab* and *loquat-mazhanje*)
Source: Troparg, 1999:60, citing Agritex, 1998

Although significant levels of fruit processing take place in Nyanga, the majority takes place on large-scale commercial farms, which process jam for example. However, cottage industries have been successful in the Nyanga region, producing jam products and honey for example. Although the majority of these enterprises are informal, some have been able to develop their own 'informal' brands for example (Zimtrade, 2001, personal communication). The solar drying of fruits and vegetables is particularly difficult in the region given the high humidity present. Much of the fruit tends to ferment rather than dry (Representative, Nyanga Experiment Station, 1999, personal communication).

One case study was conducted in Nyanga North with the Magute Spring Project located in Ward 7. The region experiences between 450-600mm of rainfall per annum and is subject to occasional seasonal droughts (Natural Region IV). The flat dry lands support little fruit production except for lemons and wild fruits such as baobab and figs.

A further study was conducted in Makoni district (Natural Region IIb). The district borders with Murehwa and Marondera in the West and Nyanga and Mutare in the East.

Six enterprises were visited in the southeastern part of Manicaland province, two in Chipinge district and four in Chimanimani district—two in Wengezi, one in Chimanimani and one in

Rusitu valley. Wengezi lies halfway between Mutare and Birchenough Bridge. It is a dryland area (Natural Region V) with similar characteristics to Nyanga North. The area experiences low and erratic rainfall and has poor typography and soils. Communal farmers do not produce a great variety of crops in the area, given the harsh environment. In terms of horticultural production, traditional leafy greens such as covo, rape and cabbage dominate. In the drier areas of Manicaland Province, such as Nyanga North and Wengezi junction, processing activities are mainly confined to drying vegetables.

By contrast Chipinge, which lies in Natural Region I, supports a variety of crops, though commercial tea and coffee plantations predominate. Guava is particularly abundant in the area.

Ngorima Communal Area in Rusitu valley (Natural Region I) which lies along the border with Mozambique, was the location of the final case study, i.e. with the Rusitu Valley Jam Canners Co-operative (RVJCC). Although forestry is a major economic activity in the highlands of Chimanimani[8], tea and coffee plantations and fruit production (orange, pineapple, banana, mango, guavas, lemons and nartjees) are predominant in the Rusitu valley. Given the hot, humid conditions in the valley, fruit production is largely confined to citrus (orange, pineapple) and tropical fruits including mango, guava and banana. Rainfall is good in summer enabling significant volumes of fruit to be produced. Agriculture production in the communal areas surrounding the Rusitu valley, is primarily subsistence orientated. Typical crops include maize, beans, tomatoes, vegetables, fruit, tea and coffee, with surpluses being sold in regional markets (Maboyi, 1999).

[8] Large companies like Border Timbers, Wattle Company, Rathmore Forests and the parastatal Forestry Commission own plantations and a number of saw mill factories in the area (Maboyi, 1999).

3. Characteristics of the case study enterprises

3.1 Nature of the enterprises

As Table 4 demonstrates, the majority of the processing enterprises visited were informal in character. Of the 26 case studies carried out, few were registered as 'formal' processing units. Registration comes in different forms. "The possible legal status for a formal sector unit would be a partnership, a proprietorship, a registered company and a registered co-operative. These legal forms are described in the company act of 1973 and the Co-operative Societies Act. The objective of the latter is to encourage the formalisation of enterprises through registration with the Registrar of Co-operatives" (van Dijk, 2000:29), which is attached to the Ministry of Employment Creation, Youth and Gender. Registered co-operatives include the Murewa Food Processors' Association[9] and the Rusitu Valley Jam Canners Co-operative.[10] Registration appears to enhance access to financial support and formal training programmes from local and international government and non-government bodies. It is also a requirement to access certain markets like large chain retail outlets.

Although most enterprises were aware of registration, not all had the incentive to register. That said, numerous processors were registered as fruit producers. Those who operate as companies are expected to sign up with the Registrar of Companies. Registered companies include Golden Harvest (Pvt) Ltd, Rain Valley Orchards (Pvt) Ltd, and Bondana (Pvt) Ltd. Halfway House and the Malwatte Farmhouse Restaurant are registered as companies in the hospitality industry (registered proprietorships). There are also other associations which enterprises can register with. For example, cross border traders can register with the Zimbabwe Cross-Border Association.

In a few cases, the processing enterprise formed part of a larger multi-faceted business, often geared towards tourism—including restaurant, grocery, curio shops, and guesthouse accommodation for example. In other cases, the processing enterprise could be seen as a strategy of on-farm diversification. Processing was a way of diminishing losses to crops produced on farm—particularly second and third grade produce that was unacceptable for the fresh produce market. Such farms were essentially small-scale commercial farms, with fruit orchards ranging between one acre and 30 hectares. It is important to note however, that the processing component of these multi-faceted businesses or diversified farms was informal and small-scale in character, either due to level of capital investment, volumes processed and/or number of staff employed.

In a significant number of cases (eight in all) however, processing is not essentially a commercial activity. Products are largely geared towards household consumption needs, with surpluses being sold when households are strapped for cash and/or there is a seasonal peak in demand for

[9] The Murewa Food Processors' Association consists of three groups of processors. Each group is composed of four teams, giving twelve teams. In each team there are six members, i.e. 72 members in the co-operative in total (van Dijk, 2000).

[10] The Rusitu Valley Jam Canners Co-operative was registered with the Ministry of National Affairs, Employment Creation, and Co-operatives in 1984. In addition, RVJCC is an affiliate member of the Nyahode District Union, which has eight other co-operatives who are members (Maboyi, 1999).

particular products.[11] Most of the processors involved are producing traditional sun-dried vegetables. Three of these processors were also involved in jam making, but again this activity was largely geared to household consumption as very small volumes of jam were being made.

Essentially, there was a clear distinction between small-scale enterprises that were market-driven and those that were essentially household food security strategies which may have offered some opportunity for income generation, but on a seasonal or temporary basis. In the latter case, although many of those involved had received formal training in food processing techniques (funded by NGOs or government bodies), they tended to lack market information. In many cases, they relied on sporadic sales to friends and neighbours, or the occasional visitor to the area.

3.2 Characteristics of entrepreneurs and employees

The case studies suggest that the large majority of those involved in fruit and vegetable processing are women. This was true of producers/processors that had essentially adopted processing as a household food security measure (but sold small surpluses), as well as those enterprises[12] whose activities were predominantly market-orientated. Of the 26 case studies enterprises visited, 19 were run entirely by females. Three enterprises were run entirely by men. Three consisted of a husband/wife joint venture and one was a processor organisation made up of male and female members, though the latter dominated. This suggests that gender relations (such as those governing mobility) do not constrain women in terms of taking on income generating activities *per se*. On the other hand, the overwhelming predominance of women in these activities (largely informal by nature) may provoke questions as to the welfare impacts (e.g. labour burdens) which women face, given that the majority of women interviewed must balance such activities with other responsibilities such as childcare.

The processors interviewed ranged between 18 and 73 years of age. At least eight processors were at or near retirement age, i.e. females over 55 years of age or males over 60 years.[13] Even co-operative membership was biased towards higher age cohorts, and tended to be largely female. The average age of membership of the Rusitu Valley Jam Canners Co-op (RVJCC) was 50 years. RVJCC membership was entirely female (Sustainable Development Services, 2000). By comparison, the Murehwa Food Processors' Association comprised of relatively younger members, mainly school going teenagers of or around 16 years of age, and young adults in their twenties. Only one female member was believed to be in her early forties.

A few of the processors interviewed were from Zimbabwe's white community—most owning small-scale commercial farms encompassing fruit orchards. It must be noted however, that the processing aspect of their activities was essentially small-scale, exhibiting little capital investment. A few such processors however, had specialist knowledge of the agricultural

[11] For example, some processors suggested that there were few opportunities for marketing traditional sun-dried vegetables locally, only peaking in the dry season.

[12] Please note that the word 'enterprise' is often used in a general sense in the text to include those processors that market their products and those that process foodstuffs primarily to enhance household food security. Eight of the processors interviewed were primarily involved in processing for household consumption needs, and only marketed limited amounts of processed fruits and/or vegetables (See Table 4).

[13] The official retirement age in Zimbabwe is 65 years.

sector—examples including a former agricultural extension officer, a retired soil and water engineer and a retired seed analyst.

The majority of processors interviewed however farmed small plots in communal area lands. In most cases, processing was a seasonal and secondary activity. Most depended on household labour for the elaboration of processing activities—particularly in the case of dried vegetables. Again, the processing (and marketing) of fruit and vegetable products was essentially a female activity. However, children were often expected and/or encouraged to help with basic tasks such as harvesting and grading of produce to be processed.

Employment levels varied between the enterprises. The general trend however, was that registered co-operatives, formal enterprises and informal processing operations attached to small-scale commercial farms which tended to operate (i.e. process fruits and/or vegetables) all year round, employed a few workers. In the more market-oriented informal enterprises—particularly those involved in jam processing, it was usual for one or two individuals to be employed. In most cases, such employment was on a seasonal basis. Of those processing enterprises that formed part of a multi-faceted business, permanent employees were likely to be involved in other business activities during the agricultural off-season. However, the number of employees involved and/or the terms of employment largely depended on the volumes being processed and/or the enterprise's cold storage capacity. The more informal enterprises, which were less market focused, essentially relied on household labour for all activities.

3.3 Experience in processing horticultural crops

Quite a number of the processors interviewed had more than 20 years experience manufacturing (and in some cases marketing) processed horticultural products. These included Rain Valley Orchards, Bonda Mission Hospital Orphanage and Mrs Masaya of Nyanga. The Rusitu Valley Jam Canners Co-op, Golden Harvest (Pvt) Ltd, and Mrs Matasva and Ms. Mutanda (both of Nyanga) had each more than 15 years experience processing fruits and/or vegetables. Seemingly few of the processors interviewed had less than five years experience, and only one or two had been involved in the activity for less than a two-year period.

Table 4: Details of processors/enterprises and source of raw material

Processor/ enterprise	District, Province	Natural region	Activity	Producer and/or Processor	Farm	Processing operation	Formal or informal activity	Focus of activity*	Production activities/source of raw material
1.	Nyanga, Manicaland Province	I	Jam making (chutneys etc.)	Producer/processor (also buys in some produce)	Small-scale commercial	Small-scale	Registered fruit producer. Informal processing activity but registered by the Ministry of Health.	Market	Has a 42 ha arable farm, most of it under fruit. Produces apples, peaches, apricots, grapes, plums, strawberry, and gooseberry. Currently processes approx. 3000 jars of jam per year, approx. one tonne of fresh fruit (second and third grade produce from her harvest). Also processes first grade apricot, as demand for apricot jam is particularly high. Buys in apricots, at times fig, oranges and banana.
2.	Marondera, Mashonaland East Province	IIb	Jam making	Producer/processor	Small-scale commercial	Small-scale	Informal processing activity but registered by the Ministry of Health.	Market (via restaurant)	Produces organic fruit and vegetables for the restaurant, and supplies produce to food outlets in Marondera.
3.			Jam making and dried fruit	Processor	Does not farm	Small-scale	Formal Company	Market	Usually processes second and third grade fruit that fails to sell in shop. However, during holiday period when sales are particularly good, often take first grade fruit off the shelf in order to process it. Tend to only process fruit, which is in season.
4.	Nyanga, Manicaland Province	I	Jam making	Processor	Does not farm	Small-scale	Informal	Market	Not involved in fruit production. Relies on purchasing fruit from neighbouring farms (e.g. Froggy Farm and other orchards around Juliasdale). Has to compete with corporate buyers like Cairns Foods Ltd, for second and third grade fruit.
5.	Nyanga Manicaland Province		Jam making	Producer/processor (also buys in some produce)	Small-scale commercial	Small-scale	Informal processing activity. Registered Fruit Production Company.	Market	3.5 ha arable farm including apples, raspberries, strawberries, youngberries, peach, and mulberry. All first and some second grade fruit is sold fresh depending on the time of the season. Sells fresh fruit from farm kiosk. The rest of the fruit—that which falls, is bruised or of an irregular shape (i.e. second and third grade) is either immediately processed into jam or frozen for processing later. Fruit that fails to sell quickly enough is withdrawn from kiosk and used for jam making. 30% of fruit produced goes into jam making. Purchases kiwi from a neighbouring farm (Bondana Pvt. Ltd) to make kiwi jam.
6.	Nyanga, Manicaland Province	II	Jam making (chutney and piccalilli)	Producer/processor (also buys in some produce)	Small-scale commercial	Small-scale	Registered Fruit Production Company. Informal processing activity.	Market and Household consumption	88 acre farm, including 1acre orchard including apple, apricot, plum, nectarine, gooseberry, youngberry, strawberry, granadilla and peach. Also 0.25 acre under vegetables. Also purchases fruit from neighbouring farms for processing.
7.	Makoni, Manicaland Province		Dried fruit	Producer/processor	Small-scale commercial	Medium-scale	Registered company	Market	Produces peach, plum, nectarine, citrus, and kiwi fruit. Buys in 90% of carrots and cabbage (smaller heads) from local farmers. Also buys in second grade potatoes form local farmers.
8.	Nyanga, Manicaland Province		Jam making	Producer/processor	Small-scale commercial	Small-scale	Registered proprietorship. Informal processing activity though registered by Ministry of Health.	Market	Produces figs and citrus fruits.
9.	Nyanga, Manicaland Province		Dried vegetables	Producer/processor	Communal area farmer	Small-scale	Informal	Market	Produces vegetables, sweet potato, and maize.
10.	Nyanga, Manicaland Province	I	Jam making	Producer/processor	Small-scale commercial	Small-scale	Registered proprietorship. Informal processing activity but registered by the Ministry of Health.	Market	Produces own fruit for processing.
11.	Nyanga, Manicaland Province	I	Jam making	Producer/processor (also buys in some produce)	Small-scale commercial	Small-scale	Registered proprietorship. Informal processing activity.	Market	Fruit growing and fruit processing enterprise. Purchases oranges from Mazowe Citrus Estates for processing. Also exports fresh-cut flowers to Europe.
12.	Nyanga Manicaland Province	I	Jam making and dried vegetables	Producer/processor	Communal area farmers	Small-scale	Informal	Household consumption	Small orchard.
13.	Nyanga, Manicaland Province	I	Jam making	Producer/processor	Communal area farmer	Small-scale	Registered fruit producer. Informal processing activity.	Market	8.3 ha under fruit. Household income is derived primarily from the sale of fresh fruit produced—peaches, apples, nectarines, apricots, plums, pears, and citrus. Also produces vegetables under contract for schools. Early in the season, when fruit is still in short supply, able to sell second grade fruit as fresh produce. As season progresses, the market experiences glut, and prices fall to point which makes it unprofitable to sell second grade fruit as fresh. At this point, second grade fruit is reserved for jam making.

Table 4: Details of processors/enterprises and source of raw material (cont.)

Processor/ enterprise	District, Province	Natural region	Activity	Producer and/or Processor	Farm	Processing operation	Formal or informal activity	Focus of activity*	Production activities
14.	Nyanga, Manicaland Province	IV	Jam making and dried vegetables	Producer/processor (also buy in some produce)	Communal area farmers	Small-scale	Informal	Household consumption*	Produces and buys in lemons.
15.	Chimanimani, Manicaland Province	V	Dried vegetables	Producer/processor	Communal area farmer	Small-scale	Informal	Household consumption*	Produces vegetables on small plot.
16.	Chimanimani, Manicaland Province	V	Dried vegetables	Producer/processor	Communal area farmer	Small-scale	Informal	Market	
17.	Chimanimani, Manicaland Province	I	Jam making, dried fruit + vegetables	Producer/processor (also buys in produce)	Communal area farmers	Medium-scale	Registered co-operative	Market	Co-op has small garden. Fruits are produced by co-op members and sold to co-op. Fruit is also sourced from non-members.
18.	Chipinge, Manicaland Province	I	Dried fruits and vegetables	Producer/processor (also buys in produce)	Grocer/ operator	Small-scale	Informal	Household consumption*	Produces fruits and vegetables, but also buys in produce.
19.	Chipinge, Manicaland Province	I	Jam making and dried vegetables	Producer/processor	Communal area Farm	Small-scale	Informal	Household consumption*	
20.	Chimanimani, Manicaland Province		Jam making	Processor	Does not farm	Small-scale	Informal	Market	Purchase oranges in Chimanimani or Mutare for processing.
21.	Murewa, Mashonaland East Province	II	Dried fruit and vegetables	Processor	Communal area farmers	Medium-scale	Registered co-operative	Market	Mango is sourced from local farmers and from as far afield as Mudzi and Chimanimani. In Murewa, mangoes mature in December/January. During 2001, the group sourced first batch of Mangoes in October from Nyanyadzi in Manicaland Province where mango matures earlier. In November, mangoes were ripe in Mutoko, just north of Murewa so group started sourcing from there. Mutoko is closer to Murewa than Nyanyadzi and hence the shift to save on transport costs. In December, the group then started sourcing their mangoes from within their local community.
22.	Murewa, Mashonaland East Province	II	Dried vegetables	Producer/processor	Communal area farmer	Small-scale	Informal	Household consumption*	Produces cowpea leaves rape pumpkin leaves and tomatoes in her vegetable garden.
23.	Murewa, Mashonaland East Province	II	Dried vegetables	Producer/processor (buys in 90% of produce)	Communal area farmer (father)	Small-scale	Informal	Market	Purchases majority of produce (90%) she processes. She buys fresh vegetables from producers by either going to their plots or they deliver to the stall. Dries vegetables that fail to sell as fresh on her stall at the Murewa bus terminus, i.e. deformed and damaged leaves, in order to avoid losses. Dried vegetables are either sold at the stall or given to relatives.
24.	Mudzi, Mashonaland East Province	IV	Dried vegetables	Producer/processor	Communal area farmer	Small-scale	Informal	Household consumption*	Produces vegetables.
25.	Murewa, Mashonaland East Province	IIb	Dried vegetables	Producer/processor (also buys in some produce)	Communal area farmer	Small-scale	Informal	Market	Processor grows most of the vegetables (cowpea leaves and muruni) she dries, but also sources fresh vegetables from friends and relatives within her community, which she receives free. When she runs out of her own dried vegetables, she resorts to buying dried vegetables from Bulawayo suppliers, which she exports to Botswana.
26.	Nyanga, Manicaland Province	I	Dried vegetables	Producer/processor	Communal area farmer	Small-scale	Informal	Household consumption*	Produces vegetables in her small urban garden.

Note: *Markets limited amounts of product.

3.4 Reasons for getting involved in processing activities

Employment creation, income generation, reduction of post harvest losses and enhancing household food security were the main reasons voiced by processors as to why they had become involved in the various activities.

3.4.1 Jam Processing

Of the case studies conducted, 15 enterprises were involved in jam, jelly and/or marmalade production. In the case of small-scale commercial farms (e.g. Golden Harvest, Froggy Farm and Mrs Masaya), jam making largely developed as a way of reducing post harvest losses, by adding value to second and third grade fruit which would otherwise be unacceptable to the fresh produce market. Processing was therefore a secondary activity—the marketing of fresh fruit being more important in terms of revenue from sales. One processor commented that they previously sold second and third grade fruit to Cairns Foods Ltd, in Mutare. However, given that they got 'next to nothing' for inferior produce, they decided to process it themselves and by adding value, increase their potential returns to lower grade fruit.

A few enterprises (e.g. the Rusitu Valley Jam Canners Co-op) have come about due to the numerous constraints faced marketing fresh produce. Lack of transport, its high cost when available and poor road networks, meant significant losses of fresh produce occurred in the Rusitu valley—some 500km from Harare. The region's red soils prove problematic for transportation during the rainy season, when heavy-duty trucks are necessary to access the area. Due to such constraints, the co-op sought an alternative to marketing fresh produce in Mbare Musika. With the donation of a manual canning machine from a local NGO in 1982, the co-op began to process and market canned jam products.

Some processors however, suggested that their processing activities started out as a pastime. This was particularly the case for a number of jam processors (e.g. Swires Farm and Rain Valley Orchards), who essentially processed jam for household consumption needs, but often gave bottles of jam to friends and neighbours as gifts. Some were encouraged by their network of friends to market their products, as they perceived them to be of a high quality—better than what was being sold on the formal market. By selling their products through local farm kiosks and tourist outlets (in Nyanga for example), their pastime quickly developed into a small-scale business. Such processors have established themselves as significant players in Nyanga's cottage-based jam industry.

One processor had benefited from former employment on large- and small-scale commercial farms, processing jam. With the wealth of informal training received, one processor decided to set up a cottage enterprise processing jam (M& C Preserves).

In a few cases (e.g. among processors producing very small volumes of jam), processing was considered an effective way of fulfilling household demand for jam products given that commercial brands were expensive.

3.4.2 Fruit and vegetable drying

A total of 14 processors were involved in drying vegetables. Five cases involved processing dried fruit. For many however—particularly those processors involved in garden vegetable production, processing is a traditional activity adopted to enhance household food security during the agricultural off-season when access to fresh vegetables is limited. Various processors suggested this was the prime reason for their involvement in processing activities. Traditional techniques of sun-drying leafy green vegetables in particular, have been passed down from mother to daughter from an early age, and continue to play an important role in current household food security measures. Some surplus may be sold to generate income.

Fruit and vegetable drying was also adopted as a method of preserving foodstuffs which could then be used as a raw material in another food product, prepared in the home. For example, dried vegetables could be used as an ingredient in soups and dried fruits could be pounded into a powder and added to flour for cakes.

In the case of those processors with larger vegetable plots, processing was a market-oriented activity, directed at increasing returns to production and/or reducing losses. One vendor of fresh horticultural produce for example, dried vegetables in order to reduce the losses incurred at her stall. The vegetables would first be displayed on the market stall as fresh vegetables, but if they were not purchased within a couple of days, the vendor would then dry the vegetables and sell them as a processed product or give them to relatives for example.

In two cases, i.e. Murehwa Food Processors' Association and Bondana Farm, fruit drying had been adopted as a commercial venture. In the former case, this was facilitated by a donor support programme which included financial assistance to establish enterprise facilities and furthermore training in processing techniques. The latter case consisted of a private venture.

3.5 Training received in food processing techniques

Few of the processors interviewed had received any formal training in food processing techniques. In only eight cases had the processor/entrepreneur received some degree of training. Most processors relied on informal training or sources of information—processing techniques passed down from mother to daughter (See Case Study of Mrs Chakanetsa, Figure 2)[14], or knowledge passed on from another 'informal' entrepreneur, and/or knowledge gained from recipes found in magazines and cookery books for example. Of the 19 enterprises run entirely by women, only five had received some formal training in (horticultural) processing techniques. Of the four that were operated by men and women, two had received some training.[15] Of the three run entirely by men—at least one had received formal training (Table 5).

[14]Food processing is traditionally a female task, explaining the high prevalence of females in the sample of case study enterprises.

[15] One case relates to the Murehwa Food Processors' Association, made up of 72 male and female members. In one other case, one of the enterprise owners had received a diploma in horticultural production and processing.

Figure 2. Case study of Mrs Chakanetsa, Murehwa

Mrs Chakanetsa is a communal area farmer, producing maize, cow pea leaves, rape, pumpkin leaves and tomatoes. She also dries cowpea leaves (munyemba), pumpkin leaves (muboora), rape and tomatoes. Mrs Chakanetsa learned how to process the vegetables when she was a child, by her mother. Like her mother, she adopts traditional sun-drying techniques to process the vegetables. While the bulk of dried vegetables goes towards household consumption, some is marketed, though in small quantities—usually to members of the local community. Marketing takes place during the dry season when there are no green/fresh leafy vegetables available locally.

Source: Field visit

Table 5. Classification of the case study participants

PRODUCER/PROCESSORS	
Produces and processes horticultural crops and **has received formal training** in processing techniques.	Mr Ferreira (jam) Mr and Mrs Matasva (jam) Magute Spring Project (jam, dried vegetables) Rusitu Valley Jam Canners Co-op (jam , dried fruit and vegetables) Mrs Gabaza (dried fruit and vegetables) Mrs Baiwa (jam, dried vegetables)
Produces and processes horticultural crops, but **has not received formal training** in processing techniques.	Mrs Masaya (jam) Mrs McIllwane (jam) Mr and Mrs Manley (jam) Mr and Mrs Hardy (jam) Mrs Bauer (jam) Mrs Chidokohori (dried vegetables) Mrs Swire-Thompson (jam) Sr. Gloria (jam, dried vegetables) Mrs Mabota (dried vegetables) Mrs Murerwa (dried vegetables) Mrs Chakanetsa (dried vegetables) *Ms Matemera (dried vegetables) Mrs Chinake (dried vegetables) Mrs Mugambiwa (dried vegetables) Mrs Mawoko (dried vegetables)
PROCESSORS	
Processes (but does **NOT** produce) horticultural crops and **has received formal training** in processing techniques.	Halfway House (jam, dried fruit) Murehwa Food Processors' Association (dried fruit and vegetables)
Processes (but does **NOT** produce) horticultural crops, but **has not received formal training** in processing techniques.	Ms. Mutanda (jam) Mr Simango and Mr Majuta (jam)
Not known	Mr Lamb (dried fruit)

Note: Ms. Matemera only produces 10% of volumes processed.

Some processors had benefited from training programmes provided by government and/or non-governmental organisations. In some cases, programmes focused on processing as a household food security measure, in others as a potential income-generating activity (e.g. training received by the Murehwa Food Processors' Association). Some programmes however, highlighted the potential benefits of both aspects—household food security and income generation. Table 6 summarises the scope of training received by a few of the processors interviewed.

Table 6. Examples of training received by some case study participants

Enterprise	**Organisations involved in the training programme**	**Type of training received**	**Length of training period**
Magute Spring Project	Various projects introduced by the Southern Alliance for Indigenous Resources (SAFIRE) in July 1999, under its rural development programme.	• Natural resource conservation • Permaculture • Fish farming • Jam processing • Soap making • Bee-keeping • Oil extraction	
Rusitu Valley Jam Canners Co-op	Ranche House College	• Training in solar drying of fruits and vegetables	
	Nyahode Union Learning Centre (NULC)	• Training in quality control of jam • Training by agricultural adviser in costing price of end product	
	Development Technology Centre (DTC), University of Zimbabwe	• Training in solar drying of fruits	
	Zimbabwe Project (local NGO)	• Training in book keeping	
	Silveira House	Not known	
Mrs Gabaza and Mrs Baiwa	Chipinge Rural District Council, Poverty Alleviation Action Plan (PAAP)*, Agribusiness Development Programme (ABDP), Africa University (AU), Southern Eastern Dry Areas Project (SEDAP), and Agritex.	• Basic nutrition and balanced diet • Food handling • Agricultural production and crop marketing • Methods of agro-processing • Construction and use of solar dryers	One-week training/ workshop
Murehwa Food Processors' Association	Ranche House College provided training in food processing techniques under a Dutch-funded programme called 'Food Processing as a Small Business'.	• Processing techniques: solar drying of fruits and vegetables • Technical and business skills • Entrepreneurship and access to finance	Basic training of 4 weeks, with follow up sessions

Note: * The Zimbabwean government endorsed the Poverty Alleviation Action Plan (PAAP) as a national policy in 1994. "The plan intends to transform the traditional poverty alleviation approach by moving from a social welfare approach towards an approach based on self-reliance and self-sustenance, focusing on transitional and chronic poor" (van Dijk, 2000:35).

3.6 Outside support: Governmental and non-governmental

As Table 6 suggests, a significant number of bodies—governmental, quasi-governmental and non-governmental (local and international) are involved in supporting small-scale processors and/or co-operatives in Zimbabwe. Of the case studies researched, only a limited number had received direct support to start up their enterprise. The majority of support has been in the form of training programmes in agro-food processing techniques. Numerous bodies however, have also provided financial support to processors—particularly international donor organisations. The latter include the Netherlands government (Department of Development Assistance, Ministry of Foreign Affairs), the European Union, the Canadian International Development Agency (CIDA), the United States Agency for International Development (USAID), the Austrian Development Co-operation (OED), and Oxfam America. The majority of this support has been in the form of start-up capital directed at the establishment of enterprise facilities and/or the purchase of capital equipment.

3.6.1 Objective of external support programmes

The main objectives of external support have included:

- **Promotion of food security programmes**

In the Musami area of Murehwa for example, donors sought to enhance food security at the village level by introducing communal drying technology which would enable households access to vegetables throughout the year.

- **Poverty reduction through income generation**

Donors involved in The Magute Spring Project sought to promote processing as an income generation project by adding value to fresh fruit and vegetables, allowing producers to generate income from locally available resources that are highly perishable.

- **Support for AIDS nutritional programmes**

Governmental and non-governmental bodies have been known to organize training programs to support the nutritional status of people living with AIDS. The training encompasses issues of resource identification, fruit and vegetable production, food processing and preparation.

Table 7. Examples of donors involved in programmes to support small-scale processors

Processor/ Enterprise	Local Government	Local NGOs	International Donors
Magute Spring Project		Southern Alliance for Indigenous Resources (SAFIRE) provided training programme.	
Rusitu Valley Jam Canners Co-op	The Organisation of Collective Co-operatives of Zimbabwe (OCCZIM) gave assistance in auditing books.	- Voice- a local NGO donated a manual canning machine in 1982. - Nyahode Union Learning Centre (NULC) provided training.* - Zimbabwe Farmers Union (ZFU) assisted with acquisition of boilers.	- Oxfam America gave assistance in 1985 to complete Phase I of the factory ng. - The Canadian International Development Agency's (CIDA) Women's Small Project Fund gave funding for 2 years in 1993. This enabled phase II of the asbestos roofed factory to be completed (e.g. cold room, kitchen and storeroom). Also provided finance for electricity supply and to purchase jam-making equipment and a one-ton truck. CIDA also provided them with a technical adviser for a 2-year period, and financed a 2-week training programme in jam processing which was run by Ranche House College. - In 1999, the co-op received EU funding—facilitated by the Austrian Development Co-operation (OED) in the Ministry of Affairs, to buy material and cover running costs for a period of 5 months (OED, 1999). - Oxfam assisted them in design of product label. - USAID, details of support unknown.
Mrs Gabaza and Mrs Baiwa	- Chipinge Rural District Council, Poverty Alleviation Action Plan (PAAP) - Agritex	- Agribusiness Development Programme (ABDP) - Africa University (AU) Southern Eastern Dry Areas - Project (SEDAP)	
Murehwa Food Processors' Association	Agricultural Finance Cooperation (AFE) provided loan facility to processor groups.		- Netherlands government helped finance building materials

Note: *Nyahode District Union is affiliated to the Organisation of Collective Co-operatives of Zimbabwe (OCCZIM), which falls under the Ministry of National Affairs, Employment Creation and Co-operatives (MNAEC). The NDU represents the RVJCC on provincial and national level bodies of the co-operative movement. It liases with governmental departments and NGOs.

4. Processing techniques, technology and end products

4.1 Product range

Most market driven enterprises have made significant attempts to broaden the range of fruits and vegetables being processed. Those that only sell surpluses tend to target a limited number of fruits or vegetables and rarely process both. For example, in Mashonaland East Province, processors have access to a wide range of fruits and vegetables suitable for drying. However, there is an almost total lack of knowledge of drying techniques for fruits in the area, whereas processors have in-depth knowledge of vegetable drying. The same applies to small-scale processors in Manicaland province involved in jam making or vegetable drying. Few had exposure to, or knowledge of, fruit drying. In general, the case studies revealed a very limited knowledge and practice of fruit drying in both Manicaland and Mashonaland East provinces, despite significant levels of fruit production in these areas.

4.1.1 Jam products

The majority of fruits processed were exotic varieties—this was true for both dried fruits and jam products. The only indigenous fruit product recorded was naartjie jam. As Table 8 demonstrates however, the variety of fruit products manufactured by small-scale processors is quite extensive. A wide range of jam products was noted, including not only common varieties of jam (strawberry, raspberry and apricot being some of the most popular varieties) but also novel mixed fruit products. One processor in particular (whose business exhibited a strong market orientation) had experimented quite a lot with exotic mixed fruit jams. The processor had established an extensive range of products that proved popular with customers—including double apple (apple and pineapple), grape and apple, guava and orange, apple and apricot, among many others. Lemon marmalade and orange marmalade were also popular products that were being manufactured by small-scale processors—particularly among the less market-oriented enterprises. Other fruit preserves noted included lemon curd, brandied peaches, apple jelly and peach preserve.

4.1.2 Dried fruit products

Five of the processors interviewed were involved in processing dried fruits. Two had adopted this as their main (or sole) activity. Unfortunately, one enterprise—Bondana Pvt Ltd, had had to cease its export-oriented drying operations due to the current socio-political climate in Zimbabwe. The Murehwa Food Processors' Association continues to export small volumes of dried fruit, but has yet to establish firm contracts in export markets. Halfway House, which also processes small volumes of dried fruit, caters to the local tourist market—although dried fruit production is a secondary processing activity after jam making. Although the Rusitu Valley Jam Canners Co-op received training in dried fruit processing (e.g. using solar frames), they currently do not process such products. Mrs Gabaza in Chipinge, is currently involved in the activity for household consumption purposes, but is interested in adopting the activity for income generation. The types

of dried fruits being processed by the processors/enterprises interviewed, included dried apple, mango, banana, paw paw, peach, nectarines and dried kiwi fruit. Some processors had experimented with drying other fruit varieties, but had encountered problems with the products (Table 8).

Table 8. Types of fruits processed and orientation of activity

Processor/ Enterprise	***Fruits processed***	***Focus of activity***
Mrs Masaya	Products include apricot jam, grape/apple, double apple (apple/ pineapple), lemon/apple, apple/lemon/orange, orange/apple, orange/lemon, guava, guava/lemon, and guava/orange. Also makes lemon curd. (Used to make brandied peaches/grapes, cucumber pickles, green tomato relish, carrot relish, carrot jam, gooseberry jam and apple sauce).	Market
Mrs. MacIlwane	Strawberry jam, lemon and orange marmalade, gooseberry jam	Market
Halfway House	Dried apples. Naartjie, strawberry and apricot jams. Lemon marmalade, orange marmalade, lemon curd.	Market
Ms. Beauty Mutanda	Apricot, plum, peach, strawberry, youngberry, gooseberry and fig jams. Naartjie, orange and lemon marmalade.	Market
Mr and Mrs Manley	Peach, strawberry, mulberry and kiwi jam. Apple jelly.	Market
Mr and Mrs Hardy	Plum, apricot, peach, gooseberry, youngberry and strawberry jams, Peach preserve, Apple preserve, Pampelmoes marmalade.	Market
Mr Lamb	Dried peaches, nectarines and kiwi fruit.	Market
Mrs Bauer	Fig jam, Lemon marmalade	Market
Mrs Swire-Thompson	Raspberry, apricot, peach, fig and strawberry jam.	Market
Mr Ferreira	Youngberry, raspberry, mulberry, strawberry, peach, fig, mulberry, plum, apricot, apple and apple/apricot jam. Apple/grape jelly, plum sauce, onion pickle, peach chutney, lemon marmalade.	Market
Sr. Gloria, (Bonda Mission Hospital Orphanage)	Lemon marmalade, peach jam, mulberry jam.	Household consumption
Mr and Mrs Matasva	Peach, apricot and plum jam.	Market
Mrs Gabaza	Dried fruits.	Household consumption*
Magute Spring Project	Lemon marmalade.	Market (and household consumption)
Rusitu Valley Jam Canners Co-op	Mixed fruit jam (mango, plums, guava, raspberry, tomato) and orange marmalade. Dried mango. Have experimented with juice extraction.	Market
Mrs Baiwa	Guava jam, strawberry jam.	Household consumption
Mr Simango and Mr Majuta	Orange marmalade	Market
Murehwa Food Processors' Association	Main product is dried mango.	Market

Note: *Markets limited amounts of dried vegetables, usually surpluses.

4.1.3 Dried vegetables

Quite a wide variety of vegetables—the majority of them indigenous varieties, were being processed. Tomatoes, onions, cabbage, rape, covo and mushrooms were being dried by a few processors. Examples of indigenous varieties being processed included cowpea leaves (munyemba), pumpkin leaves (muboora and mutikiti), munyevhe (or muruni, a traditional plant called 'wild cats'), wild spinach or mustard leaves (tsunga), nyovhi, okra (nyandanda), derere (resembles okra), chomoria, musakupuka, gumanai, black jack (guku), nyevhe and ngaka.

For a significant number of processors however, such foodstuffs were essentially processed for household consumption requirements (See Table 9). Few processors adopted vegetable drying as a market-oriented activity—only six of the 14 processors interviewed. Some marketed small quantities of indigenous vegetables, usually surpluses. Most sales were made through the local market, typically during the dry season when fresh vegetables were unavailable in the local area. One processor was involved in cross-border trade between Zimbabwe and Botswana, marketing indigenous vegetables in Francistown once a month. Although important, indigenous vegetables did not make up the bulk of her sales as a trader.

A few processors were involved in manufacturing other vegetable products. Examples noted were pickled beetroot, gherkin pickle, ginger pickle, tomato chutney, piccalilli and vegetable atcha. Such products were more likely to be sold though tourist outlets and shops, such as Halfway House for example.

4.2 By-products and wastage

The processors studied suggested that jam processing and drying of fruits and vegetables entailed little wastage. That said, there is little conscious effort to make use of waste. The exceptions being mango—the peel was used to feed livestock and the seed was put aside for planting, and apple pulp—which was used to feed pigs. The research team did not come across any examples of by-products being developed as a result of the processing activity carried out.

Table 9. Types of vegetables processed and orientation of activity

Processor/ Enterprise	***Vegetables processed***	***Focus of activity***
Halfway House	Pickled beetroot, gherkin pickle, ginger pickle, tomato chutney, piccalilli and vegetable atcha.	Market
Mrs Chidokohori	Dried vegetables including munyevhe (or muruni, a traditional plant called 'wild cats'), munyemba (cow-pea leaves), tsunga (mustard leaves/wild spinach), cabbage and rape.	Market
Magute Spring Project	Dried vegetables including musoni, pumpkin leaves, cabbages, onions and okra.	Household consumption*
Mrs Mabota	Sun-dried vegetables including cowpea leaves (munyemba), pumpkin leaves (mutikiti), nyovhi, okra (nyandanda) and an indigenous vegetable that resembles okra (derere).	Household consumption*
Mrs Murerwa	Traditional sun-dried vegetables- cabbage, rape, chomoria, musakupuka, gumanai, cowpea (munyemba, and derere (indigenous and exotic varieties). Soup mixture.	Market
Rusitu Valley Jam Canners Co-op	Dried green vegetables (though currently not processing them).	Market
Mrs Gabaza	Potential products include tsunga, rape, cabbage, spinach, black jack (guku), pumpkin leaves (mutikiti), cowpea leaves (munyemba) and derere. Dried fruits.	Household consumption*
Mrs Baiwa	Dried vegetables including black jack (guku), nyevhe, cabbage, rape, mushrooms, carrots, and ngaka for household consumption.	Household consumption*
Sr. Gloria, (Bonda Mission Hospital Orphanage)	Dried leafy vegetables including cabbage, covo, tsunga and rape.	Household consumption
Murehwa Food Processors' Association	Dried tomatoes, onions, cabbage, pumpkins, and leafy green indigenous vegetables.	Market
Mrs Chakanetsa	Sun-dried cowpea leaves (munyemba), pumpkin leaves (muboora), rape and tomatoes.	Household consumption*
Ms. Matemera	Dried vegetables	Market
Mrs Chinake	Sun-dried cabbage, rape and covo.	Household consumption*
Mrs Mugambiwa	Dried munyevhe (or muruni, a traditional plant called 'wild cats') and cowpea leaves (munyemba).	Market
Mrs Mawoko	Dried covo.	Household consumption*

Note: *Markets limited amounts of dried vegetables, usually surpluses.

4.3 Access to technology

The technology used in the enterprises visited can broadly be classified into small-scale (manual) and medium-scale (motorised) technologies. Processing in informal enterprises may be characterized as a manual activity. In most formal enterprises, both manual and motorised technologies were evidenced. Processing in some enterprises however, was quite labour intensive. For example, the Rusitu Valley Jam Canners Co-op and the Murewha Food Processors' Association had to be peel fruit by hand, so they tended to use significant amounts of labour in order to increase throughput rates at this stage of processing. Table 10 summarises the main stages of processing (in jam making and drying fruits and vegetables) and the various methods used by the processors/enterprises interviewed.

Table 10. Stages in processing and nature of activity

Processing stage	Description of activity
Washing	This is a manual exercise in all cases.
Peeling/cutting	Peeling/cutting of fruits/vegetables is predominantly manual irrespective of the scale of operation. The basic tool is an ordinary knife. Some enterprises make use of their large membership/employee numbers to achieve high throughputs at this stage.
Boiling	Jam making makes use of a boiling stage to gel the fruit. Small-scale enterprises make use of ordinary household pots and wood/gas or electrically fired stoves. In some exceptional cases special aluminium pots have been purchased for the purpose. Some processors, mainly those attached to small-scale commercial farms made use of industrial boilers powered by electricity.
Drying	Small operators tended to sun-dry vegetables in the open air. The produce tends to be laid out on a sack, and placed on a rooftop. In one case, the processor laid out the fresh vegetables on a concrete slab indoors. One processor used a solar frame made from wood and plastic transparent sheeting. Another used a purpose built tunnel dryer.
Packaging	In all the enterprises visited (processed dried fruits/vegetables and jam), packaging was a manual process. In the formal enterprises and some of the more market oriented enterprises, weighing scales were used to load the appropriate quantity into the package. In the more informal enterprises, product mass or volume was based purely on sight/touch.

Those processors who make use of medium-scale technologies have had to source their equipment beyond the local area, and/or adapt local equipment to their needs. For instance, large electric industrial boilers (which are usually used to prepare meals—e.g. sadza, in boarding schools) have been adopted for jam processing in enterprises where substantial volumes of jam are processed. In only one case, was capital equipment evidenced. This was the case of Bondana (Pvt) Ltd, where drying was carried out with a brick lined (fan assisted) tunnel dryer, fuelled by wood. The dryer has a capacity of 880kgs of fresh fruit per day. Table 11 gives some examples of the processing technologies adopted by a sample of the enterprises interviewed.

Most of the equipment which small-scale processors/enterprises use consists of basic kitchen equipment and utensils. This would imply that little if any equipment was purchased for the sole purpose of processing fruits and/or vegetables. Examples include chopping boards, knives and cooking pots. In a few cases, the processor had purchased a particular item such as an aluminium pot or a food processor, which was specific to their processing activity. However, this tended to be the exception rather than the norm. Donor support played a major role in providing knowledge and access to technology in some of the enterprises visited—particularly among co-operatives. Support included assistance in the selection and purchase of technology (see Table 12).

Some processors/enterprises were apparently processing well below their capacity. Examples include the Murehwa Food Processors' Association and the Rusitu Valley Jam Canners Co-op. There appeared to be significant capacity to increase production levels, but some enterprises had insufficient markets to absorb their products.

Table 11. Processing technologies used in a sample of enterprises

Processor/ Enterprise	Processing Activity	Preparation of raw material	Storage	Processing	Packaging	Labelling
Bondana (Pvt) Ltd	Fruit drying	Manual peeling and washing. Fruit is liquidised.		Brick lined (fan assisted) tunnel dryer, fuelled by wood. Capacity of 880kgs of fresh fruit per day.	Done in packs of 75 grams.	Packs are commercially labelled with all required information.
Rusitu Valley Jam Canners Co-op	Jam making, fruit and vegetable drying*	Manual with knife	Large cold storage facility (6 metres cubed), freezer, several storage rooms.	1x105 kg and 1x180 kg electric boilers, electric cooker, stainless steel work tops, measuring scales, several sinks. Solar drying frame.	One electric (manual) canning machine.	Manual sticking of labels onto tin cans.
Murehwa Food Processors' Association	Fruit and vegetable drying	Manual with knife		24 medium Half Kwanda solar dryers, working tables, spoons, knives, dishes, pots	Manual. Dried fruits and vegetables are packed in small plastic containers sealed with a hot iron	Packaging comes pre-labelled.
Mr. Rwere	Jam making	Manual with a knife	Medium-sized cold room and 3 freezers (1x48 cubic feet and 2x24 cubic feet).	Two gas stoves, regular cooking pots, scales, measuring jug, spoons.	Manual loading and closing of glass jars.	Manual sticking of labels onto glass jars.
Ms. Matemera	Vegetable drying	Manual with a knife		None. Vegetables are spread out over the top of her marketing stall.	Manual in small plastic bags.	No labelling.
Mrs. Mugambiwa	Vegetable drying	Manual with a knife		None. Vegetables are spread out on a sack on a rooftop.	Bulk packaging in 50 kg sacks. Client produces own container.	No labelling.
Magute Spring project	Jam making, vegetable drying	Manual with a knife.		Household equipment- pots, wooden spoons, metal cups.	Manual loading and sealing of recycled plastic/glass bottles.	No labelling.

Note: The Rusitu Valley Jam Canners Co-op is currently not marketing dried fruits or vegetables.

Table 12. Equipment and facilities provided through donor support

Organisation	Equipment/facilities provided
Murehwa Food Processors' Association	Financial assistance to acquire solar dryers, factory installation.
Rusitu Valley Jam Canners Co-op	Financial assistance to acquire electric boilers, cookers, electric (manual) canning machine, factory installation, solar dryers.
Magute Spring Project	Training in use of solar dryers

4.3.1 Fuel source of technologies used

Energy sources for the various technologies included direct solar energy (traditional sun drying and use of solar drying frames), gas, wood and electricity. Table 13 lists examples from six case study enterprises.

Table 13. Fuel source of technologies/equipment used

Processor Name	Fuel Type	Comment
Rusitu Valley Jam Canners Co-op	Electricity (cold room, boilers and canning equipment)	The Rusitu Valley Jam Canners Co-op switched from firewood to electricity after tested samples of their product suggested contamination from impurities from the wood fire.
Murehwa Food Processors' Association	Solar energy-solar dryers with plastic sheeting	The group is conscious of the need to use environmentally friendly processing methods, given they target export markets in the United States of America, which place a premium on such products. The use of solar energy gives them an advantage in this respect. However, their primary problem appears to be that most of the produce they wish to dry is only available in the summer when cloud cover is at its peak. This creates drying problems viz. an extended drying time, which leads to low output and in some cases rotting of produce as it is being dried. The group would like to access hybrid dryers, which use solar energy as the primary power source but have a fall back power source such as electricity. This would help them overcome the types of drawbacks mentioned, associated with solar drying in summer months.
Mr. Ferreira	Fossil fuel (commercial gas)	The owner of the enterprise has a gas stove, which is used for cooking jam and sterilising glass jars. Gas is normally available at fuel retail outlets countrywide, but of late has become scarce and expensive which may force one or two processors to change their source of energy.
Ms. Matemera	Ambient heat (in a shed)	The vegetables are allowed to dry slowly under a shed.
Mrs. Chidokohori	Solar energy-traditional sun drying	Problems of contamination of produce as well as losses from dried vegetables being blown away.
Ms. Mutanda	Wood fire	The fruit is cooked over an open fire. The cost of electricity is exorbitant to the processor and she sees no difference in her final product compared to that cooked by other methods.
Magute Spring Project	Wood fire	The fruit is cooked over an open fire. Other forms of energy (e.g. electricity, gas) are not available in this area.

4.4 Cooking times, drying ratios and conversion ratios

Preparation time is highly variable depending on the variety of fruit or vegetable being processed, available labour and the processing technique adopted. In jam making and fruit drying pre-processing activities are highly labour intensive. Labour intensity declines in the later stages of processing such as during the cooking of jam, or during the actual drying process.

In jam making, cooking times varied from one processor to another—even for the same fruit. In fact one gets the impression that jam processing is an 'art' not a 'science'. The question of how long it takes to prepare jam was seldom answered in minutes or hours but rather by "I know when it's done." In a number of enterprises, the owner of the business will not allow employees to 'cook' the jam despite various years of experience in the business—such is the degree of care taken with the 'art' of jam making. A significant number of jam processors lacked knowledge as to conversion ratios of fresh fruit to jam.

This was also the case with drying ratios for the various fruits and vegetables being processed. This raises the question of how processors can cost their product accurately if they are not aware of the conversion rates of fresh fruit or vegetables into dried produce. The question becomes more relevant in those enterprises that buy in all or part of their raw material requirements.

4.5 Seasonality of processing activities

In general, the more market focused (mainly jam making) enterprises tended to operate all year round facilitated by cold room or freezer space that allowed fruits to be stored during the agricultural off-season. For example, the Rusitu Valley Jam Canners Co-op was able to store fresh fruit in a cold room for a period after harvest. Mrs Masaya in Nyanga for example, only processed surplus or inferior produce which she could not sell in its fresh form. However, she was able to store pre-cooked fruit in freezers to allow for subsequent processing throughout the year. This enabled her to take advantage of any (potential) increase in demand for a particular variety of jam during the agricultural off-season, when fresh fruit was unavailable on the market. Furthermore, she could potentially demand a higher price for jam during the off-season. In general however, jam products tended to have at least a six-month shelf life under the correct storage conditions, enabling sales to be made well after actual harvest and processing (Appendix 3 provides horticultural production charts for a number of producer/processors interviewed).

For those enterprises lacking cold room or freezer capacity (i.e. the majority), jam processing was largely a seasonal activity with fruits being processed directly after harvesting. Such enterprises tended to process a limited range of produce and furthermore conduct their operations for limited periods of the year—processing coincided with the period in which the fresh fruit was in season. However, for most informal processors, processing competed with other chores and therefore may have been a lower priority activity.

In the case of dried vegetables, the majority of processors tended to dry quantities necessary to satisfy domestic requirements, with surpluses being sold on local markets. For the more market-oriented vegetable drying enterprises, produce was dried and stored in bulk until sales were made. Commercial fruit drying was again carried out during a particular season—the advantage

being that the product had a significant shelf life once dried, and hence could be stored until sales were made.

Some enterprises had tried to maximise their processing capacity by experimenting with different varieties of fruits and/or vegetables. This enabled them to continue processing over a longer time period, and not just rely on the harvest of one particular fruit or vegetable variety for raw material for their enterprise.

4.6 Access to infrastructure

Table 14 below summaries the degree of access to infrastructure, which the case study enterprises generally enjoyed.

Table 14. Access to infrastructure

Infrastructure	Issue of Access
Power-electricity	The majority of small-scale enterprises visited did not have access to mains electricity, a fact reflected in their use of other power sources—e.g. solar energy or wood.
Telecommunication facilities	Among the case study enterprises, access to telecommunication facilities was limited, with the exception of jam processors in Nyanga. In Murehwa, none of the processors interviewed had access to a personal telephone. For those informal enterprises which largely sourced their raw material and sold their product locally, limited access to telecommunications did not pose a major constraint to their business. For the more market-focused enterprises however, attempting to broaden their marketing scope, telecommunications were deemed essential.
Running water	A limited number of enterprises had access to running water, mainly those attached to small-scale commercial farms. However, various processors enjoyed access to clean water via protected wells.
Transportation and road networks	Given that the majority of processors (particularly those involved in drying vegetables) sourced their raw materials and marketed their end products locally, they rarely made use of transport networks. Exceptions included Mrs Mugambiwa who travelled by bus to Francistown, Botswana, to market her dried vegetables. However, road transportation did not pose a constraint to her informal business. The Rusitu Valley Jam Canners Co-op, in Manicaland however, did experience problems with transportation and road networks. Rusitu valley is serviced by dirt roads that become impassable in the rainy season. On the one hand, limited road transportation during the rainy season served as a catalyst for the women to undertake processing as a food preservation measure. On the other hand the same constraint serves to reduce their potential to market their processed product throughout the entire year. Current high fuel costs and fuel shortages pose a threat to jam sales for some enterprises.

5. Inputs and raw materials

5.1 Source of raw materials

The majority of processors interviewed were producer/processors—22 of the 26 case studies (Table 5). That is to say, they processed crops that were produced on-farm. For example, most processors of dried vegetables produced all their raw material requirements within their own fields or gardens. Some however, met raw material needs from two avenues, on-farm production and the purchase of crops—usually from neighboring farms or local markets. The quantities purchased tended to be small. In one or two cases, the processor was not charged for raw material sourced from a neighboring farm, and actually harvested the crop him/herself, enabling better control over the grade of crop selected for processing.

Although the majority of jam processors sourced fruits from their farm—largely second and third grade produce that would have been rejected on the fresh produce market, a number of processors also bought in fruit from neighboring farms. In some cases these were exotic fruits (kiwi, apricots, and figs) which the processor did not grow at all or only in limited volumes. Although apricot jam was one of Mrs. Masaya's most popular products, she did not produce enough apricot herself to meet demand for apricot jam. A further example is Rain Valley Orchards, which purchased kiwis from neighboring Bondana Farm (Bondana Pvt. Ltd) for jam processing.

Co-operatives in particular, sourced crops from a variety of means including on-farm production, purchasing crops from co-op members, as well as from local farmers who were not members of the co-operative. Some co-ops sourced raw materials from various districts as and when the particular fruit was in season in that area, e.g. the Murewa Food Processors' Association. This enabled the enterprise to access mango for a greater part of the year than would have been possible had they just relied upon local producers.

Few enterprises relied entirely on the purchase of raw materials for their processing activities. All such enterprises were market oriented in terms of their processing activities. Examples include Halfway House, Ms. Matanda, Mr Simango, and the Murewa Food Processors' Association.

5.2 Procurement of other inputs

5.2.1 Consumable inputs

In terms of the study products (jam, and dried fruit and vegetables), surprisingly few other consumable inputs are required in the processing activity besides the raw material, i.e. fruit and vegetables. In the case of jam making, sugar and preservatives are the other main inputs required. These tended to be sourced from local retail outlets or those in nearby towns. Numerous processors interviewed used lemon juice as a natural method of preservation, facilitated by on-farm production of lemons. A few enterprises purchased pectin. In the case of dried fruit, again little other inputs were required. Salt was the other main input required in vegetable processing (See Table 15).

Table 15. Consumable and other inputs required

Product	Washing/sterilisation	Processing	Packaging
Jam	• Milbrow chemical (for containers)	• Sugar • Lemon juice or pectin • Colourants • Metabilsulphate (preservative) • Melted paraffin or candle wax to help preservation • Vinegar to reduce risk of mould formation • Brandy to prevent formation of mould	• Glass or plastic containers • Metal ROT lids or plastic lids • Tin cans
Dried fruit	• Sodium hypochlorite (to clean fruit)		• Plastic packets
Dried vegetables		• Salt	• Plastic bags

5.2.2 Packaging materials

Glass, plastic containers, and tin cans (e.g. the Rusitu Valley Jam Canners Co-op uses 450g and 900g cans) are the main packaging materials used by jam processors. Metal rotate on twist (ROT) lids or plastic lids are used to seal glass and plastic containers respectively. New glass jars are preferable. However, recent difficulties experienced in accessing glass containers meant that quite a number of processors had resorted to using recycled packaging materials, even though they were not particularly comfortable with doing so—i.e. they questioned this practise in terms of 'food safety'. Some processors complained that recycled glass containers were more likely to break during sterilisation. A few processors had resorted to using (in some cases recycled) plastic containers to package jam—containers that were more suited to honey or peanut butter packaging. Again, the processors involved were not comfortable with this practice, pointing out that it was very difficult to thoroughly sterilise the containers. Again, processors have been forced to use plastic due to problems accessing glass containers.

6. Regulation and food safety

6.1 Legal and regulatory requirements

The Standards Association of Zimbabwe (SAZ) specifies the requirements for general hygienic practices for use in the handling (including preparation, processing, packaging, storage, transportation, distribution and sale) of food for human consumption. Table 16 provides a summary of the issues involved in terms of food manufacturing. Although processors were generally aware of the requirements to ensure basic food safety and adhered to strict hygiene practices, in a number of cases—particularly among the more informal enterprises, attention to hygiene and therefore food safety was limited.

As noted previously, the majority of enterprises visited were informal. Adherence to legal and regulatory requirements varied considerably between the processors interviewed. Those processors who marketed their product to formal outlets were generally more informed of food safety requirements as well as the legislation governing such issues. The more commercially orientated the enterprise, the greater the degree of compliance with the requirements outlined. One or two processors suggested that these regulations were not a constraint and did not pose an added cost to their operations. In fact, they suggested that compliance worked to their advantage in terms of marketing their product, as they could prove that the product was made under strict hygienic conditions. Surprisingly enough, even in the case of registered processing enterprises, some had not sought accreditation from the Standards Association of Zimbabwe (SAZ) for their product. The Standards Association of Zimbabwe (SAZ) has its own requirements which includes basic hygienic practices as demanded by the health ministry. SAZ accreditation offers assurance that the product complies with the requirements of the Zimbabwe standard. In general, processors suggested that consumers did not question the 'safety' of their product, but by contrast perceived them to be of a high quality. A few processors suggested that some large-scale food manufacturers used such poor quality fruit for their jam products for example that it was necessary to use additives and preservatives. By contrast, many small-scale enterprises were using high quality fruit, and produced natural products without the use of additives and preservatives. They inferred that their consumer base had confidence in their products for such reasons.

Some enterprises showed significant attempts to adhere to guidelines regarding hygiene and food safety. This was evidenced in some enterprises in terms of the hygienic operation of the establishment and attention to hygiene and health of personnel. Examples include the provision of medical examinations and appropriate clothing for staff. Non-compliance was most evidenced in terms of the buildings and facilities used for processing. The norm among informal enterprises was that food processing was carried out within the home—in the household's kitchen for example. Regulations regarding facilities were usually only met by formal enterprises such as registered private companies or co-operatives, given the significant capital outlay needed to meet such requirements. One or two informal processors had attempted to adhere to the guidelines, by building specific facilities or adapting current facilities to accommodate their food processing enterprise. Most informal processors suggested that adherence to such requirements and regulations would have implied a significant additional cost to them—more often than not one that they could not afford.

Table 16. Zimbabwe Standard specification for food hygiene during food manufacturing

Legal and regulatory requirements	**Concerning**
Protection from contamination by wastes	• Protection of raw food materials from waste (human, animal, domestic, industrial, agricultural)
Design of structures and facilities	• Location • Buildings and facilities • Facilities for maintaining a hygienic work climate • Equipment and utensils
Organisational provisions for hygienic operation of the establishment	• Maintenance of facilities • Cleaning and disinfecting of facilities • Cleaning equipment identification • By-products • Storage and disposal of waste • Exclusion of animals • Pest control • Storage of hazardous substances • Personal effects and clothing
Provisions for hygiene during handling of food products	• Supervision of processing by technically competent personnel • Avoidance of contamination, deterioration or development of pathogenic and spoilage micro-organisms • Avoidance of contamination of containers • Maintenance of equipment and containers • Provision and maintenance of protective clothing for staff
Provisions for hygiene and health of personnel	• Hygiene training • Medical examination • Injuries • Washing of hands • Personal cleanliness • Personal behaviour • Gloves • Visitors

Source: SAZS 126: Part 1: 1997

Most enterprises that do not use intermediaries to market their product have their operations outside the scope of health inspectors. While the more market oriented processors paid significant attention to food safety, numerous processors (particularly those using traditional means of drying vegetables) showed little or limited awareness of the basic hygienic tenets to observe. In some cases, poor infrastructure development (e.g. lack of running water and appropriate facilities) meant that processors compromised on hygiene. In some enterprises, the potential for product contamination from foreign bodies was significant—particularly in vegetable drying and jam processing. Traditional sun drying methods, where vegetables were dried in the open air (e.g. on rooftops or on rock outcrops) posed questions of contamination by all kinds of pathogens. Requirements to meet health regulations in such enterprises would likely pose a constraint and an added cost to production.

In general, lack of enterprise registration and limited adherence to regulations governing food manufacturing did not pose a significant constraint among small-scale informal processors. For example, few processors suggested that consumer concern for the food safety of their products,

acted as a significant constraint to their business. A few cases of jam products being returned by customers or retailers to processors were noted—mostly due to the formation of mould on the jam. Even so, explanations for the formation of mould on some jams and not others varied greatly between processors, from improper processing of the jam, inadequate sterilisation of packaging, or the use of unsuitable packaging materials. Where jam was cooked over an open fire, again there were possibilities of contamination from foreign bodies. A further food safety concern in the case of jam, was the questionable use of preservatives such as wax to seal the product. Table 17 highlights some of the food safety concerns that were noted during the conduction of the case studies.

Table 17. Food safety concerns highlighted by the case studies

Processing activity	Food safety concerns noted during the case studies
Jam making	• Contamination of jam when cooked over open fire • Contamination of jam as it is exposed to the open to cool before packaging • Spoilage of product due to poorly sealed or faulty containers • Use of inappropriate and/or poorly sterilised containers • Inappropriate methods of sealing jam (use of wax etc.) • Storage of jam over long periods
Fruit drying	• Possible spoilage from flies and other insects • Lack of running water for washing hands and fruits • Use of poor quality and unhygienic packaging material • Toilets located too close to dryers
Vegetable drying	• Possible contamination as vegetables are exposed to foreign matter during traditional sun drying techniques • Inadequate cleaning of vegetables prior to processing • Possible mould and pathogens build up due to sporadic sunlight and damp weather which entails lengthening of drying period • Use of poor quality and unhygienic packaging materials • Use of recycled packaging materials

6.2 Labelling of products

Legislation in Zimbabwe requires that all food products sold in containers through formal markets should display a label containing the following information:

- Name and true description of the product (product composition)
- Name and full business address of manufacturer/supplier
- Net weight of the contents
- Date of processing/expiry date
- Certification mark of the Standards Association, if used (assurance that the product complies with the requirements of the Zimbabwe standard)

The degree of compliance however varied among the processors interviewed. In general, the more commercially orientated the enterprise, the greater the degree of compliance. For example, the majority of processors that sold products through formal markets labelled their product and tended

to comply with the above requirements. Compliance among a specific group of informal enterprises was also high, particularly among informal jam processing enterprises in the Nyanga and Juliasdale region. Again, this was largely due to the commercial orientation of such ventures.

Few enterprises used elaborate printed labels on their products, notably Murewa Food Processors' Association, the Rusitu Valley Jam Canners Co-op, Bondana (Pvt) Ltd. and Mrs Swires. Labels must be ordered in bulk, which poses a significant constraint for a number of small-scale enterprises. Some enterprises have responded by ordering one standard label, which is then adapted to cover the various types of jam produced by the enterprise, as the Rusitu Valley Jam Canners Co-op have done. One processor suggested this was a cheaper way of accessing labels for their product. Numerous processors have improvised by using home made labels on their products. Examples include Diana Delights, Yena Lo, and Froggy Farm. In some cases however, expiry dates were lacking on products.

A significant number of processors interviewed did not label their product. This was true for one or two jam processors (e.g. the Magute Spring Project), but was almost the norm for processors of dried vegetables. The latter tended to sell their product to the local community via sales from the farm gate, or through local markets. Dried vegetables tended to be sold in recycled plastic packaging (mainly in the form of old sugar containers) or loose to customers who supplied their own packaging. Observations at Nyanga Bus Terminus market revealed that retailing vendors of dried vegetables used new plastic paper packages, although unlabelled. Mrs Mugambiwa who made door-to-door sales of dried vegetables in Botswana asked her clients to supply their own packaging. Dried vegetable products were therefore seldom if ever labelled. This contrasted with dried fruit, which tended to be packed in attractive plastic packaging which were well labelled. Again however, this was because the product was sold in formal urban outlets or the export market, as in the case of the Murewa Food Processors' Association. It is interesting to note however, that when the latter group sold their product in the local area, it was sold in unlabeled packets.

6.3 Product consistency

The use of solar dryers in which the heat source cannot be controlled raises the question of product consistency as drying temperatures and time will differ between batches. In terms of jam processing, the team found little evidence of measures adopted to ensure that two different batches of jam for example were identical. For example, queries on cooking time were seldom responded to in a satisfactory manner. Recipes or processing methods were often guarded. When information was forthcoming, it appeared that cooking times could vary significantly between processors which may be an indication of the level of experimentation by some enterprises.

The pre-drying process differed significantly between processors. Some processors blanched fresh vegetables before drying. Some dried the material without having blanched it first. Some cooked the raw material with salt before drying. The resultant product therefore differed substantially between the processors depending on the pre-drying process adopted. Records on the process, the recipes adopted and the relative quantities of the various constituents were generally not readily available in terms of dried vegetables. In some ways this is reflected by the fact that it is a traditional practice passed down from mother to daughter, where intuition plays a role in decision making in the processing activity.

Processors generally had little knowledge of how issues such as crop variety, agronomic practises adopted and harvesting and storage methods could affect the quality of the raw material and therefore the quality of the end product. The majority of market-focused jam processors used second and/or third grade fruit, largely unacceptable on the fresh produce market—particularly at the peak of the season. Given that processors may have sourced raw material from a number of sources, an obvious mix of varieties of raw material subjected to differing agronomic practises were used, which may have affected the quality of the end product.

6.4 Product quality and shelf-life

Jam processors manage product quality by ensuring that the jam gels well. The simplest method used to determine gel set is whereby the cooked jam forms a wrinkled layer when tilted in a saucer. The quality and shelf life of jam depends largely on the ability of the processor to ensure the jam has set correctly. Jam is usually packaged in glass jars with metal lids. Glass jars are preferred because they can be sterilised in hot ovens without them breaking. The jam is poured into the glass jar when it is still hot. Some processors cover the jam and leave it overnight to cool and it is sealed the next morning. The objective is to drain away any water (which collected from the steam) to ensure the jam does not mould. Alternatively some processors pour jam into the hot glass containers and immediately close them. The objective is to ensure the sealing of the jar such that no moulds develop. Processors of either practice defend the efficacy of the method. Either way product quality is conveyed from processor to consumer. One traditional method of preserving the quality of the product is the use of paraffin wax. A thick layer of wax is placed on top of the cooled jam and left to dry. Once dry, the jar is then closed. The wax is then removed without breaking, before consumption. The technique is seldom used however, as consumers are often weary of products preserved in such a manner.

The quality of dried vegetables is mainly managed by ensuring that drying takes place in the shortest time possible, avoiding spoilage of the product during the drying process. This is more problematic in areas of high humidity. For example, if persistent wet and humid weather is experienced then the chances of the vegetables rotting before having been completely dried are high. Dried vegetables should feel brittle and dry between the fingers or in the mouth. The vegetables are usually stored in polythene or jute sacks, and placed in dry conditions for storage. The product tends to be sold in local measurements (using cups or small plates) to consumers and is usually packaged in recycled plastic bags. Rejection of dried vegetables was highly unlikely among consumers as reported by the processors interviewed. Dried fruit was more problematic in terms of discoloration during the drying process for example, and therefore rejection of products was more likely.

Processors were generally not aware of the optimum shelf life of their product. Furthermore, the shelf life quoted varied considerably from one processor to another, even for the same product (Table 18). For example, in the case of vegetables, the recorded shelf life ranged between one and two years. The shelf life for jam varied between five weeks and five years. The Murewa Food Processors' Association quoted a six-month shelf life for their dried fruit products.

Table 18. Shelf-life of end products

Product	Examples of shelf-life quoted
Dried vegetables	1 year (1 case study)
	2 years (1 case)
Jam	5 weeks (1 case)
	2 months (1 case)
	6 months (3 cases)
	18 months (1 case)
	2 years (1 case)
	5 years (1 case)
Dried fruit	6 months (1 case)

6.4.1 Grading of product

There was no indication among the jam processors visited, of grading of the end product taking place. There was also no evidence of the adoption of grading procedures among the majority of enterprises processing dried vegetables. The Murewa Food Processors' Association did grade dried mango into two grades—higher-grade dried fruit was sold to local urban and export markets. Lower grade dried fruit was sold locally in unlabeled packages.

6.4.2 Use of additives, preservatives or colorants

Few of the processors interviewed use additives. The Murewa Food Processors' Association suggested that clients in their export markets did not accept the use of additives in the product. All processors who dried vegetables indicated that they did not use any additives other than salt. Some jam processors used artificial pectin to gel their product, but the majority tried to use natural pectin found in lemons.

7. Marketing channels and consumers

7.1 Marketing channels

The case studies suggested that processors use a number of channels to market their products—including direct sales to consumers and sales through intermediaries such as retailers. Most processors made some sales direct to consumers. For approximately two-thirds of processors, direct sales to consumers made up nearly all their sales. Direct sales were particularly common among dried vegetable processors and processors of jam. Products were marketed to both household and institutional consumers (e.g. schools).

The majority of processors drying vegetables relied on sales within their local community, particularly to friends and neighbours. Some processors marketed dried vegetables in nearby townships from market stalls rented for a daily fee. In one or two cases sales were made to intermediaries, mainly other vendors. One processor sold her dried vegetables from her shop at Wengezi junction. She also purchased dried vegetables from other processors, which were also sold at the shop.

Jam processors marketed their products through networks of friends, work colleagues, members of women's clubs or local community or church groups. A few jam processors made sales to consumers from farm kiosks[16] attached to their small-scale commercial orchard. A sizeable number of processors made sales to institutional organisations, including boarding schools, orphanages, hospitals and hotels. Diana Delight jam products were sold to Mount Claire Hotel in Juliasdale, Village Inn in Nyanga and the Inn on Rupurara. The Rusitu Valley Jam Canners Co-op marketed canned jam to local boarding schools. Mrs MacIllwane used her jam products in her farmhouse restaurant.

Quite a number of jam processors made commission-based sales through intermediaries—largely established retail outlets, including supermarkets, farm kiosks and specialist shops. For example, the Murewa Food Processors' Association marketed dried mango through Interfresh Pvt Ltd, on the basis of a commission being retained by the company. In Nyanga, sales of jam products manufactured by local cottage enterprises were largely made through local roadside kiosks. Some sales were made through specialist shops. For example, Mrs Masaya and Mrs Swires marketed jam products through Halfway House. In most cases retailers did not purchase the product wholesale, but charged a commission (usually 20% in the case of kiosks) for sales made through their outlet. Hence the retailer determined the mark-up on the product. Processors suggested that commission rates were constantly increasing, and often at a faster rate than the market price for jam. However, jam processors suggested that sales through retailers (e.g. kiosks and specialist shops) enabled them to increase their marketing channels and furthermore keep marketing costs down. Furthermore, it enabled them to make their product more accessible to a wider group of consumers than would have been possible through personal networks.

[16] Kiosks were common in the Nyanga and Juliasdale areas, given the number of visitors to the area. Most kiosks sold crafts and gifts, and some food items including fresh fruit and vegetables, jams, honey, and peanut butter for example.

None of the processors interviewed apparently made sales to wholesalers. Some indirect sales were made through distributors. For example, the Murewa Food Processors' Association made sales to clients in export markets through Ranche House College. No other intermediaries are involved except for contacts in USA, via individuals who were once a part of Ranche House College.

7.2 Consumer knowledge

It is interesting to note that quite a wide variety of consumers—rural and urban, local and foreign, high-, middle- and low-income, consumed the products manufactured by the enterprises interviewed.

7.2.1 Consumers of jam

Jam sales made through kiosks located along highways tend to attract local medium and high-income consumers (particularly from Harare) on their way to holiday destinations in the Eastern Highlands. These outlets also attract some foreign consumers, again holidaymakers to the region. By contrast, sales of canned jam products to boarding schools, orphanages and hospitals are largely geared to middle- and low-income consumers. Jam sales in tuckshops were also mainly geared to low-income consumers.

7.2.2 Consumers of dried vegetables

Most enterprises involved in traditional drying of green leafy vegetables relied on customers within their local communities, mainly middle- and low-income consumers. Demand for dried vegetables usually peaks during the agricultural off-season, when local household stocks of dried vegetables run out. As highlighted in the last section, some processors market their vegetables at market places in townships, albeit as part of a diverse product line. Again consumers tend to be from largely middle- and low-income households.

Of particular interest is the trade in dried field vegetables such as dried *muruni* and *munyemba*. These two products seem to enjoy niche markets in urban areas in particular. Two processors realised significant revenues from the sale of such vegetable products. One processor exported the products to Francistown in Botswana. Again however, the customer base consisted largely of low- and middle-income consumers. Processors suggested that demand for such products (*muruni* and *munyevhe*) is relatively constant throughout the year, while supply is highly seasonal. Some processors suggested their processing capacity is hampered by persistent humid and wet climatic conditions, characteristic of December and January, when fresh *muruni* and *munyevhe* are available. Such weather conditions are not conducive to the use of traditional drying techniques.

7.2.3 Consumers of dried fruit products

The findings suggest that most dried fruit processors target upper-income consumers, whether in the local or export market. Halfway House mainly caters to middle- and upper-income urban dwellers from Harare for example, who come to holiday in the outlying region. The Murewa Food Processors' Association is essentially focused on the local urban market and the export market and therefore tends to target high-income consumers. Although some sales are made locally (in unlabelled packages), the product is of an inferior quality to that sold on urban and export markets. Hence some sales are made to low- and middle-income consumers in the local area.

8. Estimation of potential returns to small-scale processing activities

The findings suggest that returns to small-scale horticultural processing differ significantly by product (e.g. dried vegetables, dried fruit or jam), relative resource endowment and entrepreneurial skills of the processor involved, the marketing strategy adopted, and furthermore by the context in which the processor operates. The production or processing context entails the environment, i.e. whether a processor produces their own crops, the processing technology available, whether it is an individual or group managed enterprise, etc. In order to give some indication of the potential importance of value-added processing for improved income generation among small-scale horticultural farmers, this section will discuss the returns to processing among a few of the processors visited.

8.1 Returns to small-scale vegetable processing

The case studies revealed that both garden vegetables (e.g. tsunga, and rape) and field vegetables (e.g. *muruni*[17] and *munyemba*) are being processed by small-scale producers. Garden vegetables refer to those vegetables that have to be planted annually by the producer. Field vegetables however grow freely in fields, and are largely referred to in many circles as indigenous vegetables. One processor was involved in drying both types of vegetables, which she subsequently sold at markets in nearby towns. Presented below is an estimate of her potential returns to the production and processing of garden and field vegetables. Profitability is calculated as per unit of output (e.g. per bucket or 50kg bag of dried vegetables).

8.1.1 Costs to vegetable processing

Costs to processing varied significantly from one enterprises to another. As Table 4 indicated, all of the dried vegetable processors interviewed were producer/processors, i.e. they sourced some or all of their raw material requirements from their own fields or gardens. Although none of the processors relied entirely on the purchase of vegetables, one processor did purchase as much as 90% of her raw material requirements.

The cost of vegetables to the enterprise is taken as the opportunity cost of buying vegetables—i.e. the going market price of a bundle of fresh vegetables. This encompasses all costs associated with the production of vegetables in the garden until harvest. All costs associated with the actual processing of vegetables should be included in the final price of the end product. Such costs include the labour used to dry the vegetables, the wear and tear of the utensils used in processing, as well as the additional raw materials (e.g. where tomatoes are added), among others. Marketing costs such as transport costs, packaging[18], and promotion are also included in the final product price.

[17] *Muruni* is not a wild vegetable *per se*. Initially it has to be planted but in subsequent seasons the plants germinate and it grows naturally. In subsequent years, it is a positive externality to crop production.
[18] However, in most cases dried vegetables were sold loose or in recycled plastic bags, so seldom was a packaging cost incurred.

Unlike normal garden vegetables, field vegetables do not have monetary value at village level, as they represent a positive externality to general agricultural production. For example, *muruni* grows freely in fields and yards. Given that no effort is made to plant it, it is not uncommon for villagers to harvest it from their neighbours' fields (upon request) with no money changing hands. *Munyemba* (cowpea leaves) are harvested to achieve a high grain yield from the cowpea plant.[19] If they are not harvested, cowpea grain yield will be drastically reduced. Thus both vegetables do not have a monetary value at village level. Hence their production cost (or vegetable input cost) also has no monetary value since there is no cost involved, although there is a value which can be attached once they are harvested and/or consumed. However, the moment these fresh vegetables are brought to town, they will have a monetary value attached to them, which arguably is a reward to the marketing efforts being made to avail them. This is because there is a ready market for such field vegetables in urban areas. Households not only benefit nutritionally from the consumption of such vegetables, but also economically as such vegetables may substitute purchases of garden vegetables or meat products for example. In such cases, this can be taken as their value.

The opportunity cost of labour for producing dried vegetables has not been used in the calculation of labour input costs in Case Study 1 below. This usually would be calculated as the income one would get when employed to perform a similar task. The opportunity cost of such labour, however, is subject to the availability of such employment. In most cases, and during most of the year, such employment opportunities are not available. This has led to the use of family monthly expenditure and savings as a proxy value of labour since all labour is used to cater for expenses and savings. This becomes a better proxy given that opportunity cost figures provided by most processors were highly questionable and non-reflective of the situation on the ground.

8.1.2 Case studies

Case study 1: Mrs Chidokohori

Dried vegetables were usually exchanged for cash. However, in one case, fresh vegetables were exchanged for maize grain. The grain was then sold in nearby towns for cash. The following revenue scenario emanates from such a situation.

[19] Similarly with the case of *muruni*, cowpea leaves (*munyemba*) are to some extent a positive externality to cowpea production, though it can be argued that it is a joint product with the cowpea grain.

Table 19. Returns to exchanging fresh vegetables for maize grain, Mrs Chidokohori

The Grain Option	
1 bundle fresh vegetable	= 5 litre volume maize grain
5 litre volume maize grain x 3	= 1 bucket (maize grain)
1 bucket (maize grain)	= Z$150.00
Implying: 1 bundle of vegetables	= Z$50.00
1 bundle fresh vegetables costs	= Z$15 (in SaRuchera), = Z$20 (in Nyanga)
Implying transaction cost of:	= Z$35 in SaRuchera = Z$30 in Nyanga
Total revenue	= $150

Source: Mrs Chidokohori

If the grain option is considered, in this case the opportunity cost of a bundle of fresh vegetables is calculated at Z$50 Zimbabwean dollars. This would reduce the profits to drying normal garden vegetables to almost negative levels. This is especially so considering the fact that in the case of normal fresh vegetable sales, the opportunity cost is only Z$15–20. The prevalence of similar barter trades for fresh garden vegetables may exist and may explain low availability of the product on the market. Garden vegetables are seemingly not being sold directly on the market for cash but may be exchanged between households for other foodstuffs such as maize grain.

Table 20. Estimate of costs, Mrs Chidokohori

Costs	
3 bundles of fresh vegetables	Z$60
Labour	-
Transport by cart (One 20 litre tin)	Z$10
Transport by cart (One person per 20 litre tin)	Z$10
Total costs	**Z$80**
Revenue	
10 bundles (fresh)	= 1 x 50 kg sack in vol. (dried)
One 50 kg sack (dried)	= 3 buckets (dried)
One bucket Munyemba	= $350 wholesale ($500 retail)
One bucket Muruni	= $250 wholesale ($400 retail)
One bucket Tsunga	= $200 wholesale
One bucket Cabbage/Rape	= $150 wholesale

Among the four vegetables Mrs Chidokohori specialises in, field vegetables (*munyemba* and *muruni*) are more profitable than her garden vegetables (*tsunga* and rape). Table 21 below suggests that returns to the former vegetables were Z$275.00 and Z$175.00 per bucket, compared to Z$58.33 and Z$8.33 for the latter vegetables, respectively. This may largely be explained by the fact that field vegetables do not have a monetary value in their fresh form in the village. This is not to say that fresh *munyemba* is not consumed by local households. However, they do fetch a higher price on the market in their dried form. Within the village or locality, and during the rainy season, fresh field vegetables are not scarce thus there is no market for them. Demand for fresh field vegetables does, however, exist in urban areas where they are scarce. Because not all

households dry vegetables, a market for dried field vegetables exists in both rural and urban markets. They also have the highest turnover over time. All vegetables bring in positive economic returns to the household in that the labour invested in them get returns (Z$120.00 per bag for dried vegetables), apart from net profits which should transform into household savings.

Table 21. Returns to various crops, Mrs Chidokohori

	Munyemba (Cowpea leaves)	**Muruni**	**Tsunga**	**Cabbage/Rape**
GROSS INCOME (Wholesaling)	Z$ 350.00 x 3 (buckets) = Z$ 1,050.00 (one 50kg sack)	Z$ 250.00 x 3 = Z$ 750.00	Z$ 200.00 x 3 = Z$ 600.00	Z$ 150.00 x 3 = Z$ 450.00
VARIABLE COSTS				
Fresh vegetables	Assumed free, positive externality of increasing grain yield.	Freely available in common properties and field.	10 bundles x Z$20 = Z$200.00	Z$200
Labour	Picking from field and drying. Z$ 120.00	Picking from field and common properties, drying. Z$ 120.00	Harvesting, drying. Z$ 120.00	Harvesting, drying. Z$ 120.00
Transport to Nyanga	Z$ 15 per 50kg sack	Z$ 15	Z$ 15	Z$ 15
Bus fare per person	Z$ 60 per return trip per person	Z$ 60	Z$ 60	Z$ 60
Food Allowances	Z$ 30	Z$ 30	Z$ 30	Z$ 30
TOTAL VARIABLE COSTS	Z$ 225	Z$ 225	Z$ 425	Z$ 425
GROSS MARGIN				
Net (per 50kg volume of dried vegetable)**	Z$ 825.00	Z$ 525.00	Z$ 175.00	Z$ 25.00
Net (per bucket of dried vegetable)	Z$ 275.00	Z$ 175.00	Z$ 58.33	Z$ 8.33

Case Study 2: Mrs Mugambiwa

Mrs Mugambiwa specialises in drying field vegetables, but this time for export to Botswana. When Mrs Mugambiwa runs out of her own dried vegetables, she reverts to buying dried vegetables in Bulawayo, which she then resells in Botswana.[20] After catering for all costs (variable and fixed), she makes a profit of approximately Z$81.50 per bucket of home-produced dried vegetables and -Z$318.50 per bucket of dried vegetables purchased in Bulawayo, based on the informal exchange rate. Calculations based on the formal exchange rate also portray a similar scenario, although in this case all the returns are negative. The gross revenue realised in Botswana is approximately six times that realised in Zimbabwe. The processing technique used

[20] The vegetables were exported, and therefore the processor receives payment in Botswanan Pulas. Given the foreign currency situation in Zimbabwe, foreign currencies tend to be exchanged on the black market. Although the black market price of a currency may be argued to be a fair reflection of a currency's real value, in this case it is not so representative, given that marketers charge a premium for exchanging foreign currency for fear of arrest for such illegal practices.

to dry vegetables (*muruni* and *munyemba)* for export to Botswana is different from the traditional Zimbabwean method. Furthermore, it is more costly than that used to dry field vegetables destined for local or household consumption. Marketing, transport, and accommodation costs are also higher for exported dried vegetables.

Table 22. Estimate of costs, Mrs Mugambiwa

1 bucket (carried per trip)	= $400 (if purchased)
45-50 cups per bucket (i.e. 47.5 cups)	1 cup = BWP 1 (market price in Botswana)
Costs	
Nyamutumbu to Harare Harare to Bulawayo Bulawayo to Francistown Transport (Total)	= Z$240 = Z$1,200 (bus) = Z$720 (train) = Z$300 = Z$3,480.00 (return journey)
Accommodation in Botswana (7 day stay)	= BWP 40
Total household expenditure per month	= Z$3 000
Total household savings per month (and non-consumables expenditure)	= Z$2 000

Note: BWP refers to Botswana Pulas
Official exchange rate: BWP 1 = Z$7.79; informal exchange rate: BWP 1 = Z$45

Table 23. Returns to dried vegetables (home produced and purchased dried vegetables) Mrs Mugambiwa

	Own Production		**Purchase from Bulawayo**	
Exchange rate	Official BWP 1 = Z$7.79	Informal BWP 1 = Z$45	Official BWP 1 = Z$7.79	Informal BWP 1 = Z$45
GROSS INCOME				
Bucket of munyevhe/munyemba = 47.5 cups each at BWP 1	Z$ 370.025	Z$ 2,137.50	Z$ 370.025	Z$ 2,137.50
VARIABLE COSTS				
Bucket of dried vegetables			Z$ 400	Z$ 400
Transport (20% of total transport cost) *	Z$ 696.00	Z$ 696.00	Z$ 696.00	Z$ 696.00
Labour (20% total household expenditure and savings)*	Z$ 1,000	Z$ 1,000	Z$ 1,000	Z$ 1,000
Accommodation (20% of total, at BWP 40 per 7 days) *	Z$ 62.32	Z$ 360.00	Z$ 62.32	Z$ 360.00
TOTAL VARIABLE COSTS	Z$ 1,758.32	Z$ 2,056.00	Z$ 2,158.32	Z$ 2,456.00
GROSS MARGIN (Based on figures supplied)	-Z$ 1,388.295	Z$ 81.50	-Z$ 1,788.295	-Z$ 318.50

* Dried vegetables only constitute only 20% of the value of goods marketed in Botswana, thus only 20% of transport and accommodation costs are used in the calculations.

The majority of the other processors visited (involved in drying vegetables), mainly dealt with normal garden vegetables, such as tsunga, rape, covo and pumpkin leaves for example. The scenario is not very much different from that of Mrs Chidokohori, save for the fact that most were not involved in vegetable drying as a market oriented activity, but just tended to sell surplus dried vegetables during periods when demand had peaked[21]—when fresh vegetables were scarce. The main reason being that the demand for dried vegetables is generally low because most rural households dry vegetables for subsistence purposes, and often give supplies to urban friends and relatives as gifts.

8.1.3 Potential importance of value-added processing for improved income generation among small-scale vegetable producers

The findings suggest that returns to small-scale vegetable production are boosted by the value-adding activity of processing. The actual returns, however, differ markedly depending on the market niche one depends on, conditions of sale, processing costs and the marketing costs involved. Below are summarised highlights of returns to processing vegetables based on the case studies cited above.

Table 24. Income generation among small-scale vegetable processors

Case study	Unit	Product	Gross Margin
Mrs Chidokohori	Per bucket (3 buckets = one 50kg sack in volume)	Munyemba	Z$ 275.00
		Muruni	Z$ 175.00
		Tsunga	Z$ 58.33
		Cabbage/Rape	Z$ 8.33
Mrs Mugambiwa	Per bucket	Munyevhe/Munyemba	Z$81.50* -Z$318.50**

* Based on own production and informal exchange rate.
** Based on dried vegetables purchased in Bulawayo and informal exchange rate.

8.2 Returns to small-scale fruit processing

Fruit processing ventures are at different development stages and have different objectives such that their ends are not similar. The findings suggest four categories of processing enterprises among the case studies conducted. The case studies which follow clarify this in more detail.

8.2.1 Costs to fruit processing

As mentioned previously, the main inputs to processing jam are fruit and sugar. Although the majority of processors interviewed produced their own fruit, a few processors relied on sourcing additional fruit from neighbouring farms. One processor (M & C Preservers) relied entirely on the purchase of fruit for processing. A few processors sourced their raw material requirements from common property lands.

[21] Or when, the household needed cash.

In cases where fruit is sourced on-farm, the going market price of second and third grade fruit is adopted as the opportunity cost price, given that jam is usually made from such grades of fruit. While Cairns Foods Ltd for example, was a ready buyer of third grade fruit, this was not adopted as an indicator of the market price of third grade fruit, given that processors suggested that the price offered was below its actual market value. This is mainly because to some extent, a market exists for such fruit. Apart from Cairns Foods, fellow villagers and other processors (like the case of Bonda Orphanage) can absorb such fruit. For those processors who rely on the purchase of fruit for their raw material requirements, the actual market price charged for fruit purchased was applied.

The market prices adopted for glass jars and lids, and sugar for example, are those stipulated by suppliers and government respectively.[22] The labour input for most fruit processing enterprises is usually derived from household labour (usually of the entrepreneur), or paid domestic servants for example. In the event that domestic servants were involved in processing, the percentage of time he or she spent making jam was used to calculate the labour cost involved. If the owner made the jam alone then he or she was not separated from the enterprise and the labour rewards combined with the profits that would accrue to him or her.[23] Some entrepreneurs do not use hired labour, and as such it becomes difficult to assign a cost value to their labour contribution. In such cases labour is taken as part of their profits. The marketing costs incurred are included as a percentage.

The revenue generated is calculated as the price per unit container of jam multiplied by the number of units sold. However, the revenue in this case does not include all economic benefits. For example, the most notable benefit is the availability of jam for household consumption. A further benefit may relate to the social relationships built up when jam is given to relatives and friends. Although no monetary gain is received, such actions may be reciprocated by friends and relatives in the form of gifts of other foodstuffs to the household at a later date. The satisfaction derived from making jam as a hobby is another benefit derived from the activity. However, it is difficult to quantify such benefits in monetary terms. It is worth bearing in mind, however, that most enterprises are rationally operated with processors striving to make returns over and above total costs.

8.2.2 Case Studies

Case Study 1: Rain Valley Orchards

One category of fruit processors could be characterised as a family interest that produces jam which is mainly sold in their own roadside kiosk or another kiosk in the vicinity (M & C Preservers, Froggy Farm and River Valley). For most of these processors, fruit jams are the main product. Table 25 below shows the gross margin budget of Rain Valley Orchards as a notable example.

[22] During October 2001, the Government of Zimbabwe instituted price controls on certain consumer goods, including sugar, cooking oil and fresh milk, so that their prices would remain stable.
[23] Entrepreneurship is an input awarded with enterprise profits and in this case entrepreneurship would include labour.

Table 25. Gross margin budget for jam production at Rain Valley Orchards

	Quantity/Description	Total
GROSS INCOME		
6.5 Jars	From 3.265kg of fruit	Z$ 375.50
VARIABLE COSTS		
Fruit	$30/kg	Z$ 163.25
Sugar	3/4 of fruit weight = 2.45kg at $40/kg	Z$ 98.00
Jars	7 each at $6.4545	Z$ 45.18
Lids	7 each at $2.4873	Z$ 17.41
Labels	7 each at $0.1920	Z$ 1.34
Wax	7 jars each at $0.0500	Z$ 0.35
Electricity	7 jars each at $2.9609	Z$ 20.78
Labour*	7 jars each at	Z$0.00
TOTAL VARIABLE COSTS		**Z$ 346.31**
GROSS MARGIN/6.5 jars		**Z$ 29.19**
GROSS MARGIN/jar		Z$4.49
GROSS MARGIN/kg fresh fruit		Z$8.94

* Labour costs are insignificant since these are often absorbed in other aspects of the enterprise such as fruit production on the farm.

The gross margin for fruit jam at Rain Valley Orchards suggests that processing fruit into jam for this category of enterprises is profitable, in terms of adding value to second and third grade fruit produced on-farm. However, the findings would suggest that fruit processing at cottage level is not likely to be as profitable if fruits are not produced on-farm, but have to be purchased. Most processors argued to this end, that reliance on purchased raw material (i.e. fruit) is likely to make a jam enterprise unsustainable. Furthermore, such enterprises have usually a cost to their labour. Labour costs among most enterprises that use fruit produced on-farm, were hidden in other aspects of the multi-faceted business. For most, jam processing represented only a small part of the business. Labour costs were often absorbed in other aspects, such as fruit production for example.

Case study 2: Mrs Masaya

A second category of fruit processors is made up of those that process their own fruit but sell their end products through retail outlets (e.g. Mrs Swires and Mrs Masaya). For most of these processors, jam processing was not their main income source. The marketing of jam is often carried out in the context of other activities, and furthermore the jam enterprise seldom absorbs the full cost of marketing the jam. In fact, the jam enterprise often enjoys a positive externality of other activities. A positive externality may be in the form of empty vehicle space, good entrepreneur reputation in other aspects of business, and ability to exploit one's social capital. Adding jam as part of their business can also be seen as an attempt to internalise that externality.

The sale of ten 450g jars of jam by Mrs Masaya realised a gross margin of Z$311.00. This suggests a gross margin of Z$103.66 per kg of processed third grade fruit, compared to gross margin of Z$30.00 per kg of third grade fresh fruit sold. Mrs Masaya earns approximately Z$93,300.00 per year for jam making, based on approximate sales of 3000 jars of jam per year.

The processor involved suggested that physical resource endowments and social capital,[24] along with the adoption of effective marketing strategies and enthusiasm for the business facilitated this. The ability to exploit social capital and exercise good public relations is very particular to this processor and is one secret behind their success.

Table 26. Gross margin budget for jam production by Mrs Masaya

	Quantity/Description	**Total**
GROSS INCOME		
10 jars	Each 450g jar at Z$ 75.00	Z$ 750.00
VARIABLE COSTS		
Fruit	3kg produces 10 jars of jam (Z$30/kg for 3rd grade fruit)	Z$ 90.00
Sugar	3kg sugar at Z$ 40/kg	Z$ 120.00
Jars	Z$ 7.50 each	Z$ 75.00
Lids	Z$ 5.50 each	Z$ 55.00
Labels		Z$ 1.50
Labour	Z$ 4,000 domestic servant's monthly salary. Estimates Z$ 2,000 for labour input to jam processing.	Z$ 50.00
Electricity	20% of Z$ 9,500 per month (approx. 400 jars produced per month)	Z$ 47.50
TOTAL VARIABLE COSTS		**Z$ 439.00**
GROSS MARGIN/10 jars		**Z$ 311.00**
GROSS MARGIN/jar		Z$ 31.10
GROSS MARGIN/kg of 3rd grade fresh fruit		Z$ 103.66

Case study 3: Jam processing for household consumption

The third group of processors is characterized by those involved in fruit processing, but which is not particularly market oriented. Fruit processing is mainly carried out for household consumption purposes. In fact, more than half of the total jam output from such enterprises tended to be given to friends and relatives or consumed within the home. Examples include Sr. Gloria, Mrs. Bauer, and Mr. and Mrs. Hardy. Gross margin analysis for such enterprises are difficult. For example, one processor suggested that the prime focus of the enterprise is to "ensure maximum use of what God gives" them, and therefore it is not a market-oriented venture. It may be argued that the economic rewards to these processing activities are at least positive on the assumption that decisions are rationally made to ensure maximum benefit at little or no cost. However, none of the processors involved could provide sufficient input-output information to estimate the potential returns to their activity.

Case study 4: Jam production (RVJCC) and fruit drying (MFPA) among co-operatives

The fourth category of fruit processors is made up of enterprises with greater capital outlays and perhaps large memberships as in the case of co-operatives. For all such enterprises (e.g. the Murewa Food Processors' Association, the Rusitu Valley Jam Canners Co-op), the maximisation

[24] Trust norms and networks that facilitate co-operation for mutual benefit (Putnam, 1990).

of profits was their prime focus. Both enterprises were donor-funded projects. Gross margin budgets for these enterprises are shown in Table 27 below. In the last two years, the activities of both enterprises have been relatively profitable, except for the Rusitu Valley Jam Canners Co-op in 2001. However, in terms of explaining this, increased costs during 2001 may be a significant factor. For example, income from marmalade jam sales increased by only 22.8% from 2000 to 2001; similarly income from mixed fruit jam sales increased by only 15.4%. During the same period, however, costs to sugar increased by 85.7%. Although, these figures may not be directly related, they are perhaps indicative of the general increase in costs to processing during 2001, given the particular economic situation in Zimbabwe at that time. This generally explains the rather negative returns for RVJCC for 2001.

As suggested previously, the utilisation of resources in these enterprises is below capacity. In all cases, enterprise outputs remain below the capacities or potential output levels for the respective enterprises. It would seem that there is room for both co-operatives to increase profits if more aggressive marketing strategies are adopted.

Table 27. Gross margins calculations for RVJCC and MFPA

ENTERPRISES	**Rusitu Valley Jam Canners Co-op (RVJCC)**		**Murewa Food Processors' Association (MFPA)**	
Year	**2000**	**2001**	**2000**	**2001**
REVENUE				
Marmalade Jam Sales	255740	314100		
Mixed Fruit Jam Sales	146250	168750		
Dried Fruit Local Sales			4497804	6903500
Dried Fruit Export Sales*				119000
Dried Local Veg. Sales			111020	170400
Dried Export Veg. Sales*				39200
GROSS INCOME	**401990**	**482850**	**4608824**	**7232100**
VARIABLE COSTS				
Fresh Fruit Purchases	5716	6690	515298	1050686
Fresh Local Veg. Purchases			31899	48960
Transport	16182	24390	8176	14120
Labour (paid)	38370	67147	1870013	2870208
Sugar	32777	60873		
Water Costs			18889	28992
Electricity/Energy Costs	36000	72000		
Packaging Materials	70188	116979	156960	188352
Repairs & Maintenance	19500	30000	23455	36000
MARKETING COSTS				
Transport	70816	106211	100387	154080
Shipping				17500
TOTAL VARIABLE COSTS	**289549**	**484290**	**2725076**	**4408898**
GROSS MARGIN	112441	-1440	1883748	2823202
GROSS INCOME/TOTAL V. COSTS	1.39	1.00	1.69	1.64
GM/$ VARIABLE COSTS	0.39	0.00	0.69	0.64
GM/$ LABOUR COSTS	2.93	-0.02	1.01	0.98

*Based on exchange rate of US$1 = Z$280.

8.2.3 Potential importance of value-added processing for improved income generation among small-scale fruit producers

The findings suggest that returns to small-scale fruit processing (i.e. jam making and drying) are, as is the case with processed vegetables, dependent on the market niche individual enterprises rely on, conditions of business, processing costs and marketing costs involved.

Table 28. Gross margin/Net value added in jam processing

Case study	Focus of Activity	Unit	Gross Margin
Rain Valley Orchards	Market oriented	Per jar of jam	Z$ 4.49
		Per kg fresh fruit	Z$ 8.94
Mrs Masaya	Market oriented	Per jar of jam	Z$ 31.10
		Per kg 3rd grade fresh fruit	Z$ 103.66
Rusitu Valley Jam Canners Co-op	Market oriented	Per jar of jam	Data not available
		Per kg fresh fruit	Data not available
Murewa Food Processors' Association	Market oriented	Per packet of dried fruit	Data not available
		Per kg fresh fruit	Data not available

8.3 Enterprise growth and competition

As mentioned previously, quite a number of processors interviewed had significant experience manufacturing and marketing processed horticultural products. Among the vegetable processors, Mrs Chidokohori, Mrs Murerwa and Mrs Mugambiwa had marketed dried vegetables for numerous years, using traditional techniques passed down from mother to daughter—which form part of everyday rural household food strategies. Mrs Mabota and Mrs Chakanetsa also had significant experience processing dried vegetables, even though their activities were not primarily market oriented. Fruit drying however, appeared to be a more recent venture, the Murehwa Food Processors' Association, the Rusitu Valley Jam Canners Co-op and Mrs Gabaza for example, had at most a few years experience processing dried fruit.

Among the jam processors, the tendency was that the more market-oriented enterprises had greater experience processing jam. Mrs Masaya, Ms. Mutanda, Mr and Mrs Manley, Mr and Mrs Hardy, Mr and Mrs Matasva and the Rusitu Valley Jam Canners Co-op for example, had each more than 15 years experience processing jam products. Sr. Gloria also had similar levels of experience, even though she did not market her product.

Given that a significant number of small-scale enterprises visited had been in the business for a substantial period of time, it is suggested that they have enjoyed some degree of success processing and marketing value-added horticultural products. However, the question remains as to whether these enterprises have actually experienced growth or whether they function at more or less the same level as upon inception.

8.3.1 Vegetable processing

In terms of market-oriented vegetable processing, little enterprise growth was evidenced among the informal processors interviewed. Processing capacity has largely remained the same, as enterprises continue to rely on labour-intensive traditional techniques of processing. For most it would seem that their product range has not changed greatly, if at all. Although the majority of enterprises were involved in domestic value-added processing for in-country trade, one processor adapted her dried vegetable product to meet the consumer tastes of Botswana's largest ethnic group, namely the Tswanas.[25] Returns to the sale of dried vegetables are apparently greater in Botswana, even after accounting for transportation costs.

One or two enterprises involved in drying field vegetables for both domestic markets and cross-border trade have shown some slight changes in how they conduct business. For example, as well as selling dried vegetables on the open market for cash in a nearby town, one processor exchanges dried vegetables for maize grain in her local village as households face severe liquidity problems. The subsequent resale of maize grain in town brings a higher return than that gained from the direct sale of dried vegetables. One cross-border trader has resorted to buying dried vegetables from processors in Bulawayo. However, the returns to such an activity are negative in themselves, but this is likely to be absorbed by other activities conducted on the same trip.

Given that the practice of vegetable drying is common in rural areas, potential competition exists between neighbours, particularly with dried garden vegetables. Most households dry garden vegetables to some extent or another—although the majority does so for household consumption purposes. Competition increases during the agricultural off-season when demand is heightened and households seek to sell surpluses. There is remarkably less competition for field vegetables as production is difficult given persistent cloudy and wet weather, which makes drying of large volumes difficult.

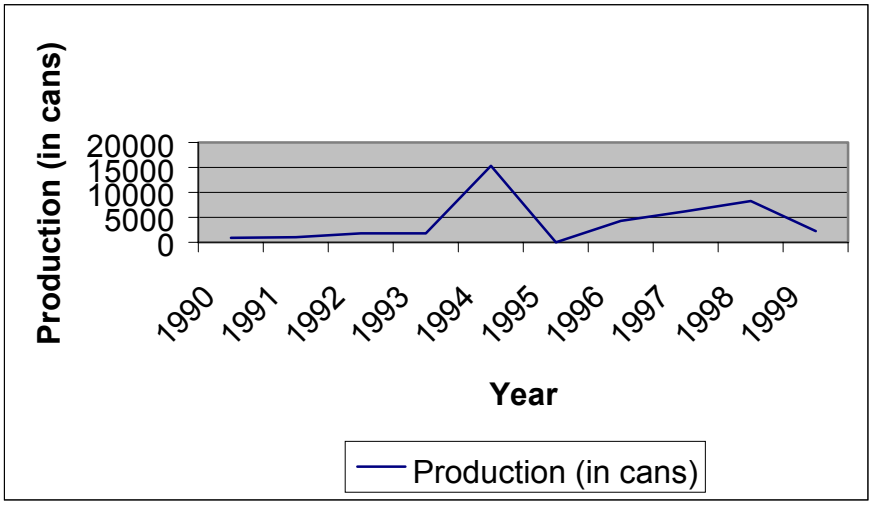
8.3.2 Fruit processing

In terms of small-scale agro-food processing in Zimbabwe, the cottage jam industry in particular has witnessed some degree of growth. A few of the jam making enterprises visited have seen their production levels increase since start-up (e.g. Diana Delights, Mrs Swires, Rain Valley Orchards and the Rusitu Valley Jam Canners Co-op). For example, some processors have succeeded in finding new markets for their products over the years, via their social networks, through retail outlets and local hotels and guest lodges for example. Some have targeted particular consumer groups such as the tourist sector, or local boarding schools for example, catering to the specifications or requirements of that particular market. For example, Mrs Masaya has diversified into products with higher margins such as exotic jam varieties (e.g. grape and apple, double apple (apple/pineapple), guava and lemon), that are sold through tourist outlets in the Nyanga region. The Rusitu Valley Jam Canners Co-op sell mixed fruit jam and marmalade in

[25] The Tswanas account for approximately 79% of Botswana's population.

larger containers, e.g. 900g cans, in order to cater for local boarding schools.[26] As Figure 3 below suggests, production levels in the Rusitu Valley Jam Canners Co-op have fluctuated significantly over the years since 1990. In 1994, production peaked to 15,339 cans, which suggests that the co-op is currently operating below its actual processing capacity. After a peak in 1994, production dived to zero in 1995. Production levels began to recover again in 1996, increasing from 4,308 cans to 8,240 cans in 1998. The figures for the first quarter of 1999 (2,237 cans) suggest that production was likely to stay at more or less the same level as during 1998.

Figure 3. Production levels in Rusitu Valley Jam Canners Co-op (1990-99)



Note: Production level of 2,237 cans in 1999, is for first quarter (Jan–March) only.
Source: Figures taken from Maboyi, 1999:14

In general, it would seem that enterprise growth has largely been the result of market awareness and furthermore innovative marketing strategies among a few enterprises. Some processors have been successful in finding new markets for their products, and in some cases diversifying their product range. On the whole however, production levels have not increased substantially (if at all, in most cases) among the enterprises visited.

It would appear that there is stiff competition within the cottage jam industry as some processors heavily guard information on processing techniques, the markets they supply, prices, etc. A number of the processors interviewed were concentrated around Nyanga and Juliasdale, where deciduous fruit production dominates. Numerous farms in the area appear to resort to processing second and third grade fruit into jam, as a way of mitigating losses. For those small-scale processors that rely on purchasing all or part of their fruit requirements for processing, competition for raw material is stiff as farmers prefer to sell to large corporate buyers such as Cairns Foods Ltd, which make bulk purchases. The recent gazetting of sugar prices—another

[26] Capital constraints have meant they cannot invest in equipment that would package jam in larger industrial sized containers. Some of their current customers have expressed interest in this.

critical input in jam making, resulted in a sugar shortage and therefore heavy competition for the input.

Informal jam processors in the Nyanga and Juliasdale region rely on similar marketing channels, largely making sales through roadside kiosks, tourist outlets etc. Some processors have responded by producing novel jam products or selling specific varieties of fruit jam during the off-season. Access to cold storage facilities is critical to such marketing strategies.

Cottage jam enterprises not only face stiff competition from neighbouring jam processors however, but also from local peanut butter and honey processors. When household purchasing power declines, peanut butter and honey may act as substitutes to jam, as they are more versatile products that can be used in the preparation of various foodstuffs e.g. cooking relish, porridge etc.

Although the majority of fruit processing enterprises were involved in domestic value-added processing for in-country trade, there was one or two examples of cross-border (Murehwa Food Processors' Association) or export trade (Murehwa Food Processors' Association, Bondana Pvt Ltd). Given that fruit drying is a recent business venture among the processors interviewed, it was difficult to ascertain whether or not any growth has taken place.

9. Constraints and coping strategies

Numerous constraints were identified during the case study interviews with 26 processors. The following section discusses the main constraints identified in turn.

9.1 Current socio-political situation

> *"Zimbabwe's agricultural sector is feeling the effect of the country's serious economic and political problems. The country is suffering from severe fuel and electricity shortages, high inflation and unemployment (both above 50 percent), an acute shortage of foreign exchange, high agriculture production costs, and a sharp decline in tourism revenue"* (USDA-FAS, 2000).

Recent socio-political tensions in Zimbabwe have had a significant impact upon the local horticultural sector—both in terms of production and agro-food processing. A few of the producer/processors interviewed (mainly those on small-scale commercial farms) suggested that they had seen business decline over the last 18 months (during 2000-2001). The volatility of the national economy has made it difficult for some horticultural producers and processors to plan ahead. Many are reluctant to invest given that production costs are volatile. One producer/processor pointed out that he had actually ceased processing dried fruits during 1999, and did not see his fruit drying business resuming until the national economy had improved. Even the cottage jam industry has not escaped the recent downturn in the economy. Generally the 2001 market for jam was deflated. For some enterprises, the depressed tourism sector in particular has affected sales.

Statistics released by the central Reserve Bank of Zimbabwe (RBZ) suggest that tourism receipts declined by more than 42% during the first six months of 2001, compared to the corresponding period in 2000—i.e. from US$75.8 million (4.17 billion Zimbabwean dollars) to US$43.4 (2.38 billion Zimbabwean dollars). Total earnings for the year 2000 were US$124.7 million, compared to US$201.6 million in 1999, a decline of 38% (The Financial Gazette, 7 February 2002). Government statistics show that in the first six months of 2000, the number of 'overseas visitors' to Zimbabwe plunged 35%, to 253,551 compared with 390,665 visitors in the same period in 1999 (New York Times, November 2000). This has affected business for some of the processors interviewed—particularly those located in the tourist areas of Nyanga and the Eastern Highlands, who rely on sales to passing visitors and tourists.

However, it is not only the decline in the number of overseas visitors that has affected sales in this area. Halfway House suggested that their customer base is mainly made up of people from Harare, who are on their way to self-catering holiday lodges to Nyanga, during weekends and school holidays for example. Erratic fuel supplies (and the equally damaging increase in fuel prices[27]) have resulted in a drastic reduction in traffic volumes along the Harare-Mutare highway.

[27] On 12 June 2001, petrol prices went up by 74%, diesel by more than 67% and paraffin—which is used by most of the population for cooking and heating, increased by 69%. Zimbabwe, which has experienced a fuel shortage since December 1999, saw fuel prices triple in the 18 month period preceding June 2001 (AFP, June 2001).

However, Halfway House is not the only enterprise to have suffered. Roadside kiosk sales of jam, which account for approximately half of total volumes sold from Froggy Farm for example, have been reduced to next to nothing. Though locals may purchase jam at farm kiosks from time to time, the main customers at farm kiosks are visitors to the area.

Furthermore, various shops and outlets associated with the tourist industry have closed down—not only in Nyanga and surrounding areas, but also in Harare. This has proved problematic for some cottage enterprises, which previously made significant sales through sculptors' workshops and galleries in Harare for example.

All in all, the majority of processors suggested that sales of jam products in particular had declined. One processor noted that sales with one client in Mutare had declined from a batch of 50 jars of jam at a time to a batch of eight. Some suggested that sales had dropped so dramatically that the situation was 'life-threatening', i.e. it questioned the sustainability of their enterprise. The potential of adopting jam processing as an alternative to marketing fresh fruit was eroding for some processors, given the downturn in the economy. One processor admitted that they anticipated selling most of their second and third grade fruits to Cairns Foods Ltd during the 2001/2 harvest—instead of processing it themselves.

9.1.1 Declining purchasing power

High inflation, growing unemployment, declining real wages and diminishing household purchasing power[28] have taken their toll on food demand. Zimbabwe has witnessed a steep rise in the price of basic commodities. The reality is that staple foods such as maize meal, bread and milk have gone beyond the reach of many families. During 2001, the cost of bread more than doubled. The price of a standard loaf of white bread rose to 50 Zimbabwean dollars (US $0.90) in August 2001, up from 23 Zimbabwean dollars (US $0.42) in January of the same year (IRIN, Johannesburg, 7 August 2001). The price of bread went up by almost 64% between January 2000 and April 2001 (Table 29).

All this has had a spiralling effect on local demand for processed food products such as jam. Jam sales are closely linked to sales of bread. One processor suggested that Cairns Foods Ltd had experienced a freeze on jam sales the moment bread prices started going up. Given the harsh economic situation, households have tightened their belts, prioritising on the purchase of basic foodstuffs and cutting back on luxuries such as jam. One processor in Chipinge suggested that households are consuming more sweet potatoes and *madhumbe* for example, instead of bread and jam. Another processor—this time in Nyanga, noted that some of her customers are now requesting her products in smaller quantities, indicating a possible reduction in jam consumption.

[28] The yearly Consumer Price Index (CPI) has been increasing significantly since the beginning of 2001 and reached an all-time peak of 97.9% in October of that year. Consequently, the purchasing power of urban households in particular (given that they rely on purchasing more foods than rural households) was further eroded. The price of food items went up by 85%.

Table 29. Percentage increases in price of basic commodities during Jan 2000-Apr 2001

Commodity	Quantity	Price ($) this week	Price ($) last week	Change since last week (%)	Change since Jan 2000 (%)
Sugar	1kg	27.60	27.60	Nil	75.6
Cooking Oil	750 ml	57.20	55.90	2.3	28.1
Mealie-meal	10 kg	169.5	185.00	15.5	47.7
Bread	Loaf	22.30	22.30	Nil	63.6
Meat	1kg	114.8	114.8	Nil	37.1
Tomatoes	1kg	46.20	46.20	Nil	259.6
Tea Leaves	250g	42.30	42.30	Nil	63.4
Margarine	1kg	76.95	76.95	Nil	47.1
Milk	500 ml	18.10	18.10	Nil	58.3
Vegetables	Bundle (Rape)	15.60	15.60	Nil	110.8
Vegetables	Head (Cabbage)	27.80	27.80	Nil	135.8
Bath Soap	Tablet	30.55	30.55	Nil	75.2
Washing Soap	Bar	36.15	36.15	Nil	43.6
Petroleum Jelly	200g	33.20	33.20	Nil	135

Source: The Financial Gazette, 12 April 2001.

9.1.2 The rising cost of inputs

Early in 1999, the Government of Zimbabwe (GOZ) imposed informal price controls on the domestic price of sugar. These were finally abandoned in June 1999 following an admission that they were unworkable. As a result, the domestic price of sugar increased significantly. Table 29 suggests that the price of sugar increased by 76% during a 15-month period between January 2000 and April 2001.[29] For small-scale processors, the increasing price of sugar—a major raw material in jam processing, became difficult to meet. The cost of processing jam—highly responsive to changes in the price of sugar, rose substantially during the first half of 2001 (RVJCC).[30]

However, in October 2001 the Government once again instituted price controls on certain consumer goods, so that they would remain stable. As a result, the November 2001 Consumer Council of Zimbabwe (CCZ) food basket remained at Z$22,875 from October. Since the introduction of controls in October 2001, Harare has experienced erratic supplies and a general shortage of some controlled products including basic food commodities such as sugar, cooking oil, margarine, salt and fresh milk (Famine Early Warning Systems Network (FEWSNET) and Agritex, December 14, 2001). In the run up to the festive season for example, the Daily news reported that major supermarkets such as OK (First Street) and Food Chain Group (Harare Street and Jarzin Angwa Street branches), did not have white nor brown sugar on their shelves. A notice in FCG supermarket to customers read: "You are only allowed to take 1 x 2kg [of] sugar per person", but there was no sugar in the supermarket (Daily News, 30 November 2001). December more or less coincides with the peak of the deciduous fruit harvest in Nyanga, when second and third grade fruit receives a very poor price on the market, and producers are keen to process to

[29] The prices were based on those recorded during visits by reporters to three major food outlets in Harare (The Financial Gazette, 4 April 2001).

[30] Production costs have also increased due to increasing labour costs and the price of fruit etc. (Magute Spring Project).

avoid losses. The short supply of sugar—a major raw material in jam making, thus affected the processing activities of numerous enterprises. Christmas is usually a time when sales of jam increase, as low-income households are more likely to purchase jam during the festive season. However, a number of processors suggested that sales were considerably down on previous years.

Other input constraints mentioned included preservatives such as pectin that had become very expensive on the market (Sr. Gloria, Halfway House). At present, there is no local producer of pectin in Zimbabwe. Some processors rely on imports, which prove expensive given current exchange rates and inflation. In Zimbabwe, ready sources of pectin include peels of lemons, oranges and gourds, which some small-scale processors use.

The escalating cost of electricity and fuel and the need to raise workers' wages by 75%, which took effect in September 2001, proved difficult for some processors. Rain Valley Orchards suggested that this was likely to affect the expansion of their business.

Electricity charges have been rising constantly (RVJCC). Golden Harvest Pvt Ltd uses gas stoves to make jam, but of late the price of gas has gone up to a level that might affect the project. A 14kg gas tank now costs Z$2500.

9.2 Production-related constraints

For some small-scale producer/processors, particularly those in communal areas, the major constraint faced is limited water availability. This means that vegetable production is restricted, and limited volumes are available for processing. Mrs Chanetsa for example, suggested that at times market demand for processed leafy vegetables outweighs her processing capacity. Access to water however, is not the only constraint to production. Access to land is a further constraint that has forced some producer/processors to sow vegetables in riverbeds—an illegal practice. For one processor, sowing vegetables on riverbeds was her main source of raw material during the dry season.

Pest control is a further constraint to production. Some orchards experience attacks of snout bugs and aphids for example, which have strongly affected output. Although farmers have tried to control pests with the use of insecticides, the cost of such inputs is so high that some have had to resort to more rustic methods, e.g. the use of detergents to mitigate the effect of pests. Wild animals (e.g. baboons) and birds also cause a lot of damage to orchards. One processor suggested that fruit losses on her farm could be as high as 50% due to such problems. Another processor suggested that they harvest their fruit a little early to avoid bird damage (Golden Harvest Pvt Ltd).

Some small-scale producer/processors face limitations in terms of having very small orchards and therefore limited supplies of fruit. The production of small volumes of fruit makes it difficult to produce jam on a consistent basis. Although some processors (e.g. Sr. Gloria) are aware that they may improve their marketing strategy by diversifying into more exotic jam products, such as plum and apricot for example, they grow small quantities of such fruit.

Various processors are reluctant to purchase fresh fruit due to what they perceive as the current high cost of fruit on the market. It is not only the cost of fruit that is problematic. For those processors that rely entirely on the purchase of fruit (e.g. Ms. Mutanda), sourcing raw material can be a constraint, as there is often stiff competition from corporate buyers such as Cairns. Such buyers tend to be receive preferential treatment from local orchards, as they are able to place bulk orders for second and third grade fruit for example.

9.3 Cost and availability of packaging materials

Numerous processors suggested that a major constraint they faced was accessing packaging materials. This was particularly the case among the cottage jam enterprises, which faced major problems accessing glass jars and furthermore appropriate lids for them (Mr Majuta, Mrs Masaya, Sr Gloria). Problems sourcing packaging materials were seen as a reflection of the current economic climate in Zimbabwe. In December 2000, Zimbabwe Glass Industry Limited (a subsidiary of the Industrial Development Corporation) suspended production because of viability problems associated with the country's economic crisis (The Financial Gazette, 3 January 2001). Although the Gweru-based firm—the country's leading glass container manufacturer, resumed production in June 2001, it did so on a limited scale (The Daily News, 7 July 2001). Glass jars were removed from the production line leaving jam processors at odds accessing packaging materials for their products. Local suppliers such as 'Farm and City' supermarkets (with outlets in Nyanga and Mutare) and Circle Pak were therefore unable to stock glass jars.

The shortage of glass jars proved detrimental for some enterprises. Stores put limitations on the number a customer could purchase at once. Some processors suggested that when packaging materials were available and not rationed, then they were simple unaffordable, as the price had gone up so much. One group of processors had resorted to using recycled glass jars. However, the majority highlighted food safety and hygiene concerns using these, suggesting that old re-cycled jars were more likely to crack or break during heat sterilisation (Mr and Mrs Matasva). Some enterprises (e.g. Mrs Swires and Halfway House) had resorted to substituting glass jars with plastic peanut butter containers, even though they were aware these were unsuitable for jam. One or two processors had even resorted to using recycled peanut butter containers, which they purchased locally. Although cheaper than glass, plastic jars were deemed inappropriate given the difficulties with sterilisation. Another processor had contemplated experimenting with the use of plastic lunch box packaging, which peanut butter processors have already begun to use to overcome packaging constraints.

Even when glass jars were available however, processors had difficulty sourcing appropriate lids for them, as the threading on lids tended to vary with design. Rain Valley Orchards had previously used metal lids, which had a seal underneath the cap, but these were now only available from South Africa and therefore proved expensive. Another processor had previously sourced lids from Metalbox in Harare, but again these were no longer available. One processor had managed to source ISO accredited 'Rotate on Twist' (ROT) lids, but questioned whether they would withstand the build up of pressure from hot jam in the containers, in order to seal the lid.

Not only was it difficult to access packaging materials however, but processors also faced the added difficulty that they were sometimes required to order packaging materials in bulk. The

Zimbabwe Glass Industry Ltd for example, required customers to make minimum orders of 500 glass jars. However, such requests were not exclusive to glass packaging. RVJCC previously relied on making bulk orders for metal cans with a company in Harare. They currently get smaller batches of cans from Cairns Foods Ltd in Mutare. Cairns Foods Ltd sources the cans from Metal Box in Harare and sells them in smaller batches to RVJCC as a goodwill gesture. Stipulations on minimum orders of packaging materials or labels for example, are not conducive to small-scale enterprises. For cottage or jam enterprises such as Mrs Masaya's, and even the RVJCC, it means tying up a significant share of the enterprise's working capital. Like glassware, metal cans have also increased significantly in price during the last year. In January 2001, RVJCC paid 30,000 Zimbabwean dollars per batch of 2400 cans—by August 2001 the same batch cost 50,000 Zimbabwean dollars.

The tremendous constraints that processors faced accessing appropriate packaging materials had severe implications upon their activities. One processor (Ms Mutanda) pointed out that she had been unable to supply jam for almost a four-month period during 2001 due to packaging constraints. The RVJCC suggested that such problems had constrained their growth as it meant they could not take on new orders. All in all, nine of the jam processors interviewed pointed out that they had experienced substantial problems accessing packaging materials during 2001.

9.4 Equipment and installations

For numerous cottage enterprises visited, lack of appropriate processing equipment and installations or premises from which to work, posed a significant constraint. For example, one group of women relied on processing jam in a traditional hut, which was owned by one of the women in the group. Most group members felt that the conditions were unsuitable for jam making.

A number of jam making enterprises suggested they lacked appropriate equipment for jam processing. Most are currently using everyday household cooking utensils and equipment to make jam. For example Froggy Farm suggested that ordinary earthenware cooking pots were unsuitable for jam making, as the jam tended to burn. Furthermore, as some processors cooked jam over an open fire, it was difficult to regulate the heat, often resulting in lower quality jam.

A further constraint to such practices however, is that processors tend to have a limited capacity to make jam. For example, the Rusitu Valley Jam Canners Co-op, has only two boilers at their disposal in which to cook the jam. This limits the amount of fruit that can be processed at any one time, even though there is an abundance of fruit in the area. The co-op also lacks simple but appropriate equipment that could facilitate a quicker and more efficient execution of some activities, e.g. fruit preparation. Currently all the fruit is prepared (i.e. graded, peeled and cut) by hand, a process that is very time consuming.

Even where more capital equipment was evidenced, the co-op also faced constraints. For example, the co-op experienced difficulties sealing the cans. One observed that a few cans in their store were not properly sealed and jam could be seen to be leaking from the container. A further constraint regarding their canning equipment, was the fact that it was designed to only seal small cans (e.g. 450g and 900g). The co-op had a batch of 2kg cans in their possession but

their current equipment was not designed to seal such large cans. Some institutional customers, such as boarding schools had expressed interest in buyer larger cans of jam, but RVJCC was unable to respond to such customer requirements.

Among vegetable processors, dependence on traditional drying techniques for drying vegetables posed problems. The product was susceptible to being blown away by the wind. More problematic however, was potential contamination from animals and other foreign bodies as the product was left in the open air to dry.

9.5 Climatic constraints

Since vegetable production and processing is during the rainy season, if the rains are continuous sun-drying becomes difficult. The worst case scenario is when, because of bad weather, the vegetables being processed fail to dry and actually rot. The processor can therefore end up with losses due to decay and mould formation.

Weather conditions played a significant constraint for processors in Chipinge. The area, which has traditionally been dubbed 'New England' is prone to drizzles and continuous rains for almost three-quarters of the normal agricultural season. Drying time depends a lot on the weather, which can be a few hours if the weather is hot or some days if weather conditions are poor. To overcome the problem of bad weather, Mrs Gabaza sometimes dries her products in a wood-powered oven.

In the case of the Murehwa Food Processors' Association, processors suggested that most products tended to dry in about 36 hours depending on the thickness of the pieces of fruit and weather conditions. In the event that the product fails to dry during the day it is left in the dryer overnight. In good weather, three drying cycles can be achieved in a week. However, in bad weather high losses are experienced as the product rots in the dryers. MFPA is unable to take full advantage of the abundance of fruits and vegetables in the region as their drying capacity is limited.

9.6 Access to cold storage

The lack of storage facilities, particularly cold storage can act as a major constraint to processors. Given that Ms. Mutanda for example does not have any means of storing fruit (e.g. cold storage or freezers), she has to make jam from fruit that is in season at a particular time. Although she can store the jam for a period without refrigeration, her marketing strategies are not so flexible as those processors that have freezer capacity for example.

Even though Rain Valley Orchards has access to cold rooms, the processor suggested that most of the fruits do not store long except apple, which can store up to six months provided the fruit is picked at the right stage of ripeness.

Although Golden Harvest Pvt Ltd does have access to some freezer space, there is not adequate storage capacity in the freezers for substantial volumes of fruit. Therefore jam is usually only made from the fruit in season during a particular period of time.

9.7 Labour

A further constraint identified by a few processors, was a limited household labour supply. This was more obvious among producers like Mrs Murerwa, who relied on a bucket watering system for example to irrigate green leafy vegetables. Mrs Murerwa who processes dried vegetables suggested she experienced labour constraints to her enterprise. Given that her family also runs a small shop at Wengezi junction (where she sells her dried vegetables), she finds it difficult to find time to process the vegetables.

Jam processing is also a labour intensive operation particularly during the preparation of fruit, which is largely done manually (Sr Gloria, RVJCC).

In the case of the Rusitu Valley Jam Canners Co-op, one of the main problems which the co-op faces is that it is unable to attract young people within the community to become members of the co-op. They suggest that school leavers for example, do not see the jam making enterprise as a viable project. Once they finish school they tend to migrate to urban areas in search of work. Members suggests that this poses a serious threat to the sustainability of the enterprise, leaving the future of the co-op hanging in the balance.

9.8 Marketing constraints

The Magute Spring Project suggested that limited market demand for their lemon marmalade hindered their processing activities. They pointed out that the local rural market, on which they rely for the majority of their sales, is both small and unreliable. They suggested that there was very little effective demand for their product locally, and what demand did exist tended to be largely seasonal. It is worth noting however, that limited effort has been made by the project to broaden their current market boundaries. For example, no effort has been made to market products through local church groups, etc.

Numerous vegetable processors (Mr and Mrs Matasva, Mrs Mabota, Mrs Baiwa) suggested that one of the major constraints to vegetable processing was the lack of a reliable and an effective market for dried vegetables. By nature, rural markets are largely seasonal (during the agricultural off-season) and suffer from low demand given the dominance of low-income consumers, which constrains the quantities that can be processed. Furthermore, Mrs Mabota pointed out, most potential clients also process stocks of dried leafy vegetables themselves.

Some jam processors suggested that penetrating some markets could be difficult. For example, they suggest that some hotels prefer to buy products from farmers with whom they have links. Various processors pointed out that it is sometimes difficult to penetrate other markets within different social networks.

Various processors admitted that poor labeling and packaging may potentially limit their market capacity. Some had taken measures to design home-made labels for their products as a way of overcoming this problem.

Some processors suggested that a further problem in terms of marketing, is that roadside kiosks and shops (which they pay on a commission basis to market their products) are slow to inform them when stocks of their products run low. Some had to make numerous phone calls in order to pursue potential orders of jam. However, the latter point may also reflect the decline in demand for products such as jam over the last 18 months.

Petrol shortages have also made marketing difficult, particularly if processors have to transport their product to clients, who may be scattered over a significantly large area. Petrol price increases have threatened the viability of the enterprise for some, in a context where the quantities marketed do not offset the fuel costs involved (e.g. Mrs Masaya, Mrs Bauer).

9.8.1 Transport

Rural markets also serve sparse populations, so marketing is at times hampered by poor transport systems and infrastructure.

Transport problems, particularly in summer, proved to be a constraint for some processors. During a visit with one processor, we learned that the processor usually transported produce to a bus terminus 15 km away by ox-drawn cart. She would subsequently travel to Nyanga by bus to sell her products. In Nyanga, it could take Mrs Chodokohori up to two days to sell all her products while putting up in the market to protect her goods.

9.9 Consumer information

Quite a number of processors interviewed had little market orientation. In fact, one often had the impression that some of the processors had started up their 'business' without actually considering where they were going to sell their products. This was particularly true for some of the more recent cottage jam enterprises that had been set up. Furthermore, processors had little knowledge of consumer preferences regarding jam varieties, and consumer requirements regarding packaging for example. Given the poor marketing skills and experience of a substantial number of processors interviewed, it proves difficult for them to sell their products.

9.10 Lack of training

Only eight of the processors interviewed had received some degree of training in food processing techniques. Some processors suggested that lack of formal training meant that they did not have a lot of confidence marketing their product, even though they made good quality jam. For example, the Community of the Holy Transfiguration in Manicaland Province suggested that the lack of training acted as a barrier against increased production and the possibility of marketing jam which was excess to household consumption requirements.

Although a number of processors had received training in processing techniques, few had received any guidance or training in product marketing. Other training needs identified by the processors interviewed included training in entrepreneurial skills, project management, book-keeping, quality control and shelf life, technical knowledge, alternative processing methods (e.g. drying vegetables) and product development. For example, various processors suggested that they had access to various local fruits that could be processed into jam. Examples include figs *(maonde), nhunguru*, marula *(mapfura)* and mulberries. However, they were unfamiliar with or lacked the knowledge to process these fruit varieties.

Some processors have tried to overcome such constraints. For example, the Rusitu Valley Jam Canners Co-op have tried to do some informal networking in order to gain better knowledge of jam processing and canning jam products. Co-op members have visited competitors and sought technical advice from formal processors, on how to improve their jam making techniques and learn more about jam making generally.

9.11 Legal requirements

9.11.1 Enterprise registration

Although various jam processors were registered fruit producers, the jam making aspect of their multifaceted business was often not registered. The main reason for this was that many considered jam processing (for example) to be a part-time activity (or cottage industry) and therefore questioned the costs of registering the activity and indeed the benefits of doing so. Some seemed to operate quite well without registration and were more or less happy with the level of demand for their products (prior to the year 2000).

9.11.2 Food safety and SAZ accreditation

For many small-scale processors, the cost of meeting health regulations is difficult, as they are based on large-scale formal enterprises, e.g. the provision of toilet facilities for employees, the availability of clothing and sterile equipment, etc. The majority of small-scale processors were unable to cover the costs of meeting such requirements. For example, the facility used by the Murehwa Food Processors' Association cost Z$400,000 to set up (FPSB, Personal communication, October 2000).

Meeting the local food standard was also deemed to be costly. A standard analysis with the Standards Association of Zimbabwe, was suggested to cost approximately Z$4000 during 2001, which was beyond the ability of many of the processors interviewed.

9.12 Accessing working capital

Various processors interviewed suggested they faced cash constraints with respect to their enterprise. Some suggested they had a poor cash flow and/or bad debts from customers.

The lack of capital for further investment in the enterprise was also an issue brought up by some processors. For example, one client had expressed interest in RVJCC supplying them with 2kg containers of jam. While the interest was welcomed by the co-op, they were unable to react. Whilst a 2kg canning machine was estimated to cost approximately Z$2,000 in 1998, galloping inflation was such that RVJCC suggested it cost in the region of Z$20,000-30,000 at the end of 2001. Considering the capital constraints faced by the co-op, they were unable to invest in such equipment and hence take on new customers.

RVJCC is not alone however, in facing problems with working capital. Members of the Magute Spring Project suggested they faced severe difficulties trying to raise the capital required to purchase packaging material for their product. This subsequently constrained them in the volumes of fruit they could process at a particular point in time.

9.13 Classification of constraints

The constraints were classified into:

- Technical
- Financial
- Infrastructural
- Institutional
- Social
- Informational

Table 30 which follows summarises the types of constraints experienced by the 26 processors interviewed and highlights some of the coping strategies adopted by processors to overcome these constraints.

Table 30. Constraints faced by producer/processors and coping strategies adopted

CONSTRAINTS FACED	COPING STRATEGIES ADOPTED (IF ANY)	OUTCOME
TECHNICAL		
Geophysical constraints to horticultural production.	• Use of river beds to overcome limited land resources and lack of irrigation facilities.	Negative environmental affect upon river courses.
Seasonality of produce restricts processing capacity.	• Plant different crop varieties that have different maturing dates to extend harvesting season. • Source fruit from various locations as fruit may mature earlier/later than in local area (e.g. MFPA and mango). • Freeze fruit juice/pulp or cooked fruit to allow processing during off-season.	Extended processing season.
Persistently wet weather is not conducive to vegetable drying.	• Have somebody nearby to move vegetables if it is about to rain.	Exacerbates labour constraints on the farm.
Increased pest problems and rising cost of insecticides.	• Harvest fruit earlier in season to avoid heightened losses through pests. • Use cheaper alternatives to insecticides, e.g. detergents to mitigate the effects of pests.	Reduce losses. Potential food safety concerns.
Limited production of particular raw material.	• Diversify range of crops for processing. • Purchase additional raw material from neighbours (RVJCC). • Invite community to donate surplus raw material (Bonda Mission).	Improved access to raw material, with increased range of raw materials to be processed.
FINANCIAL		
Lack of access to credit.		
Lack of access to working capital.		
Lack of access to essential inputs, whether through shortage or cost of inputs (sugar, packaging etc.).	• Bulk purchase of inputs to overcome short-term supply problems (RVJCC).	Enables more consistent supply of processed products to clients.
	• Source locally available alternatives, e.g. substitution of artificial pectin with its natural form derived from lemons (Magute Spring Project).	Reduced production bottlenecks and use of cheaper alternatives.
	• Limit processing activity to periods when all inputs are available (Magute Spring Project).	Diminished processing capability.
	• Use cheaper packaging alternatives or different grades of packaging for different markets. Use higher-grade packaging for markets offering best returns (MFPA).	Better margins are likely to be obtained by reducing cost of packaging.
Closure of companies supplying packaging materials (e.g. glass packaging and lids).	• Order packaging materials in bulk when available (Froggy Farm).	Overcome inconsistent supplies of packaging material.
	• Recycle packaging materials (glass and plastic).	Positive environmental impact through recycling.
	• Use alternative packaging materials where possible (e.g. plastic containers instead of glass).	Plastic packaging is cheaper and hence improves price competitiveness of product.
	• Investigate use of bulk packaging options for institutional consumers e.g. schools (RVJCC).	Bulk packaging is cheaper and may allow processor better margins or offer more competitive product.
	• Sell products unpackaged through door to door sales.	Eliminates need for packaging and reduces costs.

Table 30. Constraints faced by producer/processors and coping strategies adopted (Continued)

CONSTRAINTS FACED	COPING STRATEGIES ADOPTED (IF ANY)	OUTCOME
INFRASTRUCTURAL		
Poor road networks and public transportation facilities.		
Poor communication networks which hinders marketing.	• Build up wider social networks to enable greater market opportunities, e.g. through work colleagues, church groups, women's clubs, hotels, farm kiosks etc (Mrs Masaya).	
Lack of (appropriate) facilities for processing operation.	• Conversion of available facilities (within the home) to meet requirements as best as possible.	Reduce start-up costs.
Lack of appropriate technology makes it difficult to process large volumes and maintain consistent standards (e.g. jam).	• Use sadza boiler to increase volumes. • Measure all ingredients, time cooking period etc, to try and maintain consistency of product. • Where available, make use of service facilities (Musami).	Larger volumes processed of more consistent standard. Service facilities entail smaller costs on the part of the processor.
Maintenance of equipment and accessing spare parts.	• Adopt equipment which needs limited spares and maintenance.	Maintenance and repair costs will be kept at a minimum.
INSTITUTIONAL		
Lack of training needs (e.g. processing techniques for particular products (including indigenous products), packaging and marketing).	• Magute Spring Project received training form SAFIRE.	
Lack of processing and marketing support services.	• Nyahode District Union (member of OCCZIM) represents RVJCC on provincial and national bodies of the co-operative movement and also liases with government departments and NGOs. • MFPA receives support from Ranche House College regarding marketing. • Establish good relations with other processors (large- or small-scale). Take advantage of potential benefits of co-operation, linkages etc. (RVJCC).	
SOCIAL		
Problems encountered when attempts are made to sell to particular ethnic groups.	• Build up wider personal social networks.	
Declining demand for particular products.	• Diversify target market, e.g. out of reliance on tourists • Makes sales in tourism sectors outside Zimbabwe (e.g. Victoria falls in Zambia). • Package product in smaller volumes to cater for declining purchasing power. • Make selection of products, including traditional and exotic products so as to capture as wide a market as possible (Mrs Masaya). • Diversify into other products that may allow greater sales, e.g. RVJCC investigating the possibility of canning fruit juice.	Improve sales.
INFORMATIONAL		
Access to marketing channels.	• Make most of personal networks.	
Lack of knowledge of consumer requirements.	• Give products as gifts to family members and friends and seek advice on quality and taste of the product.	
Consumer taste and preferences. Mass market has not been exposed to a particular product (e.g. dried fruits).	• Look to export markets where product is more popular (MFPA). • Set aside time to introduce product to market.	
Lack of knowledge of product specifications.	• Source (informal) training from a reputable source (Mr Rwere).	Increased confidence in product quality.

10. Summary of findings

Interviews were conducted with a sample of 26 processors in two provinces in Zimbabwe. Seven case studies were conducted in Mashonaland East Province and 19 were compiled in Manicaland Province. Some processors were involved in more than one activity. Of the sample identified, 15 processors made jam/jelly/marmalade, five were involved in dried fruit production (although two of these processors had ceased processing fruit some months before the research was conducted) and 14 processors produced dried vegetables.

The majority of processors visited in Mashonaland East Province were involved in drying vegetables. Vegetable drying techniques have largely been passed down from mothers to daughters. The activity is primarily adopted as a food security measure at the household level, with small surpluses being sold to raise income as needed, or when demand for the product increases as happens during the off-season. Jam processing is an activity mainly confined to Manicaland province and has been adopted by the majority of processors as an income generating activity. Fruit drying is being practised in both provinces but on a very limited scale. Again this is largely a market-oriented activity.

All in all, the findings suggested that such activities—dried fruit production, processing dried vegetables and jam processing had the potential to provide small-scale producers with improved returns to horticultural production. Given the irregularity of the activity and the seasonal nature of sales for the majority of processors visited, it was difficult to make income comparisons across processors (for similar products), as the necessary data was unavailable in many cases.

Women ran most of the enterprises visited. A significant number of enterprises operated on a seasonal basis, given that few had access to appropriate storage facilities to enable processing to take place all year round. This was particularly true of vegetable processors who mainly produced their own raw materials. Markets for dried vegetables were limited largely to the immediate community in which processing took place. Therefore most sales were made direct to consumers via the farm gate or at the local market. Formal enterprises and those enterprises with a strong market focus (e.g. some jam processors) operated throughout the year. Some acquired their raw materials from a variety of sources and sold branded products via formal markets. Dried fruit processors were the only group to have established formal outlets for their product in export markets. One or two jam processors and one vegetable processor did make sales in neighbouring countries but volumes sold through such channels were very small and took place on informal markets. Jam processors in particular processed a diversified range of products, in many cases incorporating exotic varieties of fruit into their products.

Access to packaging material was proving to be a particular constraint for jam processors. There was no evidence to suggest that access to packaging material in any way limited the activities of processors drying fruits and vegetables during 1999-2001.

In terms of jam processing, access to capital equipment does not appear to be a major constraint to production. Most processors used basic kitchen utensils to make jam. For those processors that had become key players in the Nyanga cottage jam industry however, such equipment did hinder their ability to process jam in larger volumes. In terms of fruit and vegetable drying, concerns have been raised over the suitability of available equipment to meet the processors needs. Specifically the solar dryers in use are not ideal for processing in

the rainy season when cloud cover is at its worst but ironically also when fruit is most abundant.

Given the period in which the research was conducted, it is suffice to say that in many cases the constraints being faced by small-scale food processors were at an all time high:

- The impact of escalating inflation and declining incomes on demand for processed food products generally.
- Fall in number of visitors to tourist destinations and therefore lowered sales.
- Fuel shortages and increasing cost of fuel again not only affected sales in tourist areas (as there were fewer visitors), but also made marketing of products to outlying regions more difficult.
- Negative effect of closure of various industries on input supply.

During the series of case studies, processors identified knowledge gaps in the following areas in particular:

- Processing skills to ensure a safe product and consistent product quality.
- Costing of processed products.
- Marketing information.
- Knowledge of consumer requirements.

In terms of the future role of government and non-governmental bodies in this sector, processors identified the following areas for attention:

- Targeting intervention in the areas of training, and technical and financial support for small-scale food processing enterprises.
- The need to ensure public health.
- Setting standards.

In terms of the sustainability of their small-scale food processing activities, processors identified the following concerns:

- Issue of raw material supply.
- Issue of supply of other inputs.
- Capacity to improve standards to match the requirements of more demanding markets.
- Changes in the markets and how these may influence enterprise sustainability.

In terms of their future activities, various processors were aware of the need to diversify into other activities/products:

- Realisation that the current product range has a limited market and hence the need to diversify.
- Identification of other end products (e.g. juices) for which there is demand and which can be developed with minimum capitalisation.
- Realisation of availability of other (indigenous) fruit varieties in local area and the potential to exploit them, even more so given that some processors have difficulty acquiring raw materials (e.g. exotic varieties), and the seasonal nature of fruit and vegetable processing generally.

References

AFP (June 13, 2001). Zimbabwe hikes fuel prices by up to 80%. http://www.mg.co.za/mg/za/archive/2001jun/13jun-business.html

Chakwea, N.B. (1996). Financing Small-Scale Agro-Industry. Paper presented at the "Small-Scale Decentralised Agro-Industry Seminar", Harare.

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

The Daily News. (30 November 2001). Shortage of sugar, soap, oil, hits Harare shops. http://www.dailynews.co.zw/daily/2001/November/November30/3800.html

The Daily News. (7 July 2001). Zimglass retrenches 110 workers. http://www.dailynews.co.zw/daily/2001/July/July7/12080.html

Daniels, L. (1994). Changes in 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, 2-21.

Famine Early Warning Systems Network (FEWSNET) and Agritex. (14 December 2001). Food Security Monthly Update.

The Financial Gazette. (12 April 2001). FINGAZ food price monitor. http://www.fingaz.co.zw/2001/April/April12/121.shtml

The Financial Gazette. (3 January 2001). Zimglass to remain closed. http://www.fingaz.co.zw/2001/January/January 3/223.shtml

The Financial Gazette. (7 February 2002). Tourism receipts plunge 42%. http://www.fingaz.co.zw/fingaz/2002/February/February7/444.shtml

Food and Agriculture Organisation (FAO). (1997). Guidelines for small-scale fruit and vegetable processors. Rome, Italy: FAO.

IRIN, JOHANNESBURG. (7 Aug, 2001). Zimbabwe: Bread prices double since January http://www.africaonline.com/site/Articles/1,3,18488.jsp

Jaffee, S. (1993). Exporting high-value food commodities: Success stories from developing countries. Washington D.C.: World Bank.

Jones, S. (1996). Food markets in developing countries: What do we know? Working Paper No. 8, Food Studies Group/International Development Centre, University of Oxford.

Maboyi, B. (1999). Rusitu Valley Jam Canners Co-operative: Options study. Conducted for Austrian Service for Development Co-operation (OED).

Machete. C. L (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. In: Development Southern Africa, 14 (3) 377-394.

McPherson, M. (1991). Micro and small-scale enterprises in Zimbabwe: Results of a country-wide survey. GEMINI Technical Report 25.

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, M. (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.

Mugova, A. (1996). The policy environment for the creation and growth of small-scale decentralised agro-processing industries. Paper presented at the "Small-Scale Decentralised Agro-Industry Seminar", Harare.

New York Times (November 12, 2000). Zimbabwe's troubles include drop in tourism. http://www.mdczimbabwe.com/archivemat/other/econ/nytimes001112txt.htm

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

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).

Sandels, A. (1989). The potential for food processing projects in the rural areas of Zimbabwe. Harare: ITDG.

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: Literature review (General). The University of Reading, UK.

Soetan, F. (1997). Entrepreneurship and Nigerian women: Is there any meeting point? Small Enterprise Development, 8 (1).

Standards Association of Zimbabwe (1997) SAZS 126: Zimbabwe standard specification for food hygiene, Part 1: Manufacturing. Harare: Standards Association of Zimbabwe
Sustainable Development Services. (2000). Nyahode District Union: Options study for service improvement. Harare: Sustainable Development Services.

Troparg. (1997). Manufacturing sector study: Foodstuffs. Harare: Troparg Consultancy Services.

USAID. (1998). Potential for small-scale food processing in Zimbabwe. Harare: USAID.

United States Department of Agriculture, Foreign Agricultural Service (USDA-FAS). (August 2000). Agricultural Situation in Zimbabwe
http://www.fas.usda.gov/pecad2/highlights/2000/08/zim824.htm

van Dijk, M.P. (2000). Developing female entrepreneurs in agro-based micro and small enterprises in Zimbabwe in times of adjustment. The Netherlands: Shaker Publishing BV.

Zimbabwe Export Processing Zones Authority (ZEPZA). (1998). Promotion of integrated rural based export oriented project. Harare: Zimbabwe Export Processing Zones Authority.

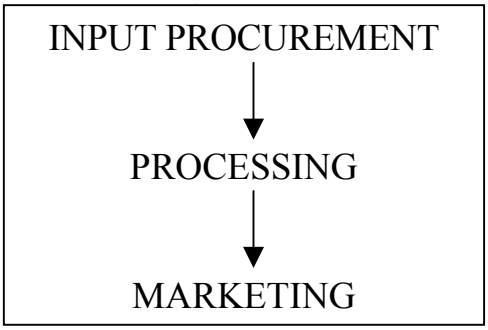
Appendix 1. Producer/Processor Case Study Guide and Checklist

Facilitating the Effective Production and Marketing of Processed Food Products by Small-Scale Producers in Zimbabwe (R7485)

Focus of the case studies:

The case studies will be conducted with processors of horticultural crops. The focus of the series of case studies is on the processing enterprise, whether micro i.e. a household based enterprise, or a small-scale enterprise such as that established by a producer organisation or co-operative. The main issues of concern include the processing function itself; furthermore, the production/procurement of inputs; and finally, information regarding the marketing of the end product(s).

Figure 1. Focus of the case studies



The objective is to consider the constraints which processors (producing or non-producing) face in terms of manufacturing processed fruit and vegetable products and furthermore accessing a potential market for these processed products. Such constraints may be technical, financial, infrastructural, institutional, social, informational etc. Affecting such constraints can be access factors that can be divided into internal and external access factors.

Choice of case study processors:

In terms of the research there are potentially four types of processors that could be included in the study. It would be interesting to consider case studies from as many different 'types' of processors as possible displayed in the following grid.

Figure 2. The processors

	Producer/Processor	Non-producer/Processor
Received training in processing techniques	1	3
Not received training in processing techniques	2	4

Notes to grid:

1. Produces and processes horticultural crops and has received training in processing techniques.
2. Produces and processes horticultural crops but has **NOT** received training in processing techniques.
3. Processes (but does **NOT** produce) horticultural crops and has received training in processing techniques.
4. Processes (but does **NOT** produce) horticultural crops and has **NOT** received training in processing techniques.

Please note that not all sections of the checklist will be relevant to the various 'types' of processors.

The study products:

The series of case studies will focus on the two product categories chosen for further research. These include dried products (i.e. dried fruits and vegetables), and jams/marmalades. A total of 12 case studies will be carried out for each product category where possible.

Key Questions:

Who? Why? What? When? Where? How?

Background data:

Please include any additional information about the area/enterprise that could be of interest. This could include whether or not they have received funding from a donor organisation for example.

Observation and photographic evidence:

See N.B. at end of interview checklist.

1. ENTERPRISE DETAILS

Where possible, please interview the owner of the processing enterprise or the elected representative of the processor organisation or co-operative.

Name of informant (*i.e. independent processor/enterprise owner or representative of processor organisation/co-operative*)

- Gender, age group[31], education, marital status

Location of enterprise

- Administrative district, agro-ecological region
- Name of nearest village/town and distance to it.

If independent processor/enterprise owner

Household information

- Relation of informant to head of household
- Size of household (no. adults/children, male/female)
- Role of other household members in the enterprise (male/female etc.)?

Enterprise information

- No. of full/part-time, seasonal/permanent workers (male/female)
- Is this a formal enterprise (i.e. registered)?
- Do you keep books on the enterprise?

If representative of processor organisation or co-operative

Enterprise information

- Relation of informant to enterprise?
- No. of full/part-time, seasonal/permanent workers (male/female)
- Is this a formal enterprise (i.e. registered)?
- Do you keep books on the enterprise?

Background information ***(Please describe how you/the enterprise got involved in processing)***

- When did you/the enterprise start processing fruits and vegetables?
- How did you get involved in processing horticultural crops?
- Did you receive any outside support (governmental, non-governmental, etc.)?
- What was the objective of the programme of support? Do you believe it fulfilled its objective?

[31] e.g. under 20, 21-30, 31-40, 41-50, 51 plus

2. PROCESSING ACTIVITIES

Which crops do you process? *(Please complete Column 1 on Appendix 1)?*

- What products are produced in each case (***Column 2, Appendix 1***)?
- What by-products are produced in each case? What do you do with them?
- Is there any wastage produced in the process? How do you dispose of the wastage?

Preparation and processing:

- How do you process each crop?
- How do you prepare each crop for processing?
- How long does it take to process each crop (preparation time, cooking time or drying ratio etc.)?
- How often do you process these crops (during the season etc.)?
- How much of each crop do you process (per season, etc.)?
- Do you use any additives, preservatives or colorants (***Please name them in each case***)?

- Did you process any other products in the past that you don't process now? Why do you no longer process them? What constraints did you face?
- Do you intend to develop any other products in the future? If so, what? Do you envisage any problems doing this?

Training in processing techniques:

- Have you (*or another member of the enterprise*) received training in food processing techniques? In what aspects? By whom/which institution? When and where?
- Have you (*or another member of the enterprise*) received training in any other relevant aspect (*e.g. business management, horticultural training if also involved in crop production, other, etc.*)?
- Has it helped the business? How?
- Do you have any previous business experience?

<u>Constraints:</u>

- What problems/constraints do you face in terms of **processing** horticultural crops?
- How have you tried to overcome them?
- To what extent have you overcome them?
- How could you eradicate these problems?
- What prevents you from overcoming these problems more fully (internal/external factors)?
- What coping strategies have you adopted in the short term?

Household consumption:

- ☛ Which product(s) does the household consume?
- ☛ Or, why does the household not consume the products processed?
- ☛ How much of each product does the household consume (*per month, season etc.*)?

3. TECHNOLOGY

What is the main piece of technology that you use to process the crops?

- What is the fuel source of this technology (solar, electric, coal, etc.)?
- Why did you choose this particular technology?
- How did you access/gain knowledge of this technology?
- Where did you purchase it (how much did it cost)? Or who was it donated by?
- What is the processing capacity of this technology (*for each crop processed*)?
- Did you (other employees) receive specific training to use the technology involved? Was this important?

- What other equipment do you use? ***(Please make a note of all the equipment that the enterprise uses).***
- Did you source it all locally?
- How much did each piece of equipment cost?
- How do you maintain the machinery?
- Is it easy to access spare parts? Where do you source them?

- Are there other ways in which you could manufacture the product? Why do you not use these alternative methods/technologies?

- **If the enterprise does not use machinery**: Why have you not adopted a particular technology to process these crops?

<u>Constraints:</u>

- What problems do you face **with the technology** you use?
- How have you tried to overcome them?
- To what extent have you overcome them?
- How could you eradicate these problems?
- What prevents you from overcoming these problems more fully (internal/external factors)?
- What coping strategies have you adopted in the short term?

4. SOURCING THE RAW MATERIAL

Where do you source the fresh fruits and/or vegetables that you process?

<u>From crops which you produce:</u>

- ☛ What is the land area given to each horticultural crop processed?
- ☛ How much is under irrigation? Describe the irrigation infrastructure?
- ☛ What are the production periods for the different fruits and vegetables that you process?
- ☛ What are the implications of this on resource availability (*vis-à-vis labour, finance, credit, land, climate*)
- ☛ What are the average yields obtained for each crop processed (*per season*)

What grade of crop do you process in each case? Why?

- How would you characterize such produce (small, blemished fruits or vegetables etc.)?

What is the purpose of processing these crops (in each case)?

- To reduce losses of fresh produce
- Add value
- Preservation
- Food security
- Reduce transportation costs
- Enhance marketing opportunities
- Income-generating activity
- Other reason

Do you cultivate other fruits and vegetables that you do not process? (*Please name them.*)

- ☛ Why do you not process these?
- ☛ What constraints do you face processing these crops, or marketing their end product(s)?

<u>You purchase the crops for processing:</u>

- ☛ Which crops do you purchase for processing?
- ☛ Why do you process them?
- ☛ Where do you source these crops (*note any seasonal changes in procurement activities*)?
- ☛ How much of each crop do you purchase (20L buckets or kgs)? When? How often (*season etc.*)? How much do they cost (20L buckets or kgs)?
- ☛ What grade of crop do you purchase (in each case)? Why? How would you characterize such crops (small, blemished fruits or vegetables etc.)?

- ☛ What costs are involved in procuring the produce (*transport/freight charges etc.*)?

Constraints:

- What problems do you face in terms of **producing and/or purchasing the raw material**?
- How have you tried to overcome them?
- To what extent have you overcome them?
- How could you eradicate these problems?
- What prevents you from overcoming these problems more fully (internal/external factors)?
- What coping strategies have you adopted in the short term?

Procurement of other inputs:

- ☛ What other inputs do you require? Do you purchase them all?
- ☛ In what quantities and how often?
- ☛ How much do they cost?
- ☛ Where do you purchase them? Why do you purchase them there?
- ☛ How do you get there?
- ☛ Do you have to store the inputs? If so, where do you store them etc.?
- ☛ What other costs are involved in purchasing these inputs (*transport/freight charges etc.*)?

Constraints:

- What problems do you face in terms of **producing and/or sourcing other inputs**?
- How have you tried to overcome these problems?
- To what extent have you overcome them?
- How could you eradicate these problems?
- What prevents you from overcoming these problems more fully (internal/external factors)?
- What coping strategies have you adopted in the short term?

5. MARKETING CHANNELS OF THE END PRODUCT(S)

Marketing channels cover, for example, direct sales to consumers, sales to supermarkets, sales to wholesalers/distributors, sales to kiosks, hotels etc. Each marketing channel represents a different customer. If the processor has direct access to consumers, it means that no sales take place through intermediaries. If the processor has indirect access to consumers, it means that some/all sales take place through intermediaries.

Marketing the product(s):

- What products do you sell? (***Check Appendix 1***)
  - ☛ Do you market an end product, or is your product subsequently used as a raw material in another product? (***Please clarify in relevance to each crop processed***)
- To whom/Where do you market the product?
  - ☛ Do you sell your products wholesale or do you work on a commission basis?
  - ☛ Who are your customers?
  - ☛ Why do you sell your product(s) through this/these marketing channel(s)?
  - ☛ How did you become informed of this market?
  - ☛ How much do you sell (*of each product*) through each marketing channel (*per season etc.*)?
  - ☛ Does this change from one season to another?
  - ☛ How do you get your product to the market/customer?
  - ☛ What price do you receive for each product, per unit ***(Please complete Appendix 1, Columns 3 and 4)***? (*If the processor sells the product in a variety of forms, some packed, some loose, what are the returns in each case?*)
  - ☛ When do you sell the product(s) (*i.e. in what season*)? ***(Please complete Column 6, Appendix 1)***
  - ☛ How often do you make sales (per season)? Can you estimate your sales (of each product) during the last 12 months ***(Please complete Column 7, Appendix 1)***
  - ☛ What costs are involved in marketing the product(s)?
  - ☛ What do you do with any product(s) that fail(s) to be marketed?
  - ☛ Do you promote/advertise your product? If so, how?
  - ☛ Where do you get information on prices, demand, markets?

Role of wholesaler/distributor *(if known)***:**

- ☛ Where/To whom does the wholesaler/distributor sell the product?
- ☛ Do you known how much the wholesaler/distributor receives for the product at the destination market?
- ☛ Why do you not sell the product directly to this market?
- ☛ What constraints do you face to do this?

Product specifications:

- Do you grade the processed product(s) before sale? Why (not)?
  - ☛ How is the product sold (*e.g. in bulk, packaged/unpacked, with label etc.?*) Describe the packaging for each product.
  - ☛ Do your packaging specifications differ for your various customers? How?
  - ☛ How much does the packaging material cost per batch? Who supplies it?
  - ☛ Have you always purchased your packaging material from this source? Where did you previously purchase it? What happened?
  - ☛ Are there any ways in which you could improve your product(s) or the packaging of it etc.?

- Does the product have a label (***Please ask for sample of label where available***)?
  - ☛ Where do you source the labels?
  - ☛ How much do they cost, per batch (***Please note quantity***)?
  - ☛ Why did you choose to put this particular information on the label?
  - ☛ Do the products have a name/logo etc.? Why did you choose this particular name/logo?
  - ☛ What is the shelf-life of the product(s)?

<u>Constraints:</u>

- What problems do you face **marketing your product**?
- How have you tried to overcome them?
- To what extent have you overcome them?
- How could you eradicate these problems?
- What prevents you from overcoming these problems more fully (internal/external factors)?
- What coping strategies have you adopted in the short term?

6. PROCESSORS KNOWLEDGE OF CONSUMERS

Who are the final consumers of your products (*high-, middle- and/or low-income consumers*)?

- How do they consume the product(s) (*e.g. as snacks, or cooked in main meals etc.*)?
- Do you have the potential to increase your consumer base? If so, whom, where? (*e.g. local and/or export market demand*)
- What are the main factors that influence consumer demand for your product(s)?

Are consumers satisfied with your product(s)? How do you know?

- How do you manage the quality, shelf-life and/or consistency of the processed product?
- How do you ensure a good quality product reaches your customer and the final consumer?

- Have you ever had your product rejected by one of your customers? Why?
- What happened to the rejected product?
- Have you been able to ensure that you do not face such problems in the future? How?

Changes in customer requirements

- Have you made changes in any of your product lines due to feedback from customers? What type of changes did you make?
- Have you seen any changes in customer requirements in the last 12 months (e.g. demand for products packaged in smaller quantities)?
- How have you adapted to such changes in demand?

Constraints:

- What problems do you face **with respect to your customers/consumers**?
- How have you tried to overcome these problems?
- To what extent have you overcome them?
- How could you eradicate these problems?
- What prevents you from overcoming these problems more fully (internal/external factors)?
- What coping strategies have you adopted in the short term?

7. REGULATORY BODIES

- **Legal and other regulatory requirements:**

  - What requirements/regulations do you have to meet in producing, processing, packaging, labelling and marketing the product (e.g. SAZ accreditation)?
  - Who regulates these requirements?
  - Do you have to meet any specific food safety requirements? (If not, why not?)
  - Do you think such regulations are important? Why (not)?
  - Do you think that you are constrained by these regulations? In what respect?
  - Have you ever sent your product for analyses? What was the outcome?

Constraints:

- What problems do you face **with respect to regulations regarding your product** (e.g. shelf-life, quality, consistency, SAZ accreditation, etc.)?
- How have you tried to overcome them?
- To what extent have you overcome them?
- How could you eradicate these problems?
- What prevents you from overcoming these problems more fully (internal/external factors)?
- What coping strategies have you adopted in the short term?

8. RETURNS TO SMALL-SCALE PROCESSING:

- What costs do you incur manufacturing and marketing processed horticultural products?
  - ☛ Input costs (*should be covered in section 4*)
  - ☛ Costs to run equipment and buy spare parts, etc.
  - ☛ Labour costs
  - ☛ Cost of packaging material, labels, etc. (*should be covered in section 5*)
  - ☛ Transport costs
- What are your current returns to processing horticultural crops?
  - ☛ After costs accounted for above

- Is this your sole income? What other incomes do you have?
- What share of total household income does the processing activity represent?
- How many household members depend on the enterprise for a living (*if it is a household enterprise*)?
- What do you do with income earned from the business?

Constraints:

- What problems do you face **with respect to returns from your processing enterprise** (e.g. are they insufficient to cover costs etc.)?
- How have you tried to overcome these problems?
- To what extent have you overcome them?
- How could you eradicate these problems?
- What prevents you from overcoming these problems more fully (internal/external factors)?
- What coping strategies have you adopted in the short term?

9. ENTERPRISE GROWTH:

You said you started marketing processed horticultural crops in 19XX (or the enterprise was established in 19XX):

- Have your activities/the enterprise changed since then? If so, in what way? (*e.g. varieties of crops processed, different product lines, number of markets, adoption of technology, etc.*)
- Could you explain why these changes have taken place *(e.g. demand for particular products increased/decreased; improved technology etc*.)?
- Has the enterprise grown (*e.g. in terms of quantities processed, number of workers employed, level of investment etc.*)?
- Has the enterprise been a success? In what sense?

Competition and linkages:

- Are there other similar enterprises located in the immediate area (numbers, similar products processed, similar technologies used, same market, etc.)?

- What competition does the enterprise face? Has competition increased/decreased? Why?
- Who are your main competitors?
- Do you have links with other enterprises (in terms of inputs, outputs, contracts etc.)?
- What have been the advantages (if any) of such linkages?

Credit and capital:

- What capital has been invested in the enterprise?
- Did you receive assistance with capital? Where? With whom?
- Has credit been obtained? Where? With whom?
- Has it been paid back? Interest rates?
- Is cash flow a problem? When (*e.g. seasonally*)? In what sense?

The future:

- How do you see the enterprise developing in the future? What opportunities do you see for enterprise growth (if any)? If none, why not?
- Do you foresee any problems?
- Do you think government policy/regulation bodies will have an impact on the future of the enterprise?
- Do you think the country's economic situation will have an impact on the future of the enterprise?
- To what degree are the enterprise activities sustainable over time (in your opinion)?
- Do you have any plans to diversify into new products?

Constraints:

- What problems have you faced in terms of trying to **developing/increasing your processing activities?**
- How have you tried to overcome these problems?
- To what extent have you overcome them?
- How could you eradicate these problems?
- What prevents you from overcoming these problems more fully (internal/external factors)?
- What coping strategies have you adopted in the short term?

10. SUMMARY OF CONSTRAINTS

- Was it easy to get involved in processing horticultural crops? In what sense?
- Would it be easy/difficult for other enterprises to enter the sector? Why?
- What constraints/problems would people face?
- What are the particular constraints/problems that you face (See below—financial, technical, infrastructural, institutional, social, informational)?
- What is the key constraint that you face at the moment? Why is it key?
- Was it easy to find a market for your product(s)? What problems did you face finding a market for the product?
- Have you taken any risks to establish the enterprise or keep it going (*e.g. take out loans, give up employment etc*)

Financial:

- ☛ Availability of start-up and working capital
- ☛ Access to credit
- ☛ Economies of scale, *e.g. cost of collecting small quantities of produce from numerous producers and transporting small quantities of the end product to market(s)*

Technical:

- ☛ Geophysical constraints to horticultural production (if producer/processor).
- ☛ Availability of appropriate processing technologies
- ☛ Ability to meet/maintain consistent standards
- ☛ Other technological limitations that reduce quantities processed

Infrastructure:

- ☛ Viability of crop processing activities
- ☛ Transportation and communication constraints

Institutional:

- ☛ Training on horticultural processing, packaging and marketing
- ☛ Actor analysis of service providers and assessment of type of services provided: *research, extension, inputs, credit, marketing and processing support*
- ☛ Constraints in accessing vital processing and marketing support services
- ☛ Awareness of legal requirements for processing, packaging and labelling etc.
- ☛ Objective and constitutional framework of processor associations
- ☛ Formal and informal rules pertaining to the trade of certain products to protect certain categories of people
- ☛ The application and relevance of particular national rules to smallholder horticultural production, processing and marketing

Socio-cultural:

- ☛ Socio-cultural impediments to horticultural processing
- ☛ Gender constraints, *e.g. gender norms regarding female mobility may impede women getting involved etc.*

- ☛ Compatibility with local socio-cultural and politico-economic environments, *e.g. within some sectors of the smallholder livestock sector it's generally a taboo to consume or market goat milk*
- ☛ Consumer taste and preferences, *e.g. dried fruit*
- ☛ Consumer willingness to pay for value-added products, *e.g. consume dried fruit instead of fresh fruit*

Informational:

- ☛ Effectiveness of formal and informal sources of processing and marketing information *e.g. from Agritex or neighbouring farmers*
- ☛ Knowledge of markets
- ☛ Knowledge of consumer demand for processed products
- ☛ Knowledge of product specifications
- ☛ Knowledge of regulatory environment

N.B.

This is a checklist, implying that researchers choose questions depending on the flow of discussion and may not necessarily ask all questions. Remember at all times through the discussion to ask 'why?' and to ask about how issues have changed during the establishment of the enterprise (i.e. dynamics). Remember this case study is not simply to collect facts and figures but crucially to discover and understand the constraints which processors face. Also you do not have to stick to the order in which this guide is presented, please conduct the discussion in the best manner for the situation.

Where possible, please take photos of the enterprise, the equipment (where applicable) and the end products, and of any other aspects you may think important.

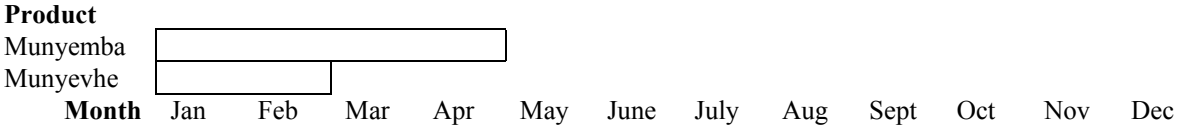
Appendix 2. Fruit and vegetable production in Zimbabwe by province (tonnes/year)

Province	**Vegetables**		**Fruit**	
	Current	Potential	Current	Potential
Mashonaland Central Province*	113,570	140,900	117,713 13,878**	120,489 13,878**
Mashonaland East Province*	138,865	277,802	36,348	52,517
Mashonaland West Province*	19,649	34,673	30,525	52,979
Manicaland Province*	163,167	261,393	91,231 49,500***	186,956 49,500***
Matabeleland North Province*	51,816	54,295	893	893
Matabeleland South Province*	23,194	38,366	1,560	5,547
Masvingo Province*	12,981	23,075	125	125
Midlands Province*	14,666	45,188	21,574	22,788
Total	537,908	875,692	299,969 *63,378	442,294 *63,378

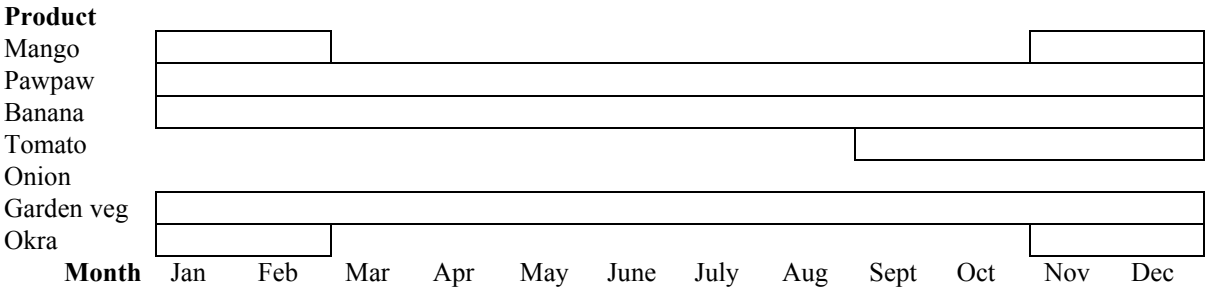
*No data on commercial area production in some districts
**Masawu wild fruit. ***Indigenous wild fruit (baobab and loquat-mazhanje)
Source: Troparg, 1999:70, citing Agritex, 1998

Appendix 3. Fruit and vegetable production calendars for sample of case study processors

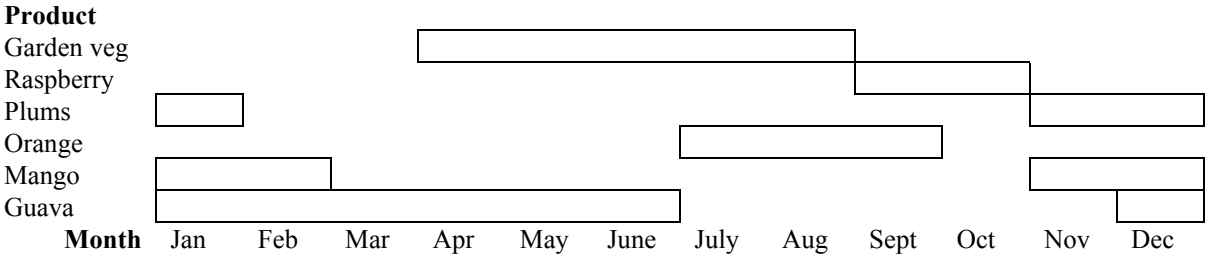
Case 1. Mrs Mugambiwa, Mashonaland East Province



Case 2. Murehwa Food Processors' Association, Mashonaland East Province



Case 3. Rusitu Valley Jam Canners Co-op, Manicaland Province



Case 4. Mrs Gabaza, Manicaland Province