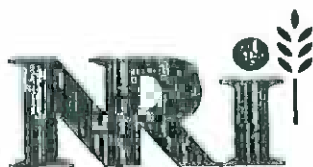
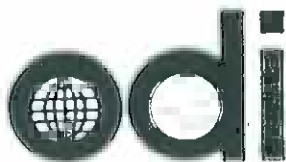




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**Crop Post-Harvest
Research Programme
Zimbabwe**

*Post-Harvest Constraints
Facing Smallholders
Growing Horticultural
Crops: A Needs Assessment
of Three Districts in
Zimbabwe*



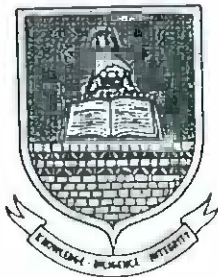
Post-Harvest Constraints Facing Smallholders Growing Horticultural Crops: A Needs Assessment of Three Districts in Zimbabwe

*Boyd C.¹, Turner A.², Nenguwo N.³ and
Bockett G.⁴*

- 1. Overseas Development Institute, London, UK*
- 2. Crop Science Department, University of Zimbabwe, Harare,
Zimbabwe*
- 3. Horticulture Research Centre, Department of Research and
Specialist Services, Marondera, Zimbabwe*
- 4. Natural Resources Institute, Chatham, UK*



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GLOSSARY OF ACRONYMS

AGRITEX	Agricultural, Technical and Extension Services
ARDA	Agricultural and Rural Development Authority
DAEO	District Agricultural Extension Officer
ITDG	Intermediate Technology Development Group
SEDCO	Small Enterprises Development Corporation
USAID	United States Agency for International Development
ZFU	Zimbabwe Farmers' Union

ACKNOWLEDGEMENTS

to be completed.....

INTRODUCTION

Background

The Crop Post-Harvest Programme (CPHP) of the Overseas Development Administration (ODA) has selected core target countries from a list contained in the Sustainable Agriculture Strategy paper prepared by the ODA. The Programme intends to concentrate its in-field research efforts in these selected target countries and it will be from these participative activities that more upstream strategic research issues may arise. Zimbabwe has been identified as one of these core countries.

It is envisaged that the CPHP's activities in Zimbabwe will therefore be made up, as appropriate, of a continuum of projects incorporating strategic to adaptive research activities. These activities will be undertaken both in the UK and in the country concerned on a collaborative basis with identified institutions.

The project activities to be undertaken in-country should complement both the country's own research planning and resultant policies and the strategies developed by ODA for the implementation of the NR Research Programmes more broadly and the Bilateral Programme for Zimbabwe more specifically.

Project proposals, initially in the form of concept notes, were sought by the ODA which pursue collaborative research actions with local organisations in both the public and private sectors in-country. Research must complement rather than duplicate existing activities being undertaken by ODA or by other donors, and should not repeat research which has been conducted elsewhere. Research proposals of a strategic, applied or adaptive nature are all acceptable. Effective links with NGOs, especially in the fields of adaptive and participative research, should be developed where possible. Attention must be given to the mechanisms whereby the ultimate beneficiaries will gain from the research to be undertaken.

The visit detailed in this report was undertaken in support of the ODA's CPHP activities in Zimbabwe (as outlined above) to specifically develop, research proposals addressing smallholder post-harvest horticulture and root-crop constraints, where appropriate.

Objectives of the study

Overall objective

A visit was undertaken to Zimbabwe to conduct a participatory survey (using needs assessment) to identify and develop concept notes for submission to the ODA's Crop Post Harvest Programme in support of the umbrella project A0549 'The identification and development of Crop Post-Harvest research activities in Southern Africa'.

Specific objectives

- complete a review of secondary data on horticultural and root crops through the finalisation of two short reports with attached bibliographies and abstracts;
- understand and define the most critical post-harvest constraints facing farmers growing horticultural and root crops using participatory research techniques; and
- prioritise those constraints which are researchable with a view to drawing up concept notes for submission to the ODA.

Assumptions and limitations of the study

Assumptions

In undertaking this study, it was assumed that there is a viable, albeit incipient smallholder horticulture industry in Zimbabwe. It was further assumed that both subsistence and commercial activities would be important in the smallholder sector to a greater or lesser degree depending on location and that these would merit examination. An assumption was made that the principal post-harvest areas of importance would be:

- harvesting
- storage
- processing
- marketing

Limitations

The availability of local collaborators was restricted to February. Two factors compounded to make the timing of the visit unsuitable for the observation of horticultural post-harvest activities. Firstly, this is the height of the rainy season during which time farmer effort is concentrated on field crops and not post-harvest horticultural activities. Secondly, for a second year running exceptionally heavy rains had fallen which tended to concentrate farmer's minds on pre-harvest constraints and activities.

METHODOLOGY

Research design

For each site, a needs assessment survey was conducted. A needs assessment study is essentially an agricultural research planning and policy exercise. The needs assessment method relies on a mixture of informal research methods and secondary data. The use of these methods is an attempt to avoid the narrow focus and preconceptions concerning the nature of agricultural problems which have historically occurred in the planning and policy phase of agricultural research. The primary objective of needs assessment is to influence technology policy, choice and applied research in a such a way that subsequent technological interventions are focused on pertinent needs and constraints of the production systems of farmers. By identifying and addressing farmers needs and constraints in this way, there is a greater likelihood that technological interventions will be readily adopted by farmers. The main research tools employed were; semi-structured interviews see below and a range of participatory techniques including seasonal calendars, matrix ranking exercises and key informant interviews.

Area of study

During a previous visit to conduct a rapid rural appraisal (February 1996) the project manager using advice provided by AGRITEX staff selected three communal areas; Chivi (South Central), Mutoko (Central) and Buhera (North). All are located in the semi-arid regions of Zimbabwe (i.e. NR III, IV and V)

Limits of the study

The study was deliberately designed to be comprehensive in order to cover all post-harvest aspects of horticultural and root crop culture. At each site, the following aspects were covered; harvesting, storage, processing and marketing. The extensive nature of the study, precluded intensive examination of the constraints identified although this was attempted where a significant constraint became apparent. It was felt that further analysis of identified constraints, would be the subject of follow up visits where necessary.

Data collection

Secondary data in the form of background reports was collected to place the current study in context and identify government policy and the extent of government and donor funded interventions that have been made to date. The secondary data also enabled the researchers to focus their observations on the key issues which had already been identified and avoid the risk of collecting the same information for a second time.

Primary data was collected throughout the course of the surveys. This data was collected through the use of Participatory Rural Appraisal (PRA) techniques which are described below under 'Research instruments'. The majority of this is descriptive information, but significant proportions are further strengthened by proxy, numerical indicators e.g. indicating the relative importance of one factor in comparison with another by using a specific number of beans during a cropping calendar exercise or matrix ranking exercise.

Sample selection and size

Farm level

Using advice from the District AGRITEX officials, two farmer groups were selected for each location. These groups were mixed and broadly representative of the communal farmers. On average groups comprised of up to 40 individuals. This was too great for effective PRA techniques and thus the groups were divided in half. Given the important role of women in the farming system, the team ensured that they were as fully involved in the discussions as possible. The sites selected were as follows;

SITE	DISTRICT	WARD	VILLAGE
1	Buhera north	Ward 10	Gaza township
2	Buhera north	Ward 13	Mavora village
3	Chivi south central	Ward 4	Gomo village
4	Chivi south central	Ward 4	-
5	Chivi south central	Ward 21	VideCo A
6	Chivi south central	Ward 21	VideCo B
7	Mutoko central	Kawere ward	Kawere village
8	Mutoko central	Kawere ward	Kawere village

Wholesalers / retailers

Principal marketing centres were chosen for analysis in each of the provinces visited. In each case, the local market administrator was approached for assistance and advice in conducting each market survey. Usually, the administrator would appoint an individual to accompany the researchers around the market. This was essential for two reasons. A local individual, who was respected by the wholesalers provided the researchers with the credibility they required in order to ask detailed questions without risk of antagonising the respondents. Secondly, the local administrator would be able to assist the researchers to assess the validity and accuracy of the responses so that they could be placed into context.

Research instruments and implementation

A range of participatory research tools were used while undertaking the study and included the following;

Direct observation

In all cases, and especially at the farm sites, the use of direct observation was encouraged to observe facts and not be misled by myths or a typical syndrome where respondents tell you what they think you wish to hear.

Semi-structured interviews

(a) Individual interviews

Random, individual interviews were used throughout to obtain representative information and to cross-check information which had been collected from other sources. They also provided

an opportunity for the researchers to follow up contentious issues which can normally be followed up only on an individual basis. An example of this nature would be the likely level of income from marketing a certain commodity.

(b) Key informant interviews

Key informant interviews were used throughout the study to obtain specialist information and cross-check the data already collected by other means. Key informants also provided the research team with information concerning systems e.g., marketing channels to the Mbare Msika in Harare and government policy on certain issues.

(c) Group interviews

Many of the PRA exercises carried out at the community level were conducted as group interviews. These interviews enabled the researchers and the community to diagnose and discuss the potential solution of post-harvest constraints simultaneously thereby avoiding preconceptions. Information from group interviews was cross-checked with key informant and individual interviews and vice versa.

Participatory exercises

A range of PRA exercises were employed during the course of the surveys. For every community visited each of the three following exercises were undertaken.

Matrix scoring

Ranking

Seasonal calendars

RESULTS

Communal sector horticulture in Zimbabwe

Communal farms cover 42% of the country and are found in all natural regions although the majority occur in the agriculturally poorest regions, IV and V. Generally horticultural production in these regions is rain-fed. Horticultural production is mainly for home consumption, and is therefore planned to fit in with other farm activities rather than to maximise market opportunities. Horticulture is not seen therefore as a significant activity. A minority of farmers derive a significant proportion of cash income from marketing horticultural produce.

The exception among the study sites is Mutoko, where good access to markets, low vulnerability to frost and year-round access to water has enabled producers to exploit a window of opportunity in both the domestic and export markets through innovative mechanisms such as that established by ARDA. This is described in further detail later in the report.

The main categories of constraints facing smallholders are as follows:

- poor communication infrastructure
- lack of efficient horticultural support services i.e., training, advice, appropriate technology
- lack of marketing information and facilities for both the domestic and export markets

General post-harvest constraints

The situation as described by Donaldson, T et al (1996) in 'Household Food Security: rapid Rural Appraisal of Villages in Three Communal Lands of Zimbabwe' remains the same. The majority of farmers grow horticultural crops for subsistence purposes only. Due to a lack of planning skills (in part based on poor market information) and availability of early and late maturing varieties of vegetables, extensive seasonal gluts occur. In these cases, the fresh produce is marketed in both local markets and where possible, the main market in the country called Mbare Msika in Harare. For those unable to access markets, a traditional drying technique is used to preserve a certain amount of the produce, usually tomatoes and leafy vegetables (both exotics and indigenous) for future use. Remaining produce which is not dried is fed to animals or left to rot in the field. An exception is a limited number of farmers in Mutoko district who grow produce specifically for the market. They indicate that horticultural production is their main source of income.

In all cases the most significant constraints facing communal farmers in natural regions III, IV and V are of a developmental nature. These can be grouped into the following areas;

- limited crop and varietal diversity,
- lack of horticultural skills,
- limited access to water,
- lack of markets and market information,
- limited access to credit facilities,
- inadequate transport facilities,
- lack of business skills (i.e. entrepreneurial skills) and
- weak linkages to potentially lucrative export markets through commercial growers.

Most of these constraints could be (and in some cases are being) mitigated through awareness creation, training and technology acquisition. This has been recognised by a number of NGOs who have implemented initiatives designed to improve small-holder horticultural production in the districts mentioned above (except Buhera).

Specific post-harvest constraints

The reader is referred to Annex 3 where a summary of PRA exercises for each site visited is presented. The information which follows is a synopsis of the key issues derived from the PRA exercises.

Horticultural crops

Harvesting

- simultaneous ripening of tomato crop resulting in significant losses where no market could be secured,
- when rape leaves are mature they often become infested with leaf-eating pests (not identified) which adversely affects saleability,
- in the case of Mutoko, labour availability becomes a serious constraint during the harvesting period due to significant volumes of produce grown for sale.

Storage

- storage is constrained by a lack of awareness of suitable processing techniques for both fruits and vegetables,
- traditionally dried leafy vegetables (both exotic and indigenous) known as 'mufushwa' suffer from pest attack (rats and weevils) during the storage period. Dried produce is also be subject to attack from certain fungal infections (not identified) during wetter months which causes losses,
- fresh produce for sale has a very short shelf-life during the handling period to the market which can cause losses.

Processing

- the traditional drying method is constrained by the weather, i.e. during wet periods, if the produce is not protected from rainfall significant losses occur,
- lack of awareness of suitable and improved techniques,
- the potential for introducing improved processing techniques is constrained by a limited market for processed products which is already supplied by commercial farmers.

Marketing

- lack of significant and accessible marketing outlets,
- lack of readily available marketing information - supply and demand trends and price data,
- lack of transport to deliver produce to the market,
- lack of marketing strategy means that everyone produces the same fruit and vegetables at the same time leading to over-supply and depressed prices.

The main constraints as indicated by wholesalers/retailers during discussions are as follows:

- lack of storage facilities,
- poor quality fresh produce,
- market organisation - farmers often sell directly to retailers bypassing the wholesalers (contrary to regulations in larger marketing centres),
- high transport costs and inconvenience when buying produce from farmers,
- lack of marketing information (supply and demand trends) and price data,

Root crops

Harvesting

- no significant constraints were reported

Storage

- traditional fresh sweet potato storage techniques are well understood and entirely appropriate to current subsistence farming. Most farmers indicate that they can store roots for periods up to 6 months without significant losses. Problems which do occur but are not regarded as important include pest and disease infestation (can be alleviated by careful selection of roots prior to storage) and sprouting of roots if rain-water leaks into the storage structures. Storage constraints may arise if sweet potato production by communal farmers becomes significantly commercial e.g. reports of sales to Botswana.
- onions suffer from neck-rot during wet periods or due to premature harvesting, which prevents them from being successfully stored,

Processing

No processing of sweet potato and or cassava was reported.

Marketing

- no significant constraints were reported.

This is a dynamic situation however, and may change if the marketing of sweet potato to Botswana becomes commercialised as some sources indicate.

Market Analysis

Market Structure

Spatial structure and integration

The spatial structure of horticultural marketing in Zimbabwe is based on a hierarchy of levels:

- national: Mbare Msika in Harare;
- regional: Bulawayo (West) and Mutare (East);
- provincial: for example, Masvingo;
- district: for example, Murambinda;
- local: non-location specific.

Horticultural marketing in Zimbabwe is highly centralised. National and regional markets act as magnets, drawing in produce and traders from around the country. Some 40% of marketed horticultural production is estimated to pass through Harare.

Market centralisation is a response to the risk associated with provincial and district markets in the absence of market information, combined with high transport costs. Small-scale farms are dispersed, and produce small surpluses at uncertain times. Bulking-up has proved difficult to organise, partly through lack of trust and confidence, both between producers and traders, and among producers themselves. Private traders prefer to source produce from national/regional wholesale markets, where they can rely on a reasonable quantity and quality of a range of products. Similarly, producers with significant produce prefer to market it at the national/regional level, where demand is more assured.

Centralisation implies significant investment by small-scale producers and traders in costly transport. Such high transaction costs reduce the overall volume of produce marketed. Improving market information may lead to the decentralisation of marketing, and thus a reduction in transport costs and an increase in total volumes marketed.

Functional Structure and intermediaries

The larger markets are structured in terms of producers, wholesale and retail.

	Retail	Wholesale	Producers
Mbare Msika	large number of small-scale retailers	up to 50 wholesalers in and adjoining market, specialising in up to 5 crops each	large number of small-scale producers
Bulawayo	large number of small-scale retailers	up to 10 large-scale wholesalers, located close together	
Masvingo	large number of small-scale retailers	up to 20 wholesalers in a separate market, specialising in up to 5 crops each	
Murambinda	large number of small-scale retailers		
Local	direct marketing between producers and consumers		

Source: PRA survey, February 1997

Producers

The Mbare Msika producers' market mainly consists of a large number of small-scale producers, selling their own produce. No individual small-scale producer has sufficient market power to influence the market price. However, the market is vulnerable to dumping by large-scale producers, contrary to regulations. Such large-scale producers may have sufficient market power to influence market prices.

In Bulawayo and Masvingo there are no producers' markets *per se*. Producers visit wholesale outlets to sell directly to wholesalers. In Murambinda, producers market directly to retailers in the retail market. At the local level, marketing is directly between producers and consumers.

Wholesale

The Mbare Msika wholesale market consists of up to 50 wholesalers, usually specialising in up to 5 crops each. Individual wholesalers of certain crops may therefore be in a position temporarily to influence prices. However, even in the short-term, such market power may be undermined by competition from the producers' market, selling directly to retailers.

Similarly, in Masvingo, up to 20 wholesalers specialise in up to 5 crops each. However, the wholesale market is undermined by competition from the retail market, purchasing directly from producers. In response, the wholesale market is also involved in retail direct to consumers.

In contrast, the Bulawayo wholesale market consists of up to 10 large-scale wholesalers, including the following categories:

- outlets for large-scale commercial growers;
- parastatal wholesalers which market produce on behalf of producers for a 10-12% commission;
- independent wholesale enterprises.

According to independent wholesalers in Bulawayo, large-scale commercial growers hold market power through vertical integration and the scale of their marketing activities.

Retail

In Mbare Msika, Bulawayo, Masvingo and Murambinda, the retail market consists of a large number of small-scale retailers, usually specialising in up to 10 crops. No individual retailer has sufficient market power to influence prices. In Mbare Msika and Bulawayo, there is additional competition from wholesalers selling directly to consumers.

A large proportion of marketing of surpluses from small-scale production is undertaken informally at the local level. Marketing is directly between producers and consumers, usually occurs between acquaintances, and is often based on barter. In addition, surpluses are often exchanged for services, such as labour.

Market Channels and Vertical Integration

Conventional market channels

In the marketing of large-scale production, there is some formal vertical integration, for example between large-scale producers and dedicated wholesale outlets. Competition from vertically integrated large-scale production and marketing systems undermines the marketing of small-scale production.

In the marketing of small-scale production, regulations separate producers', wholesale and retail markets where these exist. While these regulations are often broken informally (by bypassing either the wholesaler or the retailer), formal vertical integration in the marketing of small-scale production is limited.

In Mbare Msika and Bulawayo, independent wholesalers usually purchase from the producers' market or directly from producers at the wholesale market. Occasionally, wholesalers purchase from the farm-gate, usually in periods of low supply, when long-distance transport costs are offset by higher prices, and demand is guaranteed. Retailers purchase from the wholesale market, or from producers in the main market.

At provincial and district markets, wholesalers and retailers either purchase from national or regional markets or from producers. Occasionally, retailers purchase from the farm-gate, usually in periods of plentiful supply when long-distance transport costs are high relative to expected prices, and supply is guaranteed.

In informal local markets, trade is directly between those with surplus of own production and those with deficit, at the farm-gate.

In most cases, individual producers transport their goods to market themselves. Producers are reluctant to form marketing groups to economise on transport costs. This reluctance probably reflects hidden costs and benefits, such as hidden supervision costs involved in delegating marketing, or the hidden benefits of a trip to town where marketing can be combined with other activities. High perceived supervision costs, in part, reflect the lack of accessible information on market prices, which perpetuates mistrust. The hidden benefits of travelling to the market place may be especially high if inputs and desired consumption goods are not available closer to home. Improving the accessibility of market information may therefore consolidate marketing operations by producers, and reduce total transport costs, but the hidden benefits of travelling to the market place will remain.

Alternative market channels

In response to high transport costs associated with conventional marketing channels and the lack of widely accessible market information, various alternatives have been tested. Two examples worth mention are the ARDA initiative, and innovative mechanisms to link small-scale producers to export markets through out-grower schemes operated by private companies like HORTICO (see Conclusions and Recommendations)

Prices and Market Margins

Price-setting and market margins

Within the terms of this assessment, it was not possible to deconstruct market prices or analyse market margins. In many cases, different units are used in purchasing and selling. Furthermore, as there is no standard grading system, traders tend to keep prices fixed and adjust quantity and/or quality as necessary. However, most interviewees said that their prices were based on their purchase price plus a mark-up to ensure a reasonable profit. For traders purchasing at national/regional markets to sell at provincial/district markets, this mark-up was often estimated at 50% of the selling price.

Price stability

Prices vary seasonally for all produce, especially those which are not stored (eg wholesale price of tomatoes ranges \$2-20 per kg in Bulawayo). Prices may also vary substantially within a week, especially for crops which mature rapidly in response to climatic fluctuations (eg tomatoes). Prices at Mbare Msika are widely claimed to vary substantially within a day. Such volatility may be explained by occasional flooding of the domestic market by large-scale producers.

Market Performance

Market performance may be assessed in terms of a wide range of criteria. Resource allocation, income distribution, employment and food security are considered below.

Resource allocation

Horticultural markets in Zimbabwe have never been subject to nationalisation or intervention on the scale of grain markets. For this reason, horticultural markets are often assumed to be competitive and perform well, and hence provide the basis for efficient resource allocation. However, the combination of the following factors undermines market performance:

- price volatility;
- lack of market information;
- high transport costs.

(For further details, see market constraints below.)

Income distribution

Gender issues

In general, women are more involved at the “lower levels” of the marketing system; while men are more involved at the “higher levels”. Thus women dominate informal local level marketing, and the retail sections at all levels; while men dominate national and regional markets, in the non-retail sections. In effect, men are more likely to participate as larger financial transactions are involved.

As market intermediaries tend to retain control of profits, female participation in horticultural marketing may provide a significant increment to female bargaining status and household food security. However, as horticultural marketing in such households contributes only a small proportion of total household income, its significance should not be overplayed. As household market participation increases, men tend to assume control of marketing operations, with the implication that the potential for female emancipation through increased market participation is limited. On the contrary, increased market participation may shift control of marketing income away from women in favour of men.

Rural-urban

There are significant price differentials between farm-gate prices, rural and urban horticultural markets. However, within the terms of this assessment, it was not possible to analyse the extent to which these differentials reflected market power or high marketing costs.

Where market power does exist, it reflects privileged access to information, transport and credit. Improving access to these inputs and reducing corresponding costs is likely to have a dual impact: reducing market power and increasing the overall size of the market.

Employment

Horticultural marketing in Zimbabwe is labour-intensive rather than capital-intensive. A large number of producers participate directly in marketing operations, travelling substantial distances by public transport to personally supervise sales.

It may, indeed, be argued that the marketing system employs excess labour, and that there would be advantages in consolidating marketing operations at the lower levels. However, the apparent over-employment of labour in the marketing system [...]

Food security

Within the terms of this assessment, it was not possible to analyse income:price ratios or to monitor the stability of flows and prices. However, many informants stated that market prices, especially in Mbare Msika, are extremely volatile, often subject to significant swings within a single day.

This has implications for household food security both for consumers, in terms of affordability of food, and for producers, in terms of marketing income. Furthermore, the risk inherent in volatile prices compounded by lack of widely available market information reduces market participation, with a negative impact on food security at both the household and national levels.

Conclusion

The key market constraints identified in this assessment are: price volatility, lack of information and high transport costs. Within the terms of this assessment, it was not possible to identify the causes of price volatility. Information and transport issues are therefore considered in more detail below.

Institutional Support To Horticultural Enterprise In The Communal Farm Sector

Government support and related initiatives

There are a number of governmental and related parastatal institutions active in each of the districts. Each of these is described in turn in the following section.

AGRITEX is the Ministry of Agriculture institution responsible for technology diffusion through demonstration and training. It is based on the classic extension model where the aim is to deliver technical messages and not to seek the input of farmers in the design and adaptive testing of technology. Typically, AGRITEX is under-resourced such that they have to concentrate on farmer group formation for the transmission of messages. Typically one extension worker serves 1000 farmers. As a result of resource constraints, AGRITEX is reactive and keen to work with organisations who have resources to work on village level programmes.

To date, AGRITEX policy has emphasised the delivery of pre-harvest and agronomic practices to farmers. Only recently has the importance of post-harvest training and development been recognised. Marketing skills and market information has been identified as a critical constraint. As a result, AGRITEX has initiated a pilot programme since June 1996. Provincial level horticultural officers collect relevant price, supply and demand data. This is relayed to the District Agricultural Extension Officer (DAEO) once per week by post. The DAEO supplies this information to the Extension supervisors for each of the wards in the district who in turn relay the information to the farmers depending on the availability of transport. The linkages in this system are likely to break down easily and have done so already in a number of cases for a number of reasons.

AGRITEX provide agricultural information to farmers through a twice weekly Radio 4 programme. This sometimes provides general marketing information but is not systematic.

Zimbabwe Farmers' Union (ZFU) has a network that covers all wards in the communal lands. Its main aim is to represent the interests of small-scale farmers. The ZFU works through groups at village level and committees at ward level and above. The ZFU have recognised the serious lack of marketing skills and market information and as a result initiated the Midlands Market Capacity Building Project. A similar system to AGRITEX has been developed which was working together with the Business Herald newspaper until recently. Market information was collected from the provinces and sent to ZFU head office for collation. From there the collated information was faxed to all provinces who through the district co-ordinator disseminated the information to farmers by motor-bike. This approach has suffered from logistical problems and in addition the Business Herald no longer produces the information.

ZFU produces a weekly Radio 2 local language programme which periodically provides (non-systematic) marketing information. ZFU also has a monthly magazine that provides market information on grain crops and occasionally horticultural crops.

NGO support and initiatives

In addition to the government initiatives there are a considerable number of active NGO initiatives in each of the districts visited.

Buhera District

Many NGOs operate in Buhera district but none are currently and specifically promoting horticultural production.

Chivi District

Intermediate Technology Development Group (ITDG) has been active in Wards 4 and 21 for the last 6 years. The approach adopted by ITDG has been truly participatory and non-interfering. Emphasis is placed on the local communities deciding what their priorities are and how they should be tackled. The general constraints as identified by the community are; lack of water, lack of draught power, lack of co-operation and poor leadership skills. Specific initiatives relevant to horticulture are those related to water conservation using a range of techniques such as; tied ridging, vlei cultivation, fanya juu, and infiltration pits. These techniques have increased horticultural production significantly such that farmers often have vegetables for sale. Due to the increased production, farmers have expressed an interest in improving their traditional drying techniques. IT has therefore arranged a number of training events in vegetable processing with Mr Chitimbe of RIUPROD (an NGO) based in the Masvingo provincial offices. The team was unable to contact Mr Chitimbe.

The **CARE** office in Masvingo has established three programmes of relevance to horticultural production which address important constraints, namely provision of inputs, water supply and marketing information.

(a) The CARE agent programme has been developed to provide communal farmers with access to inputs. This is established by the identification of local entrepreneurs who are provided with credit by CARE so that they can purchase inputs and sell them to farmers at a modest profit. The agents determine the need for inputs based on the demand from the community.

(b) CARE is implementing an ODA funded small dam rehabilitation project. The aim of the project is to provide farmers with sufficient micro-irrigation potential for the production of a range of crops including vegetables. The main constraints concerning this project are ownership, irrigation skills and marketing strategies for vegetables. The last constraint has compelled CARE to initiate the third initiative.

(c) CARE have introduced a simple marketing information system to assist farmers in selling their produce. CARE field officers collect relevant production and price data which is provided to district councillors. They in turn relay the information back to the various wards where the information is written on boards in public meeting places. Contracts are also established with local institutions such as teacher training colleges, hotels, boarding schools and hospitals. The main constraint to this system is the reliability of the linkages.

Mutoko district

The **Agricultural and Rural Development Authority (ARDA)**, whose Mashonaland East Fruit and Vegetables Project is funded by the EU, has been active in Mutoko and other districts since 1985. The aim of this project is to provide irrigation, transport and marketing facilities for horticultural farmers. 25 farmers are successfully engaged as out-growers for a commercial exporter, Selbys. They are producing mange-tout peas and baby-corn which is sold to retail outlets in Holland, Germany and UK. EU funding will end in June 1997. As a result, the farmers have been hurriedly formed into a co-operative in order to continue the management of the scheme. Little training has been provided to improve their managerial and financial skills and doubt therefore exists concerning the future viability of this enterprise without continued long-term training. This has been acknowledged by the EU delegation which intends to provide further training inputs for at least two years. The major criticisms of the ARDA project are;

(i) the approach adopted was too sophisticated, e.g. the establishment of a grading machine in Mutoko was entirely unjustified as there is no requirement for superior packaging of produce before reaching the wholesale market as no systematic grading and quality standards have been established.

(ii) the scheme attempted to achieve too much too quickly without empowering the farmers concomitantly so that they could learn by doing, and

(iii) the abrupt withdrawal of funding described above has resulted in a severe lack of training and arguably therefore sustainability.

This project was reviewed during the week beginning 17 February 1997 and a document prepared for internal circulation within the EU and ARDA only. It would be worthwhile obtaining a copy of this report.

COOPIBO, a Belgium NGO has been operating in Mutoko district since 1987 and neighbouring Mudzi district since 1995. In both cases, agricultural development projects have been established. The key objective of these projects has been to strengthen farmers' organisational capabilities focusing on: organisational and financial management, establishment of a revolving loan fund to purchase inputs, encouragement of group saving for investment and training in marketing skills.

Initiatives relevant to horticultural production include: water conservation for horticultural crop production, the formation of horticultural farmer groups for marketing and the strengthening of organisational capability in order to more effectively negotiate with private transporters.

It appears that the longer-term and participatory approach implemented by COOPIBO is more realistic and likely to have significant impact. The co-ordinator of this programme, Mr Karl Vandepitte was interested to learn of the ODA's initiative and would be willing to collaborate where necessary. Mr Vandepitte advised the ODA to seriously consider focusing their activities in Mudzi district as he feels that Mutoko district and especially Kawere ward has been excessively 'researched'. As a result farmers have become particularly cynical about the

activities of researchers due the extractive nature of their work with little or no feedback or developmental initiatives.

Ranche House College is supporting small-holders in Mutoko district to establish food processing enterprises. The principal objective of the intervention is to support local entrepreneurs to earn a profit through agro-processing, and in this instance solar-drying of fruit. Ranche House introduced the solar-drying technology and protocol developed by NRI for use under Ugandan conditions. This technology has been under-going adaptation for use in the Zimbabwean situation for the last 3 years. Results appear to be significant particularly as preliminary market reception of the dried products is favourable. The single greatest constraint preventing increased market entry by small scale entrepreneurs is stringent health legislation applied to processed products using international standards.

Kajiwa Development Co-ordinating Association, is a small NGO active in Kawere ward. Its main focus is on income generating activities for women which include horticultural activities. At present, these appear to be mainly for subsistence with relatively small quantities being sold to Mbare Msika when possible. The author questions the principal objectives of this NGO and feels they may be rather more political than developmental.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The smallholder horticulture industry in Zimbabwe is relatively underdeveloped and lacking in basic skills and resources. The needs assessment revealed that before any form of significant research interventions are made, more fundamental training and skill enhancing activities should be undertaken. In all cases the most significant constraints facing communal farmers in natural regions III, IV and V are of a developmental nature. These can be grouped into the following areas;

- limited crop and varietal diversity,
- lack of horticultural skills,
- limited access to water,
- lack of markets and market information,
- limited access to credit facilities,
- inadequate transport facilities,
- lack of business skills (i.e. entrepreneurial skills) and
- weak linkages to potentially lucrative export markets through commercial growers.

In particular there are five principal constraints which impact on the ability of the communal horticulture industry to realise its potential. These were identified by a USAID mission in 1995 and concur with the findings of the needs assessment survey detailed in this report.

(1) Weak position of communal farmers in participating in the export market

Several outgrower schemes for communal farmer vegetable production appear to be functioning successfully. These schemes are operated by private, profit driven exporting companies in a very competitive business environment. The survey team interviewed staff from one of these companies, HORTICO.

The company assembles vegetables from individual farmers, grades the produce and packs it in company owned pack-houses prior to shipment. HORTICO operates on a consignment basis where payment to farmers is made later, based on the average price (a reflection of quality grading), less the company's costs and commission, and the costs for the supply of seeds and chemicals previously delivered. Farmers who participate must have access to perennial water so that they can guarantee continuity of supply.

Management and control of these schemes by the exporting company is intensive in order to meet the exacting standards required by the markets in the EU. This has resulted in a lack of joint decision making by both farmers and the exporter leading to a climate of suspicion amongst the farmers. In particular, complete control of the marketing process rests with the company which has resulted in a lack of transparency in relationships. Consequently, farmers feel that they are being used and resent this.

The low level of trust must be overcome if both parties are to prosper in the future. The management of HORTICO have realised this and are trying to develop a more equitable system with the assistance of an ODA research project managed by the NRI.

Possible means to overcome mistrust on the part of farmers would include:

- Farmers should be encouraged to form associations which can liaise between farmers and the company to the benefit of both parties
- Farmers do not understand how prices they receive are calculated, although they do appreciate that quality is the single most important price determinant. Farmers should therefore be trained and provided with more information which explains how prices are determined.
- Farmers feel that they currently bear all the risk for produce which does not meet the standards required for the export market. As a result a more equitable system should be developed such that the export company bears more of the risk and is prepared to at least guarantee a minimum price.
- Farmers require more training into why the quality of produce for the export markets is so high

(2) Lack of marketing knowledge and market information

Lack of marketing know-how has been discussed in earlier sections of this report. It stems historically from the control the state had over all forms of agricultural marketing. Parastatal organisations developed to serve the role as a government intermediary in the marketing process. Parastatals typically buy and sell agricultural produce on behalf of farmers. In effect all information and skills concerning the marketing process rested with the management of the parastatal. Farmers did not have to concern themselves with marketing and therefore have never had the opportunity to develop the necessary skills. Most importantly, farmers do not yet appreciate that markets are demand driven rather than established supply outlets.

Freely available marketing information is also a serious constraint to farmers. This is addressed specifically as one of the recommendations.

(3) Limited access to water for dry season production

Access to water is the single most important resource constraint facing farmers growing horticultural crops in natural regions III, IV and V. In these regions the majority of farmers are compelled to produce horticultural crops under rain-fed conditions. The cultivation of crops during the rainy season is far more problematical than the dry season due to the acute incidence of pest and disease attack. Many farmers indicated that they would prefer to grow their horticultural crops during the more favourable dry season - if they had sufficient irrigation facilities. It should be borne in mind that the coolest time of the year which coincides with the dry season. Crop production is thus only feasible in areas not subject to frost.

There is limited irrigation provision by government for communal farmers. These schemes are managed by Agritex staff. Not surprisingly, farmers tend to maximise the production of staple foods from irrigation schemes in the dry season rather than the production of secondary horticultural crops. The need therefore to increase the provision of irrigation schemes in natural regions III, IV and V is urgent. It is often the case that horticultural crop production is more lucrative and sustainable than staple food production as is the case in Mutoko. A number of NGOs have initiated micro-irrigation schemes such as ITDG and CARE in Chivi

district and COOPIBO in Mudzi district. The lessons learned from these projects should be understood and replicated.

(4) Inadequate business training

The urgency to train horticultural farmers in basic entrepreneurial skills cannot be overemphasised. Whether these skills can really be acquired through training or experience remains to be determined. The need however to develop them remains if the potential of the horticulture industry is to be increased for the benefit of communal farmers. Some NGOs have recognised this. COOPIBO has initiated a number of schemes in Mudzi district which have been designed to enhance farmers' horticultural business skills. In particular, the development of the following skills are emphasised: organisational management, establishing revolving loan funds, and group savings. An interesting finding from the work of COOPIBO is that co-operatives do not work in a competitive business environment such as horticulture and should not be encouraged.

(5) Lack of access to credit facilities

The provision of equitable credit facilities to communal farmers remains a serious constraint to the development of the communal horticulture sector. Numerous financing institutions exist such as the Agricultural Finance Corporation, the Zimbabwe Development Bank and a small enterprise development corporation, SEDCO. Their terms for lending however are not favourable or indeed possible for communal farmers. In particular, high interest rates of 35% and more plus legal evidence to land title, preclude communal farmers from gaining access to credit. Thus innovative mechanisms by which credit can be provided to communal farmers should be sought.

Recommendations

The main constraints identified above offer the opportunity to develop an integrated training and 'technology testing' project. It would be essential that both the technical and socio-economic post-harvest requirements of communal farmers growing horticultural crops are addressed simultaneously within the project. In particular the following aspects would be seen as the key areas of focus:

- technology;
- training and technical advice;
- credit;
- transport;
- market information.

As has been previously mentioned the majority of the post-harvest constraints detailed above can be resolved through training, awareness creation and technology acquisition. There are however four significant and specific areas which would, if effectively addressed, greatly benefit the development of communal farmer horticulture with particular emphasis on alleviating post-harvest constraints. These form the basis of the recommendations of this report which follow.

In each of the four cases the constraint is identified, justification for intervention provided and main issues concerning this constraint highlighted for consideration.

Constraint 1:

- Inability of remote small-scale producers to compete against large-scale or less remote, small-scale producers in marketing of fresh produce owing to unequal access to inputs, transport costs and economies of scale.

Justification

- Alternative niche markets for remote small-scale producers, with limited competition from commercial growers: fair trade export markets for dried fruit/vegetables; remote, low income domestic consumers;
- fair trade export markets require high quality products which current technologies cannot provide;
- in domestic markets, improved quality will shift demand curve outwards, implying increased price and/or quantity;
- improved drying technologies will reduce losses, and increase the attractiveness of dried products to consumers.

Issues

- Seasonal horticultural production for target populations implies low prices in peak seasons and high prices in off-peak seasons for fresh produce, which can be offset through storage of dried products.
- Producer willingness to market dried products depends on expected price:
ie: a producer will only market dried produce if probability of successful marketing is greater for dried than fresh produce and/or price of dried produce is greater than price of fresh produce.
- Consumers prefer fresh to dried produce, and therefore will only purchase dried produce if it costs less, but high transport costs for remote consumers imply that the total cost of fresh produce is greater than dried produce even where prices are similar, given additional storability of dried produce.
- Dried products can provide a steady income flow, which is preferred over a single lump sum from fresh produce;
- If there is not much rain, garden crops may yield better than field crops, although they require high labour inputs;
- If there is too much rain, garden crops may be abundant and over-supply of fresh produce in markets can occur, if increased disease pressures are resisted.
- Women generally retain income from horticultural produce, although men become more involved in pre and post-harvest production as horticultural income becomes more significant, and joint decision-making prevails.

It is recommended that a more thorough investigation of market potential is made, and an investigation of suitable drying technologies undertaken if appropriate with a view to addressing the constraint identified above.

Constraint 2:

- Lack of costless and freely available information, together with high transport costs, impedes efficient arbitrage between domestic markets.

Justification

- Systematic and timely dissemination of market information for a range of crops and domestic markets will increase and decentralise marketing by small-scale risk averse producers.

Issues

- Lack of market information implies that distant marketing is a risky investment (especially given high transport costs), for both producers and traders. This discriminates against risk-averse producers (and traders) in comparison with less risk averse market intermediaries.
- In the absence of systematic market information on a range of markets, both producers and traders currently target the central market in Harare, as the least risky source of demand and supply. Improved market information may facilitate the decentralisation of marketing, and consequently reduce transport costs.
- Improved information will enable remote smallholders to make better informed decisions, and may improve their bargaining position with private traders and contractors.
- Simple analysis of market information will enable producers, AGRITEX and ZFU to identify crops/seasons with high demand relative to supply and manage production accordingly. Improved information will therefore facilitate the diversification of production in terms of crops/seasons.
- Both AGRITEX and ZFU have demonstrated commitment to improving market information through programmes of collation of market information, but the current method of dissemination, largely by post to districts (3-4 days) and to wards via extension workers, is inefficient.

It is recommended that the institutional mechanisms required to collate and disseminate market information are examined and implemented with a view to providing this information on a sustainable basis to communal farmers

Constraint 3:

- Fixed-cost food processing regulations form market entry barriers which discriminate against the development of small-scale agroprocessing enterprises.

Justification

- Amendments to regulations for the agroprocessing industry will enable the market entry of small-scale enterprises.

Issues

- There is significant demand in export markets, and potentially in high income sectors of the domestic market, for dried fruit and vegetables.
- Small-scale agroprocessing is a potential mechanism for adding value on-farm to fresh produce for which there is seasonal oversupply in the domestic market.
- However, fixed-cost regulations (i.e.: which do not vary with the scale of production) in excess of export market requirements, imply economies of scale such that small-scale agroprocessing is not financially viable. A substantial gap therefore exists between processing for home consumption and informal markets (for which regulations are not enforced), and processing for formal domestic and export markets. Limited access to credit (especially for start-ups) and technical and marketing expertise (gained through experience) imply that there is currently no bridge for market entrants between informal processing activities and small-scale agroprocessing for the formal markets. The entry level to this potential market is set at a point which prevents the entry of small-scale enterprises.
- The use of appropriate Hazard Analysis Critical Control Point systems to ensure quality, food hygiene and improve efficiency would greatly improve the potential of small-scale producers to compete with the larger scale producers.

It is recommended that the barriers to market entry for small-scale agroprocessors, especially food legislation, are examined with a view to developing appropriate quality assurance systems which both maintain the required food legislation standards and fit the resources of communal farmers.

Constraint 4:

Smallholders are unable to compete in export markets due to poor access to market information, technology, credit and technical training and advice.

Justification

- Analysis of the factors influencing the success or failure of various schemes which seek to provide these services to smallholders will enable the provision of an enabling framework for replication.

Issues

- Smallholders are potentially competitive in specialised, high-value, labour-intensive production for export markets.
- However, smallholders currently focus production on a narrow range of widely-produced vegetables despite seasonal oversupply because of constraints to entering new markets due to limited access to the above services.
- Private profit-maximising exporters may prefer sourcing produce from smallholders because of diversification, lower overheads and monitoring/supervision costs within the smallholder production unit, which offset higher costs of management and support. This research would draw on lessons from experience to identify appropriate mechanisms for ensuring that the benefits outweigh the costs in a sustainable way for both contractors.

It is recommended that innovative mechanisms for export service provision are examined. In particular, the institutional aspects of information flow to enable communal farmers to access potentially lucrative export markets should be the key area of focus.

BIBLIOGRAPHY

ANNEX 1: *Itinerary: 1 February to 28 February 1997*

DATE	LOCATION	ACTIVITY
1/2	Harare	Arrival in country and initial discussions
2/2	Harare	Survey preparation
3/2	Harare	Meet with DR&SS officials
4/2	Harare	Survey preparation and depart for Chivi
5/2	Chivi 4	Arrange logistics, meet with AGRITEX and farmers.
6/2	Chivi 4	Survey
7/2	Chivi 4	Survey
8/2	Harare	Discussions and write up
9/2	Harare	Discussions and write up
10/2	Chivi 21	Survey
11/2	Chivi 21	Survey
13/2	Chivi 21	Survey
14/2	Buhera	Arrange logistics, meet with AGRITEX and farmers.
15/2	Mutare	Discussions and write up
16/2	Mutare	Discussions and write up
17/2	Buhera	Survey
18/2	Buhera	Survey
19/2	Buhera	Survey
20/2	Mutoko	Arrange logistics, meet with AGRITEX and farmers.
21/2	Mutoko	Survey
22/2	Mutoko	Survey
23 - 28/2	Harare	Survey analysis, meetings with other relevant institutions and officials, draft report.

ANNEX 2: MAIN ORGANISATIONS AND KEY INDIVIDUALS CONTACTED IN HARARE

ORGANISATION	KEY CONTACT	CONTACT NUMBERS
Overseas Development Administration, BDDCA P O Box 1030	Mr John Hansell (Senior Natural Resources Advisor)	Phone: 774719/738880 - 9 Fax: 738761 e-mail: bdcasz.bddca@oda.gnet.gov.uk
COOPIBO 313 H Chitepo Avenue P O Box CY 892 Causeway Harare	Mr Karl Vandepitte (Country Co-ordinator)	Phone: 720709 Fax: 732585
Development Technology Centre P O Box MP 167 Mount Pleasant Harare	Mr Tunga Rukuni and Kizito Mazvimavi (Solar drying technologies)	Phone: 303211 etn 1644 Fax: 333407
European Union Delegation 6th Floor, Construction House Takawira Street	Mr Laerke (EU micro-projects / ARDA)	Phone: 707139/-120/-143/722137
HORTICO	Mr Daniel Perlman	
ITDG 156 Samora Machel Avenue P O Box 1744 Harare	Mr Stephen Chipika (Technology Policy Advisor)	Phone: 723269/702138/796420 Fax: 723269 e-mail: itdg@imedtec.stellar.zw

DRAFT:

Phone: 794602/ 707311

Mr Daniel Utete)
(Horticulture specialist

Ministry of Lands, Agriculture and Water
Dept. of Agricultural Training and Extension
Block 2, Makombe Building
H. Chitepo Avenue / Harare St
P O Box CY 639

Mr Chaonwa
(Marketing specialist)

Mr Elvis Tembo
(Agricultural engineer)

Ministry of Lands, Agriculture and Water
Dept. Institute of Agricultural Engineering
P O Box BW 330
Dombashawa Road
Borrowdale, Harare

Phone: 750613/6
Fax: 724604

Ms Catherine van der Wees
(Food Processing as a small Business)

Ranch House College
Rotten Row
P O Box 1880
Harare

Phone: 720739/728282/720630

Mr Calisto Chihira and Mr D Greenburg
(Agribusiness Programme)

USAID
1 Pascoe Avenue
Belgravia,
Harare

Phone: 737733/4/751192/751748
Fax: 750456

Mr Chimanzi
(Marketing specialist)

ZFU
1st Floor, Reliance House
Speke Avenue / Takawira Street
P O Box 3755
Harare

ANNEX 3: SUMMARIES OF EACH NEEDS ASSESSMENT CASE STUDY SITE

Chivi District: Wards 4 and 21, Natural region II

Horticultural production is not important in comparison with the main agricultural activity of grain production.

This is mainly because grain crops (sorghum, millet and maize) constitute the main staple food and are grown for food security reasons especially millet. The low rainfall in Chivi means that horticultural production is restricted to the rainy season. In areas where irrigation is available, production can be continued throughout the dry season. It is often more profitable for farmers to irrigate intensive horticultural production manually - but in general, horticultural crops are usually only grown for subsistence purposes during the rainy season.

Vegetables are mainly grown on small plots by women for home consumption. They are aware that the consumption of vegetables is important to offset malnutrition and can also be a source of income. Women often dry indigenous vegetables and these are sold in various locations during the dry season.

The main root crop grown is sweet potato. In each of the districts visited this crop was regarded as a 'garden' crop i.e. an horticultural and not field crop. This is usually grown as a snack food primarily for home consumption on a small plot sufficient to 'feed' the family for several months.

No cultivation of cassava was reported.

The main horticultural crops grown

Table 1 below provides a synopsis of the most important horticultural crops and the reasons why they are grown. In Chivi, the most important horticultural crop is rape.

Exotic: cabbage, tomato, rape, spinach, carrots, Solanum potato, sweet potato, okra, and onions.

Indigenous: nyvehe, pumpkin leaves, cow-pea leaves, derere, and muchacha

Table 1: Reason and relative importance for the most important horticultural crops grown

CROP	Rape	Tomato	Swt potato	Onion	Mango
REASON					
Food	5	3	4	2	1
Sale	5	4	3	1	2
Barter	4	3	5	2	1
Fodder	4	3	5	1	1
Score	18	13	17	6	5
RANK	1	3	2	4	5

Source: Matrix ranking exercise conducted during the survey, where a score on a scale of 1 to 5 (1 = least important and 5 = most important) is applied to each reason for each crop in comparison with the other crops. On the basis of the total scores a RANK of 1 = most important to 5 = least important is applied.

Post-harvest constraints

Table 2: The relative importance of post-harvest constraints for the most important horticultural crops grown

CROP	Rape	Tomato	Swt potato	Onion	Mango
ACTIVITY					
Harvesting	4	5	3	1	2
Storage	3	4	2	1	5
Processing	3	4	2	1	5
Marketing	5	4	1	3	2
Score	15	17	8	6	14
RANK	2	1	4	5	3

Source: Matrix ranking exercise conducted during the survey, where a score on a scale of 1 to 5 (1 = least important and 5 = most important) is applied to each reason for each crop in comparison with the other crops. On the basis of the total scores a RANK of 1 = most important to 5 = least important is applied.

Harvesting

The low volume of vegetables produced means that harvesting is not currently regarded as a constraint. The single greatest problem is the harvesting of tomato. When they all ripen simultaneously, they cannot be stored or marketed at once. Farmers therefore sustain significant losses during peak periods of production.

Storage

Many farmers are unaware of suitable storage techniques for exotic vegetables. Indigenous vegetables which are routinely dried often suffer attack from weevils and rats during storage. Sweet potatoes are commonly stored and no significant problems were reported. Farmers are entirely conversant with the technology and recognise the importance of pre-selection of roots prior to storage in order to minimise rotting disorders.

Processing

A major constraint to the traditional techniques of drying is the unpredictable nature of the weather during the rainy season when most drying takes place. When vegetables become wet during the process they either dry slower or may even rot.

Marketing

Vegetables are marketed locally, primarily because there is no transport available. What is available is usually difficult to obtain. In addition, information concerning the location of markets and best prices offered is difficult to obtain.

Key Individuals who facilitated needs assessment exercises

AGRITEX

Mr Mazodze, District Agricultural Extension Officer, Chivi.

Mr Gariuanda, Ward 4 and 21 Extension Supervisor, Chivi.

Mr Mapepa, Extension Officer, Ward 4, Chivi.

Mrs Madzima, Extension Officer, Ward 21, Chivi.

Ward officials

Mr Gunge, Ward Chairman, Ward 21, Chivi.

Mrs Chiza, Garderners Group, Ward 21, Chivi.

NGO officials

Mr Butaumocho, ITDG, Project Officer, Chivi / Masvingo

Mrs Millie Vela, ITDG, Project Field Officer, Chivi Wards 4 and 21 (1993 - 1996)

Mr Mhondiwa, CARE, Programme Co-ordinator.

Mr Mahowe, CARE, Senior Field Officer, RDC, Chivi

Mr Jaka, CARE, Agent for CARE, Chivi centre and Mandanambwe

Buhera District: Wards 10 and 13, Natural region III

Buhera, like Chivi has a low rainfall pattern. Horticultural production is therefore not a significant activity in this area as rain-fed grain production is the primary source of staple food.

Vegetables are grown for home consumption and only the surplus is sold. This means that the income generated by horticultural production is much lower than grain crops and thus horticultural crops overall are regarded as insignificant.

Maize is the most important staple food crop and thus most effort is spent on this crop. Vegetable production is mainly carried out by the women and is regarded as a means to provide a source of 'relish' to accompany the main maize dish.

Given that horticultural production is mainly carried out by women, the opportunity to earn an income from vegetable sales is significant. This provides women with a potential source of independent income with which they can use for important household expenditure.

The main vegetables produced are: rape, cabbage, Tsunga, Chomollier, tomatoes, okra, onions, Swiss chard, peas and green beans.

Table 3: Reason and relative importance for the most important horticultural crops grown

CROP	Cabbage	Tomato	Onion	Rape	Shallots
REASON					
Food	5	4	1	3	2
Sale	4	5	2	3	2
Fodder	4	3	0	5	0
Score	13	12	3	11	4
RANK	1	2	5	3	4

Source: Matrix ranking exercise conducted during the survey, where a score on a scale of 1 to 5 (1 = least important and 5 = most important) is applied to each reason for each crop in comparison with the other crops. On the basis of the total scores a RANK of 1 = most important to 5 = least important is applied.

Like Chivi, the main root crop grown is sweet potato. This is usually grown as a snack food primarily for home consumption on a small plot sufficient to 'feed' the family for several months. No cultivation of cassava was reported.

Post-harvest constraints

Table 4: The relative importance of post-harvest constraints for the most important horticultural crops grown

CROP	Cabbage	Tomato	Onion	Rape	Shallots
ACTIVITY					
Harvesting	1	5	2	4	3
Storage	2	5	1	4	3
Processing	2	5	1	4	3
Marketing	2	5	1	4	3
Score	7	20	5	16	12
RANK	4	1	5	2	3

Source: Matrix ranking exercise conducted during the survey, where a score on a scale of 1 to 5 (1 = least important and 5 = most important) is applied to each reason for each crop in comparison with the other crops. On the basis of the total scores a RANK of 1 = most important to 5 = least important is applied.

Harvesting

Tomatoes ripen simultaneously and so must be harvested at once which gives rise to storage and marketing problems. Rape when mature becomes infested with leaf eating insects especially during the hotter months.

Storage

Commonly grown vegetables were reported to have a very short shelf-life and will either rot or lose their fresh appearance within a few days of storage.

Vegetables such as rape and to a lesser extent tomatoes which are stored in the dried form suffer from rots and attack from rats.

Processing

The main processing activity is the drying of green vegetables and tomatoes. The most important constraint affecting this is the occurrence of rots during the drying procedure. Lack of awareness of processing techniques and which vegetables can be processed into what product is perceived to be a constraint.

Marketing

Farmers tend to produce the same crops at the same time. This results in seasonal gluts which depress market prices and thus discourage marketing elsewhere as transport costs tend to be high. Transport from the farm-gate to the market is a serious constraint resulting in significant produce spoilage. Market information is not readily available so farmers have limited opportunities to market their crops. Further, farmers do not grow vegetables throughout the year which reduces the likelihood of contract growing arrangements which would offer farmers with greater income security.

Key Individuals who facilitated the needs assessment exercises

AGRITEX

Mr Mundeiri, District Agricultural Extension Officer, Buhera

Mr Dube, Agricultural Extension Officer, Buhera

Mr Gondo, Extension supervisor, Wards 10 and 13, Buhera.

Mr Mashuku, Extension Officer, Ward 13, Buhera.

Ward officials

Mr T Shambamuto, Ward Chairman, Ward 13, Buhera.

Mr Muridzi, Co-operative Chairman, Ward 13, Buhera

NGO officials

None available.

Mutoko District: Kawere Ward, Natural region III

Horticultural crop production plays a very significant role in comparison to other farming activities. The Mutoko area has a much higher rainfall than the previously mentioned sites. Consequently, horticultural production is a much more viable and lucrative option for farmers especially since crops can be produced throughout the year. Farmers indicated that the steady income received through vegetable production is preferred to the once off income obtained from the rain fed maize crops each year. Mutoko is relatively close (1 - 2 hours drive) to the capital city, Harare so the farmers have access to a large, guaranteed market all the year round. Vegetable production is carried out by both men and women reflecting its important income generating potential. Grain crops such as millet, sorghum and maize do not grow well under the conditions in Mutoko and thus farmers have switched to horticultural production. Farmers perceive that the total income earned through horticultural production is greater than rain-fed crops such as maize.

Main vegetable crops grown are: tomato (principal crop see Table 5 below), onion, cabbage, rape, Kale, okra, butter nut, green pepper, cucumber and Swiss chard.

Table 5: Reason and relative importance for the most important horticultural crops grown

CROP	Tomato	Rape	Onion	Cucumber	Okra
REASON					
Food	4	5	2	1	3
Sale	5	4	2	1	3
Fodder	4	5	0	2	3
Score	13	14	4	4	9
RANK	2	1	4	4	3

Source: Matrix ranking exercise conducted during the survey, where a score on a scale of 1 to 5 (1 = least important and 5 = most important) is applied to each reason for each crop in comparison with the other crops. On the basis of the total scores a RANK of 1 = most important to 5 = least important is applied.

Like Chivi, the main root crop grown is sweet potato. This is usually grown as a snack food primarily for home consumption on a small plot sufficient to 'feed' the family for several months.

Cassava is grown on a very limited scale and reflects the ethnic mix in the area as a result of an influx of peoples from both Malawi and Mozambique. Despite this, it is not regarded as a significant crop.

Post-harvest constraints:

Table 6: The relative importance of post-harvest constraints for the most important horticultural crops grown

CROP	Tomato	Rape	Onion	Cucumber	Okra
ACTIVITY					
Harvesting	4	3	1	2	5
Storage	5	4	1	2	3
Processing	4	3	1	5	2
Marketing	1	2	3	5	4
Score	14	12	6	14	14
RANK	1	4	5	1	1

Source: Matrix ranking exercise conducted during the survey, where a score on a scale of 1 to 5 (1 = least important and 5 = most important) is applied to each reason for each crop in comparison with the other crops. On the basis of the total scores a RANK of 1 = most important to 5 = least important is applied.

Harvesting

Tomatoes ripen simultaneously and if sufficient labour is not available to harvest the crops significant losses are incurred. The fruits are often damaged by red-spider mites which affects the marketability of the crop.

Leafy green vegetables are sometimes harvested after their ideal maturity period resulting in tough and discoloured leaves.

Given the higher levels of production, farmers perceive that they have significant labour constraints during certain periods in the production cycle for example harvesting.

Storage

Leafy vegetables are normally stored in the dried form but this is usually done on a small scale sufficient for house-hold needs.

Other vegetables are generally not stored as the main aim is to market them in the fresh form as soon as possible after harvest.

From Table 6 it can be seen that storage is the most significant post-harvest constraint facing tomato growers.

Processing

Lack of a means to overcome unpredictable weather during the rainy season whilst drying leaf vegetables is a constraint. Other constraints related to this issue are a lack of awareness concerning improved drying techniques and marketing opportunities.

Marketing

The main concern is lack of a reliable means of cheap transport to ferry fresh produce to the market. There is a limited market for dried leaf vegetables. These can be easily transported by bus to distant markets. It is unlikely however that demand will increase significantly as local supplies can always be obtained which discourages the need to 'import' supplies.

Key individuals who facilitated the needs assessment exercises.**AGRITEX**

Mr Mankonyere, District Agricultural Extension Officer, Mutoko.

Mr Myambo, Agricultural Extension Officer, Communal Lands Supervisor, Mutoko.

Mr Jokonya, Agricultural Extension Officer, Kawere Ward, Mutoko.

Ward officials

None available

NGO officials

Mrs Katsande, Chairperson, Kajiwa Deelopment Co-ordination Association, Mutoko.

Mrs Murwisi, Co-ordinator, Agricultural and Rural Development Authority, Mutoko.

ANNEX 4: LIST OF HORTICULTURAL CROP NAMES

Scientific name	English name	Shona name
<i>Abelmoschus esculentus</i>	Okra	Derere
<i>Adansonia digitata</i>	Baobab	Muuyu
<i>Allium cepa</i>	Onion	--
<i>Berchemia discolor</i>	Bird plum	Munyii
<i>Brassica juncea</i>	Chinese mustard	Tsungu
<i>Brassica napus</i>	Rape	
<i>Brassica oleracea var. acephala</i>	--	Rugare, covo
" " <i>var. capitata</i>	Cabbage	
<i>Capsicum annuum</i>	Paprika, pepper	Mhiripiri
<i>Citrullus lunatus</i>	Watermelon	
<i>Cleome gynandra</i>	Spider flower	Nyeve
<i>Corchorous spp.</i>	Jute	Derere
<i>Cucumis metuliferus</i>	Cucumber	Mugaka
<i>Cucurbita maxima</i>	Pumpkin, butternut	Mubovora
<i>Cucurbita pepo</i>	Gemsquash	--
<i>Daucus carota</i>	Carrot	--
<i>Ipomea batatas</i>	Sweet potato	Mumbambaira
<i>Garcinia huillensis</i>	--	Mutunduru
<i>Lycopersicon esculentum</i>	Tomato	Madomassi
<i>Mangifera indica</i>	Mango	--
<i>Morus alba</i>	Mulberry	Muaburosi
<i>Phaseolus vulgaris</i>	Bean	Nyemba
<i>Pisum sativum</i>	Pea	--
<i>Sclerocarya birrea</i>	Marula	Mapfura
<i>Strychnos spp.</i>	Bush or Monkey orange	Matamba
<i>Szygiuym cordatum</i>	Waterberry	Hute
<i>Uapaca kirkiana</i>	--	Mushanje
<i>Vigna unguiculata</i>	Cowpea	Nyemba
<i>Ziziphus mauritania</i>	--	Musau
<i>Voandzeia subterranea</i>	Bambara, groundnut	Nyimo

ANNEX 5: CHECK-LIST FOR SEMI-STRUCTURED GROUP INTERVIEWS
General Information

Village?

Number of participants in the group meeting (M/F)?

What are the villager's main economic activities (Rank in order of importance)?

What were the main changes in the economic system within the last five years?

Agricultural Production

Type of farming system and changes in the last five years?

What are the main cropsⁱ planted - rank in order of importance?

* ⁱⁱ Crop	Area planted	Quantity Harvested	How much sold
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Varieties of root and horticultural crops grown?

*What are the main reason for the crops grown?

Harvesting of Root and Horticultural Crops

When?

Who in the household harvests these crops?

Harvesting techniques uses?

*Type and extent of loss due to harvest?

*What are the constraints related to harvesting and what do the farmers suggest?

Storage of Root and Horticultural Crops

*How are crops stored - techniques?

Where are the crops stored?

Who in the household is responsible for storage?

When are the crops stored?

For how long?

*Type and extent of losses occurring during storage?

*What are the constraints related to storage and what do farmers suggest?

Processing of Root and Horticultural Crops

*Which crops do you process into what products, - rank in order of importance?

Processing techniques?

Quantities of raw material processed?

What are the labour requirements and what are the costs/

Are processed crops mainly for sale or home consumption - specify?

*How are products stored? How long, where and by whom?

*Does loss occur during and after processing?

*What are the amounts lost?

*What are the main constraints in processing crops? Please rank in order of importance

*What do you suggest to solve these problems?

Marketing of Fresh and Stored Root and Horticultural Crops

Please explain the marketing systems of fresh and processed crops?

What are your main cash crops? Please rank? Distinguish between fresh and processed?

Who do you sell to, what, where, whom, when, how much at what price and why?

How do prices change within the year?

How did prices change compared with the last three years?

Do you listen to the price broadcast on the radio? What other sources of information about markets do you have?

Do you grade the goods before marketing them?

*How do differences in quality influence the price?

*How does the age of the product influence price?

Do you package the good before selling them?

How do you transport goods to the point of selling?

*What are the main constraints in marketing crops, please rank in order of importance and explain?

*What kind of changes / improvements do you suggest?

Extension

Have you ever received any extension education concerning post-harvest? From whom, what kind of information, how often?

Needs Assessment

*What are the villagers' problems related to agriculture?ⁱⁱⁱ

ⁱ 'Crops' will only refer to root and horticultural crops.

ⁱⁱ Indicates questions which are essential.

ⁱⁱⁱ We will determine this by using the seasonal calendar and then asking villagers to identify and rank their constraints. After the ranking exercise, it will be necessary to discuss these constraints in more detail concentrating on post-harvest aspects. After the ranking exercise it may be necessary to further discuss the constraints with those concerned on either an individual or women only basis.