Private Sector Development Programme (PSDP) Botswana

In partnership with

Ministry of Agriculture

Horticulture Sector
Value Chain Analysis and Action Plan

FINAL DRAFT

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Although we have drawn on the information and opinions of others, the views and opinions expressed in this report are our own and do not necessarily reflect those of CDE, ITC or Ministry of Agriculture.

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ABBREVIATIONS AND ACRONYMS

Agri-Hub	Agricultural Hub, MOA
ASC	Agricultural Service Centre
ASSP	Agricultural Service Support Project
BCA	Botswana College of Agriculture
BCAIS	Contributory Agricultural Insurance Scheme in Botswana
BDC	Botswana Development Corporation
BHC	Botswana Horticultural Council
BHM	Botswana Horticulture Market
BIDPA	Botswana Institute for Development Policy Analysis
BNYC	Botswana National Youth Council
BOBS	Botswana Bureau of Standards
BOCCIM	Botswana Confederation of Commerce, Industry and Manpower
CAGR	Compounded annual growth rate
CCGS	CEDA Credit Guarantees Scheme
CDE	Center for the Development of Enterprise
CEDA	Citizens Enterprise Development Agency
CICE	Centre for In-service and Continuing Education
DABP	Department of Agriculture Business Promotion, MOA
DAR	Department of Agricultural Research, MOA
DCP	Department of Crop Production, MOA
DGS	Department of Geological Surveys
DMS	Department of Meteorological Services, MEWTD
DRS	Division of Research and Statistics, MOA
DWA	Department of Water Affairs, MMEWR
DWMPC	Department of Waste Management and Pollution Control, MEWT
EDD	Economic Diversification Drive
EU	European Union
FAO	Food and Agricultural Organization
FF&V	Fresh Fruits & Vegetables
GDP	Gross Domestic Product
GIS	Geographic Information Systems
IFAD	International Fund for Agricultural Development
ISO	International Organization for Standardization
ISPAAD	Integrated Support Programme for Arable Agriculture Development
ITC	International Trade Center
LEA	Local Enterprise Authority
M&E	Monitoring and evaluation
MEWT	Ministry of Environment, Wildlife and Tourism
MFDP	Ministry of Finance and Development Planning
MMEWR	Ministry of Energy, Minerals and Water Resources
MOA	Ministry of Agriculture
MOH	Ministry of Health
MOLG	Ministry of Local Government
MOLH	Ministry of Lands and Housing
MTI	Ministry of Trade and Industry
NAMPAADD	National Master Plan for Arable Agriculture and Dairy Development
NDB	National Development Bank
NDP	National Development Plan
NFTRC	National Food Technology Research Centre
NHPTC	National Horticultural Producers and Traders Committee of Botswana
OSSCA	One Stop Service Centre for Agriculture
P	Botswana Pulas
PSDP	Private Sector Development Program
PTF	Production and Training Farm
RTC	Rural Training Centre
SABS	South African Bureau of Standards
SMMEs	Small Micro and Medium-Sized Enterprises
SPEDU	Selebi-Phikwe Economic Diversification Unit
SPS	Sanitary and phytosanitary
TA	Technical assistance
TC	Technical committee
UB	University of Botswana
US$	United States Dollars
VCA	Value chain analysis
WTO	World Trade Organization
WUC	Water Utilities Company
YFF	Young Farmers Fund

EXECUTIVE SUMMARY

Background to the value chain analysis and action plan

This horticulture sector strategic value chain analysis and action plan study (VCA) has been produced in the framework of the Private Sector Development Program (PSDP) in Botswana. It is the second of three similar VCA exercises to be developed through a partnership between the Centre for the Development of Enterprise (CDE) and the International Trade Centre (ITC), the others focusing on beef and tourism. The objectives of all three studies are to identify bottlenecks and constraints in the sectors' value chains, especially related to small, micro and medium-sized enterprises (SMME), and to propose a strategy and roadmap to alleviate such constraints.

Botswana is currently in the process of implementing a number of policies and strategies at the national level. These include the National Development Plan 10; the Private Sector Development Strategy; the Agricultural Sector Marketing Strategy; and the Economic Diversification Drive: Medium to Long-term Strategy. The horticulture sector roadmap presented in this report is intended to reinforce the impact of existing proposals and facilitate the achievement of their goals.

In developing the horticulture VCA, the ITC team has worked closely with the Ministry of Agriculture (MOA), in particular its Department for Agricultural Business Promotion (DABP) and the Department for Crop Production (DCP). The sector has a scarcity of current and reliable information, and some primary research was conducted by way of targeted surveys and review market information on the internet to gather information. This study's findings and recommendations are based on available information and consultations with a wide range of producers, processors, policymakers and academics involved in the sector.

The horticulture sector is small in international terms. More than half of the fresh fruit and vegetables (FF&V) consumed in the country is imported, although this proportion has been falling. The sector has been undergoing significant transformation in recent years. The Botswana Horticulture Market (BHM), which used to be an important centralized intermediate market for FF&V, has been losing market share, is currently moribund, and is being restructured. Retail chains have been establishing direct channels with farmers and are building their own distribution and logistics functions. The sector is populated by a large number of small farms, with a significant majority of farmers being part-time owners. Quality standards are generally not adopted. Almost half of the land allocated for horticulture remains uncultivated. Good agriculture practice and record-keeping is rare. The government's policy of closing borders for the import of surplus FF&V protects the sector, but creates distortions.

Nevertheless, significant opportunities exist for improving the sector's performance. The sector benefits from producing natural FF&V, without artificial additives such as growth hormones. Most of the farmers are relatively new are well educated, and can readily improve practices with the right training and incentives. The sector benefits from various government support programs.

The VCA identifies various constraints facing the horticulture value chain, suggests strategic objectives to strengthen the sector's performance and provides a roadmap for actions to realize these objectives. It also suggests some technical assistance projects that are suitable for PSDP support.

The global horticulture market and Botswana's position

The Food and Agriculture Organization (FAO) estimates global FF&V production in 2010 to be 1.6 billion tonnes, of which Africa accounted for 9%. In 2011, total FF&V production in Southern Africa was 18 million tonnes. Botswana's vegetables production accounted for 0.8% of the region and that of fruit less than 0.1%.

In 2013, 39 million tonnes (US$39 billion) of vegetables and 77 million tonnes (US$76 billion) of fruit were imported globally. During the same year, vegetables and fruit exports were 39 million tonnes (US$38 billion) and 76 million tonnes (US$67 million) respectively.[1]

Botswana's agriculture sector accounts for 2.7% of the country's GDP. The sector is dominated by the livestock (principally beef) industry, which accounts for 61% of the sector's output. In the year ending April 2013, the horticulture sector's output is reported to have accounted for P143 million (US$14.3 million), or 0.1% of GDP. Total production and imports of FF&V in 2013 was 112,000 tonnes, of which the latter accounted for 58%. Imports are almost entirely from South Africa.

The horticulture value chain

The following are selected features of the Botswana horticulture value chain:

- Inputs such as seeds, pesticides and fertilizers are almost entirely imported from South Africa. The VCA suggests that Botswana input prices are on average 26% higher than those prevailing in South Africa.

- Production is dominated by cabbage, tomato, potato and oranges, which together account for 60% of tonnage. 83% of the 2,096 hectares of land cultivated for horticulture is used for producing vegetables.

[1] ITC Trade Map. Differences in export and import information result of reporting inconsistencies.

- As of March 2014, there were 649 active farms in the country. 26 of these were over 10 hectares in area and accounted for 43% of land under cultivation. At the other extreme, 141 farms had less than one hectare and accounted for only 3% of land under cultivation. MOA estimates suggest over 90% of farms are owned by farmers who are part-time. The central district accounts for 40% of farms in the country.

- There is limited adoption of good farming practices, record keeping and technology in farms, especially among medium-sized and small farms.

- There are significant fluctuations in production volumes and prices of FF&V due to accentuated seasons and extreme weather conditions. These fluctuations are exacerbated by the lack of technology adoption, for example green houses and poly tunnels, as well as the absence of coordination of production among farmers.

- Production yields have fallen significantly in recent years, as volumes have not kept pace with a rapid increase in land allocated to horticulture.

- Although there are voluntary national standards on grading of produce, these are generally not adopted. Retailers do not differentiate FF&V by quality at the point of sale. As a result, the competition is based mainly on price, and there are few incentives to invest in upgrading production quality.

- Access to water is a major constraint. Combined with financing constraints, for example, to drill boreholes, this contributes to low capacity utilization at farms. The authorities are piloting the usage of treated wastewater for horticulture. Technology such as drip irrigation is at its infancy. Electricity supplies in rural areas is an additional source of limitation.

- The wholesale market used to be dominated by BHM[2]. However, due to various shortcomings, it became less attractive as a channel for farmers, and it is being restructured from an agency to a wholesale market. The viability of the proposed model is unclear.

- Retail grocery chains, dominated by Choppies Group, have been building direct linkages with farms over a number of years. Farmers and some other sector stakeholders perceive that the relationship between farmers and retailers is unbalanced and as a result farmers suffer many disadvantages. Other traders[3], such as hawkers, play a small but important role in serving key segments of the population.

[2] Technically BHM has historically not been a wholesaler, and operated a centralised agency-model market.
[3] Retailers are locally referred to as traders.

- There is almost no secondary processing in Botswana and all processed FF&V, other than some processing such as making of packaged salads, are imported from South Africa. The government has supported the establishment of a FF&V processing plant at Selebi-Phikwe. Its commercial viability is unclear.

- The value chain's support network is dominated by various departments of the Ministry of Agriculture, in particular its Department of Agriculture Business Promotion (DABP) and Department of Crop Production (DCP). In addition, a range of institutions provide other services. The Botswana Horticultural Council and regional associations are very weak. Market intelligence is almost non-existent. Government subsidized finance is available through schemes operated by The Citizen Entrepreneurial Development Agency (CEDA). There is potential for significantly strengthening the value chain's support network.

- Various government policies and initiatives affect the horticulture sector, including policies related to land allocation; quality standards; grants aimed at farmers, youth, and for backyard gardening. A key policy relating to the horticulture is that of import controls through border closures in the event of surplus production of particular crops. Many of the policies are designed for arable farming and at times may not effectively meet the needs of the horticulture sector.

Competitive constraints and bottlenecks in the horticulture value chain

The analysis in this study relies on the ITC Four Gears Framework to identify competitive constraints in Botswana's horticulture value chain. Given that FF&V are not exported, three of the relevant gears have been used. These three gears relate to: constraints relating to supply of FF&V; the quality of the value chain's business environment; and long term sustainability issues. The principal constraints identified are outlined below:

SUPPLY-SIDE ISSUES

Capacity development

- The sector is dominated by small, unprofitable farmers, who lack the resources to invest in modern farming technology.
- There is limited cooperation between farmers to coordinate production or group for marketing or purchasing.
- Seasonality and large fluctuations of supplies leads to large variation in prices and wastage.
- The lack of quality grading and sorting contributes to pricing pressure on FF&V outputs.
- Almost 50% of land allocated to horticulture remains unutilized, reducing production potential.
- Ownership by part-time farmers reduces farm performance.
- FF&V production is heavily dependent on unskilled farmers who move to farming because they have no other source of employment.
- Farmers seek short-term returns in preference to long-term investment (vegetables vs fruits).

- Lack of modern technology restricts the opportunity to expand the range and volume of FF&V produced.
- There are inadequate post-harvest handling facilities.

Capacity diversification

- There is a lack of secondary processing capacity for FF&V.
- FF&V produced are very limited in range.

Development of skills and entrepreneurship

- The significant majority of farmers, especially small and medium-sized ones, lack farming skills.
- Record-keeping and financial management at farm level is often inadequate.

QUALITY OF THE BUSINESS ENVIRONMENT

Infrastructure and regulatory issues

- The border closures policy, whilst benefiting many farmers, has many distortionary effects on the sector.
- There are a wide range of policies and initiatives aimed at stimulating the sector, but the design of many produce gaps and sub-optimal outcomes.
- Land allocation policy, in particular, contributes to low utilization of FF&V allocated land.
- Transport and logistics infrastructure supporting the horticulture sector is weak and there is an acute shortage of collection and storage facilities, especially chilled ones.
- Electricity distribution to farmers is challenging due to remoteness and the cost of electricity is too high for most farmers.
- Water is not widely available for most farms and water quality is often not appropriate for farming.

Quality of the institutional support

- MOA extension services are poorly resourced and fragmented.
- The availability of market intelligence is lacking and its distribution is very limited.
- CEDA's lending products, especially those designed for youth farmers, are poorly designed and often do not meet borrower needs. Commercially available finance is not readily available.
- Botswana Horticultural Council and regional associations are under-resourced and provide limited support to farmers.
- There are limited linkages amongst government institutional support programs. They operate in parallel and lack coordination.
- Theoretical training does not address the lack of modern technical skills by farmers and farm labourers.
- Statistics Botswana does not gather or produce statistics on the horticulture sector. MOA information lacks consistency and has gaps.
- There is a large number of generalists at government department and agencies, lacking technical skills.
- Record keeping and data analysis capacity at government institutions is weak.

- The lack of a national horticulture policy acts as a barrier to developing effective support programs for the sector.
- There is a lack of horticultural crop insurance products for farmers.

Cost of doing business

- The need to import almost all inputs from South Africa increases cost of production.
- Labour is scarce and expensive and there is a need to explore seasonal agricultural work permits for foreign labour.

SOCIAL DEVELOPMENT GEAR

Poverty alleviation and employment generation

- Government incentives and schemes to generate FF&V employment have various limitations.
- Government initiatives lack focus on attracting dedicated, full-time farmers who will create employment and increase horticultural production.

Environmental sustainability and climate change

- Initiatives to increase the sustainability of water use by the horticulture sector require strengthening, through research in appropriate technology.
- Extreme environmental conditions including droughts and frost hamper production.
- Treated waste water quality is questionable for irrigation purposes. There is limited availability of appropriately treated waste water outside the Gaborone area.

Gender and youth inclusiveness

- A number of government schemes are aimed at increasing youth involvement in the sector, but many have shown limited effectiveness.
- There are various barriers to women's full participation in the sector.

Proposed strategic vision and objectives for horticulture sector

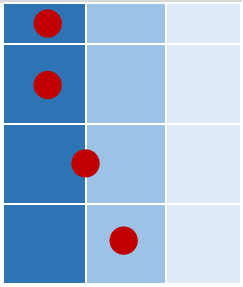
The proposed vision statement for the horticulture value chain is:

'Contributing to Botswana's self-sufficiency in fruits and vegetables by supplying high quality, naturally farmed products produced through good farming practices.'

The statement is intended to highlight the objectives of:

- Contribution to self-sufficiency. Given the limited availability of land suitable for horticulture (exacerbated by under-utilization) and its climate Botswana is unlikely to be fully sufficient in all types of FF&V demanded by consumers. Nevertheless, the sector can make a significant contribution towards this end.
- There needs to be focus on quality. It is unlikely that all FF&V produced will be of the highest grade, but some recognition and reward for quality needs to be introduced to the value chain.
- Natural farming: This is a major strength of Botswana horticulture, and needs to be recognized and exploited.
- Good farming practices cover a wide range of techniques, tools, technology, management and record keeping that contribute to improving farm performance.

The VCA proposes four strategic objectives to realize the horticulture sector's vision. Each objective has been prioritized as urgent (UR), very high (VH), or high (H). The strategic objectives are to:

		Priority		
		UR	VH	H
1.	Strengthen horticulture farm performance and product quality.			
2.	Improve gathering and distribution of information to market participants and policy makers.			
3.	Develop better targeted policies and more effective support network for the sector.			
4.	Promote SMME participation in the horticulture value chain in targeted areas.			

Proposed roadmap

The proposed roadmap provides activities and initiatives for each of the strategic objectives, prioritized as UR, VH, or H.

Strategic objective 1: Strengthen horticulture farm performance and product quality

		Priority		
		UR	VH	H
1.1	Upgrade the current voluntary FF&V quality grading system to make them compulsory. Promote local produce.			
1.2	Improve capacity and effectiveness of extension officers.			
1.3	Research and publish information on horticulture farm economics and performance.			
1.4	Strengthen farming practices especially at small and medium-sized farms			
1.5	Update training curricula at Botswana College of Agriculture (BCA) and Rural Training Centres (RTC) and introduce more vocational courses, practical and business content.			
1.6	Develop tailored curricula for different types of farm personnel.			
1.7	More actively support adoption of farming technology.			
1.8	Introduce 'Farmer of the Year' awards.			

Strategic objective 2: Improve gathering and distribution of information to market participants and policy makers

		Priority		
		UR	VH	H
2.1	Automate the gathering, analysis and distribution of farm and sector information at DCP and DABP.			
2.2	Develop a system and processes to gather, analyze and distribute FF&V import information.			
2.3	Introduce a register of FF&V plantings and harvest estimates for farms. Build on the current DCP horticulture inventory reports.			
2.4	Introduce SMS based price and volume supply/demand information system.			
2.5	Statistics Botswana should start collating and publishing horticultural sector information.			
2.6	In the medium-term, develop an integrated information system for the horticulture sector.			

Strategic objective 3: Develop better targeted policies and more effective support network for the sector

		Priority		
		UR	VH	H
3.1	Introduce a code of practice to govern relations between farmers and retailers.			
3.2	Redesign land allocation policy to increase cultivation rate and farm sustainability.			
3.3	Redesign CEDA lending policies to meet horticulture production needs and alleviate their current deficiencies.			
3.4	Combine DCP and DABP horticulture-related extension services.			
3.5	Improve transparency and process for decision-making for border closures.			
3.6	Make ISPAAD[4] more relevant for the horticulture sector and move NAMPAADD[5] horticulture services to new combined DCP/DABP unit.			
3.7	Facilitate exports of surplus vegetables			
3.8	Redesign current policies in order to incentivize full-time farmers.			
3.9	Increase coordination between RTC and BCA on horticulture training. Consider consolidating farm training within BCA.			

Strategic Objective 4: Promote SMME participation in the horticulture value chain in targeted areas

		Priority		
		UR	VH	H
4.1	Support SMMEs establish processing plants for local FF&V.			
4.2	Promote SMME participation in the development of local collection and distribution centres.			
4.3	Support SMMEs develop regional wholesaling businesses.			
4.3	Pilot local SMME sorting and packing facilities.			

[4] Integrated Support Programme for Arable Agricultural Development
[5] National Master Plan for the Arable Agriculture and Dairy Development

Recommended interventions for PSDP

The following projects are recommended as being suitable for support by the PSDP:

1. Supporting SMMEs to develop products and services to bridge gaps and strengthen the horticulture value chain. Possible areas of support are:
    a. Secondary processing of FF&V.
    b. Local collection, storage and distribution facilities.
    c. Sorting, grading and packaging.
    d. Regional wholesaling operations.

2. Implementing quality standards for FF&V.

3. Developing and implementing a code of conduct for retailers in respect to their relationship with FF&V suppliers.

1. INTRODUCTION AND APPROACH

1.1. INTRODUCTION TO THE REPORT

This horticulture sector strategic value chain analysis and action plan study (VCA) has been produced in the framework of the Private Sector Development Program (PSDP) in Botswana. It is the second of three similar VCA exercises developed through a partnership between the Centre for the Development of Enterprise (CDE) and the International Trade Centre (ITC), the others focusing on beef and tourism.

The PSDP is an initiative of the Government of Botswana, represented by the Ministry of Trade and Industry (MTI) and the Ministry of Finance and Development Planning (MFDP), in partnership with the European Union (EU). The program is supported by CDE and the Botswana Confederation of Commerce, Industry and Manpower (BOCCIM).

The principal objectives of VCA are to draw on existing information and stakeholder consultations in order to identify the main opportunities and bottlenecks in the export value chains of the selected sectors; to assess whether or not technical assistance (TA) is likely to contribute significantly to increased exports by small, micro and medium-sized enterprises (SMME) in the sector; and if so to prepare plans of action for a comprehensive capacity building intervention within the framework of PSDP. The horticulture sector is a net importer so the domestic value chain has been considered.

1.2. HORTICULTURE SECTOR RECOMMENDATIONS IN CONTEXT

The strategic recommendations and roadmap proposed in this report are intended to be consistent with and reinforce wider national and sectoral strategies being implemented in Botswana. In particular, the analysis has been undertaken in the context of:

- National Development Plan (NDP) 10, 2009-2016.
- Botswana National Export Strategy 2010-2016.
- Private Sector Development Strategy 2009-2013.
- Botswana Agricultural Marketing Strategy 2011-2016.
- Economic Diversification Drive (EDD): Medium to Long-term Strategy 2011-2016.
- Botswana Excellence: A Strategy for Economic Diversification and Sustainable Growth.

The VCA aims to support the government's objectives on diversifying Botswana's economy and PSDP aims of promoting the private sector, in particular by supporting the development of SMMEs. The study has focused on identifying constraints in the horticulture value chain in the effective performance of the private sector, the development of SMMEs, and has proposed measures to address these barriers.

1.3. HORTICULTURE VCA APPROACH

The terms of reference for the VCA provide the context and objectives for the work being carried out in developing the report.

In developing the horticulture VCA, the ITC team has worked closely with the Ministry of Agriculture (MOA), in particular its Department for Agricultural Business Promotion (DABP) and the Department for Crop Production (DCP). The sector has a scarcity of current and reliable information, and some primary research was conducted by way of targeted surveys to gather information. This study's findings and recommendations are based on available information and consultations with a wide range of producers, processors, policymakers and academics involved in the sector.

The main steps involved have been:

- Extensive consultation with a wide range of stakeholders to gather their views on the sector, its strengths and constraints, and potential for strengthening. The key stakeholders consulted are presented in Annexes I and II.

- Two stakeholder workshops to gather views and information on the value chain, its principal constraints, and the action plan. The first workshop focused on validating the value chain map and started reviewing the principal constraints of the sector. The second workshop concentrated on identifying constraints and developing an action plan. Annex II lists the participants in the workshops.

- Drawing on MOA monthly surveys to gather volume and price information on selected fresh fruits and vegetables (FF&V) in different parts of the country, and also on DCP reports for regional production and farm information.

- Joint ITC team and MOA visits to wholesalers and key retailers to gather information on volumes and prices.

- Extensive research of statistical and other sources, including the ITC Trade Map, Statistics Botswana, 2010/11 Local Enterprise Authority (LEA) study of the horticultural sector[6], Botswana Horticulture Market (BHM) volume and price information, and the MOA Horticulture Division survey information.

- Surveys of framers to gather information on their sales to different channels; surveys of input suppliers on their prices; and internet surveys on retail and wholesale prices of FF&V sold in South Africa.

[6] This study had some useful information, but the structure of the sector has changed considerably since it was produced and it had drawn on more detailed information from a 2007 LEA study so most of the information was considered to be outdated.

- Review of relevant studies and strategies related to the horticulture sector.

Relevant elements of the ITC Four Gear Framework[7] have been applied as the framework for the analysis for the VCA.

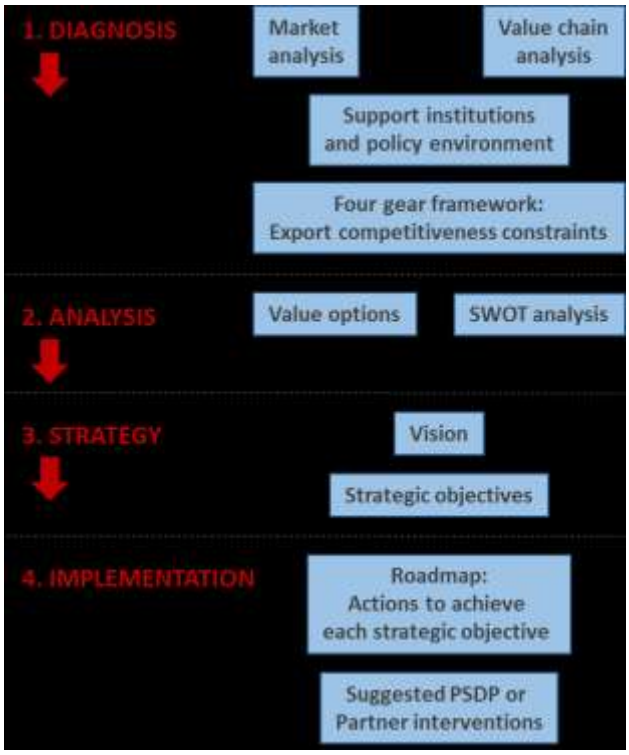
The report's analysis has focused on FF&V, although issues relating to secondary processing have also been considered.

There are significant gaps in the availability and consistency of information relating to the horticulture sector. We have sought to adjust for material inconsistencies wherever possible, and have highlighted information related constraints in the relevant sections.

1.4. REPORT STRUCTURE

Chart 1 outlines the structure of this report.

Chart 1: Report structure



The diagnostic element of the exercise comprised an analysis of the structure and key trends in the global FF&V markets and production and Botswana's position in it (Section 2). This was complemented by the mapping and description of the key components of the horticulture value chain (Section 3). The information from these two exercises, as well as an analysis of the sector's support network and policy environment (Sections 4 and 5) were drawn on to present the key competitive constraints and bottlenecks in the value chain and its support network (Section 6). The latter applies the ITC Four Gear Framework, which analyses constraints based on supply side, quality of business environment, export market entry and developmental impact issues. As highlighted earlier, given the net import position of the horticulture sector and lack of exports, the export market entry component has been excluded.

The results of the diagnosis were then built on to identify value options: how the horticulture value chain could be developed to acquire, create, add, retain or distribute value more effectively (Section 6).

[7] See Section 6.1 for an explanation of the ITC Four Gear Framework.

The strategic vision and objectives, along with a SWOT analysis of the sector, presented in Section 7, are intended to bring together the VCA findings and analyses to provide a coherent framework for intervening in the sector to realize its full potential. Section 8 presents a roadmap for implementation, with a number of suggested prioritized actions, to realize each of the strategic objectives. Finally, Section 9 provides four proposed TA interventions, for consideration of implementation under the PSDP framework.

2. BOTSWANA HORTICULTURE SECTOR IN THE GLOBAL CONTEXT

2.1. BACKGROUND TO THE HORTICULTURE SECTOR IN BOTSWANA

The horticulture sector is of strategic importance to Botswana with respect to providing food security and could potentially be a significant contributor to EDD led by MTI. Although the sector currently contributes small portion to the national Gross Domestic Product (GDP), it provides employment and livelihood to a significant number of households, particularly in the rural and remote areas of the country. In 2013 the sector imported 58% of its produce by quantity. It suffers from a number of challenges, including poor and stagnating productivity, weaknesses in support services, seasonal over-production in a number of vegetables, minimal investments in food processing and almost non-existent exports capacity. The horticulture sector has seen some growth in recent years particularly due to increased private investment and a number of initiatives by the government. Botswana's horticulture sector can considerably increase the productivity and enlarge its share of contribution to the national economy.

The agricultural sector's share of GDP has declined steadily since independence until the late 1990s. In 2013, the sector's contribution to GDP was 2.7%, or P2.9 billion. The sector is dominated by livestock, primarily beef, which contributed 61% of the sector's output in that year. Horticulture's share of GDP is included in 'Other Agriculture' in the national statistics, which contributed P857 million, or around 30% of agricultural output. The Other Agricultural classification includes beekeeping, forestry and hunting[8]. At the farm gate, the horticulture sector's output was estimated at P143 million, or US$14.3 million in the year ending April 2014.[9] This would yield a contribution of 5% of agricultural GDP and 0.1% of national GDP.[10]

In 2013/14, local FF&V production was approximately 47,000 tonnes, and imports were 65,000 tonnes.

This section provides an overview of the horticulture sector in Botswana and its imports in the context of world markets, trends and competition. Section 3 considers issues relating to the various components of the sector's value chain in more detail.

[8] Information from Statistics Botswana

[9] MOA estimate

[10] The reported FF&V GDP and import figures need to be treated with some caution. For example, while in tonnage terms, imports constitute 58% of total domestic consumption in 2013, by value imports are recoded at US$45 million, whilst domestic production is reported at US$14.3 million.

2.2. GLOBAL HORTICULTURE PRODUCTION AND TRENDS

Botswana is a relatively small FF&V producer in the international context.

Chart 2: Top international FF&V producers

The Food and Agriculture Organization (FAO) estimates that global vegetables production in 2010 was 1 billion tonnes, and world fruit production was 609 million tonnes[11]. In 2010 Asia accounted for 66% of global FF&V production, while Africa accounted for 9%.

Chart 2 highlights the top 10 FF&V producing countries in 2010. China accounted for 52% of global vegetables production and 40% of FF&V production. The top five countries accounted for 69% and 46% of vegetables and fruit production respectively.

The four highest producing countries accounted for 78% of the global vegetables production. Global fruit production on the other hand reached 30 million tons in the same year, with the top four countries having produced 48% of the world's production. China is the world's largest vegetables producer with over 161 million tons whilst India leads fruits production with an estimated tonnage of 9 million tons.

Total vegetables and fruit production in Southern Africa in 2011 was 5.2 million tonnes and 12.6 million tonnes, respectively. South Africa was the largest producer in both categories, accounting for 51% and 46% of regional production respectively. Botswana's vegetables production accounted for 0.8% of the region and that of fruit less than 0.1%.

[11] FAO Statistical Handbook 2013. Vegetables data includes melons, fruit data excludes melons.

Chart 3: Global trend in FF&V production

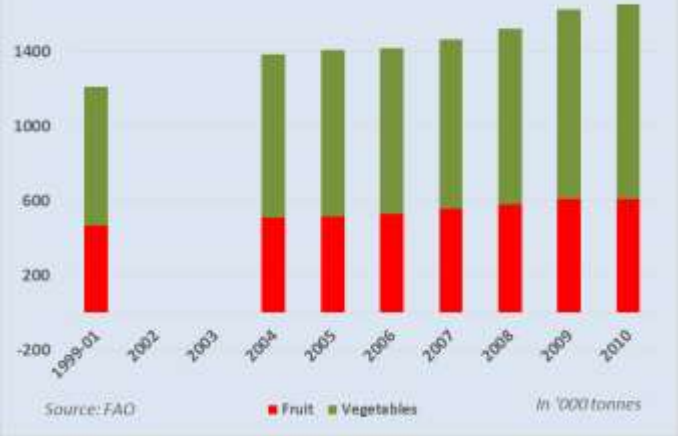
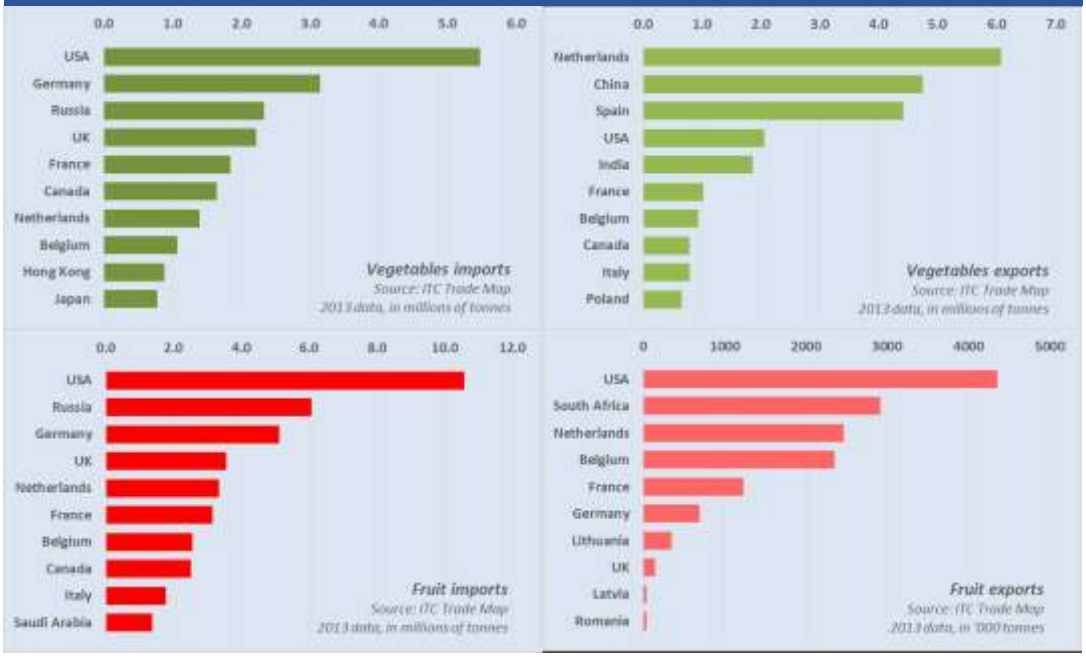


Chart 3 highlights the global trend in FF&V production between 2000 and 2010[12]. World vegetables production grew by 5.3% per annum between 1990 and 1999, and by 3.3% per annum between 2000 and 2010. The equivalent growth rates for fruit were 3.9% and 3.3% respectively. A key contributor to growth in vegetables production over the last two decades has been China. Other developing countries have also seen strong rises in production of both fruits and vegetables.

Developing countries, especially in Asia, have experienced significant rises in per capita consumption of FF&V.

2.3. GLOBAL EXPORT AND IMPORT MARKETS IN HORTICULTURE

Chart 4: Top FF&V exporting and importing countries



[12] 2002 and 2003 information not available.

In 2013, 39 million tonnes (US$39 billion) of vegetables and 77 million tonnes (US$76 billion) of fruit were imported globally. During the same year, vegetables and fruit exports were 39 million tonnes (US$38 billion) and 74 million tonnes (US$67 million) respectively.[13] Between 2004 and 2013 global horticulture exports grew by 109%, with a compounded annual growth rate (CAGR) of 8.7%. During this period fruit exports increased by 99% and 7.9% respectively. The equivalent growth rates for vegetables were 116% and 9.1%.[14]

Chart 4 above highlights the world's top FF&V exporters and importers.

In 2013 Spain exported 12% of the world's fruits and the top 10 exporting countries represented 61% of the global fruit exports. South Africa, in 10th place is the largest African fruit exporter. The Netherlands is the world's largest vegetables exporter, contributing 17.5% to the world's exports. The top 10 countries exported 75% of the world's fresh vegetables. There is no African country in the top 10. Morocco, the largest African vegetables exporter, is placed 13th globally.

Global horticulture imports grew by 105% between 2004 and 2013, equivalent to a CAGR of 8.5%. During this period fruit imports increased by 102% or 8.3% CAGR. In 2013, USA imported 13% of the world's exported fruits, whilst the world's top 10 countries imported 62%. Algeria is the highest African fruit importer, ranking 41st globally. USA was also the world's largest vegetables importer in 2013 with 17% of the world's vegetable exports. The top 10 countries represented 66% of exported vegetables. Algeria in 45th place is the highest African country in the world rankings of vegetable imports. Between 2004 and 2013 global vegetable imports increased by 106% with a CAGR of 8.6%[15].

2.4. EVOLUTION OF THE HORTICULTURE SECTOR IN BOTSWANA

At the time of independence, the Botswana agriculture sector accounted for 39% of the country's GDP. Its share has fallen over time, reaching 2.3% in 2013[16]. Expansion of the mining industry and in particular the discovery of diamonds led to a long-term underinvestment and de-prioritisation of agriculture, which was not considered a national priority. This can be seen by the lack of growth in the sector between 1974 and 2000[17].

[13] Export and import figures differ due to variances in the reporting of mirror data.
[14] ITC Trade Map
[15] *Ibid*
[16] Statistics Botswana
[17] BIDPA, Welfare Impacts of Import Controls in Botswana's Horticulture, Working Paper No. 26 June 2005, Tebogo B. Seleka, ISBN: 99912-0-558-6

Chart 7: Trend in output of agriculture sector and its components

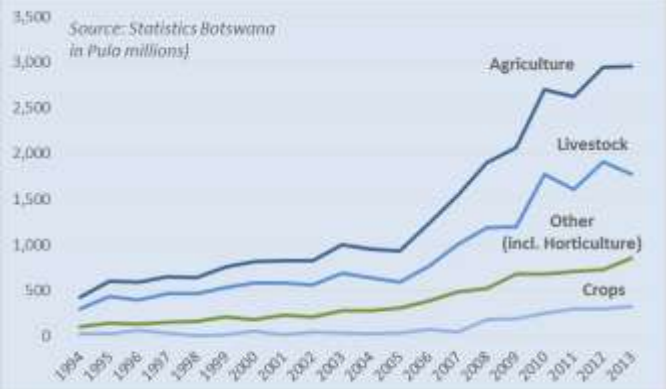


Chart 7: Trend in FF&V production and imports

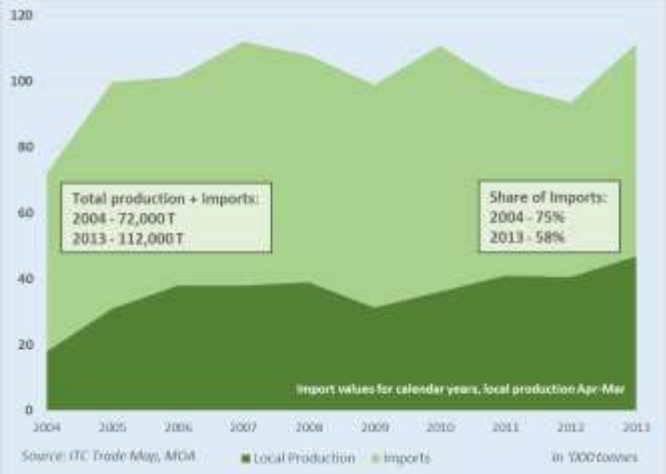
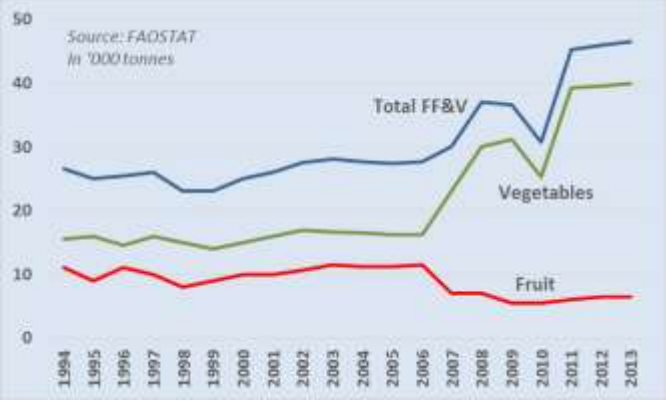


Chart 7: Annual trends in fruit and vegetables production



The agriculture sector is dominated by the livestock industry, and in particular beef production, and accounted for over 60% of the sector's output in 2013. Statistics Botswana does not separately report on horticulture. The sector's output is included in 'Others' within the agriculture sector, which, as indicated previously, also includes beekeeping, forestry and hunting. The agriculture sector's share of GDP was 2.3% in 2004 and 2013, compared to a high of 2.9% in 2009 and 2010. The share of 'Others' has been around 30% of the agriculture sector's output over the last ten years. As Chart 5 shows, in absolute terms, however, all components of the sector have grown over the last 10 years. In 2013, the output of 'Other Agriculture' was P857 million.

After a long period of relative stagnation, FF&V production increased from 3,500 tonnes in 2000 to 18,200 tonnes in 2005. Since then the sector's production has been growing at an average CAGR of 10%.[18]

As Chart 6 shows, total production and imports of FF&V increased by 55% from 72,000 tonnes to 112,000 tonnes between 2004 and 2013. Over the same period, local production increased from 18,000 tonnes to 41,000 tonnes, reducing the reliance on imports from 75% to 58%. This growth has come as a result of an increase in the number of farms, from 400 in 2004 to 820 in March 2013. The amount of land under production has also more than doubled over this period, from 1030 hectares to 2,209 hectares. Government policies incentivising horticulture production have been key contributors to this increase.

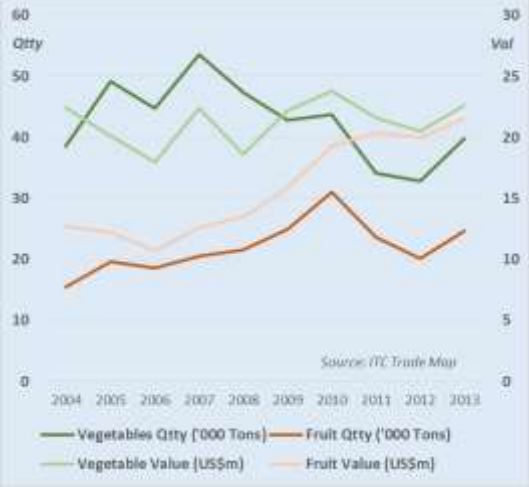
[18] This data is from MOA. The Chart is drawn from FAOSTAT data, which shows significantly larger total FF&V production volumes in the early years, although this gap has converged in recent years. Breakdown of horticulture production data into fruit and vegetables over the review period was not available.

Chart 7 shows the trends in fruit and vegetables production over the last decade. Fruit production grew by 2.2% CAGR between 1994 and 2003, but shrunk by 5.3% CAGR between 2004 and 2013. The fall in fruit production is attributed to a significant drop in production of bananas, citrus and mangoes. This was the result of change of management at some of the largest fruit farms, the loss of interest by some other large scale farmers and the ageing of existing orchards leading to lower yields.

Vegetable production has increased over the same period, especially between 2005 and 2013, when it grew at a CAGR of 10.2%. This growth is a result of the shifting of a number of fruit farmers to vegetable production and the adaptation of some cattle posts to integrated farming. During the period 2006-2009 there was a clear shift by fruit farmers to growing vegetables because of the quicker returns on investment.

2.5. BOTSWANA'S HORTICULTURE IMPORTS

Chart 8: Trends in FF&V imports



Botswana accounted for 0.6% of the world's vegetables imports and 0.2% of the world's fruits imports in 2013.[19] In the same year, 39,800 tonnes of vegetables were imported, valued at US$22.6 million. Chart 8 illustrates that between 2006 and 2013 the value of vegetables imports increased steadily at 4.1% CAGR, whilst vegetables imports fell at a rate of 3.4% in the same period. These trends complement those in domestic production. In 2013 Botswana imported a total of 24,700 tons of fresh fruits, the value of which grew by 10% CAGR, reaching a peak of US$22.5 million in 2013. Between 2006 and 2013 the quantity fruit imports reached a peak of 30,881 tons in 2010, falling to 24,700 tons in 2013. At US$45 million, FF&V imports accounted for 0.6% of the country's total imports of US$7.5 billion in 2013.

95% of Botswana's FF&V imports are sourced from South Africa.

Botswana exports very limited quantities of vegetables on a sporadic basis, through the Botswana Development Corporation (BDC) owned Talana Farms, which has a permit for exports.

[19] ITC Trade Map

Chart 9: FF&V imports by produce

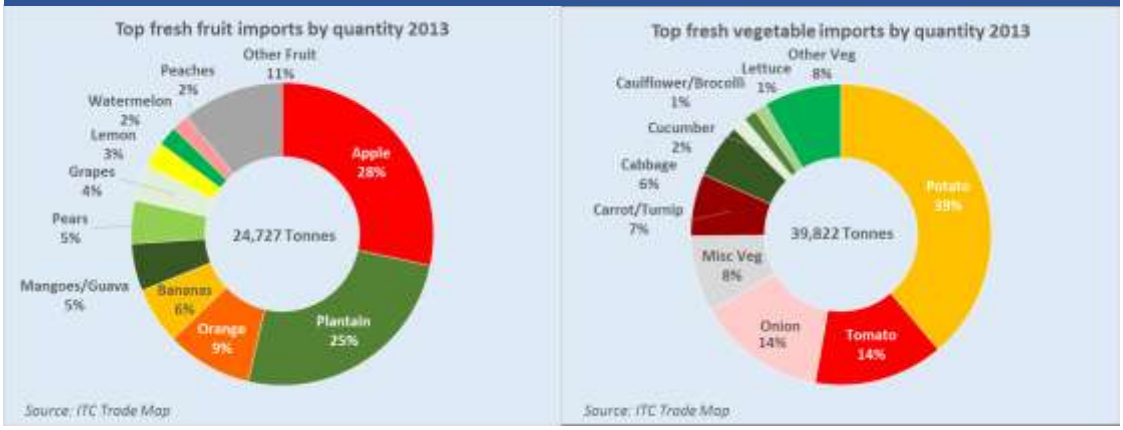


Chart 9 shows the breakdown of FF&V imports per commodity. Apples are the greatest contributor to the fruits imports, followed by bananas and oranges. Excluding oranges and to a lesser extent mangoes and bananas, no other fruits are produced at a large scale in Botswana. 39% of vegetable imports are accounted for by potatoes, followed by tomatoes and onions.

Chart 10: Self-sufficiency in key FF&V produce

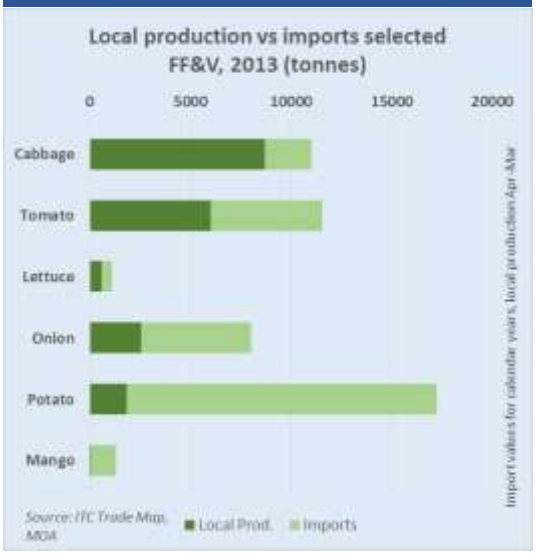


Chart 11: Per capita FF&V imports in SADC

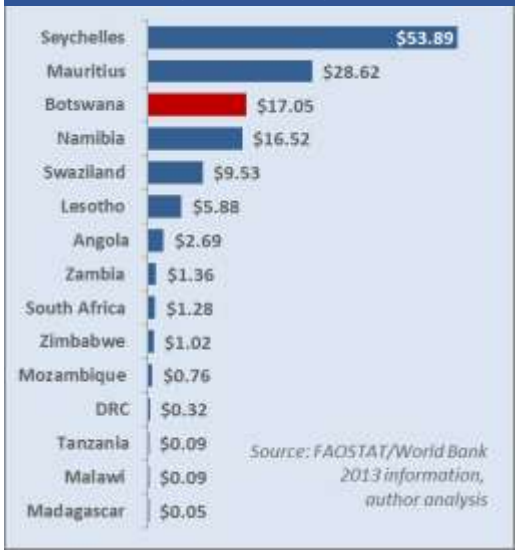
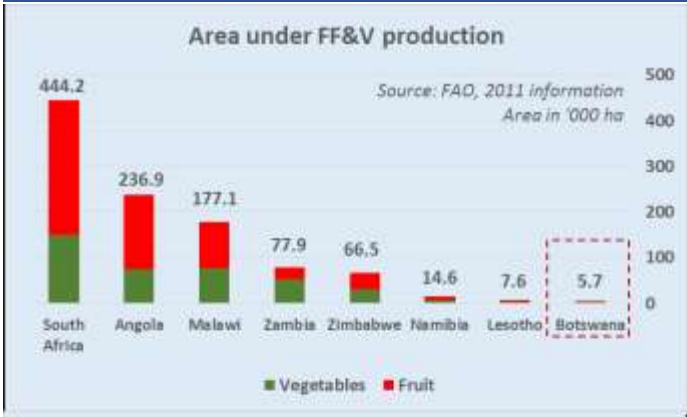


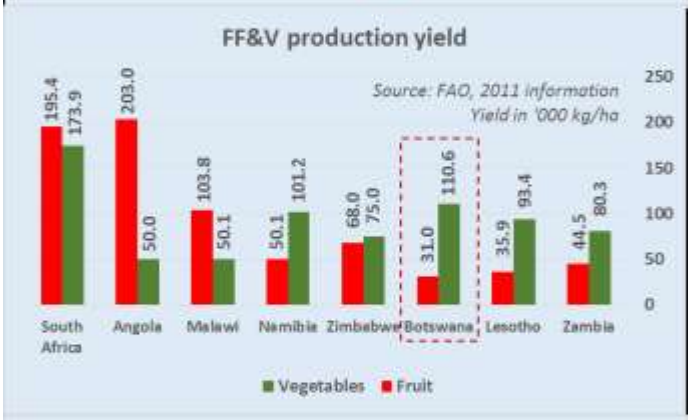
Chart 10 illustrates the degrees of self-sufficiency in different key FF&V produce. Whilst local production meets significant proportions of demand for cabbage and tomatoes, for example, a significant proportion of potatoes needs to be imported. Self-sufficiency is low across all fruits.

Chart 11 outlines the per capita value of imported FF&V in the SADC region. Botswana ranks third in this indicator, with per capita imports of US$17, behind the two island member states, Seychelles and Mauritius. When compared to other landlocked countries e.g. Zambia ($1.36) and Zimbabwe (US$1.02), Botswana's per capita value of imported FF&V is significantly higher. The SADC average stands at US$1.42.

2.6. INTERNATIONAL AND REGIONAL COMPARISONS

Chart 12: Botswana vs regional countries in horticulture





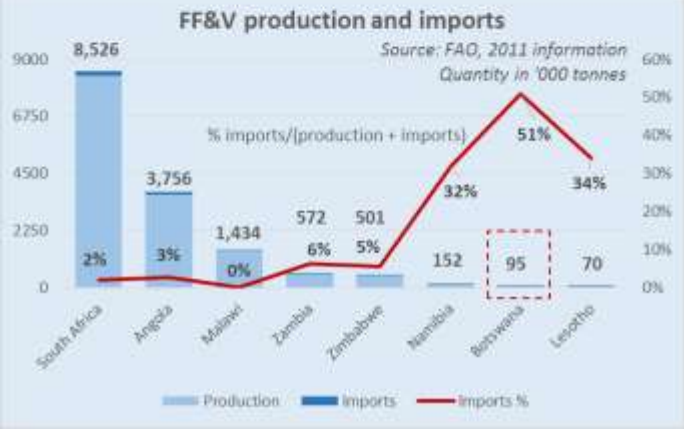


Chart 12 compares some horticulture sector indicators with those of Botswana's neighbours, based on FAO 2011 data[20].

Among regional countries, South Africa has the largest area under FF&V cultivation. The area allocated to FF&V production in Botswana is around 1.5% of that in the former country. In 2011, SADC countries had 3.3 million hectares allocated to FF&V, of which 70% was for growing vegetables.

South Africa also enjoys among the highest yields in both fruit and vegetables production, reflecting the country's relatively sophisticated and commercialised approach to the industry. Angola's fruit yields are marginally higher than that of South Africa. Botswana's vegetables yield is the second highest among the selected countries, although its fruit yield is the lowest.

Of the selected neighbouring countries, South Africa and Malawi are self-sufficient in FF&V, and Angola, Zambia and Zimbabwe mostly so. Botswana is the highest importer as a proportion of total FF&V consumption, at almost 50%. Namibia and Lesotho import around one-third of their requirements. South Africa is the only net exporter of FF&V among the selected countries.

[20] FAO Statistical Yearbook 2014: Africa Food and Agriculture. FAO.

2.7. IMPLICATIONS FOR THE HORTICULTURE VALUE CHAIN

The analysis in this section suggests the following:

- Botswana is a relatively small FF&V producer even at the SADC level. The sector's share of GDP is less than 1%.
- Production in the sector has grown significantly in the last ten years, and reliance on imports has been reduced. Nevertheless, imports still account for the majority of domestic FF&V consumption. There is considerable reliance on supplies from South Africa.
- Production yields, particularly for fruit, are low.
- There is a scarcity of reliable and timely information relating to the sector.

3. THE HORTICULTURE VALUE CHAIN

3.1. INTRODUCTION

The Botswana horticulture value chain is still at its infancy, characterised by many disjointed actors and channels. The sector is currently going through significant transformation and is very fragmented.

A significant proportion of the domestic FF&V supply is produced by a small number of large-scale farms in the Tuli Block area, with a small contribution from small to medium-scale farms (or 'projects') distributed mostly along the eastern part of the country. A substantial number of medium and small-scale producers are unprofitable. Factors inhibiting their performance include: harsh climate; inadequate suitable water; limited funds; insufficient technical knowledge; lack of entrepreneurial skills; absentee farmers; weak infrastructure and logistics at farms and in rural areas; and reliance on expensive imported inputs. The fragmented value chain exacerbates these problems.

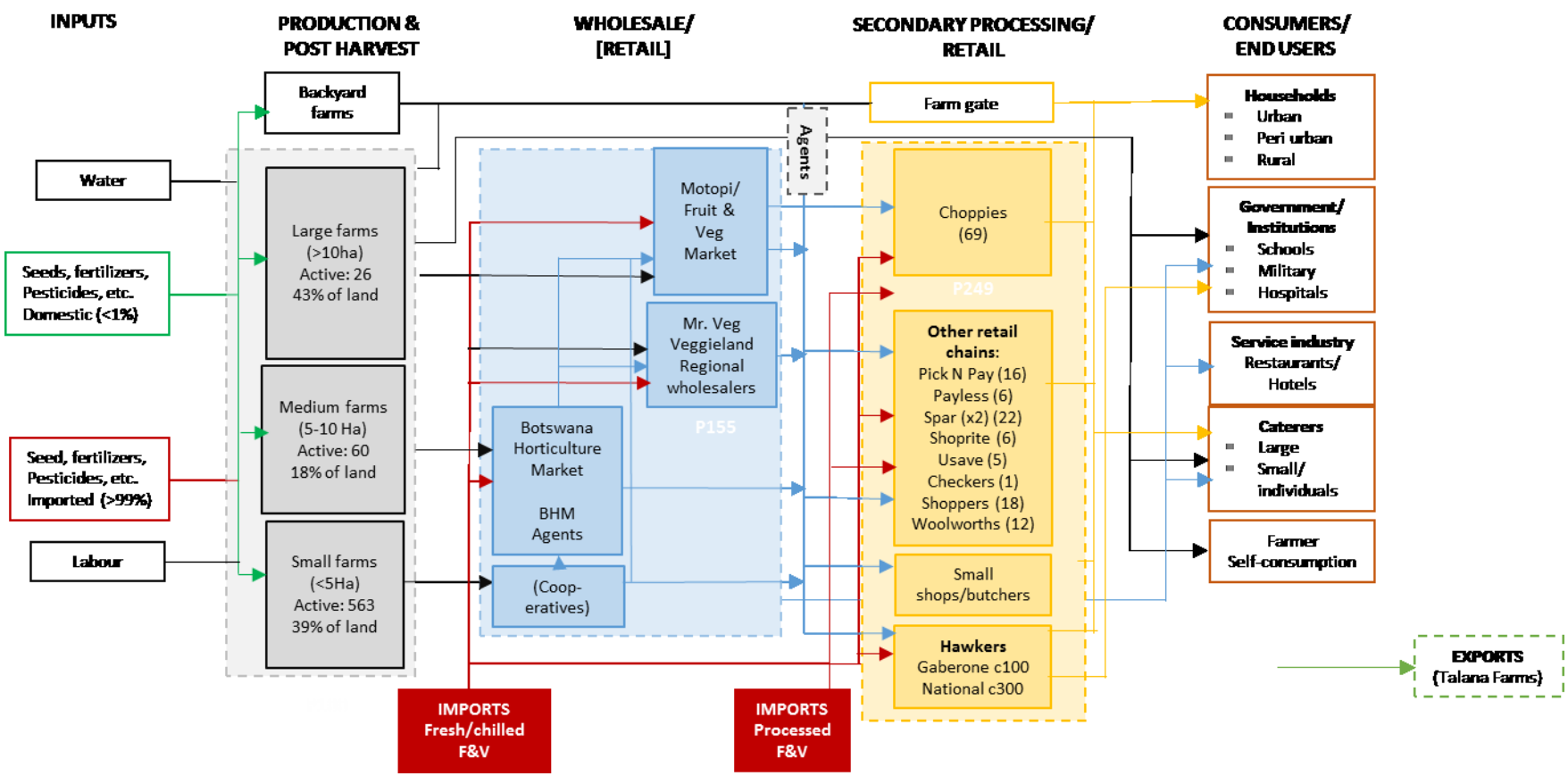
The market is dominated by large retail shops, a few wholesalers and to an increasingly smaller extent the Botswana Horticultural Market (BHM) that is currently undergoing restructuring. Hawkers (street vendors) and small stores play an insignificant but a very important role of availing produce to the rural and peri-urban population. Distribution of produce is also not well developed with farmers often mostly delivering their produce to market using either own or hired transport. Transport is often unsuitable to ensure produce reaches market in time and good quality.

This chapter presents the VCA findings relating to the horticulture value chain and highlights the associated constraints and challenges.

3.2. HORTICULTURE VALUE CHAIN MAP

Chart 13 overleaf presents the principal components and players in the horticulture value chain in Botswana. The sector is still at a developmental stage and the value chain is highly dynamic. Historically retailers, wholesalers and to lesser extent small farmer cooperative and association markets were the major FF&V distributors or dealers until the establishment of BHM in 2007. The sector has also been undergoing substantial transformation in recent years, with retailers increasingly developing direct linkages with producers either by engaging into contract farming or by acquiring land and producing crops themselves. Some retailers have also joined to form buyer groups to increase their purchasing power.

Chart 13: Horticulture value chain map



Inputs such as seeds, fertilizers and pesticides are almost entirely imported from South Africa, contributing to a higher cost of domestic FF&V production. Farms primarily rely on ground water, and water seasonality and overall scarcity is a constraint. Farms generally employ foreign workers, predominantly from Zimbabwe, and some locals. Locals are typically not attracted to farming as a source of employment.

Large farms, of over 10 hectares, are responsible for the majority of FF&V production. As at March 2014, there were 26 such active farms, accounting for 43% of land under production. Medium-sized (between 5 and 10 hectares) and small (less than 5 hectares) farms have increased in recent years and are contributing larger shares of produce. As at March 2014 there were 60 active medium-sized farms, and 563 small ones, accounting for 18% and 39% of land used respectively. The government has in recent years encouraged the establishment of backyard farms, especially in peri-urban areas. These farms mostly produce vegetables for self-consumption. 91% of overall horticulture production is of vegetables.

The wholesale and retail components of the value chain are relatively fragmented and, as indicated previously, are undergoing major transformation. Farms supply their produce to a combination of:

- Wholesalers: The largest of these is Fruit and Vegetables Market, owned by Choppies the largest grocery chain in the country. Although the vast majority of its sales are to its parent chain, it also supplies other retailers and end-users. Other large wholesalers based in Gaborone are Mr. Veg and Veggieland, which supply retailers and end users.

- BHM, which used to be the major centralized wholesale[21] market in the country, but which has been losing market share and is currently being restructured.

- Cooperatives: we understand that although historically more prominent, these play a limited role in the value chain at present.

- Agents: these are usually individuals and they buy their produce from farms and wholesalers for on-sale to end-users.

- Hawkers (street vendors): Although accounting for a relatively small share of the sector's sales, they play a critical role in distributing FF&V to consumers with limited access to the retail chains.

- Consumers: Farms also sell limited quantities of their produce to consumers at the farm gate.

- Retailers: These mainly comprise Choppies and local outlets and franchises of South African origin and domestically owned supermarket chains. They are increasingly building direct relationships with large and medium-sized farms, bypassing the wholesalers.

[21] Operated on an agency model.

The retail segment is dominated by the major chains. There are also small butchers and shops that sell FF&V as part of a wider range of products. The rapid expansion of grocery chains and Choppies in particular has had a major impact on reducing their numbers.

The majority of end users are consumers. In addition, government institutions, restaurants and hotels, and caterers form the key end-user groups.

FF&V is imported by wholesalers, hawkers and retailers, mainly from South Africa.

3.3. INPUTS

Horticulture inputs used in Botswana comprise pesticides (fungicides, bactericides, herbicides, insecticides, acaricides and others); fertilizers (both solid and liquid formulations); planting (seeds, vegetable seedlings, seed potato/tubers and tree seedlings); and other plant growth substances. All input suppliers and retailers sell pesticides, fertilizers and seeds, but do not supply vegetable seedlings and tree seedlings. Farmers source these directly from the Ministry of Agriculture Nursery.

There is very limited local production of inputs in Botswana except for some newly established organic fertilizer and seedling medium manufacturers. More than 90% of the inputs are imported from South Africa. Importation for trade and selling of chemical inputs such as fertilizers and pesticides is regulated through the Agro Chemicals Act that requires annual import permits. In addition to an import permit, any dealer in agrochemical inputs must have in their employ a person who has undergone and passed a mandatory agrochemicals course. However, farmers can import inputs directly without the agrochemicals course certificate required from traders.

A key constraint in production is the lack of variety of seeds suitable for local conditions. Seeds imported from South Africa may not always be appropriate for Botswana's more pronounced weather patterns and practice of open, unprotected farming. Although the MOA Department of Agricultural Research (DAR) conducts some research in this area, these have yielded limited outcomes to date in terms of take-up by farmers.

Acquisition of planting materials such as seeds, vegetable seedlings and tree seedlings is controlled by the Plant Protection Act through an import permit that requires a phytosanitary certificate from the country of origin.

All supplies are sourced directly from the manufacturer and to a lesser extent through agents or intermediaries, and are transported by road. The delivery system is mixed with majority of inputs coming through medium to large transport agents and own vehicles, although there are instances where suppliers also deliver directly to the trader. There are no restrictive permit conditions on the type of transportation that may be used for agrochemicals except for a requirement of appropriate warning signs on the consignment.

The tables below show average local prices for common pesticides and fertilizers and input price relationships between the local input traders as well as the equivalent South African prices. Prices differ considerably between local input traders. This is also the case between local and South African prices. The latter in particular has an important bearing on the cost of production of the same crop locally compared to South Africa. As Table 3 below shows, the local prices in the sample are on average 26% higher than in South Africa. The tables are based on surveys carried out by the authors.

Table 1: Average and variation of local prices of common pesticides

Pesticides product	Trader 1 (Pula)	Trader 2 (Pula)	Trader 3 (Pula)	National Average Price (Pula)
Sipermethrin 1 l	137.55	108.40	110.30	118.75
Hunter 1 l	N/A	1020.00	825.00	922.50
Chlorpyrifos 1 l	82.00	103.00	121.95	102.32
Dimethoate 1 l	57.50	81.56	N/A	69.53

N/A: Not available

Table 2: Average and variation of local prices of common fertilizers

Fertilizer product	Trader 1 (Pula)	Trader 2 (Pula)	Trader 3 (Pula)	National average price (Pula)
Urea (46 %) 50 kg	290.00	289.00	360.00	313.00
2.3.4 ((30%) 50 kg	325.00	338.00	387.15	350.05
2.3.2 (30%) 50 kg	369.30	N/A	N/A	369.30
2.3.2 (22%) 50 kg	309.99	N/A	N/A	309.99
Potassium Sulphate 50 kg	535.85	615.00	N/A	575.43
Potassium Nitrate 25 kg	319.00	N/A	302.85	310.93
Calcium Nitrate 25 kg	159.25	198.00	N/A	178.63
LAN 50 kg	290.00	N/A	340.00	315.00
Superphosphate 50kg	249.55	N/A	N/A	249.55

N/A: Not available

Table 3: Variation in common fertilizer prices between Botswana and South Africa

Fertilizer product	Omnia South African price (Pula)	Average Botswana traders price (Pula)	% Price differential
Urea (46 %) 50 kg	220.21	313.00	29.6
2.3.4 (30%) 50 kg	271.13	350.05	22.6
2.3.2 (30%) 50 kg	271.13	369.30	26.6
2.3.2 (22%) 50 kg	235.08	309.99	24.2
Potassium Sulphate 50 kg	410.83	575.43	28.6
Potassium Nitrate 25 kg	258.33	310.93	16.9
Calcium Nitrate 25 kg	114.17	178.63	36.1
LAN 50 kg	224.63	315.00	28.7
Superphosphate 50kg	191.88	249.55	23.1
Average price variation			**26.3**

3.4. PRODUCTION

Overview

Chart 14: Overview of FF&V production in Botswana

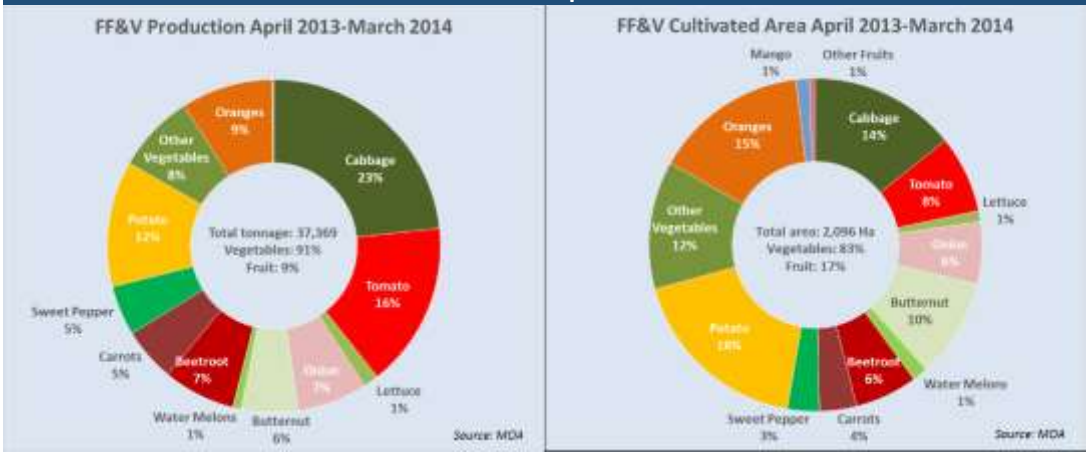


Chart 14 presents an overview of the production characteristics of the horticulture sector. Of the total FF&V production[22] in 2013/14, vegetables accounted for 91%. Cabbages, tomato, onions, potatoes and beetroots account for 65% of all FF&V production. Oranges are the most popular fruits grown, accounting for 6% of the total.

In 2013/14, 2,096 hectares of land was cultivated for horticultural farming. 83% of the total was earmarked for growing vegetables. The relative distribution of land allocation between individual fruits and vegetables broadly follows production. Nevertheless, some produce, such as cabbages and tomatoes yield greater tonnage, whereas others such as potatoes and oranges yield less, and this is reflected in the land allocations.

The production figures presented in this report are after farm-level wastage. Certain produce, such as potatoes, carrots and butternut, suffer lower wastage levels than, for example, tomatoes and lettuce. MOA estimates farm-level wastage at 20-25% on average with some FF&V, e.g. tomatoes and lettuce, reaching up to 50%. MOA estimates of wastage are based mostly on produce not harvested as producers only harvest on orders and only record sales. Wastage information is approximated therefore. At farm level wastage happens in the field because farmers only harvest produce they can sell and do not keep the remainder as they lack of proper storage facilities.

Interviews with some retailers in Gaborone reveal an average wastage of about 15%. However, there were variations in their wastage experience according to the origin of produce, with some retailers indicating that they experience more wastage on imports whilst others on local produce. A significant amount of wastage is said to happen during border closures when retailers are forced to buy from local producers regardless of quality, resulting in higher rates of rejection from customers.

[22] The FF&V production tonnage in Chart 14 that shows breakdown by produce differs from the total of 47,000 tonnes of FF&V produced reported elsewhere as they have been drawn from different MOA sources. The latter figure is considered a more accurate estimate of total FF&V production, whilst information in the chart provides an indication of FF&V shares.

As at March 2014, there were an estimated 756 registered FF&V farms (of which 649 were active). Of the registered farms, 572 were allocated to growing vegetables, 92 fruit, and 92 were engaged in both fruit and vegetables production. According to MOA, over 90% of farmers can be considered to be owned by part-time or absentee farmers. The estimate is based on feedback from extension officers. Often MOA officers find workers (who tend to be relatively untrained) at farms rather than farm owners. Absentee farming is identified as one of the major constraints on the horticulture sector's performance.

Regional distribution of FF&V production

Chart 15: Regional distribution of farms and production

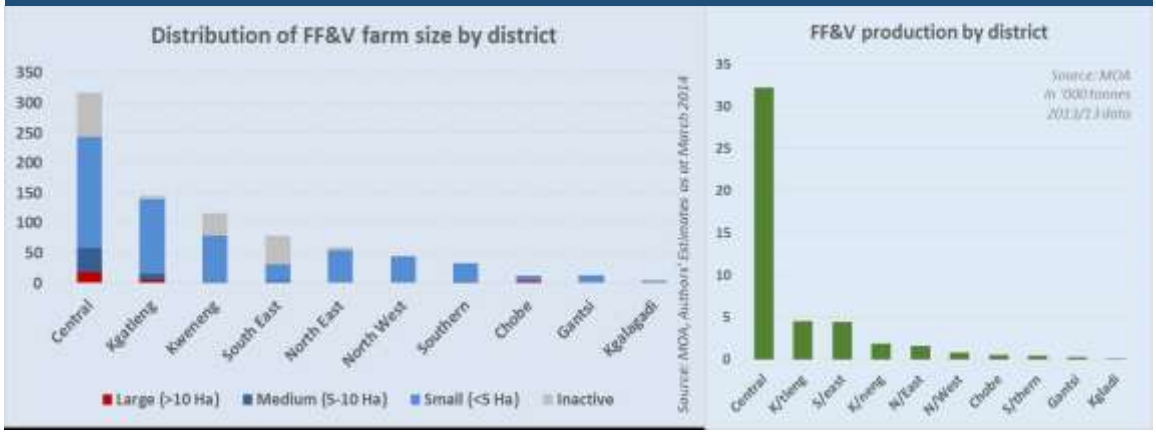


Chart 15 highlights that the central district has 317 farms, almost 40% of the total. Between them, Central, Kgatleng and Kweneng districts account for 70% of all farms in the country. The produce from the Central District is mostly from large farms located in the Tuli Block area. These large farms are also relatively more mechanised (with tractors and the necessary machinery for farm operations) and use own transport to ensure speedy delivery of produce to market. Where one does not own transport, there also exists capacity to rent. This disproportionately higher farm capacity is reflected in the fact that production in the Central District accounts for almost 70% of the country's FF&V output.

Farm sizes

Chart 16: Distribution of farms and cultivated area by farm size

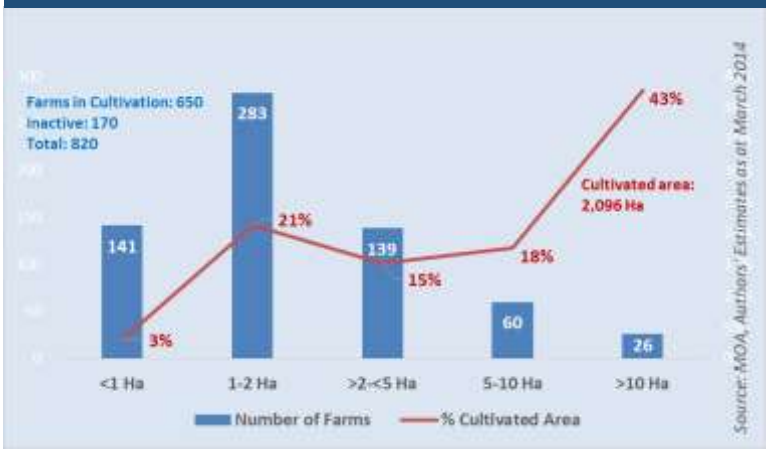


Chart 16 illustrates that there were approximately 650 active farms as at 31 March 2014. Of these, only 26 were over 10 hectares, but accounted for 43% of land under FF&V production. At the other extreme, there were 141 farms of less than 1 hectare, accounting for only 3% of land. 65% of farms are of 2 hectares or less. As discussed below, most small and many medium-sized farms are

unprofitable.

The government has been encouraging backyard farming, also known as backyard gardening, as part of its poverty eradication strategy. The initial objective was income generation. However, these usually produce FF&V for self-consumption.

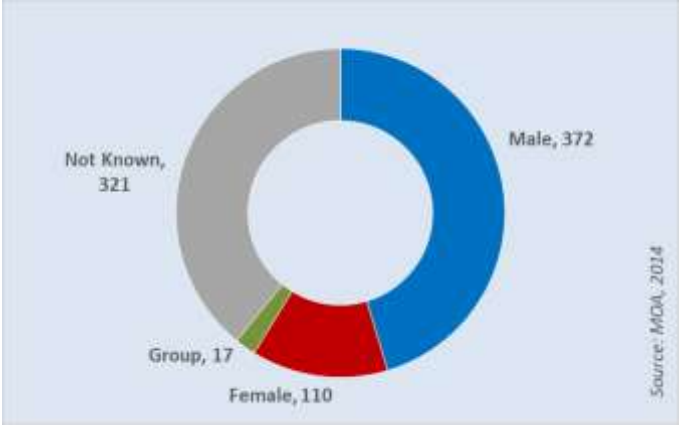
As highlighted previously, large farms are concentrated in the Central District, and are usually managed more commercially, although they do not necessarily always apply the latest available technology or modern farming methods. On the hand, most small to medium-scale farms are distributed around the country and tend to be poorly resourced, with little or no mechanisation to run basic farm operations such as tillage and spraying of chemicals. Most of the latter are likely to be unprofitable.

A key constraint in Botswana FF&V farming is the lack of commercialization. The industry's relatively young status contributes to weak capacity among farmers. In addition to a lack of understanding about good farming practices, there is limited planning and coordination on growing different crops. Crop plans are seldom prepared and even when they are, these are not adhered to. This leads to frequent over-supply and shortages of produce, as most farmers react to prevailing prices and shortages. In addition, record keeping is poor, especially among small and medium-sized farms. In addition to financial records, these extend to maintaining data for the overall crop growing cycle.

Botswana's farm size distribution is consistent with international experience. According to FAO[23], worldwide, farms of less than 1 hectare account for 72% of all farms but control only 8% agricultural land; those between 1 and 2 hectares account for 12% all farms and control 4% percent of the land; farms in the range of 2 to 5 hectares account for 10% of farms by number and control 7% of the land. In contrast, only 1% of all farms in the world are larger than 50 hectares, but control 65% of the world's agricultural land. Most farms below one hectare, however, are in developing countries and principally generate family income, rather than operate as commercial businesses.

Farm ownership

Chart 17: Ownership of FF&V farms



Given the relatively recent emergence of the horticultural sector, a significant majority of farms are owned by people new to farming. Many of the large farms in the Tuli Block are converted cattle ranches. Similarly, a large share of farms (estimated to be over 90%) are owned by absentee farmers, who engage in part-time farming. Also, the government funded Youth Development Fund has financed a large number of Batswana youth to start-up farming. Consequently,

[23] The State of Food and Agriculture 2014 IN BRIEF. FAO. 2014.

FF&V farmers often lack the tradition and know-how common in many other more established farming countries. Chart 17 shows the ownership of farms by gender. Of the 499 farms of which ownership is known, 30% are owned by women.

Women experience a number of disadvantages in farming. For example, culturally women can't inherit farms. When seeking finance, usually the husband has to provide a guarantee to the lender. Youth, in particular from disadvantaged backgrounds, have limited access to finance. Despite these disadvantages, women and youth play an active role in the sector, often as workers.

Use of farm technology and adoption of farm management practices

Technology uptake is very limited among FF&V farms. Only 92.9 hectares of the 2,096 hectares under cultivation was under protection in 2014, including simple shaded structures, tunnels or greenhouses. Most of the cultivation is under the traditional open-field, which tends to restrict production to more conducive seasons and leads to inconsistent supply of produce. Government initiatives, such as Integrated Support Programme for Arable Agricultural Development (ISPAAD), have sought to promote the adoption of technologies in farms. In addition, LEA supported pilot farms have sought to adopt technologies such as poly tunnels and greenhouses.

Chart 18: Adoption of farm management practices

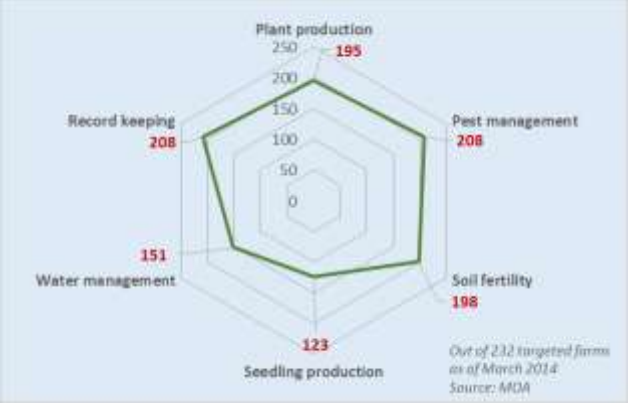
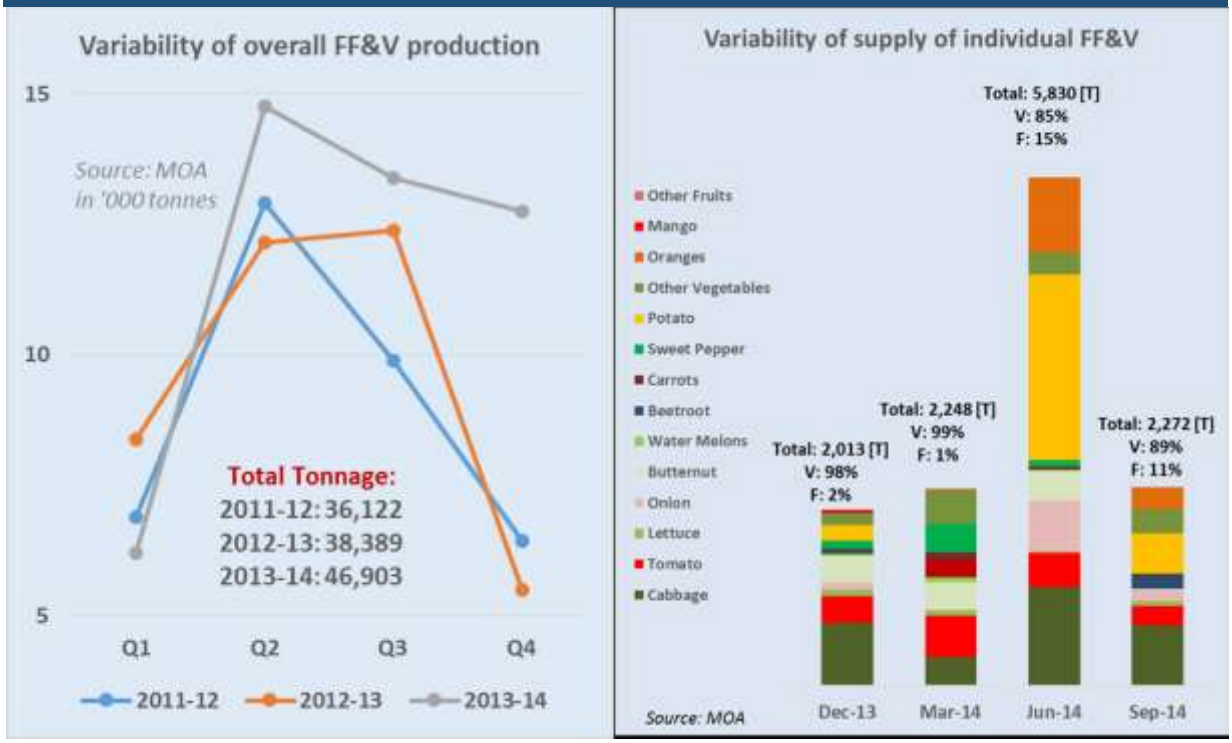


Chart 18 shows the levels of farm management practices adopted among 232 farms targeted by the DCP extension officers. Whilst plant production, pest management, and soil fertility practices were more widely adopted, water management and seedling production were not. The most common water management technology promoted for its proven water conservation ability is drip irrigation. Therefore, farmers are responding positively to water conservation measures as encouraged by conditions attached to the ISPAAD program. Although this is does not reflect all FF&V farmers, at least it indicates that majority of farmers are using water wise irrigation methods like drip irrigation. On the other hand, whilst a significant proportion of farmers are reported to have adopted record keeping, in practice this is poorly carried out, with little or no financial information and practices such as crop plans or diaries rarely drawn up or implemented.

Seasonality of production

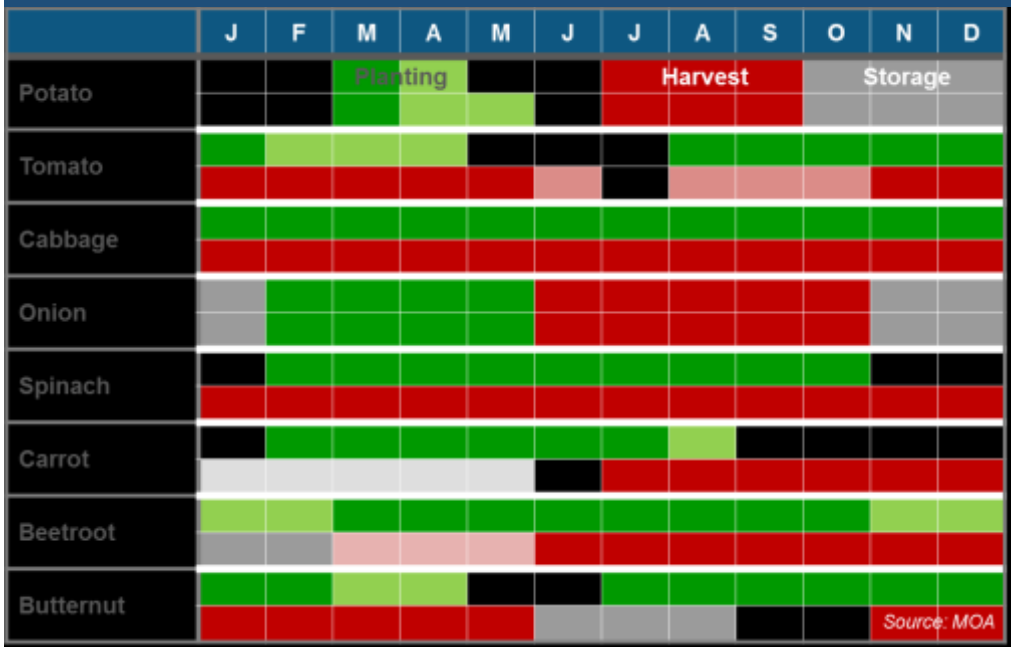
Chart 19: Seasonality of FF&V production



An important feature of FF&V production in Botswana is its seasonality, caused principally by climatic conditions. As Chart 19 above illustrates, this can increase production to up to triple that in the winter. In addition, the production of individual fruits and vegetables varies significantly across the seasons. As a result, imports remain an important source of supply for the local market.

The horticulture calendar in Chart 20 below underlines the seasonality of production.

Chart 20: Horticulture calendar



Horticulture yields

Section 2.6 highlights that vegetables yields compare reasonably with those of neighbouring countries. Fruit yields are, however, the lowest.

Chart 21: Trend in FF&V yields and land allocation

Chart 21 highlights that yields have fallen significantly over the last six years, principally because production has not kept pace with the significant increase in land under cultivation. Between 2009 and 2014, land under FF&V cultivation increased by 103%, but production increased by only 20%. This gap was more marked until 2013, when production remained at the same level as in 2009, having fallen in the intervening years, whilst land under cultivation increased by 114%.

Global experience suggests that smaller, usually family-owned farms typically generate higher yields than larger farms as they are cultivated more intensively.[24] However, this may not be the case in Botswana due to the high proportion of absentee farm owners and lack of know how among farmers.

Selected performance indicators

Chart 22: Selected production and sales indicators for individual FF&V

Chart 22 above illustrates selected performance indicators for different FF&V in the country. Generally, vegetables as a category show stronger performance. In particular, tomatoes, lettuce, and sweet pepper are the strongest performers with respect to production and sales yields. Fruits are the weaker performers. These indicators support the broad allocation of land to different produce and the trend away from fruit to vegetables production.

[24] The State of Food and Agriculture 2014 IN BRIEF. FAO. 2014.

3.5. POST-HARVEST

The Botswana Bureau of Standards (BOBS) has developed several voluntary horticulture product standards that can aid post-harvest operations, based principally on South African Bureau of Standards (SABS) regulations. They generally relate to quality grading of different FF&V. However, such operations are done on a very limited scale mostly in the form of cleaning, sorting and some packing. Such processes are prevalent mainly in larger farms. Grading and testing of produce is either non-existent or is not done properly. Produce is not displayed by retailers in the order of grade and there is no evidence of any form of certification. Therefore, produce of different grades is sold at the same price. This limits the incentives for investing in better technology and farming practices to improve produce quality.

Packaging is imported from South Africa. Availability is not seen to be a constraint, although cost of packaging can be relatively high.

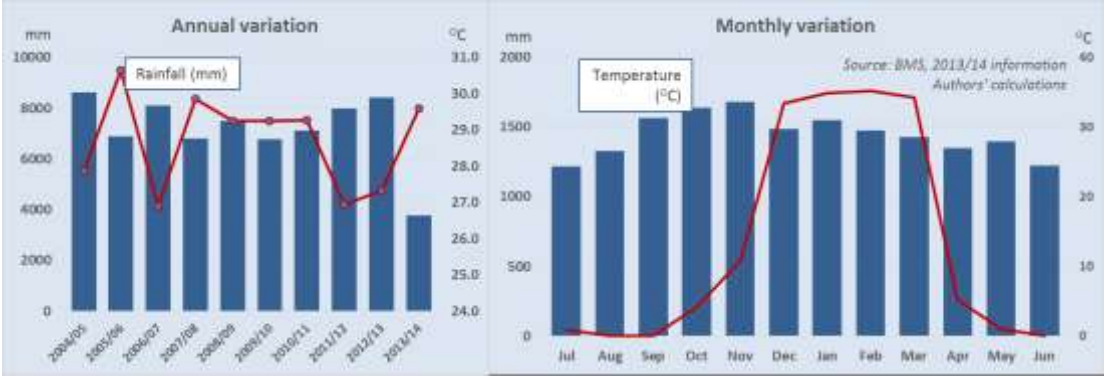
Most farmers do not have suitable storage facilities for holding produce in a cool environment before delivery to market. There are no organised pack houses or chilling facilities that farmers can utilise on rental basis.

The Ministry of Health (MOH) Department of Public Health is responsible for enforcing health and sanitary and phytosanitary (SPS) standards for the agriculture sector. However, staff and resource shortages have resulted in very limited testing of post-harvest products. Such testing is usually focused on import samples and on request.

3.6. CLIMATE, WATER AND LAND ISSUES

Climate

Chart 23: Variability in temperature and rainfall in Botswana

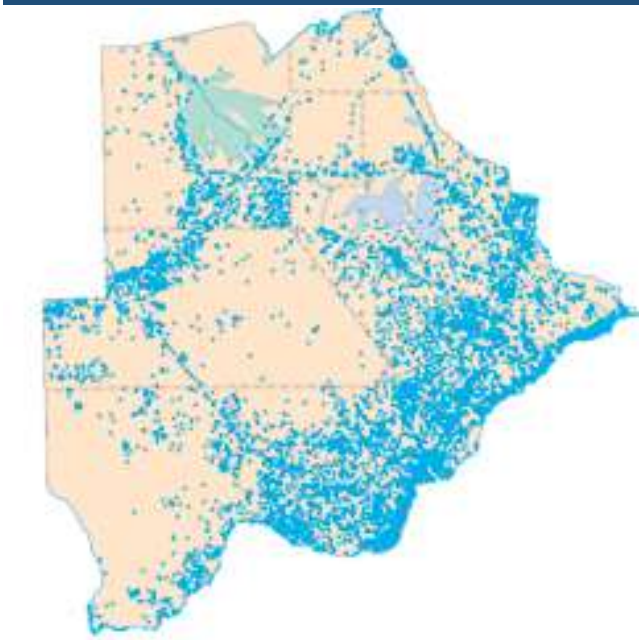


Botswana's climate is characterised by low erratic rainfall combined with extreme temperatures, which are particularly very high in the summers, thus causing loss of moisture through evapotranspiration. The extremely high and frosty temperature conditions are also major constraints in crop production as they restrict both crop establishment and growth to maturity. Average rainfall also varies significantly between regions.

Chart 23 above highlights that in addition to seasonal variation, there is significant variation in rainfall in different years. This further contributes to uncertainty and variability in horticultural production.

Water

Chart 24: Distribution of boreholes in Botswana



The National Water Master Plan[25] lists sources of irrigation water as groundwater (sand river extractions included), river withdrawals and small dams. Lately, these include areas set aside in the new dams such as Thune and Lotsane. Reclaimed wastewater is also recognised as an important source water for irrigation. The Botswana National Water Policy[26] estimates the water demand for the entire country at 250 Mm^3. The nation's water resource are characterised by spatial variability, extreme scarcity and high dependency on internationally shared and trans-boundary rivers. Most of the surface water in the country is located in the northwest, far from the populated eastern corridor.

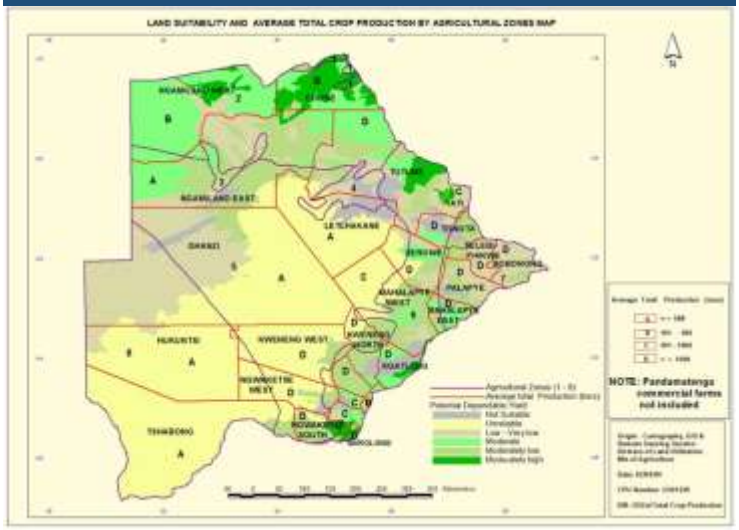
Groundwater in Botswana is limited in both quantity and quality, and is not evenly distributed in the country. Agriculture is considered to be largest consumer of water[27] despite its relatively low contribution to GDP. Government policy is supportive of water for agriculture in general as it states that *"Water must be available for agriculture to promote commercialisation and diversification of the sector in order to ensure food security at both household and national level and stimulate employment creation".*

Horticulture in Botswana is almost entirely dependent on irrigation and hence the need for reliable water source. Chart 24[28] illustrates the distribution of boreholes in the country. In most areas suitable for horticulture production ground water is the only water source and as indicated above, quality and quantity can be a constraint. Borehole sinking is risky and expensive. It costs about P500 per meter and in most cases boreholes go beyond 100 meters and even up to 200 meters. The resultant cost can range between P50,000 and P100,000 before the cost of pumping equipment. There is also likelihood of yielding inadequate amounts to cultivate a viable area, or saline water or no water to even engage in an alternative agricultural enterprise. Of late, because of the inherent risk of borehole drilling, CEDA, the only organisation with subsidised loan rates that has been funding drilling, has since stopped doing so.

[25] Final Report, 2006
[26] 2012
[27] Estimated at 36% of national consumption in 2003.
[28] Source: Government of Botswana. http://www.atlas.gov.bw/html/chapA.html

Land

Chart 25: Land suitability for FF&V production



The map in Chart 25[29] shows the main agricultural production zones in Botswana. The majority of the farms are located in the eastern part of the country that is more populated and also has relatively suitable soil, climate, as well as relatively abundant and good quality water.

Given its arid climate, Botswana soils are generally poor and require additional chemical and physical treatment to suit crop growth. This in turn makes crop production relatively costly. Lack of local fertilizer manufacturing has also exacerbated the situation due to high importation costs.

Chart 26: Horticulture land allocation and cultivation

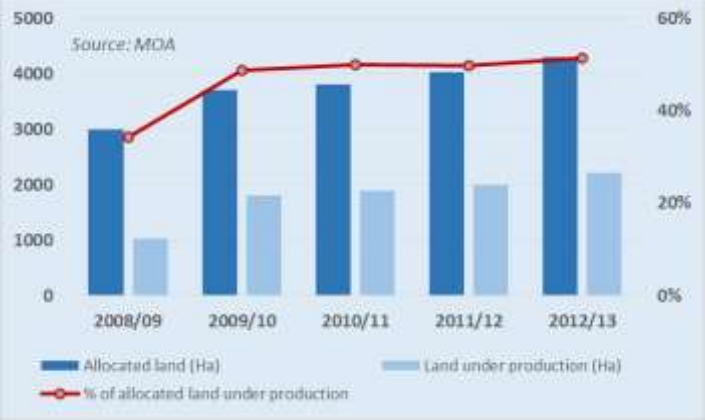


Chart 26 shows that between 2008/09 and 2012/13, land allocated to horticulture increased from 3,000 to 4,300 hectares, whilst the area under cultivation increased from 1,030 to 2,209 hectares. Consequently, around 2,000 hectares of land, or 50% of that allocated to FF&V production, has remained unutilized in recent years. Moreover, with the recently passed Presidential Directive[30] introducing integrated farming on land allocated for agricultural use and the guidelines on implementation of integrated farming in agricultural land, more land is expected to be made available for horticultural production.

[29] Source: MOA
[30] Cab. 2 (B)/2012 dated 21 February 2013

3.7. FARM EQUIPMENT AND MACHINERY

Interviews with stakeholders suggest that the majority of small and medium-sized farmers rely mostly on hired machinery for the major tillage operations of ploughing and harrowing. These farmers are also limited to using hand-held tools in operations such as chemical spraying for pest control, which in most cases is inefficient. Horticulture as an intensive production practice requires timely operations to ensure continuity and efficiency. Many farmers lose on time, particularly during ploughing season for the rain fed sub-sector, when most tractor owners decide to transfer their machinery to ISPAAD operations. Cost is highlighted as a major constraint to acquisition of own machinery. The reluctance of small farmers to form groups and buy machinery is also a factor.

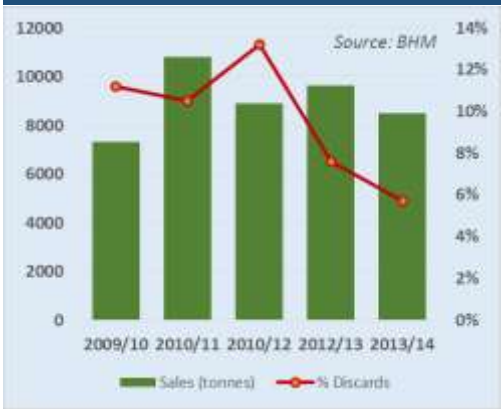
Larger farms have better access to farm equipment. However, as indicated previously, they generally take a more passive approach to horticulture production and there is limited investment in farm mechanization compared to international counterparts.

3.8. WHOLESALERS

The share of wholesalers in the value chain has been falling over recent years, as retailers increasingly develop direct relationships with farmers. In addition, BHM performance has been affected by dissatisfaction about its business model, leading to significant reduction in volumes passing through the market.

Botswana Horticultural Market

Chart 27: BHM sales and discards



BHM was established in 2007 to encourage horticultural production through the provision of a central marketing facility. It is a company jointly owned by Botswana Horticultural Council (BHC) (51%) and BDC (49%) as part of the broader government initiative of boosting local horticultural production, food security, economic diversification and citizen empowerment. The MOA is the promoter of the project and has funded BHC's ownership share.

The main BHM facilities are based in Gaborone, which includes a large 9,800 square metres cold room. In addition, it operates fresh produce markets in Lobatse and Francistown, village collection centres in the North-West District (Shakawe) and central District (Bobonong). Facilities in Lobatse and Francistown were operational for some time but later closed. The facility in Bobonong is still operational.

Since its establishment, BHM has suffered from various shortcomings, leading to the suspension of its active operations and its current restructuring. Problems have been associated with:

- High cost of premises, operations and inefficiencies.
- Its agency-based model, whereby farmers pay a commission for sales of their products and retain the risk of produce remaining unsold.
- High levels of discards.
- Perception that at times BHM agents are conflicted and may not be securing the best price for producers.
- Extended period before farmers are paid.
- No transport facility and farmers required to transport their produce to BHM facilities.
- Increased competition from retailers.

BHM is undergoing a restructuring from a commission-based to wholesale market model. Under the proposed wholesale system, produce will now be bought out-right and all the trading functions will be taken over by the market authority. BHM also plans to import some produce that is not available locally to improve the produce variety for the consumers. Product lines are expected to be expanded significantly. The border closure permit office is planned to be relocated to the market premises where it is expected there will be better coordination as issuance of permit will be related to what is available at the market floor. However, this has caused a lot of dissatisfaction amongst retailers who feel the market as a private company would be given undue advantage.

The BHM restructuring plan is confidential. Based on information gathered from discussions with sector participants, the proposed BHM model presents a number of uncertainties about its sustainability, including:

- Access to supplies: With retailers and end-users developing direct linkages with producers, and the existing wholesalers already with a robust customer base, it is unclear how BHM will access adequate volumes of FF&V to operate a profitable business at the scale envisaged.
- Access to customers: With most existing retailers procuring directly from producers or importing from South Africa, there are limited gaps in targeting this segment. It has been suggested by some interviewees that BHM could be given the monopoly to supply FF&V to government institutions. Given most government institutions currently procure directly from producers through tenders, it is unclear why they would wish to incur the additional margins BHM would charge.
- Working capital: Especially with a significantly expanded product line, the working capital and wastage costs could be substantial.
- Transport: Given most farmers do not have their own transport facilities, unless BHM invests significantly in its own transport and logistics facility, it will be at a competitive disadvantage compared with other retailers and wholesalers. If it does invest, the costs could be substantial.

- Relationship with Selebi-Phikwe plant: One of the objectives behind establishing the processing plant at Selebi–Phikwe (see Section 3.9 below) was for the latter to use lower grade and unsold produce from BHM for processing. However, the decision to locate the plant 400 kilometres from Gaborone will increase transport and wastage costs. Moreover, buying from BHM rather than directly from producers will potentially incur unnecessary additional costs for the plant. In addition, given the volumes needed for processing, BHM and the processing plant may become competitors for produce, rather than complementing each other.

Various options have been suggested to secure viability of the restructured BHM, including granting it monopoly on all FF&V imports or even giving it a monopoly right to buy from local farmers. MOA is considering these and other proposals.

BHC association operated markets

There were originally three district horticultural association/cooperative markets in Tshukudu (Francistown), Boasa-Boapele (Bobonong) and Lobatse fresh market. Currently only Tshukudu and Boasa-Boapele are functional though at a very limited scale.

Fruit & Veg Market, aka Motopi Holdings (Choppies Group)

Fruit & Veg Market is wholly owned by Choppies, the largest grocery chain in the country. Its principal activity is to procure FF&V for Choppies, although it also sells produce to other retailers. It has recently invested in a large chilled storage facility in Gaborone.

Motopi believes it deals with 80% of producers in the country, and estimates that 60%-70% of total FF&V production in the country is sold through Choppies. This has increased from around 50% three years ago.[31] 40% of turnover is sourced locally, 60% is imported. Motopi has 150 small and large trucks for FF&V transport, almost all of which are refrigerated.

Other Gaborone wholesalers

These are Mr. Veg and Veggieland. They procure locally as well as import their produce and tend to focus on higher quality FF&V. Sorting of produce is done where necessary, and if it is undertaken, SABS or BOBS grading standards are usually used. For importation, both owned (cooled and insulated) transport and delivery agents are used. The local produce is collected using own transport and delivery agents as well as farmer delivery vehicles, which are mostly open trucks. Veggieland, for example, has 10 trucks, out of which two are refrigerated. Although such wholesalers supply some of the retail chains, their main customers tend to be larger hotels, restaurant and fast food chains, and schools (e.g. for sports and other events).

Wholesalers indicate increased local procurement. For example, three-to-four years ago, 70% of sales were imported. Currently imports constitute half of the vegetables and 80% of fruits.

[31] Based on interview in August 2014.

3.9. SECONDARY PROCESSING

There are currently no large secondary processors in Botswana. There are some SMMEs producing limited pickling and pastes, but they use a combination of local and imported FF&V inputs as local supplies are seasonal and inconsistent in respect of quality and availability. Most retailers do their own preparations such as salads and pre-cut and packaged FF&V. Wholesalers such as Mr. Veg and Veggieland also do similar preparations for their customers such as hotels and caterers.

Proposed FF&V processing plant at Selebi-Phikwe

The National Food Technology Research Center (NFTRC) and the Selebi-Phikwe Economic Diversification Unit (SPEDU) are currently promoting a vegetable processing facility in Selebi-Phikwe that is expected to start operation before end of 2015. The main objectives of the facility are:

- Generate employment in the region. The plant is initially expected to directly employ 30 people.
- Address losses resulting from high levels of discards at BHM.
- Act as a customer for backyard garden farmers, who have had limited success in selling their produce in the market.
- Promote adoption of quality standards.
- Promote agro-processing know-how.

The SPEDU region is the main producer of FF&V and it is intended that the plant will be an important customer for local farmers. In addition, the plant would utilize empty warehouses that were previously used by textile plants.

A feasibility study for the plant identified the need for investment funding in excess of P14 million. The Office of President has pledged P6 million of this requirement. NFTRC is expected to manage the project for the first 3-4 years, after which it is hoped that the plant will be sold to investors.

The plant is expected to have a capacity of 500-1,000 kgs per hour. There are three processing lines: for fruit (tomato puree initially, and later tomato sauces and paste); vegetable pickle (mixed vegetable, achars and pickled onions and beetroot); and a drying line (cabbage, tomato and later spices). Total production is expected to be 4,000 tonnes per annum, assuming 60% of capacity. This compares with total FF&V production of 47,000 tonnes in Botswana in 2013/14.

A key challenge for the plant will be to achieve consistently high capacity utilization and maintain break-even volumes. In addition, there has been no research on potential market for its produce.

3.10. RETAILERS

Retail channels vary from the big chain stores (local and South African origin) to small hawkers or farm gate sales.

Choppies Group

Choppies is a domestically owned company. Through its FF&V wholesale procurement and distribution arm, Motopi Holdings, it dominates the retail market with almost a shop or more in the big population centres. It started operations in 1986. As at the end of 2014, it had 69 stores distributed throughout the country, principally targeting the lower and middle income segments of the population. Choppies is expanding very fast (it opened 13 stores in 2014) into increasingly smaller population centres. This has contributed to virtually eliminating small retailers in the rural areas. Choppies procures from its own farms in South Africa and locally. Some of the stores are supplied by local farms. Choppies has invested significantly in distribution and logistics. In addition to organic expansion, in 2014 it concluded the acquisition of a local rival that operated MegaSave and SupaSave stores, which added six outlets.

In addition to its operations in Botswana, Choppies has 27 stores in South Africa, which it entered in 2008, and recently acquired a store group in Bulawayo in Zimbabwe and has 13 stores in that country. It plans to expand regionally, including in Zambia and Tanzania.[32]

Other retail chains[33]

Other retail chains principally comprise South African origin franchises and brands, often locally owned. Although principally targeting the higher income segments of the population through their presence in shopping malls, some of the brands target other income groups as well.

The Dutch Spar International operates 20 Neighbourhood Supermarkets and six SuperSpar stores, spread throughout the country. The stores are owned by two local companies. The 18 Shoppers supermarkets are owned by the locally listed Sefalana Holding Company, which is expanding into Namibia. The South African Pick n Pay chain operates both franchise and owned stores. In Botswana it has 16 outlets. Pick n Pay is perceived as the main South African operated chain targeting a similar customer segment to Choppies. The Shoprite Group, also from South Africa, owns and operates six Shoprite stores and one Checkers store in Botswana, usually positioned as anchor tenants in shopping malls. In addition, it operates five discount uSave stores targeting lower income population segments. The 12 South African Woolworths store target the high quality segment of the market.

[32] Information on Choppies drawn principally from: Choppies Enterprises Limited – Growth profile warrants a high rating. Imara. Equity Research. December 2014.
[33] Based on data gathered through interviews and company websites.

The international chains import the significant majority of their products, principally from South Africa. They deal with local FF&V producers directly or through agents. Some are establishing their own distributions centres similar to that of Choppies. These chains also have large distribution centres in South Africa that assist in procurement of produce imported into Botswana. While all the retailers have strong linkages in South Africa, they still play a major role in the Botswana horticulture value chain.

Other retail outlets

Smaller independent outlets, such as butcheries and corner stores, sell FF&V as part of their overall offering. They usually lack chilling and cool storage facilities. Their market share has fallen significantly in recent years, with the expansion of retail chains, and in particular Choppies.

Hawkers, or street vendors, form a small but important retailer group. They typically buy their produce directly from farms or import from South Africa in small batches and sell to customers in rural and per-urban areas.

Farm gate sales constitute an estimated 10% of overall farm sales.

Agents

These are well networked individuals, often with some background in the horticulture sector. They typically act as middle-men between farms and end users such as hotels, restaurants and caterers.

3.11. END USER SEGMENTS

In the current horticulture value chain, the household segment of urban and peri-urban population is mostly served by retail chain stores. This is less so for rural consumers, who rely more on hawkers and smaller retailers as well as direct farm purchases. Although the household segment is the largest of the end-users, this is the least quality demanding segment. Consumers typically buy produce without clear quality grading, except for a small proportion of urban dwellers who patronise shops like Woolworths.

The wholesalers are the major suppliers of horticultural produce to government institutions, restaurants and hotels, while caterers buy from both wholesalers and growers. The government procurement system uses tenders that set specification of produce required and have started using standards developed by BOBS as benchmarks. Government institutions are expected to form a substantial customer base of the restructured BHM market.

FF&V consumption by households

In common with the rest of the region, FF&V consumption among Batswana households is very low. Almost 97% of the population do not consume the recommended minimum of five fruits or vegetables per day. On average, one serving of vegetables and 0.3 servings of fruits are consumed daily.[34] These rates are low even compared with other countries in the region. Low FF&V consumption contributes to the population's increased propensity to obesity and to illnesses such as diabetes. Significant potential therefore exits for increasing sales of FF&V in the market, perhaps reinforced by a coordinated public health campaign.

3.12. MARKETING ISSUES

In Botswana, the supply of horticultural produce to the formal market is mainly controlled by big companies. They generally market through the promotion of their retail brands. Horticulture products are sold loose or in packages, and are usually not branded or graded at the point of sale.

Most local farmers involved in horticulture practice peasant farming for consumption and for retail sale in the informal market, local communities and street corners in the cities. They therefore promote and place their produce directly to market. In some occasions, large retailers would buy directly from local farmers to stock their stores in rural areas. Nevertheless, the farmer remains responsible for transporting the produce to the stores and relies on the retailers for getting a fair price[35].

[34] Botswana STEPS Report 2007. WHO

[35] Analysis of Horticultural Production Trends in Botswana, M. E. Madisa, M. Obopile, Y. Assefa, Journal of Plant Studies, March 2012

3.13. CHANNEL SALES

Information on horticulture sales volumes through different channels and market shares of different retailers is not collected in Botswana. A targeted survey of farmers was conducted in partnership with DABP to estimate their sales to different customers. 58 farmers responded, of whom 26 were large (farm size of over 10 hectares), 15 were medium-sized (5 to 10 hectares) and 17 were classified as small (less than 5 hectares).

Chart 28: Farm sales to different channels

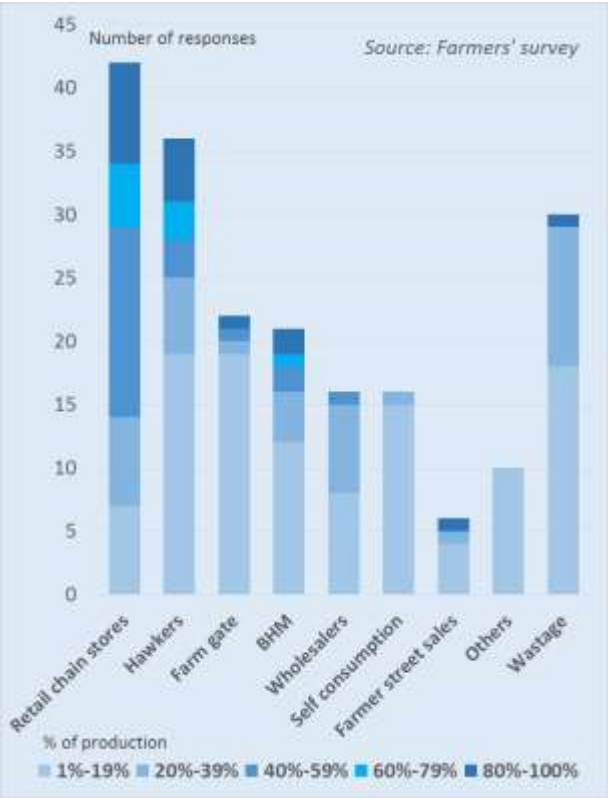


Chart 28 highlights that the most popular channel for sales among farmers surveyed was retail chains, with 42 of the 58 respondents indicating that they sold directly to this customer group. The median, 15, sold between 40% and 59% of their produce to retailers, and 8 sold between 80% and 90%.

Hawkers were identified as the second most popular source of demand by large and medium-sized farms, and third by small-farms (farm gate sales were ranked second by the latter). However, the share of sales going to hawkers is typically less than 20% for all farm sizes. Nevertheless, a small number of small and medium-sized farmers indicated that they sell between 80% and 100% of their produce to hawkers.

Farm gate sales were the third most popular outlets for all sizes of farms, with almost all of them undertaking some sales through this channel. For almost all farms, other than a few small ones, only between 1-19% of sales were conducted through this channel.

18 farms reported wastage of between 1% and 19%, and 11 reported wastage at between 20% and 39%. Of the latter farms reporting higher wastage rates, five were large, two were medium-sized and four were small.

3.14. FF&V PRICES AND MARGINS

Seasonal variation in prices

Chart 29: Monthly sales volumes and prices for selected FF&V at BHM

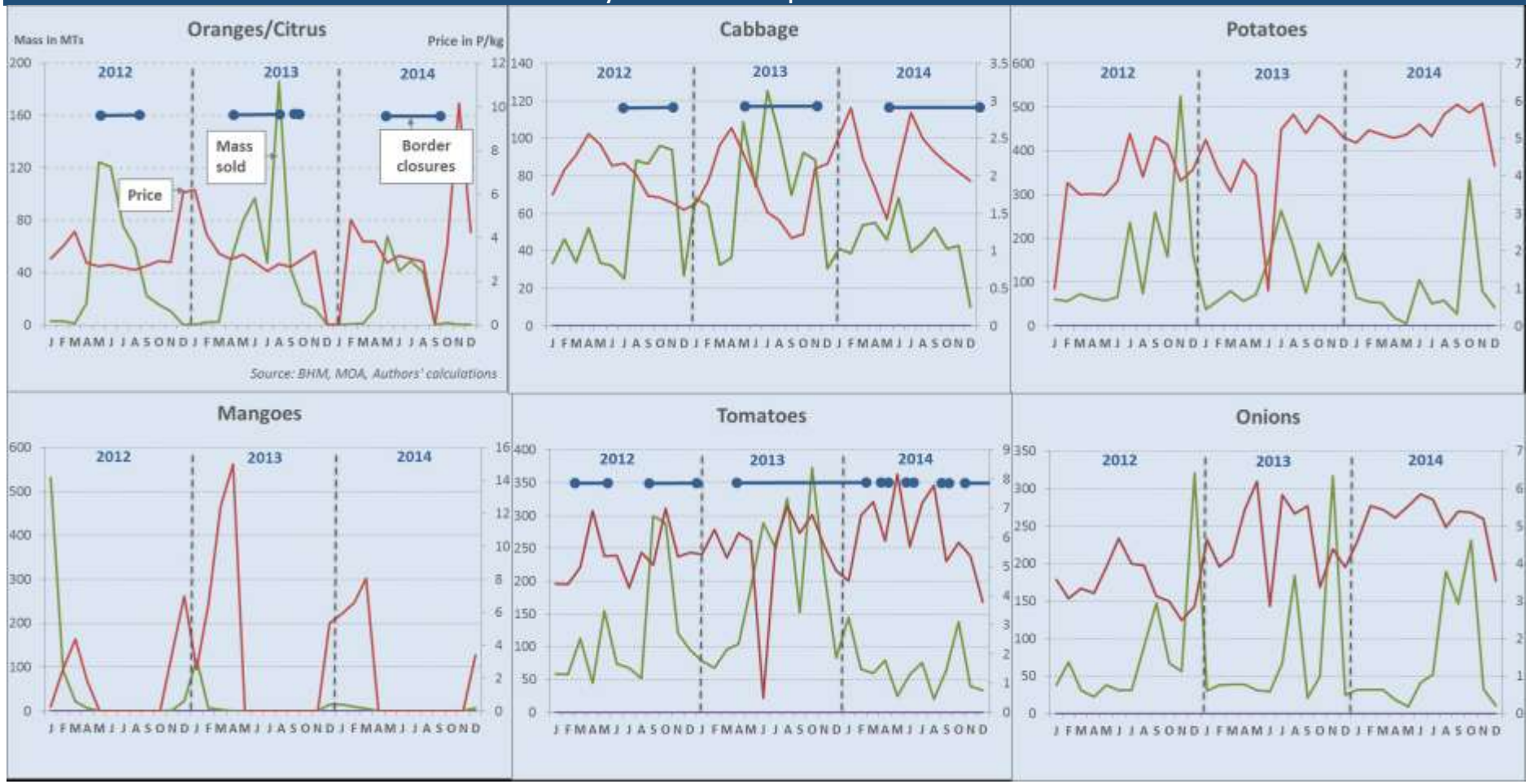


Chart 29 above shows the monthly variation of prices and volumes of selected FF&V produce at BHM between 2012 and 2014. In addition, it highlights the periods of border closures for oranges, cabbage and tomatoes (exact dates of closures are provided in Section 5.4).

Most produce show significant variation in prices, although those for oranges and tomatoes are more pronounced. Hardy produce such as potatoes and onions show less fluctuation in prices. Prices and volume variation of mangoes highlight its seasonality and limited local availability. It is difficult to assess accurately the nature and extent of any impact of border closures on prices based on the information available. Nevertheless, the chart does suggest that border closures correspond to periods of high volume and, to some extent, the inverse relationship between volumes and prices are dampened during the closure periods.

Price variation among grocery chains

Table 4: Prices of FF&V in selected Gaborone grocery retailers/cash and carry				
Cabbage/head	**Mar**	**Jun**	**Sep**	**Dec**
Choppies - Industrial	8.95	8.95	8.95	8.95
Trans Africa* (pro rata 25 kg pack)	2.55	2.77		2.30
Spar Riverwalk	10.95			
Pick n Pay	11.95	13.20		
Square Mart	9.95			
Tomatoes/kg	**Mar**	**Jun**	**Sep**	**Dec**
Choppies - Industrial	15.95	16.95	11.95	
Trans Africa* (pro rata 7 kg pack)	8.03	8.86	7.86	6.59
Spar Riverwalk	13.95			
Pick n Pay	18.50	15.10		
Square Mart	11.95			8.95
Oranges/7 kg	**Mar**	**Jun**	**Sep**	**Dec**
Choppies - Industrial	33.95	21.95	21.95	
Trans Africa*		27.90	24.00	
Spar Riverwalk				
Pick n Pay		40.35		
Square Mart	25.95			
Potatoes/kg	**Mar**	**Jun**	**Sep**	**Dec**
Choppies - Industrial	6.95	6.00		7.10
Trans Africa* (pro rata 10 kg bag)	4.80	6.55	6.24	6.24
Spar Riverwalk	4.95			
Pick n Pay	10.55	9.60		
Square Mart	8.20			11.95

*Source: MOA. * Trans Africa is a cash and carry outlet*

Table 4 is drawn from the DABP monthly price bulletin surveys. It highlights average monthly prices for selected FF&V over four quarters in 2014 in four retail stores and one cash and carry outlet in Gaborone.

Of the four retailers, Choppies is generally the cheapest, although not always so. Seasonal products such as tomatoes and oranges show high variations between the quarters. For some products, such as potatoes, the price variation can be significant.

The gap between retailers' prices and that charged by Trans Africa provide an indication of retailer margin over wholesale prices.

The above analysis was price-focused and no provision had been made for quality. We expect that some of the price differences could be attributed to variations in quality, although produce is not graded for quality by retailers.

Table 5: Prices of FF&V in Choppies stores in regional centres				
Cabbage/head	**Mar**	**Jun**	**Sep**	**Dec**
Kanye	8.95	9.45		
Ghanzi	9.95		9.95	
Gaborone - Industrial	8.95	8.95	8.95	8.95
Francistown	10.95	15.95	9.95	9.95
Tomatoes/kg	**Mar**	**Jun**	**Sep**	**Dec**
Kanye	14.95	12.95		
Ghanzi	20.50	14.95	8.95	
Gaborone - Industrial	15.95	16.95	11.95	11.95
Francistown	14.95	14.95	8.95	9.95
Oranges/7 kg	**Mar**	**Jun**	**Sep**	**Dec**
Kanye		22.95		
Ghanzi		23.95	6.95	
Gaborone - Industrial	33.95	21.95	21.95	
Francistown				
Potatoes/kg	**Mar**	**Jun**	**Sep**	**Dec**
Kanye	6.95	6.95		
Ghanzi	11.95	7.95	7.95	
Gaborone - Industrial	6.95	6.00		7.10
Francistown	7.00	7.45		8.75

Source: MOA.

Table 5 opposite also presents information from DABP surveys, highlighting regional price variations.

There are consistent differences in FF&V prices between the regions. Gaborone is generally cheaper for all products other than tomatoes, where it is the most expensive. Of the other towns, Kanye generally the lowest prices. Ghanzi and Francistown prices are comparable, although Ghanzi is more expensive in some price points.

Margins at different points in the value chain

The survey of retailers undertaken as part of the VCA elicited very little response. In their absence, an analysis was carried out of price differences at various points of the value chain based on information from the DABP monthly price surveys of retailers and wholesalers.

The prices of seven representative FF&V[36] were selected. The average prices of these produce at the survey's seven locations[37] as at December 2013 and March 2014 were determined. Based on the average prices at BHM, selected wholesalers and retailers, margins were imputed. In the absence of corresponding producer prices, these are assumed to be 12% lower than the BHM sale prices, reflecting the agency margin. In reality, the margins thereby calculated are probably understated, as retailers and wholesalers usually buy at lower prices than that applicable at BHM.

The above analysis indicates the following average margins over assumed farm prices:

- BHM: 12% (reflecting the agency fee).
- Wholesalers: 55%
- Retailers: 149%.

[36] Butternut, potatoes, tomatoes, onions, green peppers, oranges and mangoes.
[37] Gaborone, Francistown, Tsabong, Gantsi, Kanye, Maun and Chobe.

FF&V retail margins in Johannesburg[38]

Table 6: FF&V margins at selected South African Retailers					
		Retail Prices		Margins	
ZAR/pc or kg	Joburg Market ZAR	Pick n Pay ZAR	Woolworths ZAR	Pick n Pay	Woolworths
Tomatoes (/kg)	6.40	16.95	15.99	164.8%	149.8%
Potatoes (/kg)	2.87	9.99	12.99	248.1%	352.6%
Cabbage (/pc)	9.35	12.95	12.99	38.5%	38.9%
Lettuce (/pc)	2.82	12.50	12.99	343.3%	360.6%
Onion (/kg)	2.55	9.99	10.99	291.8%	331.0%
Citrus (/kg)	6.11	15.00	34.99	145.5%	472.7%
Mango (/pc)	2.16	7.95	8.99	268.1%	316.2%

Table 6 above suggests that margins at the stores surveyed varied significantly between products on the day. In addition, Woolworth's margins were generally higher than Pick n' Pay, although the survey could not determine if the former's own brand produce was of higher grading and cost more. In any event, the margins surveyed were in most cases higher than the average determined for retailers in Botswana.

3.15. LINKAGES WITH OTHER VALUE CHAINS

The horticulture value does not enjoy much linkages with other value chains except through the retail stores where FF&V are sold alongside other food stuffs. Some of the retailers' transport and logistics infrastructure are also shared with some other value chains. As part of its future wholesale market plans, BHM plans to link with the beef value chain where BMC will operate a market outlet in the same premises. This is intended to serve as a one-stop-wholesale for fresh food products.

[38] Based on an internet based survey carried out by authors on 2 March 2015. The websites of Joburg Market and two retailers were referred to. Prices were for own brand, loose produce, no speciality crop. For products sold per piece, an estimate was carried out to convert ZAR/kg to ZAR/pc.

4. SUPPORT INSTITUTIONS IN THE HORTICULTURE SECTOR

4.1. INTRODUCTION

The institutions and services supporting the horticulture value chain potentially play an important role in its success. Given the nature of the sector, it is critically dependent on the quality of services it receives, for example, on market intelligence and information on standards. To optimise effectiveness, the support institutions need to work together as part of a coordinated network.

The support provided to the Botswana horticulture value chain is mixed. A number of support-related issues hamper the sector's performance, and some of these need to be addressed urgently as highlighted below. The sector's relatively small size and the strategic and political importance of other segments of agriculture, such as beef and crops, detract from attention devoted to its needs.

4.2. MINISTRY OF AGRICULTURE

The MOA is the principal support institution in the horticulture sector. It provides its assistance to the sector through the following departments and agencies:

- *Department of Agricultural Business Promotion:* which is mandated to promote the commercialisation and sustainable development of the horticulture sector through business skills transfer, negotiations to access the national market and promotion of cooperatives and associations.

- *Department of Crop Production:* Provides support to horticulture farmers through technical capacity building in areas such as productivity and yields, plant health and disease management, irrigation and water management technologies.

- *Agricultural Hub (Agri-Hub):* Provides assistance and acts as a catalyst in commercialising further the horticulture sector in order to improve food security. The Agri-Hub promotes and manages strategic projects related to the sector.

- *Department of Agricultural Research:* Conducts research into plant and seed varieties and irrigation techniques suitable for the Botswana environment.

- *Division of Research Statistics and Policy Development (DRS)*: Provides support services in the field of policy research and development and works in close partnership with Statistics Botswana for the annual agricultural survey.

Department of Agricultural Business Promotion[39]

DABP promotes the horticulture sector by providing business advice, market access related information and support, and promoting of agricultural cooperatives and associations. DABP links support institutions with farmers, traders, wholesalers and retailers. It also manages border closures to protect domestic producers through the National Horticultural Producers and Traders Committee of Botswana (NHPTC). DABP staff also sit at the BOBS horticulture technical committee in charge of drafting and rolling out standards related to horticulture products. Amongst DABP's strengths are:

- Facilitation of the supply chain through the creation of linkages amongst stakeholders. For example, DABP has promoted the formation of a lettuce producers' association, which is seen as highly successful.
- The capacity building provided to horticulture farmers, particularly in the area of farm management.
- The protection of infant industries, particularly in the case of tomatoes, lettuce and butternut by implementing border closures.

Nevertheless DABP suffers from some weaknesses, including:

- Strengthening record keeping at farm level as part of the farm management skills provided by the corresponding division.
- Record keeping and data processing at DABP.
- Dissemination of information back to farmers and other sector stakeholders.
- Development of cooperatives and associations.

DABP consists of the following divisions that are relevant to horticulture:

- *Agricultural Cooperatives,* responsible for developing the policy framework that enables the formation of agricultural cooperatives and the monitoring of their performance. It also administers associations. There has been limited success in this area to date.

- *Farm Management,* primarily focuses on improving the farmers' business skills including record keeping as well as the collection and analysis of data at farm level, including productivity and profitability. It also produces monthly price bulletins of horticulture products. As mentioned earlier the above areas need strengthening, which underlines the need for capacity building of this division. Currently the division targets 275 farms. Shortage of personnel and transport results in limited coverage, and visits can sometimes take place only once every 2-3 months. The division has benefited from FAO and Commonwealth Secretariat farm management training, but this needs to be augmented.

[39] For a detailed study on DABP operations and performance and recommendations for its strengthening see Public sector support for inclusive agribusiness development: An appraisal of institutional models in Botswana. Patrick Malope. Ed Nomathemba Mhalnga. FAO. 2014. http://www.fao.org/docrep/019/i3633e/i3633e.pdf

- *Agricultural Trade,* responsible for promoting international trade through participation in trade negotiations and implementing and monitoring of trade policies and agreements. Botswana has signed a number of bilateral and regional trade agreements and it is also a member of World Trade Organization. These agreements allows Botswana's goods and services to benefit from duty free and quota free market access and preferential markets. Given the net import position of horticulture, this division plays a limited role in this sector.

- *Agricultural Marketing,* which focuses its efforts on providing marketing information, developing marketing networks, conducting market research and gaining market intelligence. Services promote:

    - Importance of agricultural commodity prices
    - Informed marketing decision
    - Future planning
    - Effective and efficient trading
    - Ability to take advantage of favourable prices changes.

Department of Crop Production

DCP's key mandate is to provide technical services to farmers and the general public to improve farm productivity and efficiency. The department works closely with farmers through extension officers to facilitate the allocation of land for agriculture, control the spread of pests and plant diseases, coordinate horticulture programmes and adopt technology, particularly irrigation. DCP has four divisions:

- *Land Utilization Division* responsible for soil survey and mapping, land husbandry, agricultural land use planning, cartography, Geographic Information Systems (GIS) and remote sensing sections. The key activities of this division aim to promote appropriate land husbandry practices, promote sustainable land resources management and develop water resources for irrigation. Difficulties in accessing suitable water resources have been identified by stakeholders as one of the most important factors that restricts farmers from increasing production. The difficulty lies either because of lack of water at the proximity of the respective farm, or the reluctance of financial institutions, both CEDA as well as private banks, to finance the drilling of boreholes.

- *Plant Protection Division,* mandated to control and manage crop pests and diseases, through environmental friendly practices (e.g. integrated pest management). The core functions of the division include the provision of technical support to farmers and extension officers in the field of pest control, implement the 1999 Agrochemical Act, limiting post-harvest losses and the issuance of phytosanitary certificates and import permits to safeguard plant health.

- *Horticulture and Beekeeping Division* is a relatively new division established in 2008 following the merge of the Horticulture and the Beekeeping sections. The sections constituting this division are Vegetable Production, Fruit Production, Flower and Ornamental Production and Beekeeping.

The main functions of this division are to develop, implement and monitor technical programs aimed at strengthening the horticulture sector, showcase new technologies through field and farm days, as well as contribute to the training of extension officers and farmers. The division manages horticulture extension officers. However, there is shortage of staff and transport. Extension officers often do not have adequate practical skills. The division also collects through its district offices production data such as volume, yields, size of farms for a number of FF&V, for a wide range of farms across the country. Much of the data collection is still done manually with the division lacking systems that enable a relatively automated way of data collection and analysis. Staff limitations also hamper the regular collection of information. The information available therefore suffers from gaps and inconsistencies. Data collected is not widely disseminated.

- *Agricultural Engineering Division* focuses primarily on the effective management of water resources in extreme weather conditions such as drought and the efficient adoption of irrigation technologies. Furthermore, the division is responsible for the allocation of sufficient water resources by ensuring access to dams and wells as well as the provision of potable water to cluster famers under ISPAAD.

There is an overlap between the capacity building of the DABP and DCP particularly with respect to training farmers on new technologies and business skills through extension officers. This represents multiple entities providing a fragmented service to the farmers, who could benefit more by more coordinated and consolidated services. MOA has suggested that there is need to consider a Commodity Cluster Approach that would encourage joint operations, training activities and general programming to encourage complementarity. We believe that in the absence of our suggested approach in Section 8, that of a merger between the units, this might be an alternative that could be considered.

Agricultural Hub (Agri-Hub)

The Agri-Hub was established in 2008 to catalyse the commercialisation and diversification of the agriculture sector and improve food security, and meet the objectives of NDP 10. The Agri-Hub's role is that of a coordinator amongst the various MOA functions, government ministries, parastatals as well as the private sector.

The following are current Agri-Hub projects relevant to the horticulture sector:

- National Master Plan for Arable Agriculture and Dairy Development (NAMPAADD)40. Adopted by an Act of Parliament in 2002 it aims to support both traditional and commercial farmers adopt technology and management practices. Particularly for horticulture, NAMPAADD focused on irrigation farming, especially Glenn Valley and Dikabeya irrigation farms. The objectives of Agri-Hub NAMPAADD projects are to:

    - Establish pilot farms to demonstrate the advantages of irrigation.
    - Encourage small scale horticulture farmers to work in clusters around anchor projects.
    - Encourage farmers to coordinate the production of tomatoes, potatoes, onions and cabbage.
    - Improve extension services by allocating officers near the pilot farms.
    - Encourage farmers to use treated wastewater for irrigation.
    - Expand collection and marketing outlets.

  Further information on NAMPAADD is provided in Section 5.4.

- Facilitate the establishment of the Contributory Agricultural Insurance Scheme in Botswana (BCAIS). The scheme's objective is to reduce the risk absorbed by the farmers caused by climatic seasonality variations and by extreme natural disasters. A feasibility study on the BCAIS has been completed. The Policy Advisory Committee of the MOA is expected to advise on the way forward in the near future.

- Facilitate the establishment State Farms at the proximity of multi-purpose dams and sewage ponds applying irrigation farming. This initiative intends to identify farms that otherwise would remain commercially unexploited and allocate them to individuals or companies interested in engaging with horticultural farming.

Department of Agricultural Research

The overall mandate of DAR is to research areas of improvement in crop and livestock production technologies. In farming, its principal focus is on arable crops, but it also carries out some research into horticulture. Areas covered include: Seed production; soil management; and irrigation. The department has historically also produced model farm accounts. DAR has undertaken research on suitable varietals of FF&V for growing in Botswana. However, to date there has been limited uptake of the outputs of its research by local farmers.

[40] http://www.gov.bw/Global/Ministry%20of%20Agriculture/NAMPAAD.pdf?epslanguage=en

Division of Research Statistics and Policy Development

DRS is mandated to provide specialised social research, monitoring and evaluation (M&E) of projects and collect and compile agricultural statistics. The functions of the division are to:

- Act as the focal point for policy development and all research activities carried out at MOA.
- Undertake research activities, M&E, policy research and program implementation according to pre-defined success criteria.
- Carry out M&E of programs undertaken by the various departments of MOA or their partners.

Despite the broad and enabling mandate, arguably the DRS has minimal participation in the M&E of current programs undertaken by MOA departments and its role needs to be reinforced with specialised staff in the field of M&E, research, statistics and project management.

4.3. TRAINING ORGANIZATIONS

Botswana College of Agriculture (BCA)

BCA was established in 1991. The College is a parastatal under MOA and an associate Institution of the University of Botswana (UB). BCA offers the following programs related to horticulture:

- Higher Diploma in Forestry and Range Ecology
- Higher Diploma in Agriculture
- Bachelor and Masters of Science (Agricultural Education)
- Bachelor and Master of Science (Agriculture)
- Bachelor of Science, Master of Science and Doctor of Philosophy (Crop Science).

As an associate institution BCA offers UB higher diploma and degree programmes in agricultural sciences, while it's responsible on its own for short courses offered by its Centre for In-service and Continuing Education (CICE). Currently the College is going through a period of transformation to become an agricultural university. Arguably BCA offers a relatively good level of theoretical education to its undergraduate and graduate students. Nevertheless, the students receive limited practical experience as part of their curriculum, a significant shortcoming in educating young farmers or extension officers.

Relevant CICE short courses (1-2 weeks) offered to professionals include:

- Nursery seedling and tree production
- Vegetable production
- Agro chemicals management
- Introduction to fruit production
- Diagnosis and management of pest and diseases
- Mushroom production
- Citrus production
- Farm records and accounts
- Marketing of agricultural products
- Business proposals
- Irrigation with treated waste water
- Irrigation management and scheduling
- Design and implementation of irrigation systems.[41]

The above training courses are also relatively theoretical and are not widely attended by professional farmers, partly because they are not provided for free (the fees charged are considered reasonable).

Rural Training Centres (RTC)

The MOA Division of Farmer Training is responsible for training farmers in transfer technologies. The Division comprises of five RTCs in Denmam, Francistown, Southern, Ngamiland and Mahalapye that offer *inter alia* training in crop production, marketing of agricultural produce, agro-processing and conservation of natural resources. Courses offered at RTCs range from one to six weeks and are free. The key strength of RTCs is their ability to provide a hands-on practical training to professional farmers. In addition, the centres are well distributed across the country. On the other hand, the centres' infrastructure has deteriorated over time, causing many professionals to lose interest and enthusiasm to attend. Also, instructors can be underqualified, with most of them holding Diplomas instead of Bachelors or Masters degrees. The curricula need to be updated to the most recent technologies and business practices. Moreover, courses are often attended by farm owners, who may not be engaged in day to day farming, rather than employees working on the farms.

[41] http://www.bca.bw/cice/CICE%20COURSE%20CALENDA%202015.pdf

4.4. LOCAL ENTERPRISE AUTHORITY

LEA was established in 2004 to provide business advice and training to SMMEs. It reports to MTI. LEA contributes to the commercialization of the agricultural sector by promoting value chain analyses and by emphasizing the need for the collection and sharing of data on to develop accurate business plans[42]. LEA published a detailed horticulture price survey in 2007 and a value chain study of the sector in 2011. The authority has established a horticulture incubator aimed at developing farmer entrepreneurship. LEA services include the training of farmers with practical skills and promoting start-up ventures through incubators. On the other hand, LEA contribution to the horticulture sector has been characterized by, we understand from some interviewees, limited cooperation with other stakeholders in the sector. Pilot horticulture farms have had limited success to date.

Relevant LEA divisions include:

- *Capacity Development Division* supports entrepreneurs and SMMEs through training, mentoring and entrepreneurship development. The division has two departments: Training and Mentoring; and Entrepreneurship Development.

- *Enterprise Development Division* is responsible for designing wholesale programmes/ interventions for SMMEs in Botswana. It has two departments: Micro Business Programme; and Small and Medium Business Programme.

- *Research and Development Division* is responsible for providing other LEA divisions with research and information services that will help develop informed and knowledgeable SMMEs in Botswana. The division is divided into three departments: Research; Public Policy; and Knowledge Management. The Research Division was in charge of preparing the 2011 horticulture value chain study[43].

- *Public Policy Department's* principal aim is to support development of the SMME sector in Botswana in the context of a robust, effective, relevant and supportive policy, legal and institutional framework. The department recommends policy options and choices to LEA, its stakeholders and the government by undertaking public policy research, analysis and review.

[42] Botswana Agricultural Marketing Strategy (2011-2016), Commonwealth Secretariat, Botswana MOA
[43] http://www.lea.co.bw/uploads/files/Horticulture%20Value%20Chain%20Executive%20Summary.pdf?size=535243

4.5. MARKET INTELLIGENCE

Botswana Horticulture Market

The BHM website can disseminate daily FF&V volumes and prices from the market, but the service has not been updated since Nov 2014. BHM also disseminates weekly market prices to producers, buyers and the public through print media, radio and bulk SMS. Each consignment is captured into the sales processing system. These records have been used as part of this report[44]. Given the ongoing restructuring discussions, BHM's new role with respect to the horticulture sector and dissemination of market intelligence is uncertain.

Department of Agriculture Business Promotion

DABP currently faces a number of constraints, particularly in areas such as lack of human resources on the ground and availability of transport. Nevertheless, it has been very active collecting marketing intelligence data. On a monthly basis, DABP staff at the district level collect information from farmers on anticipated production levels, yields and type of planted FF&V. In addition, it conducts regular meetings amongst farmers, traders, agents and wholesalers where issues and challenges being faced by the sector are discussed.

One of the outcomes of the above activities is the issue by DABP of monthly price bulletins that summarise average prices of selected FF&V across the country, average prices sold by the BHM and average wholesale prices. We have drawn on these bulletins for the VCA.

Based on the collected market intelligence, DABP implements the government's border closures policy. The issue of border closures is discussed further in Section 5.4.

Joburg Market

The Joburg Market, 100% owned by the Johannesburg Metropolitan Municipality, is the largest fresh produce market in the world by volume. By way of comparison, the Joburg Market is twice the size of the second ranked market in the country and bigger than 17 other local markets combined. The market serves approximately 5,000 farmers from across South Africa who send their fresh produce to be traded. The Joburg Market disseminates daily price information through its website for a wide range of FF&V, which are often used as benchmarks for local price negotiations in Botswana[45].

[44] http://www.bhmarket.co.bw/
[45] http://www.joburgmarket.co.za/

4.6. BOTSWANA HORTICULTURE COUNCIL AND LOCAL PRODUCERS ASSOCIATIONS

BHC is the apex institution of regional horticulture producers associations. Its aim is to promote the interests of producers. As indicated previously, it is a 51% shareholder of BHM, the investment having been funded by the government.

BHC is almost wholly dependent on the government for funding and has limited resources. It mainly represents small farmers, owning between 0.1 and 3 hectares. There are around 250 affiliated members. Annual membership is P300 payable to regional associations, but most members don't pay any subscriptions. Each regional association contributes P2,500 to BHC annually. Subscription income is very limited. Large farmers in the Tuli Block have their own association.

The Council has five office holders, including the Chairperson, Secretary and Treasurer. Each affiliated region is represented. The Council also includes one commercial farmer, one retailer, and *ex officio* members including from DCP and BHM.

BHC lobbies for its members through the press, public engagements and through its membership of various decision-making institutions and committees. Neither it, nor the regional associations, provide structured services to their members. Some associations, however, organize training and other events for their members, which are funded by the attendees. Associations in Francistown, South East and Kgatleng are particularly active in this regard.

DABP has promoted the establishment of a Lettuce Producers' Association, and provides it with ongoing support. This association is highly regarded and is very active in knowledge sharing, coordination of production and negotiations with traders. This association could potentially act as a model for organizing producers of other key FF&V.

4.7. RESEARCH AND DEVELOPMENT

Botswana College of Agriculture

In addition to providing horticulture-related training, BCA carries out relevant research in order to generate suitable technologies and provide advisory services to the agricultural and related sectors in Botswana. The college has human and physical resources for research distributed in the Departments of Agricultural Economics, Agricultural Engineering and Land Planning, Basic Sciences and Crop Science and Production. The college farm also has facilities such as the center pivot irrigation system, various farm implements and animals for supporting staff research[46]. Very limited interest has been shown by graduate students to proceed with research in horticulture. Additionally, despite the efforts of BCA staff, the research outcomes have yet to make an impact for the farmers and it remains restricted to theoretical levels.

[46] http://www.bca.bw/bojaas/Researchmain.php

National Food Technology Research Centre

NFTRC boasts one of the most impressive staff rosters and premises amongst government departments and parastatals, which include a large number of MSc and PhD graduates in food technology, food processing and specialized laboratory and food processing equipment. The centre has been involved in new product development over the last years, formulating processed food recipes adaptable to the local palate. Nevertheless, very little of the research carried out by NFTRC has been implemented in the market. Additionally, the remote location of the centre puts it at a distance from both the commercial and industrial enterprises of the country. NFTRC research and development activities include:

- *Food technology,* which exists to promote food-processing activities from product formulation to finished products. The objective of this research is to increase the self-reliance of Botswana in semi-processed and processed food by selecting FF&V that are widely available in the local markets in line with the government's priorities. Other criteria such as quantities of imported FF&V and the potential value added to the final product are also applied.

- *Food biochemistry department* performs regular food analysis to assess the amount of nutrients and remnants of contaminants that could potentially affect food quality, particularly with relation to mycotoxin and pesticide residues. This type of research should become part of a coordinated effort by MOH and MOA to ensure food safety.

- *Food Microbiology & Biotechnology* analyzes food samples for pathogenic microbes with the aim of ascertaining food safety. The lab also researches useful microorganisms that could find use in industrial applications. The activities of the department include experimental and proficiency testing and validation of analytical methods and procedures, general maintenance and updating of stock cultures.

- *Nutrition & Dietetics* aims to improve the nutritional status and health of the local population and carry out research that will eventually prevent and treat diet-related diseases amongst Batswana. With the population boasting a relatively high level of diabetes, this type of research should be encouraged and the research team should be reinforced. Unfortunately, the results of this research has not become known to the general public. [47]

As indicated in Section 3.9, NFTRC is partnering with SPEDU to promote and operate the food processing plant in Selebi-Phikwe.

The study did not find any evidence of NFRTC research being used in the horticulture sector.

[47] http://www.naftec.org/

Botswana Institute for Development Policy Analysis (BIDPA)

BIDPA is an independent trust set up by a Presidential Decree. It started operations in 1995 as a non-government policy research institution. BIDPA focuses mainly on policy analysis and capacity building. It is a key contributor to national policy formulation. Its key objectives are to conduct research analysis on policy issues, monitor the performance of the Botswana economy, offer consulting services to the government and provide technical and financial assistance to individuals and organizations for purposes of facilitating policy analysis[48]. Currently there are 19 researchers consisting of five Senior Research Fellows, six Research Fellows, six Associate Researchers and two Research Assistants[49]. BIDPA has been actively researching the fields of food security and macroeconomic policy particularly for the overall agriculture sector. With regards to horticulture a BIDPA paper argues for the need to establish a national horticulture policy alongside the agriculture one and expand the extension service to make provisions for horticulture farmers in and beyond the Gaborone area. In addition the paper points out that there is a need to expand small scale farming ventures in rural areas to secure food for a larger portion of the population[50]. In another paper[51] BIDPA points out how horticulture produce import restrictions have benefited the local producers contributing to the economic diversification.

In addition to the above institutions, DAR, discussed previously in Section 4.2, carries out research on various aspects of the sector's operations.

4.8. FINANCE AND INSURANCE

Chart 30: Sources of finance for horticulture farms

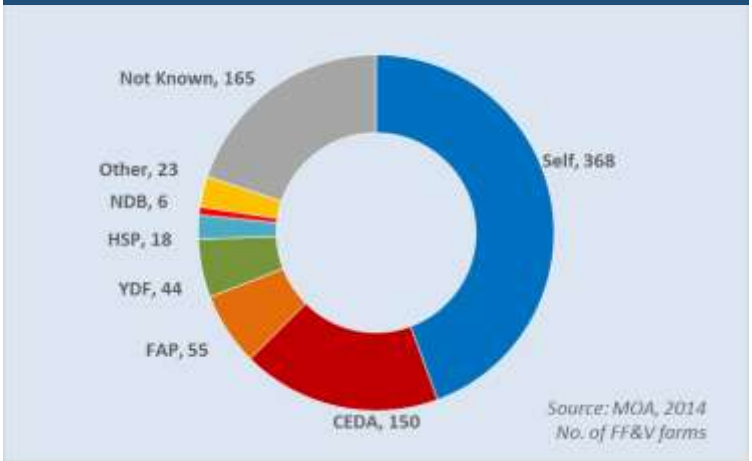


Chart 30 highlights the principal sources of finance for horticultural farms. Of the 820 farms surveyed by MOA in 2013/14, 368, or 45% were entirely self-funded. 18% had CEDA funding. Almost all other farms for which information was available were funded by various government schemes. The chart highlights the scarcity of commercial bank finance to the sector.

[48] http://www.bidpa.bw/img_upload/pubdoc_17.pdf
[49] http://www.bidpa.bw/
[50] Rural development in Botswana, Dr Pelotshweu Tapologo Moepeng, BIDPA, May 2013
[51] http://www.bidpa.bw/img_upload/pubdoc_33.pdf

Citizens Enterprise Development Agency (CEDA)

CEDA, a government-owned agency, specializes in the provision of loans to farmers at a fixed concessionary rate in close collaboration with LEA. CEDA is an important stakeholder in the horticulture sector, providing the necessary access to finance and to some extent provide coaching and mentoring support to the farmers for up to six months. In 2004, the Young Farmer Fund (YFF) was established focusing on 'young' farmers up to the age of 41 to provide financial assistance to subsistence farmers in urban and per-urban areas of the country.

The current interest rate on CEDA loans is 5% for loans between P500 and P500,000, and 7.5% for loans greater than that amount. CEDA can provide loans of up to P30 million for bigger projects. YFF loans are made for up to P500,000 for up to five years, including a one year grace period. Working capital loans are usually provided for one year, with a two-year maximum. Mentors are provided for up to six months to YFF borrowers

The main focus of CEDA within agriculture is the livestock sector. CEDA loans provided to enterprises for agricultural projects correspond to approximately a quarter of its total portfolio. Horticulture-related loans have constituted less than 5% of CEDA's loan portfolio since its inception. In comparison, livestock loans correspond to 18.5%. The rate of loans written off or delinquent for over six months for the horticulture sector is reported at 30%, whilst that for livestock is almost 12%[52]. These figures exclude loans written off. Once they are included, CEDA's losses in lending to horticulture have been substantially higher, with some estimates reaching as high as 85%.

CEDA's policies for horticulture loans suffer from a number of shortcomings. The P500,000 maximum under YFF is considered too low to finance start-ups fully. The length and quality of mentorship is considered inadequate. CEDA has now stopped providing 100% loans and no longer provides finance for drilling boreholes. It has also been highlighted by some stakeholders that the grace period provided in CEDA loans is relatively short and doesn't allow time for a horticulture business to become adequately operational.

CEDA also operates a Credit Guarantee Scheme (CCGS), for commercial bank borrowers who do not possess the required level of security or collateral. The loans are available to individuals or companies owned by citizens aged 18 or more either wishing to start a new business or wanting to expand on an already existing one[53]. The facilities can be from any of six commercial banks that participate in the scheme.

[52] Based on data provided to the authors by CEDA
[53] http://www.ceda.co.bw/credit-guarantees-scheme

Botswana Development Corporation

BDC was founded in 1970 and is one of the biggest investors in the country with investments exceeding P1 billion. BDC was established with the mandate to develop the country's commercial and industrial activities with the aim of reducing dependency on mining.[54]. The products and services offered by BDC are:

- Loan financing, by financing up to 75% of the total project value
- Equity participation, by taking a shareholding of the company
- Invoice discounting, by providing of working capital through by buying invoices
- Provision of Industrial, commercial and residential premises (warehouses, factory shells, office space and residential houses).

Horticulture remains a relatively small portion of BDC's investments that mostly include hospitality and services, properties and manufacturing ventures[55]. BDC's key participation in the horticulture sector is through a 49% ownership of BHM. BDC has been playing an important role in BHM's restructuring.

Commercial banks

Commercial banks provide relatively little financing to the horticulture sector, primarily because of its high risk.

Other finance

Supplier credit is provided by retailers to larger farmers, and to a very limited extent. Some suppliers finance is provided by wholesalers and retailers, but is limited in scope. Some wholesalers highlight bad experience, especially with smaller farms, who diverted funding made available for working capital and did not adhere to crop plans.

Horticulture farmers can also access grants and other financial support from other government programs, such as ISPAAD and youth grants. These are discussed further in Section 5.4.

[54] http://www.proudlyafrican.info/Botswana/Botswana-Development-Corporation-Limited.aspx#
[55] http://www.bitc.co.bw/sites/default/files/BDC%20Investment%20Opportunities.pdf

Insurance

Crop production insurance policies were pioneered by Swiss Re in the early 2000s but the company ceased to offer these products due to low take-up. Recently, AON, the insurance broker has been selling insurance products issued by Phoenix of Botswana Assurance Company and reinsured by FMRE Property & Casualty[56]. The insurance is principally aimed at arable crop producers, rather than horticulture farmers. Risks covered include fire and lightning, hail and storm, but excluding cover due to damages caused by drought or frost. So far these policies have had very low take-up from farmers. As indicated previously, the Agri-Hub through its activities with relation to BCAIS is expected to provide additional assistance to farms, particularly small scale ones, for protecting them against loss of income.

4.9. OTHER SUPPORT INSTITUTIONS

Ministry of Lands and Housing (MOLH) Department of Land

The Department of Land's overall responsibilities are to provide direction on all land related matters by initiating, implementing, coordinating and monitoring land policies. The Department is mandated to oversee the allocation, use and management of state land through government policies and statutes[57]. It partners with DCP's Land Utilization Division to allocate suitable state land for appropriate agriculture purposes and define the monthly rent. The MOA Agricultural Land Allocation Committee additionally identifies and coordinates investment in land suitable for agriculture. The National Land Policy produced by the MOLH omits horticulture as an area for allocating land for either personal or industrial use. In the meantime clear provisions are included for land allocation for arable crops and livestock in the document. This omission could also be the result of the absence of a National Horticulture Policy that ensures amongst others, that part of the communal and state land is allocated for horticulture purposes. In addition it appears to be common practice amongst horticulture farmers to cultivate only part of the land allocated to them, thereby limiting its productive use.

Ministry of Environment, Wildlife and Tourism Department of Meteorological Services (DMS)

The Department of Meteorological Services monitors and analyses Botswana and regional weather, providing weather forecasts, bulletins and an extensive range of meteorological and climatological data and reports. The department has 486 staff, amongst whom are 30 meteorologists. DMS operates 16 synoptic stations through which important information related to horticulture is collected monthly such as rainfall and temperature. This data can be used for identifying extensive periods of droughts or frosts and facilitate the decision on which type of crop to produce for a given district and period of time. There is limited evidence of extensive use of such meteorological information by horticulture farmers.

[56] http://fmrepropertyandcasualty.co.zw/
[57] http://www.sarpn.org/documents/d0001172/Botswana_NDP9_chapter17.pdf

Ministry of Minerals, Energy and Water Resources (MMEWR) Department of Water Affairs

MMEWR, through the Department of Water affairs (DWA) is responsible for the management and allocation of water resources in the country, and for the provision of water in the rural areas. With respect to horticulture, DWA is responsible for authorizing individuals and companies to irrigate and issues permits for drilling boreholes.

Department of Geological Survey (DGS)

The Geological Survey of Botswana was formally constituted in 1948 as the Geological Survey of the then Bechuanaland Protectorate. Its principal role as the national repository of geological information is proper management of the geoscientific information to assist in the economic development of Botswana as well as its natural environment, more especially, the country's scarce water resources. From its inception, the DGS has focused on groundwater development due to the need to supplement the very limited surface water resources of much of the country[58.]

Ministry of Local Government and Rural Development (MOLG)

MOLG, through local authorities, is responsible for wastewater collection, treatment and disposal. Gaborone, with an estimated population of 300,000 inhabitants, produces 57 million liters of wastewater on average. The wastewater is treated twice before being used, mostly for irrigation purposes. Currently the effluent water is used for watering two golf courses in Gaborone and part of it irrigates the Glen Valley farms located at the proximity of the Water Utilities Company (WUC) water treatment plant. Horticulture production from Glen Valley is regularly sold to retailers and wholesalers. Challenges surrounding the water treatment include public's perception about the quality of the water, the water quality and its suitability for entering the food chain as well as its impact on the environment. It is estimated that if adequately treated, wastewater could increase the national water resources by 16%[59].

Ministry of Environment, Wildlife and Tourism (MEWT)

MEWT through its Department of Waste Management and Pollution Control (DWMPC) provides technical support to MOLG in the management of wastewater in the country.

[58] http://www.gov.bw/en/Ministries--Authorities/Ministries/Ministry-of-Minerals-Energy-and-Water-Resources-MMWER/Departments1/Department-of-Geological-Surveys/Introduction/

[59] http://www.ais.unwater.org/ais/pluginfile.php/231/mod_page/content/188/Session3a_CaseStudy_Botswana.pdf

Water Utilities Corporation (WUC)

MOA has partnered with WUC for the economic utilization of recycled water from Gaborone city sewage treatment plant with plans to follow a similar pattern with other cities through roll-out of NAMPAADD. Botswana has reached her peak of dam development owing to the country's flat topography. With economics of dams deteriorating with additional sites, the need for efficient use of existing dams is even greater. Dams are currently managed by the WUC as a parastatal. WUC's main objective is the supply of both treated and raw water to households and industry. This mandate has been extended through the recent water sector reform program to cover not just urban areas but the entire country. WUC is the management authority for all the major dams in the country.

Botswana Bureau of Standards

BOBS is the official body responsible for all issues related to standardization and quality assurance at the national level. BOBS is also a full member of the International Organization for Standardization (ISO) and the national contact point for all SADC programs on standardization and quality assurance. BOBS offers technical services in the areas of standardization, testing of goods, certification of products, industrial & trade metrology, quality management systems, environmental management systems, information and training. BOBS is also a member of the World Trade Organization (WTO)[60].

In the area of horticulture, BOBS has created a number of voluntary standards in relation to appearance grading. MOA has not enforced these standards, leaving therefore their implementation on the discretion of the various sectoral stakeholders. In addition to the above activities, BOBS carries out a comprehensive program of workshops and training on the standards related to horticulture.

Ministry of Health, Food Control Laboratory

The ministry is mandated to set standards for food processing, manufacturing and promotion; investigate, assess risks and inspect all food items that are made available to the public; and monitor compliance with set standards. The ministry issues appropriate alerts and public advice. *Codex Alimentarius*[61] standards are used where legislative gaps are present. The Food Control Division's laboratory is understaffed and the current horticulture-related activities are limited to pesticide residue controls, which it carries out on selected imports and on an as-requested basis. The laboratory is also responsible for ensuring guidelines on water quality usage on farms are complied with.

[60] http://www.bobstandards.bw/Pages/aboutbobs.aspx?pid=0&mnusub=1&mp=0&sp=1

[61] A collection of international food safety standards that have been adopted by the FAO and WHO funded Codex Alimentarius Commission. See www.codexalimentarius.org.

4.10. TRANSPORT & LOGISTICS SERVICES

The horticulture value chain is very fragmented with respect to transport and logistics.

The retail chains and wholesalers own their own transport facilities. Motopi, which procures FF&V for Choppies, has its own vans, almost all of which are refrigerated. The Gaborone based wholesalers also use their own vans, some of which are refrigerated. Some farmers use their own transport to deliver produce to their customers, but very few of these provide for cooling. A substantial proportion of FF&V is transported by vans and at times lorries hired out by small transport operators. These are usually not refrigerated.

A lack of cooled or chilled distribution hubs exacerbates the shortcomings associated with weaknesses in the transport infrastructure. Large wholesalers, such as Motopi and BHM have large centralised chilled distribution hubs. However, suitable collection and distribution facilities are rare outside Gaborone.

5. GOVERNMENT POLICIES RELATING TO THE HORTICULTURE SECTOR

5.1. INTRODUCTION

The government has put in place various policy instruments, subsidy programs and legislation to support the development of horticulture sector. However, their utilization or implementation is not always followed and their effectiveness is often very limited.

5.2. LAWS AND REGULATIONS AFFECTING THE SECTOR

Botswana Land Use Policy

Land in Botswana is administered by MOLH in three tenures systems, being state land, tribal land and freehold farms. Approximately 70% of land in Botswana is tribal land, 25% state land and 5% freehold land.[62]

State land

State land is allocated by the Department of Lands under the provisions of the State Land Act, 1996, in eight urban areas of Botswana: Gaborone, Francistown, Selebi-Phikwe, Jwaneng, Lobatse, Ghanzi and Kasane. State land is allocated for commercial and industrial use, including agriculture, by way of tender and is open only to Botswana citizens holding a valid omang ID and above the age of 18. The allocation is not free and governed by a lease agreement for a stipulated period. Lately, this has been extended to certain parts of the country with potential for horticulture production due to availability of water, such as effluent and waste water treatment plants, small dams such as Dikabeya and the newly built large dams of Thune and Lotsane.

Tribal Land

The Tribal Land Act, 1968 governs the management use of tribal land. Allocation of tribal land in all the villages in Botswana has been undertaken by the 12 district Land Board authorities through customary law that must be converted to the common law system. This provides for a memorandum of agreement of lease between an individual and the Land Board, which spells out all the legally binding conditions expected to be fulfilled by both parties. However, the process of conversion from the customary law to common law has been found to be cumbersome and in some instances hindered project establishment.

Land use for integrated farming

[62] Property Rights and Resource Governance. USAID. http://usaidlandtenure.net/sites/default/files/country-profiles/full-reports/USAID_Land_Tenure_Botswana_Profile.pdf

To address this problem, the government through Presidential Directive[63] approved the introduction of integrated farming on land allocated for agricultural use and the guidelines on implementation of integrated farming in agricultural land. Prior to the introduction of the integrated farming approach, the sectoral nature of land use planning was found to be counterproductive. Therefore, the directive allows compatible activities to be practised on the same piece of land without having to seek permission from the land authorities. Applicants are required to fill a common law application form and undertake in writing their intention to convert from customary law to common law and submit their request to the Land Board. It is expected that the development will make land available to horticulture as they will not limit the land use activity to be undertaken.

Freehold land

The use of freehold land for horticulture, concentrated in urban areas and some large cattle ranches, is very rare.

Plant Protection Act, 2007

The legislation was enacted to: prevent introduction, spreading and establishment of plant pests; facilitate trade in plants; enable Botswana to comply with its international obligations; and provide for related matters. It came into force in April 2009 with MOA as the regulating body by issuing conditional plant or plant product importation permits and phytosanitary certificate for exportation of plant or plant products. Any plant or plant product entering the country needs to be declared to the plant inspector and has to be accompanied by a phytosanitary certificate from the exporting country. In the same manner, issuance of phytosanitary certificate is inspected for compliance with phytosanitary regulations of the importing country.

Agrochemicals Act, 1999

The Agrochemicals Act was enacted as an "Act to provide for the registration and licensing of agrochemicals; to control or regulate their importation, manufacture, distribution, use and disposal, so as to prevent pollution to the environment or harm to human, plant or animal life, and to provide for matters incidental and connected to the foregoing". The legislation covers any organic, inorganic or live biological material intended or offered for sale for purposes of: (*a*) destruction, control, repulsion, attraction or prevention of any undesirable life forms injurious to plant and animal growth; or (*b*) promotion or inhibition of plant growth such as fertilizers, growth regulators, hormones, defoliants or legume inoculants. The Act regulates agrochemicals entering the country through the issuance of import permits while internal distribution is regulated through annual permits. However, no license is required for a farmer importing solely for use in his or her farm operations. The agrochemicals import permit requires that traders provide information on quantities imported but does not impose any penalty for failure to do so. This requirement is found to be more voluntary hence not very helpful in ascertaining quantities and value of chemicals actually entering the country.

[63] Cab. 2 (B)/2012 dated 21st February 2013

Food Control Act: Cap 43:06

The law aims to ensure the provision of clean, safe and wholesome food to consumers. If fully implemented, this act would go a long way in ensuring that only good quality products enter the market as opposed to the present where no requirement is imposed. As indicated in Section 4.9, staff limitations at the Ministry of Health impedes full enforcement of this act.

Weights and Measures Act

The act prescribes the standard units of weights, length and volume in Botswana. These standard units are based on the International System of Units established by the General Conference on Weights and Measures. The act also provides for verification (assizing) of instruments, weights and measures. The act further prescribes the provisions of sale of any pre-packed products. These also forms part of the requirements of product standards alluded to below.

BOBs regulations and standards

BOBS was established by an Act of Parliament No 16 of 1995. It is a parastatal organization governed by a Standards Council with representatives from industry, government, research institutions and consumer groups. BOBS has several objectives but the most relevant to horticulture value chain is that of establishing and implementing national standards. Standards are developed by groups of experts, within technical committees (TC). TCs are made up of representatives of industry, NGOs, governments and other stakeholders. Each TC deals with a different subject, for example for horticulture the TC focuses on FF&V. The FF&V TC has developed more than ten voluntary standards. Although voluntary, the FF&V standards developed so far can be of great benefit to FF&V value chain.

5.3. NATIONAL HORTICULTURAL POLICY

Botswana does not currently have any specific policy relating to horticulture development except for the National Policy on Agricultural Development of 1991, which is currently under review. The policy then had as its objectives to "improve food security, diversify the production base, increase output and productivity, increase employment, and provide a secure and productive environment for producers as well as the conservation of agricultural land resources for future generations". Cognizant of the broad nature of the current policy and also the need to diversify the sector further, it is important to note that MOA has been for some time in the process of developing a horticulture sector specific framework. It is hoped that through the proposed policy, the sector's development will be enhanced. The National Agriculture Policy review document recognises the policies and tools outlined below as having a bearing on the development of the agricultural sector.

Vision 2016

One of the main pillars of the vision is that of sustainable growth and diversification. It envisions a diversified economy, with mining, agriculture, industry, manufacturing, services and tourism all making a substantial contribution. Agriculture in particular will be productive, profitable and sustainable, and make a full contribution to economic development, poverty alleviation, food security, improvement of the quality of life, and the sustainable utilisation of our natural resources. The vision sets a target of trebled and profitable production levels in dryland crops and horticulture of 1996 by the year 2016. The vision calls for more innovative use of modern techniques such as improved animal husbandry and irrigation (including the use of recycled water) to raise productivity in the agricultural sector, and maximise the returns to investment.

National Development Plan 10

The current NDP designed for the period remaining of the Vision 2016 outlines the government's objectives for the sector. The current plan, NDP 10, covers the period 2009 to 2016. It sets out the following goals, objectives and programs aimed at the agricultural sector in general, and horticulture in particular:

Goals

1. To facilitate the growth and competitiveness of the agricultural sector.
2. To enhance farmers' capability and willingness to use resources sustainably and safeguard rangeland resources.
3. To provide the necessary human resource needs.

Strategies

The goals are to be achieved through the following:

- *Support to Household Food Security and Small, Micro and Medium Size Enterprises.* **T**his strategy is aimed at enhancing production levels and sustaining livelihoods for small scale farmers in rural areas. The strategy focuses on the provision of subsidised services, inputs, skills and the promotion of clustering through service centres to be distributed strategically across the country.

- *Commercialisation Based on Competitive Advantage.* The goal of this strategy is to promote commercialisation in areas of competitive advantage, and recognises the potential key role played by private investment in increasing agricultural production. It recognises horticultural production taking place around Kasane, in the Tuli Block and other locations with water availability. Attention will focus on the potential for irrigated production in the northern Pandamatenga area and in areas bordering new dams, such as those at Thune and Lotsane. Government will put in place the following to support the sub-sector:

    - Attract private investment through provision of infrastructure such as roads, electricity, water and telecommunications and technology necessary to enhance productivity and production.
    - Facilitate access by farmers to credit, markets and insurance.
    - Hive off services currently provided by government to the private sector.
    - Investigate the technical and economic viability of investment in technological development, and in the areas of bio-fuel and bio-technology and value addition
    - Institutional capacity building.

    This strategy is aimed at:

    - Improving efficiency of the extension service through skills development and technology transfer.
    - Strengthening farmer associations to enable them to lobby for policy to ensure that technology development is demand driven.
    - Decentralising key services and manpower to the farming communities to ensure that there is readily available support.
    - Developing skills for agricultural professionals according to market demand.

    The overall target to end of plan period is to have increased domestic horticultural production to meet 80% of national demand. The plans sets out several programs to achieve this goal, such as:

    - Arable Agriculture Development Programme
    - Agricultural Business Development Programme
    - National Plant and Animal Health Regulatory Services Programme
    - Agricultural Research and Technology Development Programme
    - Support to Enhance Service Delivery Programme.

Botswana Agricultural Marketing Strategy (2011-2016)

This strategy was developed in cooperation with the Commonwealth Secretariat. The principal recommendations of the strategy are:

- Improve farm production costings.
- Press for more positive image of Botswana agricultural produce.
- Improve data capture and handling.
- Strengthen BCA support for market oriented training.
- Support value addition to farm products.
- Improve effectiveness of MOA infrastructure interventions.
- Improve the parastatals, including BHM.
- Strengthen DABP.
- More effectively promote clusters, agricultural management associations and cooperatives.
- Support small farmer development.
- Reduce barriers to trade.
- Improve consumer representation.

Maputo Declaration

At the Second Ordinary Assembly of the African Union in July 2003 in Maputo, African Heads of State and Government endorsed the "Maputo Declaration on Agriculture and Food Security in Africa". The Declaration contained several important decisions regarding agriculture, but prominent among them was the "commitment to the allocation of at least 10% of national budgetary resources to agriculture and rural development policy implementation within five years". The NDP 10 strategies and programs support the commitment of government of Botswana to the declaration.

Trade Policy

Although Botswana trade policy is founded on the principles of free trade and competition, the government recognizes the fact that countries rarely put in place policies that permit perfectly free international trade. Instead, each country maintains a mixture of both restrictive and free trade policies. Relevant to the horticulture value chain is the recognition of its vulnerability due to its infancy, therefore, where feasible, government uses measures for infant industry protection purposes. An example relevant to the horticulture sector is the issue of border closure discussed in more detail in Section 5.4 below. Permits are needed for both export and import of horticulture products.

National Strategy for Poverty Reduction 2003

The objective of the strategy is to link and harmonize anti-poverty initiatives, provide opportunities for people to have sustainable livelihoods through expansion of employment opportunities and improved access to social investment, and to monitor progress against poverty. Horticulture is recognized as one of the sectors that have the potential to create employment opportunities and eradicate poverty.

Economic Diversification Drive Strategy, 2010

The EDD was established after realization that in spite of the rapid economic growth the country experienced in past decades, the economy continued operating on a narrow path. The initiative adopted in 2010 endeavors to intensify diversification through a short-term strategy and a medium to long-term strategy. The EDD short-term strategy is based on the use of government interventions such as local procurement, the use of preference margins and citizen economic empowerment strategies to promote local production and consumption. The EDD medium to long-term strategy is to provide sustainable interventions through the development of sectors that will continue to grow long after minerals have run out.

Water Master Plan on Agriculture

The National Water Master Plan Review of 2006 recognizes the importance of agricultural sector as a provider of employment for large rural population and as source of income. Government policy is supportive of water for agriculture in general as it states that "Water must be available for agriculture to promote commercialisation and diversification of the sector in order to ensure food security at both household and national level and stimulate employment creation". Therefore, this positive consideration is expected to catalyse growth of horticulture through provision of water.

Other government policies having a bearing on the horticulture sector include:

- Millennium Development Goals
- Gender and Agriculture Policy Framework (2006)
- Science and Technology Policy (2002)
- Botswana Land Policy (2002)
- Agricultural Infrastructure Development Initiative
- Privatisation Policy for Botswana (2000)
- Policy on Small Medium and Micro Enterprises in Botswana (1999)
- Revised National Policy for Rural Development.

5.4. OTHER CORE SUPPORT POLICIES AND INITIATIVES

National Agriculture Plan for Arable Agriculture and Dairy Development

NAMPAADD was established in 2002, arising from a consultancy study that recommended a 10 year program. The primary objective of the plan was to create competitive agriculture as well as reduce imports of produce that could be viably produced in the country. It was to be achieved through programs that strived to transform subsistence farmer operations to commercial levels. The initiative also aimed to enable commercial farmers upgrade their level of management and technology uptake. The horticulture sub-sector was to be covered under the Irrigated Agriculture Sub-sector provisions that recommended minimum farm size of 1-2 Ha depending on the system in use.

The program is intended to provide farmers with technical guidance and advice to commercialise their farming activities. It is also meant to assist farmers with preparation of business plans for loan application to financial institutions. It additionally endeavours to encourage farmers form clusters to reduce production and market costs through cost sharing. NAMPAADD also established Production and Training Farms (PTFs) to serve as training facilities, demonstrating technologies and serve as production units for commercial farming. Two horticulture PTFs were established at Dikabeya (Palapye) and Glen Valley (Gaborone). The two farms operate production of various vegetable under both open field and protected environment systems. In addition, the Glen Valley PTF also operates a seven hectares olive farm.

In addition to the PTFs, NAMPAADD was to identify pilot farmers to work under regular and close guidance with relevant officers, establish Agricultural Service Centres to provide inputs, mechanical draught power hiring as well as provide extension support for farmers and create an agriculture insurance scheme. The program has since identified 10 farmers and established One Stop Service Centre for Agriculture (OSSCA). A feasibility study on contributory agricultural insurance scheme is being undertaken by a consultant.

NAMPAADD has had limited success in implementing the program and achieving its main objectives:

- The PTFs are essentially dysfunctional with rundown facilities.
- The olives are now big trees that have never realised their potential.
- The program is still to showcase the achievements of the ten initially selected pilot farmers.
- There are no operational service centres and farmers still experience shortage of machinery to hire and expensive inputs.
- Farmers are still not clustered and operate on individual basis.
- There is very little technology uptake evidenced by poor yields and high seasonal volatility of production.
- The agriculture insurance scheme is still to be establishment and farmers continued to experience losses from natural disasters without any cover.

Integrated Support Program for Arable Agricultural Development

ISPAAD was introduced in 2008 to mitigate challenges facing arable farmers. The program initially targeted rain-fed crop production through assistance in fencing of fields, drought power for tillage operations and the acquisition of requisite inputs amongst others. In 2010, the program was extended to cover horticulture enterprises with several goals, amongst which has been to increase production levels. The program has two components: a) production inputs support; and b) farm equipment that includes irrigation system and production structures (shade nets and polythene tunnels) to lower the risk of extreme weather conditions.

Input support of the ISPAAD horticulture component includes support of up to 60% grants for purchase of fertilizer, seeds, seedlings and pesticides. Equipment grant support includes purchase of shade nets, reservoirs, piping equipment and irrigation equipment such as drip irrigation equipment.[64]

The support available from ISPAAD is not fully utilised because most farmers are unable to raise the contribution required. Some have also felt the program ceiling of P200,000 on equipment (protective structures and irrigation) is inadequate for cultivating economically sized areas. One of the key inadequacies of the program is the absence of the component of water development (e.g. borehole) since it is the most risky investment but very essential in horticulture. A review of the program is planned for mid-2015.

Youth grants

The Revised National Youth Policy introduced the youth economic empowerment program, whose goals are the empowerment of the youth as well employment creation for those providing labour in farms. The program termed Youth Development Fund has two components differing in the level of assistance. There is the P100,000 ceiling category and P450,000 one. The P100,000 category is for projects promoted by individuals at small scale in terms of capital requirement while P450,000 can be for individuals or groups but with larger capital investments. Both funds are on a 50% grant and 50% interest free unsecured loan basis repaid over 72 months. The fund works closely with MOA and other organisations such as LEA on technical and business mentoring. Training courses are also organised for participants to provide them with requisite skills in both technical and entrepreneurship. The program has generated both success stories and challenges. Amongst the challenges met has been the issue of facilities like land (high rentals), water and market access.

Botswana National Youth Council (BNYC)

The council was established as the body to represent the voice of the youth in various sectors of policy and decision-making such as government funding institutions. BNYC involvement in the horticulture sector is through a farm in Mankgodi that produces vegetables for sale. The organisation also works with other affiliated organisations such as Young Farmers Association on youth agricultural related issues.

[64] A Study of the Contribution of Sustainable Natural Resource Management to Economic Growth, Poverty Eradication and Achievement of NDP 10 Goals Sector Assessments: Tourism & Agriculture. BIDPA and GY Associates. http://www.unpei.org/sites/default/files/e_library_documents/Sector%20Assessments%20Tourism%20%26%20Agriculture.pdf

Backyard gardening

The initiative was adopted as one of the tools for poverty eradication where households are provided with a water tank, drip irrigation equipment and shade-net covered garden for vegetable cultivation. The purpose is to assist households with sustainable subsistence. In addition to the foregoing, households were to be trained on how to produce and prepare or process for eating, value addition and preservation to avoid wastage. Surplus production sold would provide the household with income to meet other needs. However, the initiative has fallen short of expectations due to a variety of challenges, prominently water shortage exacerbated by recurring droughts. Urban uptake has also been low due to limited space and issues relating to land ownership as the target population live mostly in rented premises.

Import permits for horticultural produce (border closure)

Importation of horticultural produce is restricted through the Control of Goods, Prices and other Charges Act (Cap 43:08) using the Control of Goods (Import and Export of Agricultural Products) regulations. Import permits are required. The permit is a single entry valid for seven days with a requirement for endorsement by an official at the point of entry and return of an endorsed duplicate to the issuing office. The endorsed duplicate permit is required for renewal as well issuing of any new permit.

Under this regulation, the importation of horticultural produce is restricted when domestic production is assessed to be adequate for regional or national demand. The restriction applies to commonly produced vegetables, but fruits such as oranges are also subject to import restrictions. Most farmers have attributed survival of their farms to the border restriction system. The system is also acceptable to the traders as there is a forum where traders and farmers meet to deliberate and determine restrictions dates. Border closure decisions are taken by NHPTC, a committee comprising representatives of producers, retailers, wholesalers and MOA.

DABP marketing officers submit situational reports from their respective districts (Chobe, Central and Gaborone) for decisions on which products to close borders for to be taken. Retailers have however, voiced reservations on practicality of accessing produce available in distant farms or districts and indicated that sometimes it is not commercially feasible to procure locally. In addition, the choice on quality is restricted during period of border closures. Moreover, there is a perception among some industry participants that a small number of large producers can unduly influence border closure decisions to serve their interests.

Table 7: Border closure dates for selected FF&V 2012-2014												
2012												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Tomato			16-27	7-22	21-30				10-23	1-15	12-18	1-17
Cabbage							19-				-12	
Orange					07-			-27				
Mango												
2013												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Tomato	21-30		11-26 /3/13	4-17	6-28	10-26 22-	-31	8-27	4-16	4-23	11-28	6-12
Cabbage					10-						-17	
Orange				08-				-12	8			
Mango												
2014												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Tomato	1			2wks			7-28		9-19			
Cabbage					26-							
Orange				21-					-16			
Mango												

Source: MOA

Table 7 highlights border closure dates for selected fruits and vegetables between 2012 and 2014. The produce were selected to highlight a range of patterns in border closures. The data suggests that for certain produce like cabbages, and to a lesser extent tomatoes, imports are closed for almost the entire year. This is also the case for oranges throughout its growing season. On the other hand an exotic fruit variety such as mangoes is not subject to any import restrictions. The period over the last three years has also seen an increase in the length and frequency of closures, partly reflecting increased supply of some FF&V varieties.

Export barriers for Botswana produce

There are no barriers to export of Botswana produce to South Africa or other neighbouring countries except the phytosanitary requirement by the receiving country. There has been some exportation in the past particularly from some farmers in the Tuli Block area after conformity to requirements were ascertained by the MOA Department of Plant Protection. The government owned Talana farms, in particular, targets export markets. Botswana exports of FF&V are very limited. Export permits are required.

Agricultural Service Support Project (ASSP)

The principal objective of the International Fund for Agricultural Development (IFAD) supported ASSP is to achieve a viable and sustainable smallholder agricultural sector based on farming as a business, and not reliant on subsidies or welfare measures. The project aims to contribute towards economic diversification, reduction of rural poverty, food security and improved livelihoods of rural communities. ASSP pursues a number of opportunities to improve rain-fed agricultural technologies, provide lower-cost farm mechanization services and develop a viable model for smallholder irrigation using wastewater resources. The primary target group comprises smallholders experiencing household food and income insecurity, but with the potential to benefit from improved agricultural services and technologies. Within this population there are four main principal groups for ASSP targeting:

- Smallholder households hiring tractors for land preparation and planting.
- Owners of drought animals who continue to cultivate part of their land using drought animals.
- Single women as small holder farmers, as well as women in married households.
- Youth who are currently engaged or potential new entrants into agricultural production.[65.]

Impact of Ipelegeng

To address rural youth unemployment, the government has introduced the Labour Intensive Relief Public Works Programme (LIRPWP) or Ipelegeng. In practice its geographic and population coverage is relatively wide. This provides income to poor by providing employment, for example in public works. Unfortunately, the scheme tends to divert farmers from uncertain income at farms to more certain, though minimal, reward from working in the LIRPWP. In some extremes, some farmers could cultivate their lands through the ISPAAD program and then join the Ipelegeng program, leaving the fields un-weeded and unharvested. [66]

[65] http://www.gov.bw/Global/Ministry%20of%20Agriculture/ASSP%20briefing%20Notes.pdf

[66] A Study of the Contribution of Sustainable Natural Resource Management to Economic Growth, Poverty Eradication and Achievement of NDP 10 Goals Sector Assessments: Tourism & Agriculture. BIDPA and GY Associates. http://www.unpei.org/sites/default/files/e_library_documents/Sector%20Assessments%20Tourism%20%26%20Agriculture.pdf

6. COMPETITIVE CONSTRAINTS AND VALUE OPTIONS

6.1. INTRODUCTION

Chart 31: The four gears of export competitiveness

The analysis of the VCA relies on the ITC Four Gears Framework[67]. The framework is designed principally to identify constraints to a sector's export success, but given the net importer position of the horticultural sector, relevant gears aimed at the components of the domestic value chain have been selected for the analysis.

The Border-In Gear identifies supply-related competitiveness constraints, relating to matters such as capacity limitations, degree of diversification in the product base, as well as the entrepreneurialism and skills available in the sector. Border issues relate to the sector's business environment, in particular the strength of its support services, legal and regulatory environment, and the relative cost of doing business in the sector. The Border-Out Gear analyses the constraints the sector faces in entering export markets and this gear has been excluded from the analysis. Finally, the Development Gear addresses long-term sustainability issues such as poverty alleviation, gender and youth development and the environment, as well as matters relating to regional cooperation.

Competitive constraints identified under these gears impair a sector's performance both in isolation and by interacting with each other. It is therefore important that all the key constraints are addressed by way of a coordinated strategy to ensure that the sector's performance is optimized.

In this section, the preceding information and analyses have been built on to identify the horticultural sector's key competitiveness constraints, by applying the Four Gears Framework. The vision, strategy and roadmap provided in the subsequent sections aim to alleviate these constraints.

[67] This framework has been created by ITC for developing its export strategies.

6.2. SUPPLY SIDE CONSTRAINTS

SUPPLY-SIDE ISSUES

Capacity development

- The sector is dominated by small, unprofitable farmers, who lack the resources to invest in modern farming technology.
- There is limited cooperation between farmers.
- Seasonality and large fluctuations of supplies leads to large variation in prices and wastage.
- The lack of quality grading and sorting contributes to pricing pressure on FF&V outputs.
- Almost 50% of land allocated to horticulture remains unutilized, reducing production potential.
- Ownership by part-time farmers reduces farm performance.
- FF&V production is heavily dependent on unskilled farmers who move to farming because they have no other means of employment.
- Farmers seek short-term returns in preference to long-term investment (vegetables vs fruits).
- Lack of modern technology restricts the opportunity to expand the range and volume of FF&V produced.
- There are inadequate post-harvest handling facilities.

Capacity diversification

- There is a lack of secondary processing capacity for FF&V.
- FF&V produced are very limited in range.

Development of skills and entrepreneurship

- The significant majority of farmers, especially small and medium ones, lack farming skills.
- Record-keeping and financial management at farm level is often inadequate.

Capacity development

The sector is dominated by small, unprofitable farmers, who lack the resources to invest in modern farming technology

At a total output of P143 million (US$14.3 million), the horticulture sector is of limited scale. The sector is also highly fragmented, with 649 active farms, 563 of which are less than 5 hectares (141 below 1 hectare). At the smaller end of the range, it is not feasible to invest in farm technology and inputs on an individual farm basis. Commercialization is difficult.

There is limited cooperation between farmers

There is limited cooperation among farmers to join together to increase scale. This is attributable principally to cultural factors, and initiatives to form buying or marketing groups in horticulture and other sectors have had limited success. A number of stakeholders pointed out that that there is often disagreement among farmers, for example when they share boreholes. The DABP cooperatives division has experienced many barriers in supporting the development of cooperatives. The lack of a strong industry association exacerbates this problem.

Seasonality and large fluctuation of supplies leads to large variation in prices and wastage

There is significant fluctuation in production volumes and prices, which increases risk to farm sustainability. Although principally caused by seasonal and weather fluctuations, the variations in production volumes are magnified by the lack of implementation of crop plans and coordination of production between farmers. This leads to in turn oversupply and shortages, leading to large price variations and, in case of the former, wastage.

The lack of quality grading and sorting contributes to pricing pressure on FF&V outputs

Farmers confirm that whilst superior quality produce might improve the certainty of a sale, they do not generally yield a higher price. Some wholesalers, retailers and government contracts provide for minimum quality standards. Nevertheless, retailers do not grade or differentiate prices of FF&V at the point of sale. This limits incentives to invest in producing higher quality FF&V and the focus on price competition reduces margins further especially at the farm level.

Almost 50% of land allocated to horticulture remains unutilized, reducing production potential

Only 2,209 hectares of the 4,300 hectares of land allocated for horticulture was being cultivated as at March 2013. This gap is attributable to a number of factors, including farmers having the capacity and resources to utilize only part of their allocation; a lack of finance precluding necessary investment, for example in drilling boreholes; or applicants securing land for speculative purposes. The lack of effective utilization of allocated land places a cap on increasing FF&V production.

Ownership by part-time farmers reduces farm performance.

Over 90% of horticulture farmers are estimated to be engaged in farming part-time. Often with full time occupation in cities, such farmers lack the necessary incentives to invest in professionalizing their farming operation. Moreover, their employees who work on farms on a day-to-day basis often lack the necessary know-how to optimize farm performance. This further depresses farm yields.

FF&V production is heavily dependent on unskilled farmers who move to farming because they have no other means of employment

Similar to the point above, the various government incentives often attract into horticulture individuals who are induced by the availability of finance and subsidies, rather than a commitment to farming *per se*. This increases the risk of such farmers not investing for the long-term development of their farms so that they can become sustainable and productive.

Farmers seek short-term returns in preference to long-term investment (vegetables vs fruits)

A number of these supply-side constraints, such as the low prices for produce, part time or unskilled farmers, lack of incentives for professionalization, contribute to a short-term horizon for farmers. The focus on seasonal or annual profits detracts from higher, more sustainable returns in the long-term.

Lack of modern technology restricts the opportunity to expand the range and volume of FF&V produced

There is limited use of technology in farms, such as the use of poly tunnels, greenhouses, or farm machinery. Contributed by the lack of scale, limited access to finance, weak profitability and inadequate incentives to professionalise the operation for the long-term, this further depresses farm yields.

There are inadequate post-harvest handling facilities

Most farmers do not have post-harvest handling facilities such as pack houses and proper storage. Produce from the fields is usually sorted and packed in exposed environment not suitable for preserving the quality of produce, contributing to high spoilage rates. Due to lack of appropriate storage facilities, farmers usually harvest produce only destined for market and the rest is left to spoil on the field, especially in the case of highly perishable produce such as tomatoes and lettuce.

Capacity diversification

There is a lack of secondary processing capacity for FF&V

Secondary processing capacity of FF&V is almost non-existent. The proposed processing plant at Selebi-Phikwe might alleviate this problem, but we are unclear about the long-term sustainability of the project. Some small local processors do exist, but they often need to import their raw materials due to constraints on reliable volumes and quality of supplies.

FF&V produced are very limited in range

Fruits account for only 9% of FF&V production. 51% of vegetable production is accounted for by only three vegetables: cabbage, tomato and potato. This is partly due to climactic conditions, the tradition to grow certain crops that are consumed by the farmers' families, and also because of a lack of investment in farms to produce a wider range of FF&V. The narrow range of produce means that Botswana continues to rely heavily on imports.

Development of skills and entrepreneurship

The significant majority of farmers, especially small and medium ones, lack farming skills

Horticulture is a relatively young occupation in Botswana, and farmers lack the traditional skills available in some other countries. However, the training available is biased toward theoretical rather than practical knowledge. Training on farm economics and commerce is lacking. The availability and up to date specialist knowledge of extension officers is also limited. Moreover, training is often directed at farm owners, at the expense of building capacity of workers.

Record-keeping and financial management at farm level is often inadequate

The lack of commercialization in the horticulture sector is particularly evidenced by the poor record-keeping and financial management at farms. Many medium-sized and most small farmers do not keep crop diaries, do not prepare or implement crop plans, and diligent financial book keeping is rare. This contributes to poor performance of farms.

6.3. QUALITY OF BUSINESS ENVIRONMENT ISSUES

QUALITY OF THE BUSINESS ENVIRONMENT

Infrastructure and regulatory issues

- The border closures policy, whilst benefiting many farmers, has many distortionary effects on the sector.
- There is a wide range of policies and initiatives aimed at stimulating the sector, but the design of many produce gaps and sub-optimal outcomes.
- Land allocation policy, in particular, contributes to low utilization of FF&V allocated land.
- Transport and logistics infrastructure supporting the horticulture sector is weak and there is an acute shortage of collection and storage facilities, especially chilled ones.
- Electricity distribution to farmers is challenging due to remoteness and the cost of electricity is too high for most farmers.
- Water is not widely available for most farms and water quality is often not appropriate for farming.

Quality of the institutional support

- MOA extension services are poorly resourced and fragmented.
- The availability of market intelligence is lacking and its distribution is very limited.
- CEDA's lending products, especially those designed for youth farmers, are poorly designed and often do not meet borrower needs. Commercially available finance is not readily available.
- Botswana Horticultural Council and regional associations are under-resourced and provide limited support to farmers.
- There are limited linkages amongst government institutional support programs. They operate in parallel and lack coordination.
- Theoretical training does not address the lack of modern technical skills by farmers and farm labourers.
- Statistics Botswana does not gather or produce statistics on the horticulture sector. MOA information lacks consistency and has gaps.
- There is a large number of generalists at government department and agencies, lacking technical skills.
- Record keeping and data analysis capacity at government institutions is weak.
- The lack of a national horticulture policy acts as a barrier to developing effective support programs for the sector.
- There is a lack of horticultural crop insurance products for farmers.

Cost of doing business

- The need to import almost all inputs from South Africa increases cost of production.
- Labour is scarce and expensive and there is a need to explore seasonal agricultural work permits for foreign labour.

Infrastructure and regulatory issues

The border closures policy, whilst benefiting many farmers, has many distortionary effects on the sector

The border closures policy has mixed effects. Whilst protecting some farmers who produce the vegetables that qualify for border closures, it leaves others unprotected. It reduces incentives for product diversification. It does not take into account the quality of available produce. Moreover, the feedback received suggests that some large farmers have a disproportionate influence on the timing of closures, enabling them to benefit from higher prices for their produce. Although the final decision on closures is taken by a group comprising a range of sector stakeholders, there is a perceived lack of transparency about the process leading to the closures. Some retailers feel that the closure policy forces them to purchase sub-standard vegetables, a large proportion of which is eventually rejected by their customers. On the other hand, there have been claims that large retailers attempt to stockpile FF&V on occasions in order to reduce the impact of border closures.

There is a wide range of policies and initiatives aimed at stimulating the sector, but the design of many produce sub-optimal outcomes

Although the horticulture sector benefits from a number of supportive government policies, many of them have not been designed specifically for it. As a result, they do not meet the needs of farmers. For example, tractors are available for hire under ISPAAD, but only during the harvesting season for rain fed crops and even when they are available, inadequate numbers of drivers preclude their use in horticulture farms. The need for contribution from farmers acts as a barrier to accessing grants and subsidies under the scheme. NAMPAADD service centres were never really established therefore farmers do not get access to farming equipment. The latter program has yielded limited results to date. Most of these programs and policies target a large number of farmers. The resulting lack of focus reduce the chances of success. Also, programs such as Ipelegeng yield adverse consequences for farming.

Land allocation policy, in particular, contributes to low utilization of FF&V allocated land

The fact that 50% of land allocated for horticulture is not being cultivated suggests strongly that the policy for allocating land is not effective. Financial and technical capacity as well as motivation of potential farmers needs to be assessed more appropriately to alleviate this problem. Moreover, the policy of allocating relatively small parcels of land for horticulture farming prevents the necessary scale to achieve commercialization.

Transport and logistics infrastructure supporting the horticulture sector is weak and there is an acute shortage of collection and storage facilities, especially chilled ones

The lack of suitable transport and logistics infrastructure available for the sector increases wastage and costs for farmers. It can also restrict their choice to the buyers who have suitable transport to collect produce. In addition, the scarcity of collection and distribution facilities increases costs in the supply chain as goods need to be collected from each farm, particularly disadvantaging small farmers. The lack of a cold chain increases wastage.

Electricity distribution to farmers is challenging due to remoteness and the cost of electricity is too high for most farmers

Although the government, often in partnership with international cooperation partners, has increased electrification, rural farms still often lack access to electricity. Where it is available, costs can be high. This prevents the adoption of more efficient technologies. There is lack of access to alternative methods of electricity generation such as autonomous solar panels, as well as implementation of good electricity consumption practices.

Water is not widely available for most farms and water quality is often not appropriate for farming

The scarcity of suitable water is a major constraint for horticulture in Botswana. Improving the allocation and utilization of land near dams and other sources of water might alleviate this problem. However, government support policies in respect of drilling boreholes are not very effective at present. Moreover, initiatives piloting the use of wastewater also need to be accelerated. There are currently plans by WUC to expand the use of wastewater for irrigation around Francistown. Strict and more consistent quality control measures need to be implemented to ensure that treated wastewater is fit for horticulture use.

Quality of the institutional support

MOA extension services are poorly resourced and fragmented

MOA extension services are provided by DCP, on technical issues related to farming, and DABP, with a focus on business and marketing issues. Clearly there is interaction between the two subjects and the advice provided by the two groups of extension officers often overlap. It is not efficient for two sets of extension officers to be advising the same farmer, even on complementary subjects. The same applies to NAMPAADD horticulture extension service in relation to the DCP horticulture extension. Moreover, a shortage of adequate staff (there are 10 DCP extension officers: one per district, too low especially for areas such as Central District) and lack of transportation often precludes regular visits to all target farmers. MOA has pointed out that the establishment of the office of the District Agricultural Coordinator, who is expected to provide guidance in joint programming and operations to minimize duplication of effort, should improve this situation.

The availability of market intelligence is lacking and its distribution is very limited

Farmers lack access to timely and accurate pricing and demand information for their produce. Similarly, retailers lack information on available supply. BHP price information is currently not distributed widely and may in any event not reflect the position in a particular region. DABP does collect monthly price information in the regions, but these are historic and have limited reach. Limited information on imports is collected in a usable form or distributed. Limited information is disseminated on technological and standards development. This lack of information reduces the efficiency of the horticulture value chain.

CEDA's lending products, especially those designed for youth farmers, are poorly designed and often do not meet borrower needs. Commercial finance is not readily available

A number of shortcomings have been highlighted about CEDA's lending policies. For example, the maximum P500,000 lent under the youth farmers scheme is usually not adequate to take a farmer to production, sales and meet his working capital needs, so in the absence of alternative funds, leads to projects failing before they have reached their full cycle. Mentors assigned by CEDA to support borrowers often do not have appropriate technical knowledge, or are not allocated adequate time to advise farmers effectively. CEDA's recent reluctance to finance the drilling of boreholes is contributing to a bottleneck in land utilization. Additionally, given the risks associated with the sector and poor lending experience, commercial providers of finance such as banks avoid lending to the sector.

Botswana Horticultural Council and regional associations are under-resourced and provide limited support to farmers

BHC appears to lack of *raison d'être*. It lacks resources and is unable to raise adequate funds from farmers to finance its operations. Its promotion of BHM has not succeeded in building a sustainable and attractive service for farmers, and the prospects of the restructured BHM are uncertain. Currently it is unable to provide any meaningful support to its members. Most of the regional associations are inactive. Some do organize events, but usually on an *ad hoc* basis. Therefore, horticultural farmers currently have a dearth of association support.

There are limited linkages amongst government institutional support programs. They operate in parallel and lack coordination

DCP, NAMPAADD and DABP are mandated to build the capacity of farmers, DCP mostly with respect to technical assistance, DABP concerning business skills and NAMPAADD was initially conceived to provide support in both areas. In addition, RTCs have been established to train existing farmers to the latest technologies. In many cases, the trainers either they lack knowledge of the latest practices or they lack adequate education.

Theoretical training does not address the lack of technical skills by farmers and farm labourers

Training available from RTCs and BCA is seen to be too theoretical and the curriculum requires updating to incorporate modern farming techniques and technology. BCA courses, for example, lack provision of practical farm experience (including through apprenticeships). There is limited coordination and interaction between farmers and training providers to design a curriculum that meets the formers' needs.

Statistics Botswana does not gather or produce statistics on the horticulture sector. MOA information lacks consistency and has gaps

Statistics Botswana does not collect information on the horticulture sector. Joint Statistics Botswana and MOA surveys cover livestock, crops, dairy and small livestock holdings. However, costs of carrying out horticultural sector surveys, exacerbated by the seasonality of production, preclude data collection at the moment. DCP at MOA conduct monthly surveys of horticulture farms through their extension officers. However, gaps exist in information as extension officers are not always able to make visits due to resource and transport constraints. Also, reports produced have inconsistent data as they are produced from different sources. Poor record keeping at farms exacerbate these problems. It is difficult to formulate effective policies in the absence of full, reliable and timely information. Sector participants are unable to make effective plans for their businesses.

There are a large number of generalists at government departments and agencies, lacking technical skills

DCP, for example, lacks people with the necessary technical knowledge. Inadequate vocational training is received by BCA graduates who get hired by government agencies and departments.

Record keeping and data analysis capacity at government institutions is weak

DABP and DCP collect a significant amount of data from farmers. The data is captured on paper. This practice increases the risk of error. The costs of gathering, analysing and disseminating the information also increases.

The lack of a national horticulture policy acts as a barrier to developing effective support programs for the sector

The lack of a specific national horticulture policy impedes the development of effective interventions to support the development of the sector. As a result, often policies and programs designed, say, for the arable crops sector are extended to horticulture. These interventions are consequently less relevant and yield limited results.

There is a lack of horticultural crop insurance products scrutinize farmers income in case of a natural disaster

The lack of horticulture crop insurance exposes farmers to risks and constrains their ability and willingness to invest in horticulture production. We understand that the MOA Agri-Hub is working on a project to meet this constraint.

Cost of doing business

The need to import almost all inputs from South Africa increases cost of production

It is unlikely that Botswana horticulture is likely to achieve adequate scale to support a viable domestic inputs production industry. Nevertheless, the higher cost of important inputs does reduce the competitiveness of local produce.

Labour is scarce and expensive and there is a need to explore seasonal agricultural work permits for foreign labour

Batswana youth do not consider horticulture an attractive source of employment. The sector's lack of commercialization, low profitability and high risk are contributory factors. The generally subscale nature of the industry offers limited opportunities for career progression. Limitations in vocational training courses further reduce the sector's accessibility. Under the circumstances, barriers to engaging foreign labour, such as seasonal work permits, need to be explored.

6.4. SOCIAL DEVELOPMENT GEAR

DEVELOPMENT GEAR

Poverty alleviation and employment generation

- Government incentives and schemes to generate FF&V employment have various limitations.
- Government initiatives do not attract sufficient dedicated, full-time farmers that will create employment and increase horticultural production.

Environmental sustainability and climate change

- Initiatives to increase the sustainability of water use by the horticulture sector require strengthening, through research in appropriate technology.
- Extreme environmental conditions including droughts and frost hamper production.
- Treated waste water quality is questionable for irrigation purposes. There is limited availability of appropriately treated waste water outside the Gaborone area.

Gender and youth inclusiveness

- A number of government schemes are aimed at increasing youth involvement in the sector, but many have shown limited effectiveness.
- There are various barriers to women's full participation in the sector.

Poverty alleviation and employment generation

Government incentives and schemes to generate FF&V employment have various limitations

There is a lack of focus in the government initiatives, targeting a wide range of the population. There is the perception that the policies target people for employment in the horticulture sector who due to their lack of skills couldn't get employment elsewhere.

Government initiatives do not attract sufficient dedicated, full-time farmers that will create employment and increase horticultural production

Government support and land allocation policies have led to a situation where an estimated over 90% of farmers are engaged in horticulture part-time. This contributes to the lack of commercialization of the sector and its growth. The opportunity to optimise employment generation is being foregone as a result.

Environmental sustainability and climate change

Initiatives to increase the sustainability of water use by the horticulture sector require strengthening, through research in appropriate technology

Technologies such as drip irrigation and underground bleeding irrigation are not implemented widely. The choice of drought resistant varieties of crops that would eventually lead to a more sustainable use of water is limited.

Extreme environmental conditions including droughts and frost hamper production

Whilst climatic and weather variations cannot be avoided, the lack of prevalent adoption of technologies such as poly tunnels and greenhouses exacerbates the problem.

Treated waste water quality is questionable for irrigation purposes. There is limited availability of appropriately treated waste water outside the Gaborone area

Wastewater use for horticulture is currently very limited. Pilots on wastewater use are being undertaken. There are plans to expand the practice in Francistown, but with no clear dates. Nevertheless, the lack of a wide ranging strategy with clear objectives, developed and implemented in coordination between MOA and MEWT is needed to ensure rapid progress in this area.

Gender and youth inclusiveness

A number of government schemes are aimed at increasing youth involvement in the sector. Many of these require redesign and strengthening in order to improve effectiveness

As highlighted previously, for example, CEDA's implementation of the Young Farmers' Scheme has limitations and impedes the realization of its objectives.

There are various barriers to women's full participation in the sector

Various barriers exist to women's full participation in the sector, including cultural practices relating to land inheritance, and the need for husbands to guarantee borrowings.

6.5. VALUE OPTIONS

The value options analysis is intended to identify opportunities for strengthening the effectiveness and efficiency of a value chain through:

- Acquiring value by improving efficiency within the horticulture the value chain (and thereby enhancing the sector's competitiveness).
- Retaining greater value by reducing leakage from the value chain.
- Adding value by developing new product lines and/or extending the value chain.
- Creating value by increasing production of existing or new product lines or by entering the value chains of related sectors.
- Distributing value within the economy by increasing the sector's direct contribution to such national development goals as employment generation, poverty reduction, rural and regional development, gender equality and sustainability of the environment.[68]

The analysis of the horticulture chain suggests there is a large range of options for improving its performance. Some of the principal ones are:

Acquiring value

1. Incentivise and train farmers to adopt more modern and professionalized farming practices.
2. Improve the availability and distribution of market intelligence.
3. Strengthen the efficiency and effectiveness of horticulture extension services.
4. Improve infrastructure, transport and logistics available to farmers.

Retaining value

1. Improve allocation of land and increase cultivation of allocated land to increase farm sizes and FF&V production volumes.
2. Promote and facilitate exports of surplus vegetables.
3. Proactively promote integrated farming to increase land utilization and reduce imports of inputs.
4. Promote production of seedlings in farms or as new SMME business opportunities.

Adding value

1. Introduce compulsory quality grading of FF&V produce and the consumption of locally produced FF&V.
2. Promote SMME food processors.
3. Support the production of higher value FF&V.

[68] Drawn from ITC guidance for identifying value options

Creating value

1. Develop linkages with the value chain of other sectors, such as crops and livestock, to share infrastructure and support services.
2. Increase research into identifying suitable FF&V breeds and varieties for production that are currently neglected by farmers.

Distributing value

1. Improve effectiveness of policies aimed at employment generation, especially those aimed at youth.
2. Increase allocation of land to full-time farmers with credible plans to increase farm employment.
3. Remove barriers to increasing participation of women in the sector.

7. PROPOSED STRATEGY

7.1. INTRODUCTION

This section presents the key elements of the proposed strategy for strengthening the performance of Botswana's horticulture sector, drawing on the analyses in the preceding parts of the report and the SWOT analysis below.

The vision statement seeks to serve as a guide for the future direction of the sector and summarize its aspirations. Four strategic objectives have been identified to provide the implementation framework to achieve the vision. Section 8 provides a roadmap of activities that require implementation to achieve each of the strategic objectives.

7.2. SWOT ANALYSIS

Strengths	Weaknesses
▪ Naturally produced FF&V. ▪ Young industry, without a legacy of outdated practices. ▪ Farmers typically well-educated and have capacity to absorb new practices and skills. ▪ Extensive government support schemes.	▪ Large number of small farms lacking economies of scale and prevalence of absentee farmers. ▪ Very small size of the sector. ▪ Weak extension services. ▪ High cost structure, especially due to imported inputs and lack of scale in most farms. ▪ Lack of commercial and modern farming practices. ▪ Poor farm infrastructure, logistics and transport. ▪ No quality grading or quality-based pricing. ▪ Market structure disproportionately favours retailers. ▪ Lack of market intelligence. ▪ Seasonality and poorly coordinated production.
Opportunities	**Threats**
▪ Unmet local demand, currently satisfied by imports. ▪ Scope for improving effectiveness and efficiency of government support programs. ▪ Significant potential for increasing production volumes through higher land utilization. ▪ Strengthening capacity of farmers through more practical curriculum and targeted training delivery. ▪ Scope for increasing production volumes and supply consistency by adopting modern farming technology.	▪ Reliance on a small number of vegetables. ▪ Seasonality and extreme weather. ▪ Reliance on imported inputs and labour. ▪ Water shortage. ▪ Continuing drops in South African farm production will put exports of FF&Vs to countries in the region at risk.

A high level SWOT analysis of the horticulture sector indicates:

- The sector's strengths lie mainly in its production of naturally grown FF&V, without the use of artificial additives. The industry is young and almost all farmers are commercially motivated. The general level of education is high, and farmers should be able to learn about and implement modern farming practices more readily. Although they need refinement, there are many government programs supporting the sector.

- Unfortunately, the sector suffers from a range of weaknesses. A key contributor to these is its lack of scale, generating outputs of only P143 million per annum. This is exacerbated by its fragmented nature and prevalence of small farms. Partly a result of government policy of allocating enough land for an individual or a family to generate adequate income, small farms make it difficult to invest in new technology and practices to build a strong, sustainable business. The fact that most farmers are new to the occupation, combined with paucity of technical training and weak incentives for producing higher quality FF&V, also contributes to poor adoption of modern farming practices. The sector's support services are also weak and relatively uncoordinated.

- Nevertheless, there are many opportunities to improve the horticulture sector's performance. 58% of FF&V is currently imported, and increasing production, for example through a more effective land allocation and utilization policy and introduction of a wider range of suitable FF&V, can meet this demand locally. Better farming practices, improved coordination between farmers and increased adoption of technologies would increase yields, reduce large volume and price fluctuations, and reduce wastage.

- The principal threats to the sector arise from weather related issues. In addition, the need to import inputs, and the total reliance on South Africa for this purpose, presents risks to local production. Although steps are being taken to increase the use of wastewater for horticulture, water scarcity remains a key threat in the medium to long term.

7.3. STRATEGIC VISION FOR THE HORTICULTURE SECTOR

The proposed vision statement for the horticulture value chain is:

'Contributing to Botswana's self-sufficiency in fruits and vegetables by supplying high quality, naturally farmed products produced through good farming practices.'

The statement is intended to highlight the objectives of:

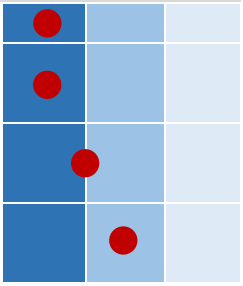
- Contribution to self-sufficiency. Given the limited availability of land suitable for horticulture (exacerbated by under-utilization) and its climate, Botswana is unlikely to be fully sufficient in all types of fruits and vegetables demanded by consumers. Nevertheless, the sector can make a significant contribution toward this end.
- There needs to be focus on quality. It is unlikely that all FF&V produced will be of the highest grade, but some recognition and reward for quality needs to be introduced to the value chain.

- Natural farming: This is a major strength of Botswana horticulture, and needs to be recognized and exploited.
- Good farming practices cover a wide range of techniques, tools, technology, management and record keeping that contribute to improving farm performance.

7.4. STRATEGIC OBJECTIVES

The sector's vision could be realized through achieving the four strategic objectives outlined below. Each objective has been prioritized as urgent (UR), very high (VH), or high (H).

	Priority		
	UR	VH	H
1. Strengthen horticulture farm performance and product quality.			
2. Improve gathering and distribution of information to market participants and policy makers.			
3. Develop better targeted policies and more effective support network for the sector.			
4. Promote SMME participation in the horticulture value chain in targeted areas.			



Strategic objective 1: Strengthen horticulture farm performance and product quality

Whilst yields in the production of some vegetables are comparable with regional counterparts, the horticulture sector currently lacks professionalism and the implementation of good farming practices. In addition, partly because of lack of incentives, there is little focus on produce quality. An important priority for the sector should be the adoption of better practices to strengthen operational and financial farm performance and improve FF&V quality.

Strategic objective 2: Improve gathering and distribution of information to market participants and policy makers

There are significant gaps in sector-related information available to farmers, traders and policy makers. The information available often lacks consistency, accuracy, periodicity and timeliness. This contributes to poor planning, sub-optimal outcomes, loss of profits and misdirected policies related to the sector. Strengthening the information framework of the sector is seen as another critical objective.

Strategic objective 3: Develop better targeted policies and more effective support network for the sector

The sector's relatively small size and its recency has meant that government policies developed for other sectors, notably arable farming, are often applied to horticulture. Other policies, including in the area of lending, are at times poorly designed. There are instances of opaqueness in practices and processes associated with arriving at policy decisions. New policies are needed to address weaknesses in the value chain. There are duplications and gaps in supporting the sector. This strategic objective is aimed at correcting these shortcomings.

Strategic Objective 4: Promote SMME participation in the horticulture value chain in targeted areas

Although most small farmers are themselves SMMEs, and opportunities exist for individuals to provide services in retail as hawkers, as agents, or by providing transport to farmers, there is limited involvement of SMMEs with the potential to scale up and generate employment. This strategic objective aims to bridge gaps and address inefficiencies in the value chain through promotion of SMMEs in target areas.

8. STRATEGIC ROADMAP FOR THE HORTICULTURE SECTOR

8.1. INTRODUCTION

The section below outlines the roadmap for achieving each of the strategic objectives. Each of the proposed actions has been marked as either urgent (UR), very high priority (VH), or high priority (H).

8.2. IMPROVING FARM PRACTICES AND FF&V QUALITY

Strategic objective 1: Strengthen horticulture farm performance and product quality

		Priority		
		UR	VH	H
1.1	Upgrade the current voluntary FF&V quality grading standards to make them compulsory. Promote local produce.			
1.2	Improve capacity and effectiveness of extension officers.			
1.3	Research and publish information on horticulture farm economics and performance.			
1.4	Strengthen farming practices especially at small and medium-sized farms			
1.5	Update training curricula at BCA and RTC and introduce more vocational courses, practical and business content.			
1.6	Develop tailored curricula for different types of farm personnel.			
1.7	More actively support adoption of farming technology.			
1.8	Introduce 'Farmer of the Year' awards			

Upgrade the current voluntary FF&V quality grading standards to make them compulsory. Promote local produce

There is a critical need to improve the general quality of Botswana FF&V. The lack of produce grading and price differentiation reduces incentives for improving quality. The resulting focus on price competition only reduces sustainability, especially for small and medium-sized farms. As an initial step, the main supermarkets should adopt a voluntary quality grading system for packaged FF&V. It would be regulated and enforced by the NHPTC. In addition, retailers should be required to clearly mark origin of FF&V on sale. They should be required to report to MOA on the volumes of FF&V procured and sold from Botswana and those from South Africa and other foreign countries. Incentives should be provided to promote Botswana produce. The focus on supermarkets as the first step is to balance the cost and ease of enforcement against the disproportionate benefit of targeting a relatively high volume of the sector's output. Over time, the practice could be extended to other parts of the value chain.

Lead responsibility: Retailers, MOA, producers

Improve capacity and effectiveness of extension officers

Extension officers need more training on good farming practices. In addition to general farming, specialist courses in particular aspects of farming, for example irrigation, pest management, particular groups of FF&V, etc. should be provided. The consolidation of DCP, NAMPAADD and DABP extension services proposed below should increase coverage. In addition, there is a crucial need to ensure that adequate transport, IT equipment and other tools are available for them to discharge their responsibilities effectively and efficiently.

Lead responsibility: MOA

Research and publish information on horticulture farm economics and performance

DCP, DABP, DAR, CEDA BCA and LEA all produce model farm accounts of varying degrees of detail, based on standardized assumptions. However, there is very little understanding among key sector stakeholders of actual farm profitability and how that varies with size, produce, season, technology adoption, input management etc. Without this understanding, advice given to farms by extension officers is not productive; policymakers cannot develop policies and initiatives to target support where it is needed most; current and potential farmers cannot develop credible business plans; and institutions such as CEDA cannot assess borrowing proposals effectively. The poor record keeping at farms contributes to this gap in information. MOA should commission research to ascertain horticulture farm economics in Botswana and disseminate it widely.

Lead responsibility: MOA

Strengthen farming practices especially at small and medium-sized farms

DCP and DABP extension officers, as well as LEA staff managing its pilot projects, have all highlighted the lack of professional management at farms to be a major constraint the sector's development. Crop plans need to be developed and adhered to. Good agricultural practices[69] in horticulture production, including site selection and preparation; maintaining site fertility; water management including irrigation; seed, crop selection and seedlings production; crop pest and disease control; farm hygiene issues; harvesting and post-harvest practices; etc. all require strengthening. Record keeping and financial management at farms need particular focus. In addition to action in the other areas highlighted with respect to this strategic objective, we recommend DCP, DABP, LEA and CEDA jointly organize pilots, managed full time by a team of horticulture specialists, to establish the most effective practices suitable for Botswana.

Lead responsibility: MOA

[69] See for example Good agricultural Practices (GAP) on horticulture production of extension staff in Tanzania. Training manual. FAO GAP Working Paper Series. FAO. 2010 http://www.fao.org/docrep/013/i1645e/i1645e00.pdf

Update training curricula at BCA and RTC and introduce more vocational courses, practical and business content

RTC and BCA curricula are too theoretical and lack adequate practical content. Curricula at both institutions should be upgraded with at least 30-40% of practical content, including on the farm demonstrations and exercises. Farm economics and business content of courses also need to be increased. Consultation with industry practitioners, including farmer and retailers, should be important inputs in this redesign. BCA horticulture students should invest 1-2 semesters of practical work at farms. Vocational training courses will better equip students to contribute to the sector more productively. See suggested actions below on strengthening coordination between RTC and BCA courses.

Lead responsibility: BCA, RTC, MOA

Develop tailored curricula for different types of farm personnel

Currently, the same courses on horticulture farming are offered to all attendees. However, in reality, farmers of different levels of experience, or working on different aspects of farming (e.g., labourers, owners, marketers, etc.) need different degrees of depth of knowledge based on their specialism. In addition to a core curriculum, specialist modules need to be developed and offered. In addition, attention needs to be paid to ensure that farm workers who often miss out of training at present are included.

Lead responsibility: BCA, RTC, MOA

More actively support adoption of farming technology

The current structure and relatively small sizes of horticulture farms, lack of incentives for increasing quality and poor access to training and know-how impede investment in farm technology. In addition to affecting quality of produce, it leads to avoidable losses of production and exacerbates the effect of climate and weather. Increased use of farm technology such as poly tunnels, greenhouses, precision soil and water management processes including drip irrigation technology is needed to improve the sector's performance. Such investment will only happen significantly when some of the other actions proposed are starting to achieve results. Nevertheless, MOA should work with counterparts such as CEDA, LEA and BCA to develop a program to proactively promote financially viable technology adoption. The proposed redesigns of support programs such as ISPAAD should further facilitate the achievement of this objective.

Introduce 'Farmer of the Year' award

An annual Farmer of the Year award would contribute to the focus on quality and good farming practices. It would also increase the profile of horticulture in Botswana. It should be coordinated with wider activities relating to improving produce quality and promotion of Botswana FF&V.

Lead responsibility: BHC, MOA

8.3. PROVIDING MORE USEFUL INFORMATION TO SECTOR STAKEHOLDERS

Strategic objective 2: Improve gathering and distribution of information to market participants and policy makers

		Priority		
		UR	VH	H
2.1	Automate the gathering, analysis and distribution of farm and sector information at DCP and DABP.	●		
2.2	Develop a system and processes to gather, analyze and distribute FF&V import information.	●		
2.3	Introduce a register of FF&V plantings and harvest estimates for farms. Build on the current DCP horticulture inventory reports.	●		
2.4	Introduce SMS based price and volume supply/demand information system.		●	
2.5	Statistics Botswana to start collating and publishing horticultural sector information.			●
2.6	In the medium-term, develop an integrated information system for the horticulture sector.			●

Automate the gathering, analysis and distribution of farm and sector information at DCP and DABP

DCP and DABP currently gather significant volumes of information relating to farm sizes, production, prices, ownership, utilization, etc. However, they are collected sporadically. DCP regional offices often use different templates and provide different levels of information. They are collated manually. As a result, the information collection, collation, analysis and reporting process is inefficient, has gaps, produces inconsistencies, can be inaccurate and results in delays in producing reports. The entire process, from collection of information to reporting needs to be automated and an integrated information system introduced. They system should include within its scope information produced under the remit of both DCP and DABP, so that combined analyses can be produced.

Lead responsibility: MOA

Develop a system and processes to gather, analyse and distribute FF&V import information

Currently, very little information about FF&V imports is collected at the border. For example, no data is collected on the identity of importers or the intended destinations. As a result, it is not possible to produce any analysis about issues relating to almost 60% of the FF&V industry's sales in the country. It is critical that key variables are recorded and reported on in relation to FF&V imports.

Lead responsibility: Botswana Unified Revenue Service, MOA

Introduce a register of FF&V plantings and harvest estimates for farms. Build on the current DCP horticulture inventory reports

Retailers highlighted a lack of knowledge about the timing and volume of potential supplies of different FF&V as a major constraint in their planning process. This leads to gaps in supplies and unnecessary reliance on imports, which are more consistently available. A register of plantings and harvest information, with information available to all sector participants will alleviate this problem. In addition it would enable farmers to manage their plantings in light of other expected supplies. Some DCP regional offices already collect this information. The register should be integrated with the wider farm information system proposed above, and will incur limited marginal cost.

Lead responsibility: MOA

Introduce SMS based price and volume supply/demand information system

DABP currently collects and publishes retail prices of selected FF&V produce on a monthly basis. This information is historic and often distributed after some delay. In the absence of auction markets it is difficult for farmers to know the prevailing prices on offer for their produce. BHM is currently and is likely to remain a marginal market and in any event prices can vary significantly between regions. It is critical therefore a market intelligence system is implemented that provides farmers with current information on prevailing prices, accompanied by, if necessary, regulations to compel all farmers, wholesalers and retailers to report to the system. The system could be shared with other agricultural sector segments. Successful models introduced in other African countries could be used as a reference. Preparatory work already undertaken by DABP in this area could be built on.

Lead responsibility: MOA

In the medium-term, develop an integrated information system for the horticulture sector

The various pieces of information highlighted above should be integrated in the medium-term to provide a comprehensive information database for the sector.

Lead responsibility: MOA

Statistics Botswana to start collating and publishing horticultural sector information

In the national statistics horticulture information is classified as ‘Other’ within the agricultural sector, and is consolidated with information about forestry, hunting and beekeeping. Despite its relatively small size, the horticulture sector plays a critical strategic role in Botswana’s economy. Building on the other information-related initiatives highlighted above, Statistics Botswana should start publishing disaggregated information about the horticulture sector.

Lead responsibility: Statistics Botswana, MOA

8.4. IMPROVING THE SECTOR'S POLICY AND SUPPORT FRAMEWORK

Strategic objective 3: Develop better targeted policies and more effective support network for the sector

		Priority		
		UR	VH	H
3.1	Introduce a code of practice to govern relations between farmers and retailers.			
3.2	Redesign land allocation policy to increase cultivation rate and farm sustainability.			
3.3	Redesign CEDA lending policies to meet horticultural production needs and alleviate their current deficiencies.			
3.4	Combine DCP and DABP horticulture-related extension services.			
3.5	Improve transparency and process for decision-making for border closures.			
3.6	Make ISPAAD more relevant for the horticulture sector and move NAMPAADD horticulture services to new combined DCP/DABP unit.			
3.7	Promote exports of surplus vegetables			
3.8	Redesign current policies in order to incentivize full-time farmers.			
3.9	Increase coordination between RTC and BCA on horticulture training. Consider consolidating farm training within BCA.			

Introduce a code of practice to govern relations between farmers and retailers

With the increasing fragmentation of the sector, the reduced role of BHM and direct channels being established between retailers and farmers, the governance of the relationship between the latter has become extremely important. A key complaint among farmers relates to the disproportionate power of the retailers in the horticulture value chain and various instances of abuse of that power. At the same time, retailers have highlighted examples of where farmers do not meet their commitments. Various countries have codes of conduct that govern the relationship between retail chains and suppliers. Such a code is urgently needed in Botswana to be monitored and enforced in the first instance by NHPTC. Work done by DABP in this area could be built on to develop and implement the code. As with quality standards, this code could be extended over time to other participants in the value chain.

Redesign land allocation policy to increase cultivation rate and farm sustainability

Almost 50% of land allocated to horticulture currently remains uncultivated. Whilst constraints such as lack of finance are highlighted as contributory factors, the current situation represents significant opportunity cost to the Botswana economy. Fuller utilization of available land could potentially bridge significantly more of the deficit in horticulture and considerably reduce reliance on imports. The current land allocation policy needs to be significantly revised to ensure that only potential and current farmers with adequate financial and technical capacity as well as motivation are eligible for land. In addition, unutilized land should be reallocated to other eligible farmers after a prescribed period. Moreover, there is a need to allocate land for horticulture farming in a more concentrated

manner, so that economies can be derived by location in proximity with each other. The average size of plots allocated may also need increasing on a targeted basis to increase the potential for commercialization.

Lead responsibility: Ministry of Lands, MOA

Redesign CEDA lending policies to meet horticulture production needs and alleviate their current deficiencies

CEDA currently experiences very high rates of non-performance and write-offs in its horticulture lending portfolio. Although this partly reflects the inherent risks of the sector, it is also a consequence of shortcomings in its lending policies. For example, the cap of P500,000 lent under the Young Farmers' Scheme is often not adequate to fully finance set-up investments and working capital needs. Mentors assigned as part of the loan scheme are given inadequate time and often lack the necessary experience. As a result, in addition to reducing the prospects for full loan servicing, the policies impair the performance of farms. Such deficiencies should be corrected. CEDA should research the sector, its performance, and borrower needs and develop a horticulture finance package of services tailored to different types of farmers and their investment and working capital needs.

Lead responsibility: CEDA

Combine DCP and DABP horticulture-related extension services

DCP and DABP extension officers currently serve the same farms, advising on technical and business issues respectively. This is inefficient and causes overlaps, especially in light of MOA resource constraints. The services should be consolidated. A small cadre of specialists in particular aspects of horticulture could support the core extension officers on a needs basis. Improved coordination between the departments is an alternative, but likely to yield lesser outcomes.

Lead responsibility: MOA

Improve transparency and process for decision-making for border closures

Whilst seen to be benefiting the domestic horticulture sector as a whole, the border closures policy is seen to benefit and disadvantage different segments of the industry. Larger producers are seen to be advantaged at the expense of many smaller producers whose interests are not fully considered. Retailers face higher prices and are forced to purchase inferior quality produce, leading to wastage. Moreover, the process of arriving at decisions on border closures is not widely publicised and is perceived as biased by many sector stakeholders. MOA should review the current border closures process to ensure equity between all sector participants, publish the criteria and process for border closures, and consider disseminating the minutes of the NHPTC meetings arriving at each border closure decision.

Lead responsibility: MOA

Make ISPAAD more relevant for the horticulture sector and move NAMPAADD horticulture services to new combined DCP/DABP unit

ISPAAD was designed for the arable farming sector and has been extended to horticulture farming. As a result, various elements of the policies do not meet the needs of FF&V farmers, resulting in low take-up. The policies need to be reviewed in light of horticultural sector needs and appropriate amendments made. In addition, various objectives and services provided under NAMPAADD overlap with those provided by DCP. These should be consolidated with the proposed joint DCP/DABP unit.

Lead responsibility: MOA

Facilitate exports of surplus vegetables

Certain FF&V such as cabbages, tomatoes and oranges during the season are subject to almost permanent border closures, indicating that these are being produced at a surplus to domestic needs. The fact that surpluses are currently not exported results in higher prices for local consumers, higher wastage and other inefficiencies. Consideration should be given to facilitating exports of FF&V produce that are consistently subject to border closures. An appropriate export initiative should be developed and implemented by MOA, with licenses, export permit procedures and registration processes tailored to the industry after stakeholder consultation. This may also require increasing knowledge among farmers of standards and processes required in potential export countries.

Lead responsibility: MOA, MTI

Redesign current policies in order to incentivise full-time farm owners

A key underlying reason for the sector not realizing its potential is because an estimated 90% of farm owners are only occupied in horticulture part-time. A coordinated effort is required between all government ministries and departments involved in horticulture to correct the situation. Their policies, including lending, land allocation, technical support and access to subsidies should be redesigned to incentivise ownership by full-time farmers.

Lead responsibility: MOA, CEDA, LEA, MOL

Increase coordination between RTC and BCA on horticulture training. Consider consolidating farm training within BCA

The training provided RTCs and BCA should be better coordinated to ensure they complement each other more effectively in targeting the needs of the horticulture sector. Over time, consideration should be given to consolidating the training activities of these institutions, perhaps under BCA. In addition, the feasibility of moving NAMPAADD PTFs to these institutions should be explored and if appropriate implemented.

8.5. PROMOTING OPPORTUNITIES FOR SMMES

Strategic Objective 4: Promote SMME participation in the horticulture value chain in targeted areas

		Priority		
		UR	VH	H
4.1	Support SMMEs establish processing plants for local FF&V.		●	
4.2	Promote SMME participation in the development of local collection and distribution centres.		●	
4.3	Support SMMEs develop regional wholesaling businesses.		●	
4.4	Pilot local SMME sorting and packing facilities.		●	

Support SMMEs establish processing plants for local FF&V

The government is establishing a large FF&V processing facility at Selebi-Phikwe. There is significant potential for small, SMME owned and operators to process horticulture produce from local farms. Smaller scale would give such processors more certainty of operating at viable capacity and achieving financial sustainability. Coordinated effort is required between LEA, CEDA and MOA to enable this to happen.

Lead responsibility: LEA, CEDA, MOA

Promote SMME participation in the development of local collection and distribution centres

As with small processing plants, there are opportunities for SMMEs to establish collection and distribution hubs, including cold storage facilities, which could be hired or leased to local farmers. Such hubs would significantly reduce distribution costs in the value chain, as well as reduce wastage. As in the case of processors, coordinated effort between agencies is required to promote these.

Lead responsibility: LEA, CEDA, MOA

Support SMMEs develop regional wholesaling businesses

With the fragmentation of the value chain and the demise of BHM, potential opportunities exist for the growth of SMMEs to provide wholesale services to local farmers and supplying local branches of retail chains and other end users. Some of these could be agents who have the skills and network of contacts but lack the finance and some know-how to scale up. Promoters of such wholesaling businesses should be supported.

Lead responsibility: LEA, CEDA, MOA

Pilot local SMME sorting and packing facilities

SMME sorting and facilities could be established, either independently, or at collection centres.

Lead responsibility: LEA, CEDA, MOA

9. PROJECT IDEAS FOR PSDP

9.1. INTRODUCTION

Drawing on the roadmap for the horticulture sector, three suggested project options that warrant consideration for PSDP support are presented. There is a need to develop a market intelligence system for horticulture. However, that is more efficiently implemented as a comprehensive system for the agriculture sector as a whole, or a number of its components together. Possible intervention in that area has therefore been excluded from the options presented. In addition, potential interventions completely with MOA remit, and included in the strategic plan, have also been excluded from this list

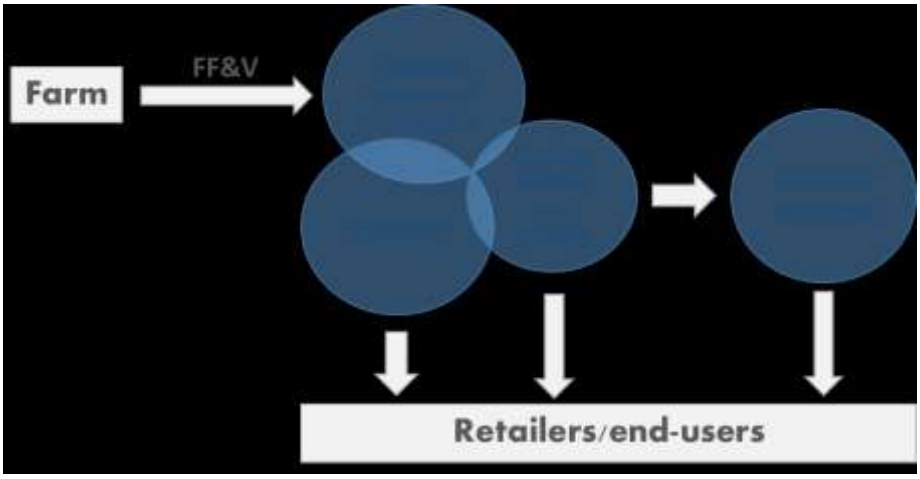
Suggested projects could be funded either by the PSDP itself, or in partnership with other donors. Pursuant to its statutory responsibilities, the government, and in particular, MOA, would be expected to play a key role in coordinating the projects suggested below.

The suggested projects are:

1. Supporting SMMEs to develop products and services to bridge gaps in and strengthen the horticulture value chain.
2. Implementing quality standards for FF&V.
3. Developing and implementing a code of conduct for retailers in respect to their relationship with FF&V suppliers.

9.2. SUPPORTING SMMES IN THE HORTICULTURE SECTOR

Chart 32: Suggested SMME interventions for PSDP



The fragmentation and gaps in the horticulture value chain present various opportunities for SMMEs to develop attractive businesses and increase the sector's efficiency and performance. The VCA has identified four such areas in particular:

- Secondary processing of FF&V.
- Local collection, storage and distribution facilities.
- Sorting, grading and packaging.
- Regional wholesaling operations.

The above activities are complementary and co-locating them within a cluster would generate efficiencies. Nevertheless, each project could be supported independently.

One or more promoters of these projects would be selected through advertising and competition.

Secondary processing of FF&V

Viable small-scale secondary facilities could be developed that would process lower graded FF&V and produce that would otherwise be wasted. Locating them in areas of high production would limit risks associated with low capacity utilization. These could complement the government's proposed processing plant in Selebi-Phikwe. Such facilities could, for example, produce pastes, sauces, pickles and canned FF&V.

The principal *objectives* of a project to support small-scale secondary processing would be to:

1. Generate private sector commercial activity and provide income to SMME owners.
2. Increase efficiency of the horticulture value chain by reducing wastage.
3. Increase self-sufficiency by reducing imports of processed FF&V.

The principal *outcome* of the project would be to establish one or more commercially viable FF&V processors.

The main *outputs* would be:

1. Business plan for FF&V processing operation.
2. Trained owners and employees.
3. Operational manual for plant.
4. Periodic reports on progress against plan and recommendations for corrective action.

Envisaged technical *inputs and activities* would include the engagement of a full time experienced consultant with experience of establishing small-scale processors (suitable examples exist in some East African countries and India) for an extended period and coordinated support from institutions such as LEA, CEDA, DCP and DABP. NFTRC would also be a possible supporter, but potential conflicts of interest arising from its role as a promoter of the Selebi-Phikwe plant would need to be addressed.

Collection, storage and distribution

There is a critical gap in this area in the value chain, resulting in significant duplication of transport, other distribution, and wastage costs. In addition, smaller farms are disadvantaged as it is often uneconomic to collect or deliver low volumes. Operating small regional storage facilities, with an allocated cooling area, would present significant potential for SMMEs to develop viable businesses. In addition, providing linked collection and delivery services would add considerable value and economies to farmers and customers. Farmers could rent space in such premises on a volume or time basis and pay for transport services if needed. Infrastructure issues, such as suitable roads and availability of electricity may pose some risks, however.

This business proposal has the merit of requiring less specialist technical capability than FF&V processing. Nevertheless, risks exist related to adequacy of throughput and meeting service standards. Availability of finance for capital investment in the storage facility, cooling plant and transport are important prerequisites.

The principal *objectives* of a project to support small or medium-scale regional collection, storage and distribution operators would be to:

1. Generate private sector commercial activity and provide income for SMME owners.
2. Increase efficiency of the horticulture value chain by reducing distribution costs and wastage.

The principal *outcome* of the project would be to establish one or more commercially viable collection, storage and distribution facilities.

The main *outputs* would be:

1. Business plan.
2. Trained owners and employees.
3. Periodic reports on progress against plan and recommendations for corrective action.

Limited support would be required by way of technical *inputs and activities*. Some exposure to similar operations in other countries, combined with advice from an expert in assessing feasibility and developing the business plan, along with periodic mentoring support would be required.

Sorting, grading and packaging services

The viability of this business would depend heavily on the adoption of quality and grading standards by retailers. In addition, depending on volumes, such a service would need to be provided from a centralized facility. Finally the demand from farmers and retailers for a paid service compared to undertaking the tasks themselves would need to be accurately established. For cost reasons, it is likely that the business would need to be strongly linked with the collection and storage operations highlighted above, rather than have independent premises. Investment in packaging facilities would be required, but this is likely to be of limited magnitude.

The principal *objectives* of a project to support a business to provide sorting and grading services would be to:

1. Generate private sector commercial activity and provide income to SMME owners.
2. Improve the quality of FF&V.
3. Generate efficiencies by centralising a key task in the value chain.

The principal *outcome* of the project would be to establish one or more commercially viable sorting, grading and packaging facilities.

The main *outputs* would be:

1. Business plan.
2. Trained owners and employees.
3. Periodic reports on progress against plan and recommendations for corrective action.

Similar technical *inputs and activities* to that envisaged under the processing plant would be required, albeit at a lower intensity.

Regional wholesale services

BHM and other agents with an active network of producers and customers would be suitable candidates for establishing regional wholesale facilities. They would create efficiencies by developing nodes in the horticulture value chain. A key dependency on their viability is the degree to which retailers have already established, or are planning to develop, direct channels with producers and whether there remains scope for a viable intermediary. Limited technical input is required. The key requirement is working capital. In the absence of the ability to share or rent appropriate storage services, funding would also be required for premises and cooling facilities.

9.3. IMPLEMENTING QUALITY STANDARDS FOR FF&V

Adopting compulsory quality standards in the horticulture sector will generate considerable value in the FF&V value chain. In addition to significantly improving the perception of Botswana FF&V among local consumers, it will enable price differentiation. Achieving higher price for quality produce will provide incentives for farmer to invest in better farming practices. Overall production volumes and farm viability will increase.

BOBS has produced voluntary standards for grading FF&V. These are currently not followed. Some retailers and wholesalers implement their own, independent quality standards which are agreed bilaterally with producers. The key *objectives* of the proposed intervention would be to:

1. Ensuring retailers, wholesalers and BHM adopt the BOBS quality standards.
2. Developing a light touch enforcement mechanism to ensure adherence to such standards.

Botswana agriculture already implements quality standards, most notably in the livestock sector. In addition, it is proposed that quality standards are initially applied to packaged FF&V sold to consumers only. Sales of loose produce would be excluded. Government procurement contracts already specify quality and grading requirements. Over time, the applicability of such standards could be extended to produce sold through a wider range of channels.

The main *output* of the project would be an agreement between retailers and MOA on:

- Applying BOBS quality standards and its coverage.
- Enforcement and complaint handling mechanism.
- Penalties for non-compliance.

The main *inputs and activities* of the project would include:

1. Initial consultative workshop on merits and scope of the proposals.
2. One or more workshops on experience of similar voluntary standards in other countries.
3. Drafting of regulations, with input from an international expert if necessary.
4. Membership and mandate of enforcement committee or independent ombudsman.
5. Agreement on a process to periodically review the performance and impact of the code.

9.4. RETAILERS' CODE OF CONDUCT FOR SUPPLIERS

The recent transformation of the horticulture value chain and increasing direct channels between retailers and producers have generated considerable friction. The commercial relationship between the parties is seen to be unbalanced, with retailers perceived by some to be misusing their power in respect of pricing and contract terms. To prevent such occurrences, most countries have implemented codes of conduct or practice, monitored and enforced in the first instance by the retailers' industry associations.

It is proposed that a code of conduct is developed in Botswana that governs the practices of retailers in relation to their suppliers in the country. The UK Groceries Supply Code of Practice, for example, covers the following issues[70]:

- Principle of fair dealing
- Variation of supply agreements and terms of supply
- Changes to supply chain procedures
- No delay in payments
- No obligation to contribute to marketing costs
- No payments for shrinkage
- Payments for wastage
- Limited circumstances for payments as a condition of being a supplier
- Compensation for forecasting errors
- No tying of third party goods and services for payment

[70] https://www.gov.uk/government/publications/groceries-supply-code-of-practice/groceries-supply-code-of-practice

- No payments for better positioning of goods unless in relation to promotions
- Promotions
- Due care to be taken when ordering for promotions
- No unjustified payment for consumer complaints
- Duties in relation to de-listing
- Retailer senior buyer role and responsibilities.

The code is enforced by an independent Groceries Code Adjudicator, who investigates complaints and arbitrates in disputes. In Botswana, existing structures, such as NHPTC, could perform the role. An important prerequisite for effectiveness, however, is the availability of adequate funding and human resources to ensure that the enforcement function can be carried out quickly and thoroughly in order to preserve the credibility of the code.

The key *objective* of the proposed project would be the strengthening of the horticulture value chain by improving certainty and equity in the relationship between local suppliers and retailers.

The principal *outputs* would be:

1. A code of good practice for retailers in relation to their dealings with suppliers.
2. Terms of reference including scope of activity and powers of entity that will enforce the code.

The main *inputs and activities* would include:

1. Initial consultative workshop of industry stakeholders.
2. One or more workshops on experience of similar voluntary standards in other countries.
3. Agreement on level and source of funding.
4. Drafting of code and enforcement mandate, with input from an international expert if necessary.
5. Membership and mandate of enforcement committee or independent ombudsman.
6. Agreement on a process to periodically review the performance and impact of the code.

ANNEX I: LIST OF MEETINGS AND INTERVIEWS

Organisation	Position	Name
Ministry of Agriculture		
Department of Agricultural Research	Principal Agricultural Research Officer	Mr. Douglas Machacha
	Chief Agricultural Research Officer	Ms. Ketseemang Safi
	Principal Technical Officer (Horticulture)	Mr. Morena M. Hunyepa
	Technical Officer (Irrigation)	Mr. Marumo Letumile
	Chief Technical Assistant (Horticulture)	Mr. Churchill Modise
	Research Officer (Horticulture)	Mr. Goalatlhe Nong
	Research Officer (Irrigation)	Ms. Marea Radi Kgomo
Department of Crop Production	Chief Horticulturalist	Mr. Barutwa Thebenala
Department of Agricultural Business Promotion	Director	Mr. Boweditswe S. Masilo
	Deputy Director	Ms. Kelebonye Tsheboeng
	Chief Agri-Scientific Officer	Ms Seeng Manne
	Scientific Officer	Mr Onkemetse Mathemabe
	Chief Agri-Economist	Mr Kelemetse Garebamono
Agricultural Hub	Director	Ms. Mmadima Nyathi
	Deputy Director	Ms. Chada Koketso
Ministry of Trade and Industry	Chief Commercial Officer, MTI	Mr. Gideon Mmolawa
	Chief Commercial Officer, MTI-EDD	Ms. Obusitswe Tiroesele
Local Enterprise Authority	Acting Director for Research	Ms. Neo Mahube
	Research Manager, Lead Researcher for Horticulture	Ms. Dynah Solani
	Research Manager	Mr. Jacob Kegakgametse
	Research Manager, Services and Tourism	Mr. Mopati Jobe
	ISS Manager (Agric)	Mr. Legotla Kgaswanyane
Statistics Botswana	Senior Statistician, on secondment to MOA	Mr. Dickson Gareoitse
Botswana Bureau of Standards	Principal Scientist-Certification Services	Dr. Nomeko T. Mlobeli
CEDA	Chief Operations Officer	Mr Lesego Selotate
	Head of Research & Product Development	Mr Tiro Kayawe
	Communications Manager	Mr, Leatile Bakwena
	Portfolio Executive, Agribusiness Sector	Mr. Ben Kgabanyane.
SPEDU	Projects Officer Agribusiness	Mr. Maiba Samunzala
National Strategy Office	Chef Strategist	Ms. Thato B Morule
	Manager	Mr. Sipho Madisa
Ministry of Health, Nutrition and Food Control Division	Principal Scientific Officer I, Head of Food Safety Unit	Mr. Hussein Tarimo
	Food Safety Officer	Ms. Rosinah Pitinyane-Modise
	Food Safety Officer	Ms. Rinett Pharatlhatlhe
Botswana Horticulture Market	Acting CEO	Mr. Simon Meti
	Operations Manager	Mr. Mojaki Mazebedi
	Marketing Officer	Mr. One Dennis Maswabi
	Accountant	Ms. Thapelo Mokgatle
BHM Marketing Agents	Marketing Agent	Ms. Nurse Modisaotsile
	Marketing Agent	Ms. Mkgathatsang Obakeng
Motapi Holdings (Pty) Ltd, T/A Fruit & Veg Market (Subsidiary of Choppies)	Managing Director	Mr. Abdel Magid El Halabi
Veggieland	Director	Mr. Anil Kumar C. Pillai
	Director	Mr. Dinesh K Gopalakrishnan
Stanbic Bank	Head, Commercial Banking	Mr. Desma Elvis-Ncaagae
	Relationship Manager Assistant, Commercial Agric-Business	Ms. Rapula M. Kegopilwe
Sleek Foods	Managing Director	Ms. Nkata CSeleka
Hortilus	Managing Director	Mr. Rom Smet
Moleps Horticulture Enterprises	Farmer/Owner	Ms. Koketso Keoagile

Organisation	Position	Name
AON	Broker	Mr. Maano Keakabetse
FMRE	Managing Director	Mr. Ian Tavovesa
	General Manager	Mr. Bongai Muhau

ANNEX II: LIST OF PARTICIPANTS IN STAKEHOLDER WORKSHOPS

Inception workshop, 21 November 2014

Name	Company/Organisation
Rom Smet	Hortilus
Eric Caiphus	Botswana Horticulture Market
Thapelo Mokgatle	Botswana Horticulture Market
BL Thebenala	Ministry of Agriculture
TF Ramolala	Ministry of Agriculture
S Manne	Ministry of Agriculture
C Motlhabane	Trader
Jobe Moseki	Trader
Chada Koketso	Ministry of Agriculture- Agri Hub
K Koyabe	PSDP - CDE
S Chatterji	ITC/Consulting Base
A Hatzipeteros	ITC/ASCA Group
O.Oagile	ITC/Botswana College of Agriculture

Consultation and validation workshop, 20 February 2015

Name	Position	Organisation
Phyllis Grey		Trader
Rom Smet	Managing Director	Hortulus
Thato B Morule	Chief strategist	National Strategy Office
Dinesh Gopalakrishnan	Director	Veggieland
Suresh Babu	Finance Director	Spar
Nkata Seleka	Managing Director	Sleek Foods
Jobe Mopati	Research Manager	LEA
Thato Supang	Director	Agribusiness Botswana
Baveditswe Masilo	Director	MOA/DABP
Obusitswe Tiroesele	Deputy Director	MTI-EDD
Kamogelo Kesilwe	Head-Business Development	BPC
Neo Mahube	Director-EDD	MTI
Fiona Manger	Farmer	Oodi Investments
Onkemetse Mathenabe	Scientific Officer	MOA/DABP
Seeng Manne	Chief Agriculture Officer	MOA/DABP
Kagiso Koyabe		PSDP - CDE
Subhrendu Chatterji	Consultant	ITC/Consulting Base
Otsoseng Oagile	Consultant	ITC/Botswana College of Agriculture
Agapitos Hatzipetros	Consultant	ITC/ASCA Group