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Opportunities and Constraints in the Horticultural Sector of Botswana: A SWOT Analysis

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Abstract: Botswana's horticultural sector faces several constraints that impede its growth, as actors are unable to take advantage of opportunities that are created by the market. This study used SWOT analysis to identify the main opportunities and constraints in Botswana's horticulture sector using data collected from a farm survey, in-depth interviews, and focus group discussions conducted with other key stakeholders between June and August 2023. The study found that the main constraints in the horticulture sector include expensive inputs, a lack of technical knowledge, low technology uptake, a lack of market access, high in-field and post-harvest losses, limited access to credit, limited processing, and ineffective support systems. The opportunities within the horticulture sector include unmet local demand for both fresh and processed products, productivity gaps, and supportive government policies. To develop the horticulture sector and ensure its sustainability, it is recommended that the identified constraints be addressed by actors and the government. For instance, the government should address the lack of technical skills through the provision of improved extension services, as this would address the low productivity that is brought about by both in-field and post-harvest losses. Additionally, the identified opportunities should be taken up by actors to enhance the sector's performance and sustainability.



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Keywords: Botswana; horticulture; sustainability; market access; technology uptake; agronomic practises; constraints; opportunities

1. Introduction

Horticulture is one of the sectors that has been chosen by the government of Botswana as a priority for agricultural diversification and employment creation. The sector has also been chosen for value chain development as a means of supporting private sector development through which more value could be unlocked [1]. Horticultural products are an important part of a healthy diet [2,3], with [4] estimating that insufficient consumption of fruit and vegetables causes 14% of global deaths. As a result, the government has instituted several support programmes to develop the sector. Despite these efforts, the sector is still at an infant stage and undeveloped. However, there are opportunities within the value chain which, when seized, could develop the horticultural value chain.

Over the years, the government has instituted several programmes to promote horticultural production in the country. At the production level, some of these programmes

include the Special Integrated Support Programme for Arable Agriculture Development (ISPAAD) [5] and the current Impact Accelerator Subsidy (IAS), [6] which became operational in 2021 as a response to the COVID-19 pandemic. The government has also instituted programmes at the market level, such as the construction of fresh produce markets (FPMs) and the Botswana Horticultural Market (BHM), to address farmers' challenges relating to a lack of market access. Additionally, the government has instituted regulations at the border with the aim of protecting the local horticultural industry from the stiff competition that is posed by foreign products, especially those from South Africa. These regulations include import controls through the Control of Goods, Prices, and Other Charges Act [7]. In January 2022, an import ban was imposed on 16 selected vegetable crops and was scheduled to run for 2 years up to December 2023. In July 2023, the ban was extended to December 2025, with 16 additional crops being included. Moreover, the government instituted the Economic Inclusion Act No. 26 of 2021 [8], whose objectives are to increase citizen participation in the economy as part of the implementation of the Citizen Economic Empowerment Policy (CEEP). In the horticulture sector, the act provides market access for horticultural producers through public procurement, allowing them to enter into contracts to supply government institutions such as schools and hospitals [8]. The government has also developed a National Horticulture Strategy with technical assistance from the Food and Agriculture Organisation (FAO) of the United Nations (UN). The main objective of this strategy is to guide the development of the horticulture sector [9].

Government efforts to develop non-traditional sectors, such as horticulture, are starting to bear fruit, with production of horticultural products rising from 47,539.38 mt in 2015/16 to 75,448.92 mt (58%) in 2020/21. The number of farms has also increased by 47% from 880 to 1292, while planted areas have increased by 26% from 2653 to 3360.88 hectares during the same period [8]. According to the Department of Crop Production (Horticulture Production Trends), although there was negative growth between 2009 and 2012, horticulture production has shown steady growth when measured on a year-on-year basis. This increase is attributed to improved technology uptake, increased market opportunities, and increased production under protected environments [10].

Despite this increase in local production, the country still imports substantial amounts of horticultural products. For example, between 2012 and 2021, Botswana's horticultural import bill rose from BWP (Botswana Pula, the currency of Botswana, which was equivalent to USD 13,75 at the time of writing) 475 million to BWP 1.2 billion (51%), while the quantities imported increased by 35% from 70,170 mt to 94,954 mt over the same period [11]. However, the import bill fell by 50% from BWP 1.2 billion to BWP 817 million between 2021 and 2022, while imported quantities fell by 60% from 105,053 t to 43,759 t, mainly as a result of the import ban on selected horticultural crops [11].

While there have been notable improvements in the horticultural sector in Botswana, the sector is still faced with several constraints that impede its growth and sustainability, similarly to other developing countries. These constraints hinder chain actors from taking advantage of opportunities that are presented by the market as a result of urbanisation and the supermarket revolution, which have led to increased demand for vegetables [12].

One of the key constraints that are faced by horticultural farmers in developing countries is a lack of market access [13–20]. This issue is made worse by stringent supermarket requirements, which smallholder farmers are unable to meet [21]. The lack of production contracts between farmers and buyers also worsens the market access problem [19]. Constraints relating to climatic conditions include the increased incidence and severity of extreme weather events such as droughts, floods, fires, frost, etc. [20,22–26]. Additional constraints include a lack of technical skills, leading to improper agronomic practises such as poor post-harvest handling techniques, unscientific application of fertilisers, and inef-

fective control of pests and diseases [13,17,20,21,25,27]. This lack of technical skills results from inadequate provision of extension services, especially in marketing and financial management [28].

Horticultural farmers in developing countries also have to contend with inadequate infrastructure such as marketing, cold storage, and processing facilities [13–15,17,19]. Access to credit is another constraint on farmers' ability to adopt modern technologies such as production under protected environments (net shade, greenhouse gas, hydroponics, tunnels) [29–32]. Constraints relating to soils include degradation, poor soil fertility, and low moisture levels [12]. In some countries, land is a constraint [13], while in others, water is a significant challenge [18,33]. Furthermore, refs. [14,19] identified inadequate support services as a major constraint to horticultural production.

Additional challenges include post-harvest losses, which are very high due to the lack of suitable post-harvest techniques and processing, cold chain technologies, and infrastructure, which remain largely non-existent [2,34]. For instance, refs. [34–36] found that the productivity gap could be in excess of 50%, even in areas that could be considered biophysically and institutionally equipped. The unregulated and ineffective seed sector for horticulture compared with staple crops is another constraint facing the horticulture sector and leading to low productivity [12,19].

Food safety is a major concern in horticulture, as supermarkets are starting to pay attention to maximum residue limits and traceability. In Southern Africa, there are a few standards, such as those relating to maximum residue limits, and, if standards are in place, they are mostly implemented or adhered to for overseas exports [12].

These multitudes of constraints limit productivity growth and the development of the horticultural sector, as well as its sustainability. Despite the many challenges facing this sector, there are several opportunities which include new channels for horticultural produce. Urbanisation and the supermarket revolution have also led to increased demand for fresh vegetables and processed products as consumption patterns change due to increased income [21].

Similarly to other developing countries, the horticulture sector in Botswana faces several constraints which impede its growth. These constraints are especially pronounced at the primary production and processing stages. Several studies [37–40] have identified constraints to the development of the horticulture sector, focusing on primary production at the expense of other activities. Thus, none of these studies took a holistic view of the constraints and opportunities in the horticulture sector. Additionally, the studies were conducted some time ago, with the last study being conducted in 2015. Since then, several changes have taken place, such as the introduction of the import ban and the collapse of the FPMs and central market. These changes are expected to have introduced new constraints and opportunities in the horticulture sector. It is hypothesised that the constraints facing the horticultural sector of Botswana limit its potential growth and, hence, its sustainability. Therefore, the main objective of this study was to identify constraints and opportunities in Botswana's horticultural sector. This study used the SWOT analysis to determine the strengths, weaknesses, opportunities, and threats, with the aim of identifying constraints and opportunities in the horticultural sector in Botswana using data collected in 2023. As a priority sector for economic diversification and employment creation, it is important that the performance of the horticultural sector is enhanced, which is only possible if constraints hindering the sector are identified and dealt with, while opportunities are taken to ensure the sustainability of the sector. The remainder of this paper is organised as follows: Section 2 covers the materials and methods, while Section 3 presents our results. In Section 4, a discussion of the results is undertaken, and Section 5 concludes the paper.

2. Materials and Methods

2.1. The Study Area

This study was carried out in the nine (9) out of the ten (10) administrative districts of Botswana: Central; Chobe; Gantsi; Kgatleng; Kweneng; South-East; Southern; Ngamiland; and North-East. Figure 1 shows a map of Botswana depicting all ten districts. The Kalahari district, in the southwestern part of the country, was excluded in the sample, because there was no vegetable production due to its climatic conditions and poor soils. This study is part of a larger project on “Botswana Horticulture Value Chain Mapping and Analysis”.



Figure 1. Map of Botswana.

2.2. Data and Data Collection Methods

The data collection for the study was carried out between June and August in 2023 from both the primary and secondary sources using mixed-method approaches. The main use for these data was to construct the strengths, weaknesses, opportunities, and threats (SWOT) analysis of the horticultural sector, as outlined in Figure 2.

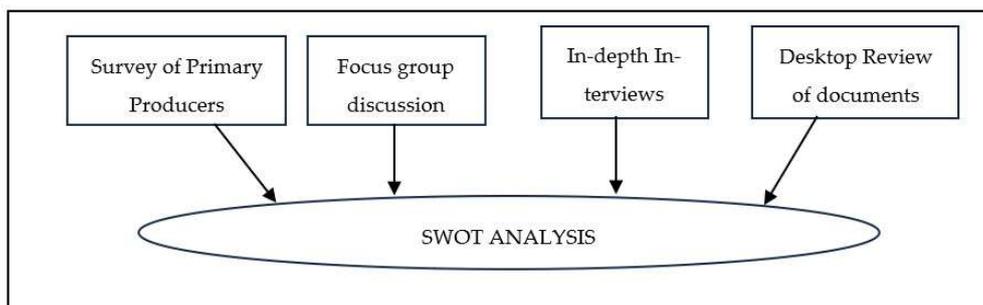


Figure 2. Information sources for construction of SWOT analysis.

2.2.1. Survey

Primary data were collected by surveying farmers who planted the top five vegetables (cabbage, tomatoes, potatoes, onions, and rape). A total of 900 (70%) out of 1292 farmers planted the top five vegetables in 2021/22 across the country. Out of the 900 farmers who planted the top five vegetables, 102 farmers were randomly selected in the nine (9) districts mentioned above. The selection of the 102 farmers was based on the number of farmers in each district, ensuring that at least 10 percent of farmers in each district were selected.

A questionnaire was administered to the selected farmers in each sampled district. The questionnaire sought to characterise primary producers in terms of their farm size,

technologies employed, and markets. Additionally, data collected included the strengths, weaknesses, opportunities, and threats (SWOT) to determine leverage points which could be exploited to enhance the efficiency of the sector, as well as weak points which needed to be improved for better sector performance and continued sustainability.

2.2.2. In-Depth Interviews

In-depth interviews were held with actors across the horticulture sector, starting from input suppliers to retailers, as well as support institutions (Table 1). At the input level, interviews were held with nine (9) input suppliers. The interviews sought to determine the sources of inputs and the challenges encountered by suppliers. At the wholesale level, data were collected on where they sourced their products. Furthermore, wholesalers were asked whether they undertook any value addition, as well as the constraints that they faced and opportunities that were available to them. At the processing level, in-depth interviews were conducted with National Agro Processing (NAPRO), street vendors, retailers, and wholesalers who performed some processing. In-depth interviews were also held with twelve (12) retailers (supermarkets), eighteen (18) street vendors, and five (5) wholesalers, with the main aim of gathering information on their relationship with other chain actors (especially producers), as well as the challenges that they faced.

Table 1. Data collection methods and respondents.

Method of Data Collection	Type of Respondents	Number of Respondents
Survey	Primary producers	102
	Input suppliers	9
	Wholesalers	5
In-depth interviews	Processors	1
	Street vendors	18
	Retailers	12
	Finance and insurance	2
	Business advisory services and standards	4
	Research and development; education and training	2
	Government departments	7
	Focus group discussion	District-level and national (Botswana Horticultural Council) farmers associations
Desktop review	Value chain studies on Botswana and other countries' horticultural sectors; studies on horticulture in Botswana and elsewhere; Statistics Botswana International Merchandise Trade Statistics; Horticulture Unit—Production Trends	-

Source: created by the authors.

In-depth interviews were also conducted with financial and business advisory support services. These included the Local Enterprise Authority (LEA), Citizen Entrepreneurial Development Agency (CEDA), and National Development Bank (NDB). Consultations were also held with training, education, research, and capacity-building institutions, such as the LEA, Botswana University of Agriculture and Natural Resources (BUAN), the National Agricultural Research and Development Institute (NARDI), Botswana Bureau of Standards (BQA), and the extension services of the MoA.

Lastly, in-depth interviews were held with key stakeholders offering institutional and regulatory support to the horticultural sector. These included government ministries and departments: the Ministry of Agriculture (Department of Crop Production and Department of Plant Health), Ministry of Entrepreneurship (Department of Cluster Development, representing the former Department of Agribusiness Promotions in the Ministry of Agriculture), Ministry of Trade and Industry (Department of International Trade), Ministry of Land Management, Water and Sanitation Services (Department of Water Affairs and Department of Lands), and Ministry of Health (Department of Public Health—Nutrition and Food Control Division).

2.2.3. Focus Group Discussions

At the support level, two main data collection methods were used: focus group discussions (FGDs) and in-depth interviews. FGDs were held with key stakeholders in the horticultural sector, including national and district-level farmer-based organisations. The FGDs were held with three (3) farmers' associations at the district and national levels, including Botswana Horticultural Council (BOHOCO). The main purpose of the FGDs with farmers associations was to identify the role that they perform, as well as their strengths and weaknesses in the performance of their mandate. Additionally, the FGDs were also aimed at determining the opportunities and threats faced by these associations.

2.2.4. Desktop Reviews

In addition, data were also collected through a desktop review of documents on the horticultural sector, especially previous value chain studies undertaken on Botswana's horticultural sector. Desktop reviews of horticultural value chain studies undertaken elsewhere, as well as secondary data on horticultural production and trade from the MoA and Statistics Botswana, were undertaken to augment the primary data.

2.3. Data Analysis

2.3.1. Analysis of Survey Data

Data collected through the survey were mainly analysed using descriptive measures such as frequency tables to characterise the farmers in terms of the farm size, level of technology used, technical skills, etc. Some of the questions from the survey were analysed using rankings, as the respondents were required to rank their responses. The different items in each question were given weights, and their influence on a particular issue under investigation was determined by reporting the total score (computed by multiplying the weights * frequency counts). All analyses were performed using Microsoft Excel.

2.3.2. Analysis of the Strengths, Weaknesses, Opportunities and Threats

A SWOT analysis of the horticulture sector is a tool that can be used to determine what the sector does well (strengths) and what it does not do well (weaknesses). The strengths are the positive attributes of the value chain, while the weaknesses are the negative attributes; these are internal to the horticulture sector. The SWOT analysis also identifies the opportunities and threats that can shape current and future operations and strategic interventions. The opportunities and threats are external to the chain, and hence, chain actors have no control over them. Opportunities are the positive attributes that can enhance the value chain's performance, while the threats are negative factors that could inhibit the efficient working of the chain (Table 2).

Table 2. SWOT analysis.

Strengths	Weaknesses	Opportunities	Threats
Internal: positive attributes of the value chain	Internal: negative attributes of the value chain	External: positive attributes that can enhance the performance of the chain	External: negative factors that can prevent the efficient working of the chain

2.3.3. Characterisation of Producers

The characterisation of primary producers is shown in Table 3. The majority (71%) of primary producers were male. In terms of educational level, an overwhelming majority (99%) had received some kind of formal education, with 58% and 36% having received secondary and tertiary education, respectively. However, only 57 (56%) of the primary producers had received training on horticultural production. This training was mainly received through short courses (38 participants, 67%), with only 19 (33%) having received formal training at the certificate, diploma, and degree levels.

Table 3. Characteristics of producers.

Variable	Category	Frequency (%)
Gender	Male	72(71)
	Female	30(29)
Educational Level	Primary	6(6)
	Secondary	36(35)
	Tertiary	44(43)
	Postgraduate	14(14)
	Non-formal	1(1)
	<30	7(7)
Age	30–39	29(28)
	40–49	32(31)
	50–59	20(20)
	60–69	9(9)
	>=70	2(2)
Training received in horticulture	Yes	57(56)
	No	45(44)
Training in horticulture	Short course	38(68)
	Certificate	12(21)
	Diploma	3(5)
	Degree	4(7)
Production system (indicated in hectares planted)	Open field	246(85)
	Tunnel	7(2.4)
	Shade net	35(12)
	Hydroponics	0(0)
	Greenhouse	1(0.34)

Table 3. Cont.

Variable	Category	Frequency (%)
Membership of farmers' group	Association	35(50.72)
	Cluster	19(28)
	Cooperative	4(6)
	Association and cluster	2(3)
	Association and cooperative	1(1)
	Association, cooperative, and cluster	1(1)
Source of water *	Borehole	56(55)
	River—perineal	28(28)
	River—seasonal	93(92)
	Dam—perineal	3(3)
	Dam—seasonal	4(4)
	Treated water	1(1)
	Other	3(3)
Source of power for pumping water *	National grid	30(29)
	Solar	25(25)
	National grid and solar	9(9)
	National grid and engine/generator	2(2)
	Petrol engine/generator	23(23)
	Diesel engine/generator	22(22)
Irrigation technology *	Drip	83(81)
	Sprinkler	32(31)
	Spray cubes	10(10)
	Hose pipe	23(23)
	Farrow	3(3)
	Watering can	16(16)
	Other	5(5)

Note: Figures in parentheses are percentages. * Numbers do not add up to 100% because some respondents use multiple sources of water, power sources, and irrigation technologies. Source: created by authors from survey data.

The sampled farmers planted a total of 289 hectares in the 2022 planting season. Out of these hectares, 246 (85%) were planted as open fields, followed by 35 (12%), 7 (2.4%), and 1 (0.34%) being planted under shade nets, in tunnels, and in greenhouses, respectively, with no land being planted using hydroponics. Thus, despite the challenges brought by climate change, such as the increased frequency and severity of extreme weather events, most vegetable production is undertaken using open field cultivation.

When farmers were asked whether they belonged to any farmer-based organisation, 69 (68%) indicated that they belonged to one form of organisation, with 35 (51%) indicating that they belonged to an association, 19 (28%) indicating that they belonged to clusters, 4 (6%) saying that they belonged to cooperatives, and the remaining 11 (16%) reporting that they belonged to a combination of associations, clusters, and cooperatives. The majority (31%) of farmers were aged between 40 and 49 years, followed by those aged between 30 and 39, 50 and 59, 60 and 69, and above 70 at 28%, 20%, 9%, and 2%, respectively.

In terms of sources of water, most of the sampled farmers used river water, with 93 (92%) using seasonal and 28 (28%) using perineal river, followed by 56 (55%) who used boreholes. The most commonly used irrigation technology was drip irrigation, which was used by 83 (81%) of the sampled farmers, followed by sprinklers (32; 31%), hose pipes (23; 23%), and watering cans (16; 16%), with the least used being farrow (3; 3%) and others (5; 5%).

3. Results

The objective of this study was to identify constraints and opportunities in the horticulture sector of Botswana. This section presents the results of the SWOT analysis, which covered the strengths, weaknesses, opportunities, and threats in the horticulture sector. This is followed by a discussion of the main constraints and opportunities at each stage of the value chain.

3.1. SWOT Analysis

A SWOT analysis of Botswana’s horticulture sector is presented in Table 4. The analysis was undertaken to identify key strengths that the sector can rely on and opportunities which could be exploited to improve the performance of the supply chain. The SWOT analysis also identified key weaknesses which need to be addressed to improve the sector. Lastly, the analysis identified threats that could pose a problem to the sector and hence need to be considered when developing interventions to improve the functioning of the value chain. The SWOT analysis identified three (3) key strengths, twelve (12) weaknesses, five (5) opportunities, and eleven (11) threats.

Table 4. SWOT analysis of the horticulture sector in Botswana.

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> • Supportive government programmes and policy • Availability of land • Availability of cheap labour 	<ul style="list-style-type: none"> • Food safety issues • Lack of mandatory standards and certification • Inadequate biosecurity laws • Poor extension services • Poor technical and business management skills • Lack of market access and corrupt marketing system • Limited market intelligence • Uncoordinated production • Unskilled labour • Uncoordinated support services • Poor infrastructure • Limited access to credit 	<ul style="list-style-type: none"> • Increased interest in horticulture • Public procurement • Sufficient demand for vegetables • Processing potential • Reliable input suppliers 	<ul style="list-style-type: none"> • Support programmes mainly focused on primary production • Limited water resources • Lack of interest among the youth • Removal of the import ban • Stiff competition from imports • Smuggling of banned products • Low technology adoption in the face of climate change • Vertical integration of some retailers into production • Poor control of pests and diseases • Criminal activities • Poor infrastructure in farming areas

Source: created by authors from survey data, in-depth interviews, focus group discussions, and literature reviews.

3.1.1. Strengths

As indicated earlier, the strengths are internal to chain actors and are positive attributes of the sector that could be leveraged to improve supply chain performance.

Supportive Government Programmes

One of the key strengths of the horticulture sector is that it receives support from the government, as it is seen as an avenue through which the agriculture sector could be diversified and employment could be created. This support has been concentrated around

primary production and includes the Impact Accelerator Subsidy (IAS), which offers grants of 50% for horticultural farmers up to a maximum limit of BWP 300,000.00 [6]. Additionally, through the Control of Goods, Prices, and Other Charges Act, the government has been imposing import restrictions, and in 2022, an import ban on sixteen (16) types of vegetable was imposed, with the aim of improving smallholder farmers' access to the market. The ban was initially in place for two years and has been extended by a further two years, with the list of banned products being expanded to 32 vegetables. Support has also been given through the construction of fresh produce markets and a central market, with the aim of improving market access. These markets, however, were not successful, as they have now collapsed; however, there is a desire to reopen them, with the central market beginning operations at one location, with plans to expand to other regions.

Availability of Land

Availability of land is one the greatest strengths for horticultural production, as the sector does not need much land. This is corroborated by the fact that most farmers have idle land, as shown by our farm survey results, which indicated that only 78% of available land was under cultivation at the time of the survey.

Availability of Cheap Labour

Farmers indicated that labour for horticultural production was readily available at cheaper rates. This labour was mainly sourced from locals (66%) and foreign nationals (34%), mostly Zimbabweans (30%). The farm survey results showed that most foreign workers did not have both work and residence permits. The main reason for this was that farmers felt that the costs of obtaining residence and work permits were prohibitive.

3.1.2. Weaknesses

Weaknesses are also internal to the sector and are negative attributes that need to be addressed to improve performance.

Food Safety Issues

One of the main weaknesses of the horticulture sector in Botswana is concern regarding food safety. Horticultural products are produced using agrochemicals, whose residues can be harmful to human health if they exceed certain levels. These results are similar to those presented in [12], which indicated that, in Southern Africa, there are only few standards, such as those relating to maximum residue limits. Globally, quality standards and certifications have emerged to ensure food safety [2], but these are lacking in Botswana's horticulture sector. To ensure that fresh produce is safe, there is a need to test and certify the minimum residue levels. However, there are no testing services for determining residues in fresh produce for products that are destined for retailing, which poses serious risks to human health. This occurs in spite of the Food Control Act, enacted in 1993, which aims to ensure the provision of clean, safe, and wholesome food to consumers [41]. This suggests that the act has been poorly implemented.

Lack of Mandatory Standards

Although BOBS has 33 standards on horticulture, these are not mandatory and hence, not regulated. This lack of mandatory standards also means that fresh produce from farmers is not graded; hence, poor- and high-quality produce receive the same price. This acts as a disincentive for farmers who want to improve the quality of their produce. A lack of mandatory standards does not only disadvantage producers who produce better-quality products but could also act as a hindrance if the country wants to access global markets at a later stage. Export markets are particularly important for countries like Botswana, which

has a small population and, hence, a small market. As production increases beyond the local demand, there will be a need to export. This can only be achieved if the country meets the standards that are set by importing countries.

Inadequate Laws Covering Biosecurity

Currently, there are no laws on biosecurity, leading to a threat of imported pests and diseases. In fact, it has been reported (in an interview with the Department of Plant Health) that, in the last five years or so, about six new diseases and pests have been imported into the country. The current Plant Protection Act of 2009 [42] appears to be ineffective. Thus, the lack of biosecurity laws leads to a situation in which seeds enter the country without checks on their safety, posing serious risks of importing diseases. In addition, our interviews with input suppliers revealed that there are several unregistered seed suppliers who do not only pose a threat of importing diseases, but also unfairly compete with the registered suppliers, as they do not pay tax.

Poor Extension Services

One of the weaknesses of the horticulture sector is poor extension services. Farmers reported that the extension services offered to them by the DCP Horticulture Unit are insufficient, with many arguing that officers from the section are preoccupied with collecting data from their farms and provide limited extension services. This has resulted in farmers relying on social media for extension services, some of which may not be credible. An analysis of our farm survey revealed that only 40% of farmers had received extension support from the government, 10% from the private sector, 9% from non-governmental organisations, and 5% from other providers.

Poor Technical and Farm Business Skills

Related to poor extension services are the poor technical and business skills of primary producers. This leads to low productivity, partly due to poor crop husbandry and management of pests and diseases. In addition to poor technical skills, farmers lack farm business management skills. This results in poor record keeping and hence, makes it difficult for farmers to identify causes of poor financial performance. Without any knowledge of the causes of poor financial performance, it is difficult for farmers to control their costs, sales, and profitability margins, which are crucial for any business enterprise. This negatively impacts the sustainability of horticulture farms.

Lack of Market Access and Corrupt Marketing System

Despite government efforts to improve market access through interventions such as the import restrictions and bans, the problem of market access persists, especially for smallholder farmers. The problem of market access is made worse by the fact that there is no operating central market, nor any collection centres through which farmers can sell their produce. For instance, in our farm survey results, the lack of market access was ranked as the 4th most important challenge faced by farmers out of the 14 challenges identified (Table 5). The lack of a central market presents logistical challenges to buyers, as they have to source their supplies from several small farms.

The problem of market access is also exacerbated by the fact that farmers reported that the marketing system is corrupt, in the sense that traders prefer to buy from certain suppliers not because of good quality, but because of friendship or other considerations. Instances where farmers are required to hand out favours to buyers have been reported across the marketing system. Moreover, farmers reported a lack of a marketing infrastructure for fresh produce, such as cold rooms, which leads to high post-harvest losses, as products deteriorate before they are marketed. For instance, our farm survey results

indicated that only 33 (32%) of the surveyed farmers owned some kind of storage facility, with only 1 out of these owning a cold room. These results are consistent with the findings of [13–20], whose authors found that market access was one of the key constraints faced by horticulture farmers in developing countries.

Table 5. Challenges faced in production.

Challenges Faced in Production	Weighting														Score	Rank
	14	13	12	11	10	9	8	7	6	5	4	3	2	1		
Limited knowledge of horticultural production	1	3	3	2	2	6	5	5	1	1	4	3	2	0	300	12
Pests and diseases	33	16	11	11	9	3	4	1	1	0	0	0	0	0	1085	1
Limited land for expansion	6	4	3	3	3	1	2	1	3	2	5	2	2	0	325	10
Limited water for irrigation	6	4	2	4	1	2	2	6	3	4	3	2	1	0	348	9
Expensive inputs	12	23	19	9	3	4	6	0	1	2	0	1	0	0	927	2
Market access	12	12	11	8	6	5	4	3	2	0	1	1	1	0	723	4
Lack of storage	2	6	8	4	3	1	4	6	6	5	1	2	1	1	433	6
Weather conditions	7	17	17	14	6	8	2	3	2	1	2	0	1	0	873	3
Transport	2	1	5	7	5	2	6	5	3	3	3	1	4	0	385	7
Limited working capital	6	4	8	9	15	7	2	4	2	2	1	0	0	0	614	5
Lack of skilled labour	2	3	5	4	8	3	2	4	3	6	3	3	0	0	391	8
Lack of reliable labour	1	1	2	5	2	5	4	2	2	5	3	6	3	0	290	13
Lack of funds to produce under controlled environments	1	4	2	4	5	6	1	1	4	2	3	3	1	0	310	11
Other (e.g., wild animals, acidic water, high costs of fuel for irrigation)	9	2	2	0	1	0	1	0	0	0	0	0	0	0	194	14

Highest score—most important challenge; lowest score—least important challenge. Source: created by authors from survey data.

Limited Market Intelligence

One of the prerequisites of an efficient marketing system is that there should be a free flow of information. This information should include prices and quantities, as well as locations. This information is lacking in the horticultural industry. The Department of Agribusiness Promotions attempted to improve this by developing an online platform (AGRIMA) through which farmers and traders could determine the quantities of a produce that have been sold, as well as prices. At the time of writing, this platform was not operational. An interview with the Department of Agribusiness Promotions revealed that the new parent ministry, the Ministry of Entrepreneurship, intends to expand the platform to cover all agricultural products. It was not clear how accessible the platform was to both traders and farmers, especially smallholders. However, these updates do not cover the majority of farmers and hence will not accurately indicate the availability of products.

Uncoordinated Production

Production is poorly coordinated, with farmers planting the same vegetables at the same time, leading to excess supply in some instances and shortages in other periods. This persists despite attempts at coordination by district-level farmers associations and at the national level. The Botswana Horticultural Council (BOHOCO) does not have the capacity to develop and enforce cropping plans because of a lack of funds. At the time of this study,

the association did not have a secretariat, making it difficult for it to develop national cropping plans. Thus, farmers tend to plant in-season vegetables, which leads to a glut in the market, causing prices to fall, even to below production costs, leading to losses for the farmers. On the other hand, shortages lead to increases in prices, leading to reduced affordability on the part of consumers, especially low-income households. The problem of uncoordinated production is associated with unorganised farmers, which in turn results in them being price takers, as individually, they do not have strong bargaining power against retailers or traders. For instance, our farm survey results revealed that 69 (68%) farmers belonged to a farmer-based organisation, with the majority (52%) belonging to an association (Table 3). However, our farm survey results indicated that the main mandate of these associations was advocacy, with limited roles in the marketing of both inputs and outputs.

Unskilled Labour

Although farmers indicated that one of the strengths of the horticultural industry is that cheap labour is readily available, they felt that it is unskilled and highly unreliable. The use of unskilled labour affects crop husbandry and management, leading to high in-field losses. The result is low productivity and profitability, affecting the sustainability and survival of such enterprises. As indicated in Table 6, the main causes of in-field losses are diseases and pests, which require technical skills for effective control.

Table 6. Major causes of crop loss.

Cause	Weighting					Score	Rank
	5	4	3	2	1		
Causes of post-harvest losses							
Lack of market	60	20	4	2	0	396	1
Poor storage	18	27	10	8	0	244	2
Poor transportation	5	14	23	8	0	166	3
Poor quality due to harvesting	7	7	13	19	2	142	4
Other (e.g., theft)	2	1	0	0	0	14	5
Causes of in-field crop losses							
Pests	54	21	13	3	0	399	1
Diseases	8	47	20	8	1	305	2
Hailstorms/rain	11	3	15	22	3	159	4
Frost	16	19	20	13	1	243	3
Other (e.g., high temperatures, fungus)	11	2	5	2	0	82	5

Source: created by authors from survey data.

Uncoordinated Support Services

Several institutions (public, public–private-partnerships, and private) provide support to the horticultural sector. In most cases, these institutions work separately without any coordination of their interventions, leading to fragmentation and ineffective and inefficient support to the sector [9].

Poor Infrastructure

Horticultural production requires specialised infrastructure. For example, due to the perishable nature of fresh produce, products need to be stored and transported in refrigerated storage and vehicles. Our farm survey results indicated that only 1 out of the

102 surveyed farmers used refrigerated trucks to transport their vegetables. This was one of the main reasons for high post-harvest losses (Table 6). The farm survey results also indicated that, despite the increased frequency and severity of extreme weather events, an overwhelming area under cultivation—246 hectares (85%) of the 289 hectares—were planted in open fields, exposing crops to risks of damage due to extreme weather events. In addition, irrigation equipment and protected-environment infrastructure are very expensive, and most farmers do not have these facilities, as indicated by our farm survey results. At the market level, there is insufficient marketing infrastructure, such as collection centres and a central market, as well as processing facilities, making it difficult for farmers to sell their produce. These results are similar to what was found in [13–15,17,19], indicating that horticulture farmers in developing countries are faced with inadequate infrastructure.

Limited Access to Credit

Most farmers use their own sources of funds to start and expand their horticulture projects. Credit for the horticulture sector is limited, and this inhibits the growth of the sector, as it is capital-intensive. Additionally, poor access to credit also inhibits productivity growth, as farmers are unable to adopt technologies such as production under protected environments in the face of harsh climates. For instance, our farm survey results indicated that 76 (75%) farmers used their own funds to start their horticultural projects. The main source of finance, apart from own funds, is the Citizen Entrepreneurial Development Agency (CEDA), which funded seven (7%) of the surveyed farmers, followed by the National Development Bank (NDB). Both of these are development finance institutions, and the level of funding from commercial banks is very low, with only one farmer indicating that they received start-up finance from commercial banks. Our in-depth interview with CEDA revealed that the majority of horticultural projects that they have funded have performed poorly, hence limiting financing for horticultural projects.

3.1.3. Opportunities

Opportunities are external to the sector and are positive attributes that can enhance the sector's performance if they are taken up. The identification of opportunities is critical for the horticultural sector, as exploiting them could enhance the sector's development and, hence, its sustainability.

Increased Interest in Horticulture

There is growing interest in horticultural production, as new farmers are entering the sector. This will surely increase production and substitute imports, which will save the much-needed foreign exchange that is spent on imported vegetables. The extra produce can also be used as raw materials in the processing sector and hence reduce the import bill for processed horticultural products.

Public Procurement

Through the Citizen Economic Empowerment Policy (CEEP) and Economic Inclusion Act, the government facilitates market access, including for horticultural farmers with citizenship. Government institutions such as schools, hospitals, and the disciplined forces (the army, police, and prison services) are required to prioritise procurement from farmers with citizenship, thereby increasing their market access. Our farm survey results showed that 53 (52%) of the surveyed farmers sold to public institutions, with schools dominating at 90%, followed by hospitals and a combination of schools, hospitals, and prisons.

Sufficient Demand for Vegetables

The local production of vegetables falls short of the demand, which presents an opportunity for farmers to increase their production. However, in 2021, before the imposition of the import ban, the local consumption (estimated based on local production and net imports) amounted to 120,687.53 t, while in 2022, the local demand was 64,340.21 t [43,44] due to the imposition of an import ban on selected vegetables. This shortfall in consumption provides an opportunity for increased local production.

Processing Potential

Most processed products from vegetables are imported, which presents an opportunity for local processors to meet the local demand for processed products and, eventually, exports. In 2021 and 2022, the imports of processed vegetable products amounted to BWP 254 million and BWP 348 million, respectively, while exports were valued at BWP 19 million and BWP 6 million over the same period [11]. This creates an opportunity for increased local processing.

Reliable Input Suppliers

The local market for inputs is reliable, although farmers complained about high prices, as most inputs are imported. For instance, our farm survey results ranked expensive inputs as number 2 out of the 14 challenges faced by farmers (Table 7).

Table 7. Market outlets for vegetables and reasons for choice of channel.

Market Outlets in Order of Priority	Weighting						Score	Rank
	6	5	4	3	2	1		
Retailers	44	20	13	8	0	0	440	1
Wholesalers	8	20	9	5	5	0	209	5
Hawkers	28	27	22	5	1	0	408	2
Public institutions (schools, hospitals, etc.)	5	14	9	18	15	0	220	4
Individuals	11	16	32	18	10	0	348	3
Other (e.g., hospitality industry)	4	1	0	0	0	0	29	6
Market outlets paying better prices								
Retailers	36	18	20	9	2	0	417	1
Wholesalers	3	16	14	8	2	0	182	5
Hawkers	23	30	14	13	0	0	383	2
Public institutions (schools, hospitals, etc.)	21	12	6	10	11	0	262	4
Individuals	14	18	27	12	10	1	339	3
Other (e.g., hotels, lodges, and restaurants)	3	2	0	0	0	0	28	6

Source: created by authors from survey data.

3.1.4. Threats

Threats are negative factors that could prevent the efficient running of the sector and which therefore need to be addressed for improved sector performance.

Support Programmes Focused on Primary Production Only

Government policies are only geared to primary production at the expense of other activities such as processing. This limits sector development, as poor performances at some stages of the chain affect the performance of the entire chain. For instance, limited

processing potential leads to high post-harvest losses during period of excess supply. The import ban on selected vegetables did not cover processed products, which limited the development of the processing sector, as imports of processed products increased tremendously.

Limited Water Resources

Horticultural production is water-intensive, and, due to limited surface water resources in Botswana, farmers rely on underground water sources. In some places, it is difficult to obtain sufficient water for irrigation. In other places, the drilling and equipment costs are prohibitive, especially to smallholder farmers, because of deep water tables. In some cases, the quality of the water is not suitable for irrigation. Limited water resources were ranked ninth out of the fourteen major weaknesses of the horticultural sector by the surveyed farmers (Table 5).

Lack of Interest in the Sector Among the Youth

Although one of the opportunities in the horticulture sector is growing interest, there is limited youth participation in horticulture. Most farmers are elderly and often retirees, who may not have the same energy and zeal as that possessed by the youth to move the sector forward. Our farm survey results showed that only 7 (7%) farm owners were less than 30 years old; 36 (35%) were below 40 years, while the remainder (57%) were above 50 years of age (Table 3).

Removal of the Import Ban

One of the biggest threats at the primary production level is the removal of the import ban on selected vegetables, as it has the potential of raising trade disputes. In fact, South African farmers have raised the issue with their government. The removal of the import ban would further exacerbate the problems of market access for local smallholder farmers, as supermarkets have in the past shown a preference for sourcing their supplies from imports, because they can buy a variety of products in bulk from one source and hence reduce the logistical requirements arising from buying small quantities from several local smallholder farmers [45].

Stiff Competition from Imports

Local farmers face high production costs due to their relatively small farms and lack of experience compared with their relatively large and experienced counterparts in neighbouring countries, particularly South Africa. For instance, the costs of electricity, seeds, fertilisers, insecticides, and pesticides are higher than in South Africa, making it difficult for farmers to compete with imported products from that country [9].

Smuggling of Banned Products

The smuggling of banned products by some traders negates government efforts to promote horticultural production, as it limits the market access of local producers. In addition, the smuggled products can also pose risks of introducing diseases and pests, as they have not been issued with import permits and hence have not been certified as safe.

Low Technology Adoption in the Face of Climate Change

A lack of technology adoption was observed, in part due to costs such as the expense of growing in protected environments, which are prohibitive to farmers, especially smallholders. This leads to high in-field losses and poor-quality products due to extreme heat waves, frost, and other extreme weather events. This, coupled with climate change, which leads to an increased frequency of extreme weather events, results in high in-field losses.

Our farm survey results showed that only a handful of farmers have adopted production under protected environments, despite the increased frequency and severity of extreme weather events as a result of climate change. This lack of technology adoption is partly a result of the lack of access to credit [29–32], which leads to limited funds for purchasing protected environment infrastructures such as greenhouses, tunnels, and net shades.

Vertical Integration into Primary Production by Retailers

Retail stores are integrating vertically into production, as they have opened and are operating horticulture farms and selling the products in their retail stores. This will surely reduce the amount of fresh produce that the retailers' source from farmers and hence, reduce farmers' market access. On the other hand, such a move might lead to anti-competitive behaviour in the industry. However, the current competition law allows for vertical integration and only prohibits it if it is achieved through mergers and acquisitions.

Poor Control of Disease and Pest Outbreaks

Disease and pest outbreaks are a major concern at the primary production levels and lead to heavy in-field losses. Some farmers do not have either the financial or technical capacity to control diseases and pests, leading to heavy losses. This is corroborated by the fact that there is a huge difference between actual productivity and efficient productivity. For example, for the top five vegetables, the gap between efficient production and actual production was as high as 53% for cabbage, 47% for rape, 39% for onion, 37% for tomato, and 16% for potatoes, as shown by our farm survey results.

Criminal Activities

Stakeholders, especially farmers, indicated that there is an increased incidence of criminal activities on farms. This is because farms are located in rural areas and are susceptible to break-ins and theft of valuables, especially equipment such as solar panels and borehole pumps. This disrupts production and impart heavy losses on the farmers and, hence, the sustainability of horticulture production.

3.2. Challenges at Each Stage of the Value Chain

One of the objectives of this study was to identify the constraints on the horticultural sector. The SWOT analysis presented above identified several weaknesses that inhibit the development of the horticultural sector. This section presents the main constraints at different stages of the value chain, from input supply through to end markets. The identification of constraints is critical, because it is only when they are identified that proper interventions can be carried out to address them and thereby enhance the working of the value chain, which will lead to the development of the horticulture sector.

3.2.1. Input Supply Challenges at Input Supply

The major challenge at the input supply level, as stated by the stakeholders, is that there is no seed policy, which puts the country at risk of importing diseases through infected seeds. In addition, there are unlicensed seed suppliers in the market, and these do not only pose a risk of bringing diseases into the country or supplying farmers with poor seeds, they also compete unfairly with licenced seed suppliers, as they do not pay tax (income and value-added taxes). For agrochemicals, Botswana does not have regulations for their registration and relies on third-country regulations. This reliance on third countries poses some risks of corrupt practises in the country in which the certification is carried out, as well as difficulties detecting this.

3.2.2. Primary Production Challenges at Primary Production

Primary producers face several constraints, with pests and diseases being the most significant (Table 5). Producers are not able to effectively control pests and diseases, mainly due to a lack of technical knowledge and an inability to afford the required agrochemicals. This leads to high crop losses and huge divergence between the actual and efficient outputs. Another constraint is that most of the supplied inputs are imported and therefore expensive. Seeds, fertilisers, agrochemicals, machinery, and equipment are mostly imported, especially from South Africa. This makes them more expensive than in South Africa, and hence, it is difficult for local producers to compete with imported South African products [9].

The increase in the severity and frequency of weather conditions is another major challenge at the primary production level and is mainly caused by climate change. Related to this is the lack of capital due to the limited access to credit. A lack of capital leads to farmers being unable to adopt modern farming technologies to minimise the effects of extreme weather events. The failure to adopt modern farming technologies, such as production under protected environments, leads to poor productivity. The limited access to credit is particularly a constraint for smallholder farmers, who constitute the majority of horticultural farmers. The main source of funding is government programmes such as the IAS and Youth Development Fund for young farmers. However, for the IAS, farmers are required to contribute 50% of the costs, and for some farmers, raising the required contribution has proven prohibitive, leading to a low uptake of the scheme.

At the primary production level, further constraints include crop losses, both in-field and post-harvest (Table 6). The main causes of post-harvest losses are a lack of market access, poor harvesting and handling techniques, and poor storage and transportation. As argued in [12], post-harvest losses in Southern Africa are very high, especially for horticulture, due to a lack of suitable post-harvest and processing techniques. Additionally, insufficient or lacking cold chain technologies and infrastructure exacerbate the post-harvest losses experienced by smallholder farmers. While there are technologies available, a lack of finance is a major impediment to their adoption. The greatest causes of in-field losses, as reported earlier, are pests and diseases, followed by weather conditions such as frosts and high temperatures/heatwaves (Table 6).

3.2.3. Challenges at Processing Level

A limited amount of processing of horticultural products is carried out in Botswana, partly due to an inconsistent supply of raw materials. In response to this, the government of Botswana, through the National Agricultural Research and Development Institute (NARDI), set up a National Processing Plant (NAPRO) to promote the processing of horticultural products in the country. NAPRO was set up as a prototype to be tested for commercial use. The plan was for NAPRO to test the prototype and, once successful, pass the model to commercial undertakers, who could start processing various products from fresh produce. The plant and equipment were based on a model imported from India. Since its commissioning, the plant has faced operational problems and has never operated at full capacity.

The key challenges faced by NAPRO include a limited and inconsistent supply of raw materials from farmers, limited acceptance by consumers of the new products, and the limited shelf life of products compared with established brands, especially for tomato sauce.

Another challenge faced by NAPRO is that the local varieties that are produced are not suitable for processing, especially into tomato sauce. The parent organisation (NARDI) is aware of this and is planning to characterise tomato varieties into those that are suitable for table use and processing. This work will involve the characterisation of varieties of

several locally produced crops. A lack of processing results in produce being lost, especially during periods of excess supply, as the market cannot absorb all the produce.

3.2.4. Challenges at End Markets

The main market outlets for producers are retailers (supermarkets), followed by hawkers and individuals (Table 7). These are also the highest-paying markets. The main constraint at end markets is that farmers reported low prices received for their produce, as they are price takers and negotiate from a weak position. This is because farmers are unorganised when it comes to marketing their produce, leaving them at the mercy of buyers. Farm gate prices are highly volatile, with the prices of certain products fluctuating by a margin as high as 60%. These fluctuations imply that farmers are unable to recoup their production costs during periods of excess supply, rendering their enterprises unprofitable and, hence, unsustainable.

3.3. Opportunities Along the Value Chain

The identification of opportunities in the value chain is critical, as leveraging these could develop the value chain. This section identifies opportunities along the value chain that actors could seize and thereby develop the chain.

3.3.1. Input Supply

There are opportunities at the input supply level, as most inputs are imported, except for irrigation accessories such as pipes, driplines, and plastic reservoirs, which are manufactured locally. This creates an opportunity for local manufacturers to produce inputs such as net shades and fertilisers. In fact, during our in-depth interviews, it was revealed that some local manufacturers have started producing certain inputs that are needed for horticulture production. One local manufacturer had started producing net shades, while others had started producing organic fertilisers and packaging materials.

3.3.2. Primary Production

At the primary production level, there are several opportunities emanating from the fact that there is an unmet local demand for horticulture products, as well as low productivity and high in-field and post-harvest losses. Thus, farmers have the opportunity to increase their productivity using almost the same number of inputs by adopting good agronomic practises. To improve productivity, extension services must be improved to impart both technical and business management skills to farmers. This will also reduce in-field and post-harvest losses, as farmers will become more knowledgeable on disease and pest control, as well as proper post-harvest handling techniques.

3.3.3. Processing

Most of the processed horticultural products in Botswana are imported, presenting an opportunity for local processors. One of the key constraints at the processing level has been a poor and inconsistent supply of raw materials, as well as inappropriate varieties being supplied.

3.3.4. End Markets

As stated earlier, end markets in the horticulture value chain include street vendors, retailers (supermarkets), and public institutions. While there are issues in terms of accessing the supermarkets, especially for smallholders, there are opportunities that could be exploited through public procurement. This could be supported through the Citizen Economic Empowerment Policy (CEEP) and enforced by the Citizen Economic Empowerment Act.

4. Discussion

This section discusses the main constraints in the horticultural sector of Botswana, as well as available opportunities for the development of this sector. The findings of this study revealed that there are several constraints that have inhibited the growth of the horticultural sector and, hence, its sustainability. Furthermore, this study has revealed that there are several opportunities which have not been taken up by actors in the horticultural sector. These constraints and failures to take up opportunities in the horticultural sector negatively impact the sector's sustainability. Thus, the findings of this study support the hypothesis that the constraints faced by the horticultural sector and failure to act on opportunities limit the growth of the sector and its sustainability.

4.1. Constraints

It is critical to identify constraints in the horticulture sector, as they impede its development. After identification of these constraints, specific interventions can then be carried out to address them in order to improve the workings of the sector and increase its sustainability.

4.1.1. Lack of Market Access

One of the key constraints on the development of the horticulture sector in Botswana is the lack of market access. Several interventions have been developed to address this lack of market access, with limited success. These include import restrictions and bans, as well as fresh produce markets. The import restrictions were ineffective, especially for the smallholders, as individually, they could not trigger border closures due to the insignificant quantities that they produce. Even during the import ban, farmers still faced a lack of market access. This was particularly grave during periods of excess supply, as the market could not absorb all the produce. Part of the reason for this is the limited processing capacity and cold storage facilities, resulting in huge post-harvest losses. The lack of market access is made worse by the fact that there is uncoordinated production, with shortages and excesses during off-season and in-season production, respectively.

4.1.2. Pests and Diseases

Pests and diseases are one of the major causes of in-field losses. This is because farmers lack the necessary knowledge to control them effectively. Additionally, some farmers lack the resources to purchase effective pesticides and chemicals to control pests and diseases. A lack of technical knowledge for controlling pests and diseases is one of the major causes of in-field losses.

4.1.3. Limited Access to Credit

A limited access to credit denies farmers the opportunity to adopt modern farming practises such as production under protected environments. Farmers are unable to adopt technologies such as net shades, greenhouses, and tunnels due to a lack of capital. As a result, they incur high in-field losses due to the increased frequency of extreme weather events as a result of climate change.

4.1.4. Inadequate Infrastructure

Farmers lack marketing infrastructure such as cold storage facilities and refrigerated transport, leading to huge post-harvest losses. Additionally, there are inadequate processing facilities, resulting in losses, especially during periods of excess supply, as the fresh produce cannot all be sold.

4.2. Opportunities for Improving Value Chain Performance

The identification of opportunities in the horticulture sector is critical, as leveraging these could develop the sector and increase its sustainability. This section identifies opportunities in horticulture which actors could take up to develop the sector and increase its sustainability.

4.2.1. Import of Most Inputs

There are opportunities at the input supply level, as most inputs are imported, except for irrigation accessories such as plastic pipes, driplines, and plastic reservoirs, which are manufactured locally. This creates an opportunity for local manufacturers to manufacture inputs such as net shades and fertilisers. In fact, during our in-depth interviews, it was revealed that some local manufacturers have already started manufacturing certain horticulture inputs, such as net shades, organic fertilisers, and packaging materials.

4.2.2. Unmet Local Demand and Low Productivity

At the primary production level, there are several opportunities emanating from the fact that there is an unmet local demand for horticulture products, as well as low productivity. Furthermore, high in-field and post-harvest losses offer an opportunity for increased production to meet the local demand. Thus, farmers have the opportunity to increase their production and productivity by adopting good agronomic practises.

4.2.3. Lack of Processing

Most processed horticultural products in Botswana are imported, presenting an opportunity for local processors. One of the key constraints at the processing level has been the poor and inconsistent supply of raw materials and the inappropriate varieties supplied. Thus, there is an opportunity for further processing to substitute imports.

4.2.4. Public Procurement

As stated earlier, end markets in the horticulture sector include street vendors, retailers, and public institutions. While there are issues in terms of accessing supermarkets, especially by smallholders, there are opportunities through public procurement. This opportunity has been created through the Citizen Economic Empowerment Policy (CEEP), whose implementation has been supported by the Citizen Economic Empowerment Act.

5. Conclusions

Horticultural production in Botswana is at an infant stage; however, the sector has shown considerable growth in recent years, with both the number of farms and output increasing. This was spearheaded by several supportive policies. However, the sector faces several challenges. The development of the sector requires these challenges to be addressed, so that the actors can grab the opportunities that are presented to them.

This study found that the weaknesses (12) of the horticultural sector far outweigh the strengths (3). It is therefore critical that the government and other stakeholders address these weaknesses to develop the horticultural sector. For instance, the lack of market access could be addressed by farmers acting collectively in marketing their products and the government assisting in the construction of a marketing infrastructure.

Furthermore, the threats (11) far outweigh the opportunities, suggesting that there is a need to tackle these threats to ensure that they do not negatively affect the growth of the horticultural sector and, hence, its sustainability. The few identified opportunities should be leveraged to improve the horticultural sector and ensure its sustainability.

This study also found that there are additional constraints at each stage of the value chain. The development of the horticultural sector requires these constraints to be addressed fully.

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