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AGRONOMY AND HORTICULTURE MARKET DEVELOPMENT DIVISION RESEARCH AND POLICY DEVELOPMENT SUBDIVISION

THE POTENTIAL OF PROCESSING FRUITS AND VEGETABLES IN NAMIBIA



ABSTRACT

This article examined the extent of processing in Namibia's horticulture sector and explored the critical success aspects, opportunities, and bottlenecks in processing fruits and vegetables. Face-to-face interviews were conducted with 54 industry players, and this was substantiated with secondary data from documents and the internet. The collected data were then analysed in Microsoft Excel for descriptive statistics and thematic analysis. The study observed limited processing of fruits and vegetables in Namibia as only fruits and vegetables worth N\$ 124.4 million were processed in the country versus net imports worth about N\$ 1.5 billion, whereas exports are extremely low at about N\$ 1.6 million. Critical aspects that are pivotal to success in processing fruits and vegetables were identified such as the nature of packaging and labelling, supply contracts and pricing, marketing and transportation, cold storage facilities, quality assurance, and human capacity. Namibia has import substitution opportunities for non-sophisticated products such as fruit juice, fruit pulp, frozen vegetables, frozen potato chips, pumpkin (jam and purees), chilled vegetables (cut and dice, spices), tomato paste, tomato sauce, virgin olive oil, spices, and other dried vegetables. Bottlenecks observed include: high prices (costs of transport, storage, certification, labour, and importing packaging materials), lack of skills, lack of information, lack of infrastructures and machinery, poor planning, absence of supply chain coordination, diseconomies of scale and inconsistency, thus resulting in low competitiveness. Therefore, at a high level, this study recommends that all interested parties (stakeholders) should invest in capacity-building programmes that are focused on farmers and other interested parties in the agro-processing of fruits and vegetables; the main actors in the horticulture agro-processing sector should be represented at NAB platforms, for the smooth facilitation, control, and development of the sector; and agro-processing should be a Chapter in the 5-year Crop Value Chain Strategy that is being developed by the NAB, to have targeted interventions that will stimulate agro-processing in Namibia.

Keywords: *Agro-processing, Namibia, fruits and vegetables, raw materials, products, farmers, traders, agro-processors, supply chain aspects, distributors, domestic production, imports, and exports.*

1. INTRODUCTION

“Consumption is the sole and end purpose of production” (Smith, 1776, p. 58). Due to low primary production, Namibia remains a net importer of processed horticultural products. This article, therefore, provides data regarding the extent of processing fruits and vegetables in an attempt to attract investment into and stimulate growth in the agro-processing industry. Agro-processing refers to the subset of manufacturing that processes raw materials and intermediate products derived from the agricultural sector (FAO, 1997). Despite the government’s efforts to increase market access for locally produced fresh vegetables through the introduction of Market Share Promotion (MSP) and Special Controlled Products (SCP) schemes via the Namibian Agronomic Board (NAB), these mechanisms are currently limited to primary production. The consumption of agro-processing products in Namibia ensures the necessity to extend the MSP and SCP interventions to agro-processing products. However, investment has to be increased for the industry to have justifiable local processing volumes. Despite the call for agro-processing in meeting the local demand through import substitution, actors in the food sector should comply with the Namibia Food Safety Policy, “to ensure food safety for all consumers in the Republic of Namibia, and provide scientific food safety guarantees on all food products traded nationally or exported to other countries” (Namibia Food Safety Policy, 2014, p. 1).

This article, therefore, provides research findings on the extent of agro-processing including supply chain drivers of the agro-processing sector as per the food safety policy, as well as the opportunities, bottlenecks, and suggestions to stimulate agro-processing within the horticulture sector in Namibia. Information in this article was obtained from a study conducted by the NAB in 2022, titled “An analysis of Namibia’s potential for agro-processing”. The study collected primary data from key value chain members, namely, farmers, traders, processors, and distributors within Namibia’s horticulture sector, and secondary data was collected from the International Trade Centre (ICT), Food and Agriculture Organization Corporate Statistical Database (FAOSTAT) and the Namibian Agronomic Board (NAB) database.

2. METHODOLOGY

The study was conducted in Namibia, in all seven (7) horticultural production zones, namely, Central, Karst, Kavango, North Central, South, Orange River, and Zambezi. The study had a population size of 543 value chain members in Namibia’s horticulture sector, consisting of 439 horticultural farmers, 80 traders, and 24 processors. The research sample encompassed 54 value chain members and it consists of 25 farmers, 21 traders, and 8 processors of horticultural produce. An exploratory research method was used, where both qualitative and quantitative approaches were used to collect both primary and secondary data. Primary data was collected through a survey (face-to-face interviews) using a structured questionnaire with both closed and open-ended questions. Telephone interviews were also

used for follow-up questions with the study respondents. A review of secondary data from documents and internet-based sources was also used to support primary data obtained from the field survey. Collected data were analysed using descriptive statistics, thematic analysis, and with an aid of online data analysis tools and Microsoft Excel.

3. RESULTS AND DISCUSSIONS

3.1 Status Quo of the Agro-processing Industry in Namibia

Domestic agro-processing: The survey identified 24 local active processors of fruits and vegetables. Fifteen (15) are based in Central, three (3) in Karst, another three (3) in the South, and one (1) in each of the Zambezi, Kavango, and North Central production zones. The products observed as domestically processed include tomato sauce, chilled baby potatoes, chilled vegetables (cut/sliced/diced), and fruit juice. Cut/sliced/diced vegetables are produced from cucurbits, onions, cabbage, carrots, spinach, and sweet potatoes, whereas the juice is produced from concentrate and pulp ingredients which are normally imported from South Africa.

Table 1 presents the processed local products, volumes, value per annum, and percentage share of total tonnage produced. The table shows that in 2022, Namibia processed a total volume of 7,731 tons per annum valued at N\$124,368,385.00.

Table 1: Fruit and vegetable products domestically processed in Namibia annually

Product	Tons	Value N\$	Percentage share of total tonnage
Tomato sauces	1691	67,640,000.00	21.87%
Chilled baby potatoes	3	44,200.00	0.04%
Chilled vegetables (cut, sliced, and diced)	195	3,900,000.00	2.52%
Fruit juice	5,842	52,784,185.00	75.57%
Total	7,731	124,368,385.00	100.00%

Source: Survey respondents

Imports and exports of processed fruits and vegetables: Four (4) main distributors of processed food into main food retail shops in Namibia were observed, of which three (3) of them are based in the Central production zone, and one (1) is based in South Africa (distributing directly to several retailers in Namibia, without a focal distributor in Namibia). The study observed that distributors mainly imported processed foodstuffs from South Africa and distributed them to retail shops in Namibia. The current study found that more than 54,570 tons of processed products from fruits and vegetables worth approximately N\$1.5 billion are imported into Namibia annually. These include tomato ketchup and tomato sauce, frozen potatoes, frozen vegetables, mixed vegetables, frozen spinach, frozen beans, frozen peas, other frozen leguminous vegetables, dried vegetables, spices, dried onions, processed

mushrooms, frozen fruits, nuts, frozen raspberries, blackberries, loganberries, black and white currants, gooseberries, frozen strawberries, dried fruits, jam/fruit jellies/marmalade/fruit and nut paste, fruit juice, tomato juice and virgin olive oil and olive oil residues. The tonnage, value, and percentage shares of these products are presented in Table 2.

Table 2: Fruit and vegetable processed products imported into Namibia annually

Agro-processed product	Tons	Value N\$	Percentage (%) share of total tonnage
Fruit juices	35,854	1,046,919,400.00	67.877
Tomato ketchup and tomato sauce	5,112	93,960,800.00	9.678
Spices	4,221	168,104,251.00	7.991
Frozen potatoes	1,892	31,169,400.00	3.582
Jams/ fruit jellies/marmalade/fruit and nut paste	1,748	4,330,600.00	3.309
Frozen mixed vegetables	1,193	29,336,200.00	2.259
frozen vegetables	752	17,322,800.00	1.424
Virgin olive oil and olive oil residues	753	16,983,486.00	1.426
Dried fruits	554	33,931,087.00	1.049
Frozen sweetcorn	221	3,478,200.00	0.418
Frozen beans	165	2,336,800.00	0.312
Frozen peas	107	1,558,200.00	0.203
Dried vegetables	93	2,661,200.00	0.176
Frozen spinach	48	905,200.00	0.091
Tomato juice	41	415,400.00	0.078
Other frozen leguminous vegetables	11	580,000.00	0.021
Dried onion	5	35,000.00	0.009
Processed mushrooms	2	46,800.00	0.004
Frozen fruits and nuts	24	847,800.00	0.045
Frozen berries other than strawberry	22	1,137,200.00	0.042
Frozen strawberries	4	81,400.00	0.008
Total	52,822	1,456,141,224.00	100%

Source: International Trade Centre (ITC) (2020), FAOSTATS (2021), Trend Economy (2021), OEC (2020)

On the other hand, Namibia exported/re-exported about 63 tons of products from processed fruits/vegetables annually, worth around N\$1.6 million. Horticulture-based processed products exported/re-exported by Namibia include tomato sauce, spices, dried fruits, Jam, and virgin olive oil. The tonnage, value, and percentage shares of these products are presented in Table 3.

Table 3: Fruit and vegetable processed products exported/re-exported by Namibia annually

Agro-processed product	Tons	Value N\$	Percentage share of total tonnage
Tomato sauce	15	324,750.00	24%
Spices	19	539,651.00	30%
Dried fruits	12	315,532.00	19%
Jams	3.6	39,000.00	6%
Virgin oil	13	400,085.00	21%
Total	63	1,619,018	100%

Discussion: Results show that Namibia's agro-processing industry is sluggish, given the small number of processors, few food types being processed, and minimal volumes of agro-processed products. Low agro-processing can be associated with Namibia's already low primary production of fruits and vegetables, which only stood at 35% during the 2018/19 production season (NAB, 2020). Moreover, 78% of the products processed domestically as shown in Table 1, use imported semi-finished products as the main ingredients. These include the juice manufactured using imported fruit pulps and juice concentrates and tomato sauce manufactured using imported tomato paste.

The fact that Namibia is very sluggish in horticulture-based agro-processing does not underscore the demand for its processed products. This is because the importation of fruit and vegetable processed products into Namibia is enormously high, hence there is an import substitution opportunity for Namibia. In correlation to low domestic processing, the exportation of processed fruits and vegetables is relatively very low.

The Agricultural Marketing Policy (2014) advocates for the adoption of market orientation as opposed to the production-orientated approach, whereby production is based on market needs, in contrast to engaging in marketing once there is a product in the market (MAWF, 2011). The export market also seems not to have been thoroughly explored to trigger domestic agro-processing for export purposes.

3.2 Supply Chain Drivers of Agro-processing in Namibia

Recurrent aspects of the supply chain that are critical to success in the agro-processing business were explored. After interviewing farmers, traders, and processors, the following aspects were observed as critical in the industry of processed fruits and vegetables: the nature of packaging and labelling, supply contracts and pricing, marketing and transportation, cold storage facilities, quality assurance, and human capacity. These aspects are presented in the following subsections.

Nature of packaging and labelling: A total of 83% of traders interviewed during the current study prefer to purchase in bulk the packaging instead of loose items, whereas packaged products should be labelled, branded, barcoded, and have an expiry date indication. It was further suggested that for farmers to be able to supply the manufacturing sector, it is important for them to thoroughly understand how raw materials are prepared, packaged, and transported, for example, tomato paste has to look and taste correct and the texture also needs to be correct, as one of the processors said.

Figure 1 illustrates selected fruit and vegetable processed products and the preferred nature of packaging in the market according to the interviewed processors and traders.

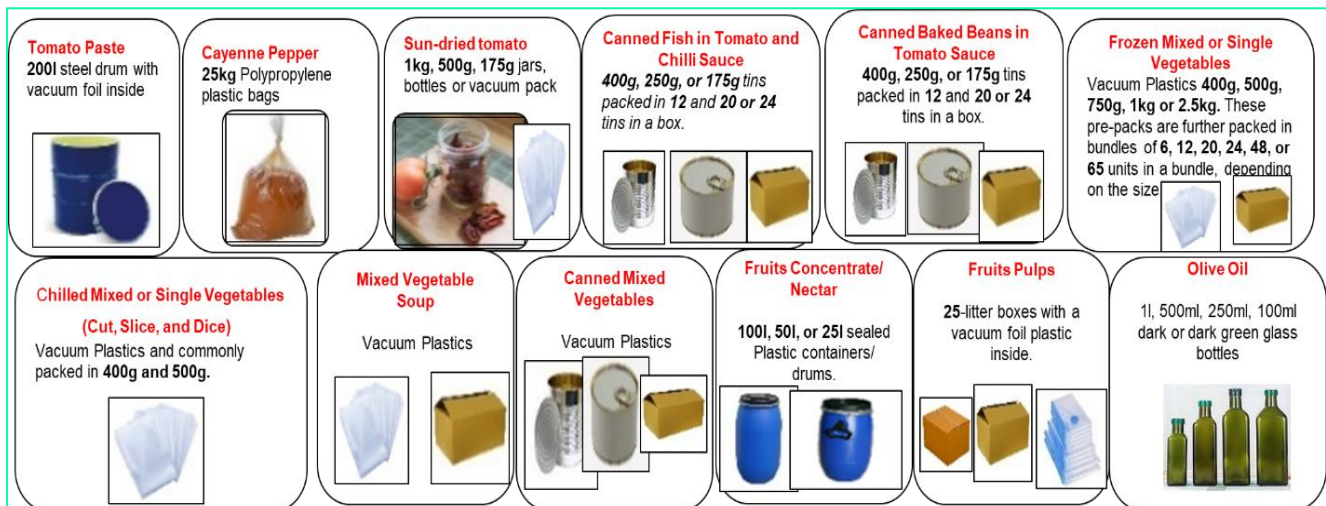


Figure 1: Selected agro-processing products and their expected nature of packaging

Supply contracts and pricing: Supply contracts and pricing approaches are among the supply chain aspects investigated during the study, as they may directly or indirectly influence the success of the business, especially the new entrants to the markets. As presented in figure 2, only 8% of the interviewed farmers have supply contracts with processors. This shows that the approach of signing supply contracts is not so well adapted in the agro-processing industries in Namibia.

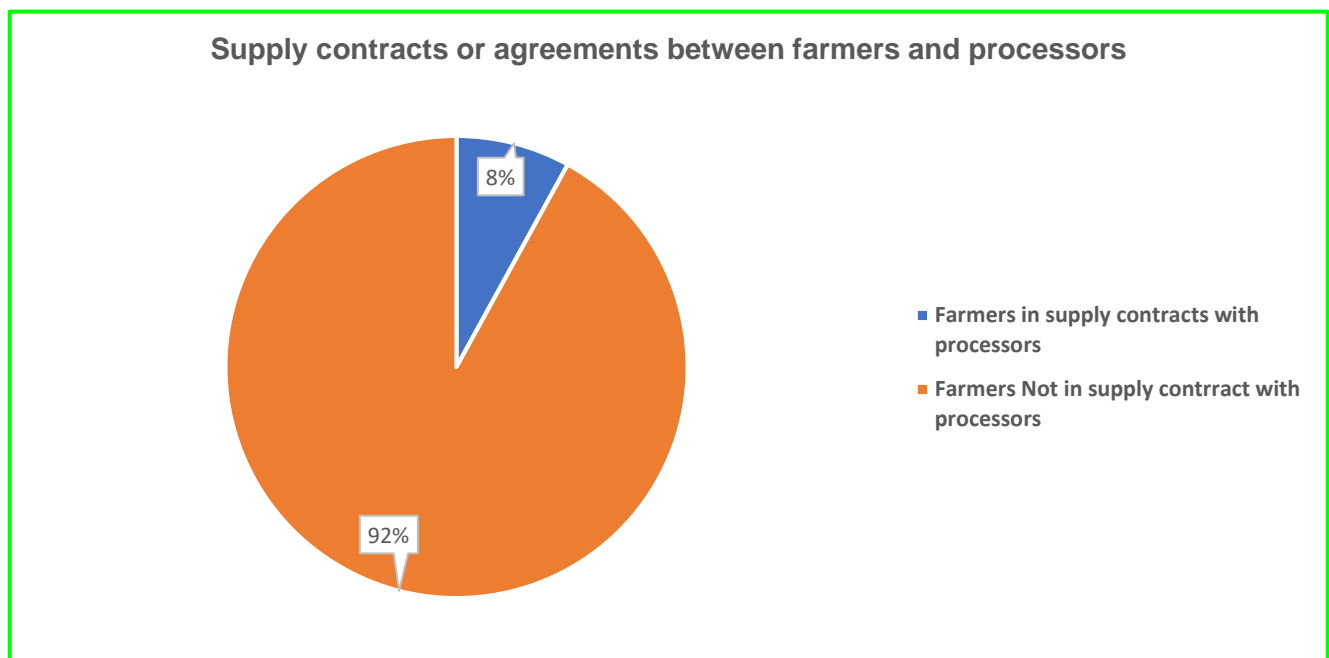


Figure 2: Percentage of respondent farmers regarding supply contracts

However, 75% of traders and 57% of processors indicated a willingness to enter into supply contracts with their suppliers, as presented in figure 3.

Willingness of traders and processors to enter into supply contracts



Figure 3: Percentage of respondent traders and processors regarding supply contracts

On a different note, price negotiation is the main approach that is used to set prices for processed fruit and vegetable products. Seventy-five per cent (75%) of interviewed traders voiced that local farmers can only supply the manufacturing sector if reasonable prices are charged. This is because there is weight reduction as well as labour, packaging, and storage costs involved in processing fruits and vegetables.

Marketing and transportation: The marketing and transportation of raw materials, as well as semi-finished and finished products also play a critical role in the success of the agro-processing business, be it at the farm, processing factory, or trading facility level. Exploring and approaching buyers or suppliers directly is the approach that is used by over 51% of industry members and there are no advertisements that are done. However, the majority of the traders and processors acknowledged having accessed their suppliers through government agencies such as the NAB and AMTA. The transportation of various agro-processing products or raw materials for processing may differ from those of raw fruits and vegetables and close to 90% of interviewed traders indicated preferring how each of the products should be transported.

Respondents to the survey indicated that products such as frozen vegetables should be transported in refrigerated vehicles at about -18°C to -20°C, and chilled vegetables (cut/sliced/diced) should also be transported in refrigerated vehicles but they should not exceed 15°C nor be below 0°C, whereas, fruit pulps should also be transported in refrigerated vehicles. It is therefore crucial for upcoming processors and suppliers of raw materials to contact their potential buyers for them to be able to make the correct decisions.

Cold storage facilities: Cold storage is essential, especially for heat-sensitive agro-processed products such as frozen vegetables, chilled (cut/sliced/diced) vegetables, fruit pulp, some juices, etc. As presented in figure 4, the study revealed that most of the farmers (63% of respondents) do not have cold storage facilities at their farms, and the 37% that have cold storage facilities are farmers that seasonally use such facilities for grape packaging and those that have pre-packing lines on farms. Hence it is critical for enterprises that intend to venture into the agro-processing business to consider the establishment of cold storage facilities to ensure the acceptability of their products by the markets.

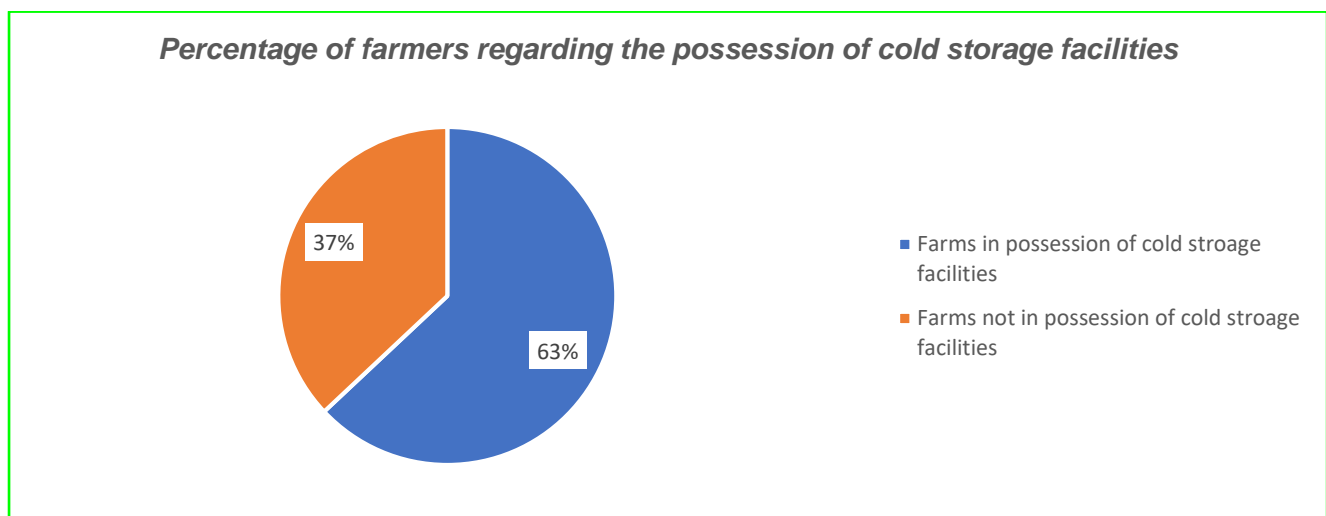


Figure 4: Percentage of respondent farmers regarding the possession of storage facilities

Quality assurance: Quality assurance is another supply chain aspect that the extension of an agro-processing industry may not be successful if it is not well propagated among the actors in the sector. As shown in Figure 5, traceability, good agricultural practices, quality systems, or good handling practices are the most critical certifications required by the interviewed processors when buying from suppliers of raw materials. The figure shows that quality assurance is more critical at the processing business level as traders do not demand so many certifications as processors do. However, the critical certifications required by traders when buying from processors are Good Handling Practice, HACCP, quality system, and traceability system, as also shown in Figure 5.

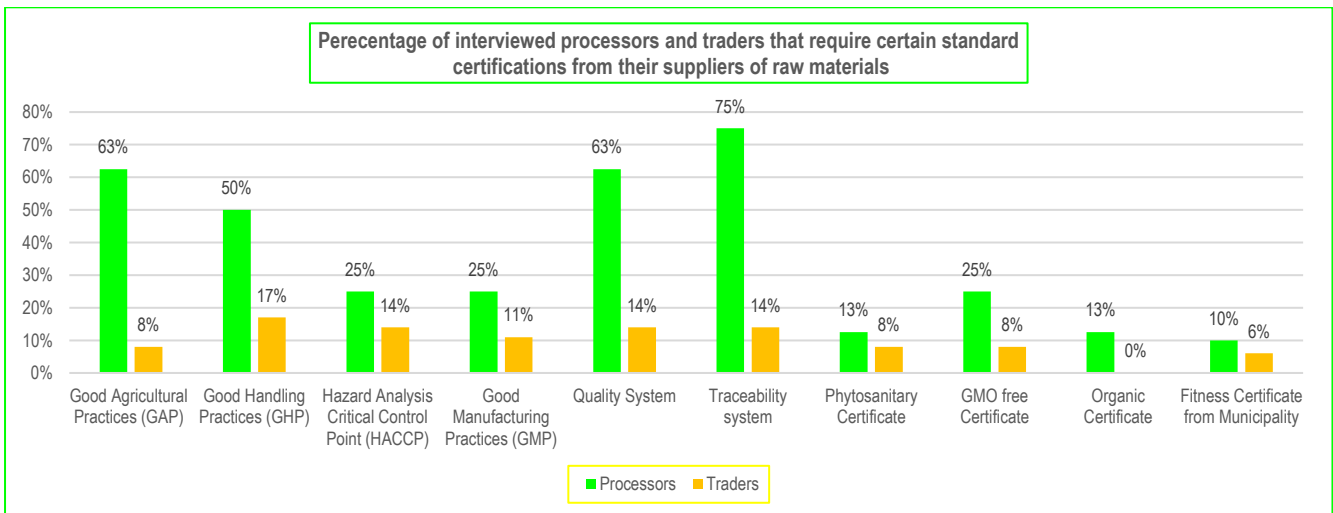


Figure 5: Percentage of responses on the types of certification required by buyers

Human capacity: The skills and intellectual capacity of those working in farms, facilities, and market outlets matter in quality assurance for processed food. Hence, industry actors were asked during the survey, to confirm whether or not their staff is trained on quality checks of agro-processing raw materials and products. Eighty-eight per cent (88%) of interviewed traders indicated that their staff is trained, whilst 100% of processors indicated that their staff is trained on quality checks of processed fruits and vegetables. However, only 52% of interviewed farmers indicated that they have trained their staff on quality standards.

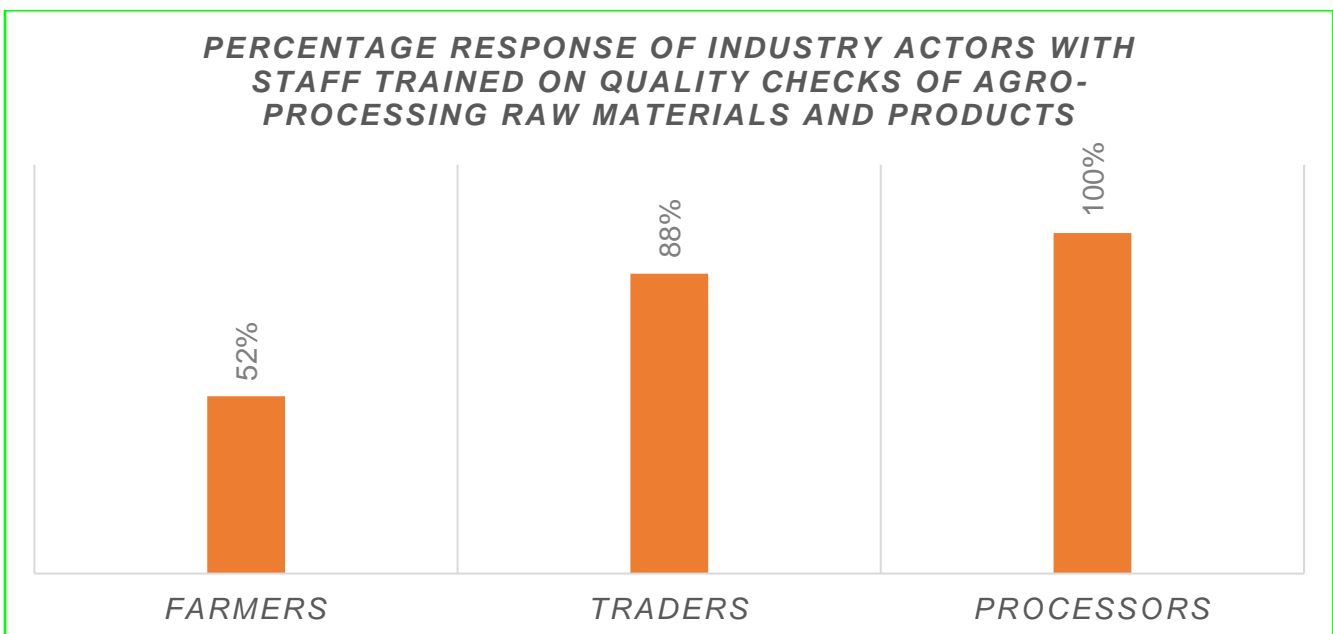


Figure 6: Percentage of industry actors found to have trained staff on food quality checks

Discussion: The results of the study show that not all industry actors are in fulfilment or possession of the crucial supply chain aspects as per the requirements of the Namibia Food Safety Policy (2014), as well as the requirements of other industry actors. Meeting all the critical supply chain aspects provides scientifically proven food safety guarantees (Namibia Food Safety Policy, 2014). Several critical supply chain aspects as adopted from the Namibian Food Safety Policy (2014) were also mentioned by the study respondents. Such aspects include the nature of packaging and labelling, supply contracts and pricing, marketing and transportation, cold storage facilities, quality assurance, and human capacity.

These aspects are pivotal to the success of any business in the agro-processing sector or its failure if they are ignored, hence the significance of fulfilling and/or being in possession of such aspects. Helping farmers to get GAP (Good Agricultural Practice) certifications may unlock the potential to access export markets.

3.3 Opportunities and Constraints in Namibia's Agro-processing Sector

Opportunities: Based on the study responses, non-sophisticated agro-processed products such as fruit juice, frozen vegetables (including frozen potato chips), pumpkin jam, butternut puree, chilled vegetables (cut/sliced/diced), tomato paste and dried vegetables (sun-dried tomatoes and cayenne pepper powder) are products perceived to have a high potential for processing in Namibia. Fruit and vegetable canning, fruit juice, and fruit pulps were other potential products mentioned by various processors and traders, but they may require sophisticated technology.

Bottlenecks: According to various farmers, traders, and processors interviewed, the sluggish growth of the fruit and vegetable processing sector is observed to be attributed to challenges such as high prices and costs of transport (storage, labour and certification), lack of guaranteed market opportunities, lack of skills, information, infrastructures and machinery, and poor planning and supply chain coordination, as well as diseconomies of scale, inconsistency, and the nation's competitiveness in the fruits and vegetables industry.

Discussion: Statistics provided evidence that Namibia as a nation is not only faced with the opportunity to increase the primary production of fruits and vegetables but also processing and diversifying into growing rare commodities such as fruits. Namibia without delay should scale up venturing into the processing of non-sophisticated products from fruits and vegetables such as fruit juice, fruit pulp, frozen vegetables, frozen fruits, pumpkin jam, butternut puree, chilled vegetables (cut, diced, and sliced), tomato paste, tomato sauce, olive oil, dried fruits and dried vegetables (sun-dried tomatoes, cayenne pepper powder, and vegetable soup). These would trigger the introduction of import substitution strategies such as market share promotion schemes (MSP) and Special controlled products (SCP).

Other considerable products in the near future would be canned fruits and vegetables, dry chips, biscuits, spices, colourants, flavourants etc.

Despite the opportunities and suggestions discussed above, results indicated potential bottlenecks that could disrupt the efforts of capitalising on the fruits and vegetables processing opportunities. Potential investors should, therefore, be prepared to develop mitigating and coping strategies for the identified challenges that are currently perceived as limiting the growth of the fruits and vegetables processing sector. These challenges include high prices and costs (of transport, storage, labour, and certification), lack of guaranteed market opportunities, lack of skills, information, and infrastructures and machinery, poor planning and supply chain coordination as well as diseconomies of scale, inconsistency in supply, and the nation's poor competitiveness. The success of Namibia's agro-processing dream requires efforts and collaborations among all industry stakeholders for this to succeed.

5. CONCLUSION AND RECOMMENDATIONS

Owing to the challenges and weaknesses of Namibia's fruits and vegetables industry highlighted in this article, statistics have shown that Namibia's agro-processing sector is undeveloped but it has enormous potential to grow. Statistics such as high importation of agro-processed basic food, low exportation of agro-processed foods, and low domestic processing of horticultural produce have proven the point of poor competitiveness that Namibia as a nation suffers from.

The baseline information provided in this article may, therefore, trigger potential investors and policymakers to stimulate the growth of agro-processing within the horticulture sector in Namibia. If all of the critical supply chain aspects are not met by all levels of the value chain members, risks of industry failure are likely to occur. However, through collaborations among value chain actors, the industry's competitiveness may become a reality. Value chain actors that may collaborate, include farmers, processors, traders, distributors, policymakers, regulators, financiers, and other development agents.

Therefore, to stimulate the agro-processing of fruits and vegetables, we recommend the following specific interventions:

- a) All interested parties (stakeholders) need to invest in capacity-building programmes that are focussed on farmers and other interested parties in the agro-processing of fruits and vegetables.
- b) The main actors in the horticulture agro-processing sector should be represented at NAB platforms, for the smooth facilitation, control, and development of the sector.
- c) The NAB needs to establish an agro-processing information database that is accessible to all interested parties.

- d) The NAB, in conjunction with other interested ministries and agencies, should work towards promoting investment in the agro-processing of fruits and vegetables in Namibia, including access to agro-processing technology.
- e) Financial institutions should introduce an affordable agro-processing financial product.
- f) The NAB needs to include strategies that will stimulate agro-processing in Namibia into its 5-year crop value chain strategy that is being developed.

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