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NAMIBIAN AGRONOMIC BOARD

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AGRONOMY AND HORTICULTURE MARKET DEVELOPMENT DIVISION

RESEARCH AND POLICY DEVELOPMENT SUBDIVISION

AN ANALYSIS OF NAMIBIA'S POTENTIAL FOR HORTICULTURE AGRO-PROCESSING

December 2021

NAMIBIAN AGRONOMIC BOARD

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EXECUTIVE SUMMARY

The study aimed to examine the extent of horticulture-based agro-processing in Namibia, explore opportunities and identify bottlenecks in Namibia's horticulture-based agro-processing sector and make recommendations on what should be done to stimulate agro-processing in Namibia. The study surveyed 54 industry players comprising eight processors, 21 traders (retailers and distributors) of main horticultural agro-processing products traded in Namibia, and 25 farmers from various horticultural production zones in Namibia. Qualitative and quantitative methods were used to collect primary and secondary data through face-to-face interviews using structured questionnaires and statistics hubs reviews. Collected data were analysed using descriptive statistics and thematic analysis, with an aid of online data analysis tool (QuestionPro) and Microsoft excel.

Results show that over ***9 000 tons of agro-processed products worth approximately N$162 million*** *are produced by Namibia annually, namely tomato sauce, chilled vegetables (cut, sliced, and diced), and juice (excluding exports). Namibia imports an annual average of* ***54 570 tons of agro-processed products at an estimated average value of over N$1.5 billion****, mainly; juice, frozen vegetables, frozen potato chips, jams, olive oil, spices and other forms of dried vegetables. South Africa accounts for over 97% of most of the agro-processed products imported by Namibia. Namibia only exports an aggregated 63 tons of tomato sauce, olive oil, and spices worth about N$ 1.6 million on average per annum. The study further revealed that actors in the agro-processing sector are not fully aware or in possession of all supply chain aspects that are critical to success in the agro-processing sector. These supply chain aspects are mainly the nature of packaging and labelling, supply contracts and pricing, marketing and transportation, cold storage facilities, quality assurance, and human capacity. Moreover, fruit juice, fruit pulp, frozen vegetables, pumpkin jam, purees, chilled vegetables (cut & dice, spices), tomato paste, tomato sauce, olive oil, spices, and other forms of dried vegetables are currently imported into Namibia, which presents an opportunity for investors who want to venture into agro-processing in Namibia.*

The study also identified the high prices and costs of transport, storage, certification, labour, and importing packaging materials, lack of skills, market opportunities, information, infrastructure and machinery, poor planning and supply chain coordination, diseconomies of scale and inconsistency, and South Africa's competitiveness, as the major perceived bottlenecks limiting the growth of Namibia's agro-processing sector. Economies of scale, diversified vegetables, increased fruit production, value chain agreements, active associations, access to information, branding, consumer education, and processing facilities are perceived as stimulants in the growth of Namibia's agro-processing sector. Thus, the study recommends NAB to register the processors and distributors of agro-processed products, for inclusivity, and a national development agenda/strategy for the agro-processing sector to propel and attract investment is critically required.

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

Due to low primary production, Namibia remains a net importer of processed horticultural products. It has been noticed by the Namibian Agronomic Board (NAB) that Namibia imported over N$1 billion worth of processed horticultural products in 2020. However, there has been no data regarding the extent of horticulture agro-processing in the country and also regarding the specific lines being imported into Namibia. Therefore, NAB has commissioned this in-house study to analyse the extent of horticulture agro-processing in Namibia and the imports thereof. This data is key in attracting investment in the horticulture agro-processing sector in Namibia while ensuring that there are policies to encourage horticulture agro-processing in the country.

Agro-processing refers to the subset of manufacturing that processes raw materials and intermediate products derived from the agricultural sector (FAO, 1997). Nonetheless, this study focused on products that are derived from fruits and vegetables and traded in/or by Namibia. Specific companies and several horticulture-based agro-processors, types, and estimated volumes and values of products are established, hence the extent of agro-processing. The perceptions of farmers, processors, and traders on the opportunities and bottlenecks in Namibia's agro-processing sector are also explained, whilst exploring what should be done to stimulate agro-processing in the country. A survey research approach was used, whereby 54 industry actors were interviewed face to face through the use of a structured questionnaire.

The tentative list of companies identified as involved in agro-processing is provided in this report, as well as the products that are produced domestically, exported, and imported relative to volumes, values, and countries involved. The products that are in Namibia and have the potential for agro-processing include tomato paste, tomato sauce, various types of frozen vegetables, chilled vegetables (cut, sliced, and diced), fruit juice, pumpkins, jam, and dried vegetables such as black carrot, cayenne pepper powder, dried onion, and soup. Namibia is not so well advanced with regards to exporting agro-processed products that are derived from fruits and vegetables, except for asparagus (canned and bottled) and black carrot (dried), which are exported to Europe. Some of the targeted survey respondents were not so open to disclosing their trade information, hence full information on the volumes and value of different agro-processed products imported and exported was established using data from the International Trade Centre statistics.

Challenges and opportunities perceived by respondents (farmers, agro-processors and traders) are provided in this report, with most of the challenges being but not limited to transport and storage costs, lack of market opportunities, certification costs, lack of skills and information, poor planning, high price and cost of importing packaging materials, lack of infrastructure and machinery, labour costs, poor supply chain coordination, diseconomies of scale and inconsistency, and South Africa's

competitiveness. The opinions of study respondents on how to stimulate agro-processing in Namibia are narrated and ultimately, conclusions and recommendations are presented.

2. PROBLEM STATEMENT

Despite government efforts to increase market access for locally produced fresh fruits and vegetables through the introduction of the MSP (Market Share Promotion) and SCP (Special Controlled Products) schemes via the NAB, these mechanisms are currently limited to primary production. There is a lack of information on the agro-processing of horticultural commodities in Namibia, thus making it difficult to attract investment and develop policies that can drive the sector's growth. This exploratory study provides horticulture agro-processing baseline information for a better understanding that can assist potential investors and policymakers in stimulating horticultural agro-processing in Namibia.

3. OBJECTIVES

- ✓ Examine the extent of horticulture-based agro-processing in Namibia
- ✓ Explore opportunities and identify bottlenecks in Namibia's horticulture agro-processing sector
- ✓ Make recommendations on what should be done to stimulate agro-processing in Namibia

4. SIGNIFICANCE OF THE STUDY

It is anticipated that the outcome of this study will establish a tentative list of processors of horticultural commodities, agro-processing products, and estimate volumes and values, whilst explaining the prevailing bottlenecks and opportunities as perceived by active and key actors in the horticultural agro-processing sector. The study makes practical recommendations on how best horticulture-based agro-processing in Namibia may be stimulated. This information is useful to stakeholders in the sector, such as investors, lawmakers, raw material suppliers, agro-processors, and traders at both domestic and international levels.

5. RESEARCH METHODOLOGY

5.1 STUDY DESIGN AND LOCATION

This exploratory research used both qualitative and quantitative methods to collect primary data and secondary data. Primary data were collected through a survey (face-to-face interviews) using a structured questionnaire, with both closed and open-ended questions. The telephone interviews approach was also adopted to make follow-up questions with the respondents and mostly to trace the operational status of identified horticulture-based processors. A review of secondary data from internet-based sources was useful to support the primary data obtained from the field survey. Collected data were analysed using descriptive statistics and thematic analysis and with the aid of online data analysis

tools and Microsoft Excel. The study was conducted in Namibia, in all seven horticultural production zones, namely, Central, Karst, Kavango, North Central, Far-south Orange River, South-central, and the Zambezi.

5.2 POPULATION AND SAMPLING STRATEGY

There are about 439 registered horticulture-based and active farmers in Namibia, situated in seven different horticultural production zones, namely, Central, Karst, North Central, Kavango, Zambezi, South-central, and Far-south Orange River production zones. In addition, there are about 80 companies that are registered as traders of fruits and vegetables in Namibia, including distributors of frozen fruits and vegetables. The number of horticulture-based processors in Namibia was not known to the current research team, as this has to be established through referrals during the research process. According to Table one below, the research sample, therefore, encompassed 54 active stakeholders in Namibia's horticulture sector and this consists of 25 farmers, 21 traders, and eight processors of horticultural produce. The categories for farmers and traders, gender, age groups, and positions of the respondents

Table 1: Composition of the study sample for the field survey

Respondent Groups	Number of Respondents	Category	Gender		Age Group of Respondents					*Position of the respondent in the business*
			Male	Female	Below 30	30 to 39	40 to 49	50 to 59	Above 60	
Farmers	25	*12 small scale* *9 medium scale* *4 large scale*	22	3	0%	32 %	24%	28%	16%	*5 farm managers / Directors and 20 farm owners*
Processors	8	*N/A*	8	0	0%	13 %	38%	38%	13%	*2 general managers, 2 production managers, 1 procurement officer, plus 3 factory owners*
Traders	21	*14 Retailers* *6 Distributors* *1 Caterer*	15	6	24%	24 %	33%	19%	0%	*1o, 5 buyers, 9 managers, 1 general manager, and 5 CEOs/ MDs*
Totals	54		45	9						

within the business are also indicated in Table one. Furthermore, figure one above illustrates the seven horticultural production zones in Namibia, as well as the number of producers, processors, and traders sampled and interviewed from each production zone.

Figure 1: Number of survey respondents sampled from each of the production zones

5.2 DATA COLLECTION AND ANALYSIS

Through the use of structured questionnaires, some oral interviews about the extent of agro-processing were conducted. The extent of agro-processing was investigated in terms of identifying the agro-processors and the main agro-processing products, analysing the trade statistics of agro-processed products, as well as investigating the supply chain aspects that may drive agro-processing. The supply chain aspects that are investigated as propellers of the agro-processing sector included but were not limited to, the nature of packaging and labelling, marketing and transportation, cold storage, quality assurance, and human resources capacity. Last but not least, opportunities, challenges, and suggestions for stimulating agro-processing in Namibia were brainstormed by the survey respondents – farmers, processors, and traders.

A field trip to different areas where horticultural produce is produced, processed, distributed, and traded was undertaken to conduct interviews and observations. This was in addition to telephone calls that were used to gather quantitative and qualitative data for analysis and report writing. An online software (QuestionPro), as well as Microsoft Excel and Microsoft Word were useful to analyse and organise the data. The entire research data collection process is illustrated in Figure two hereunder.

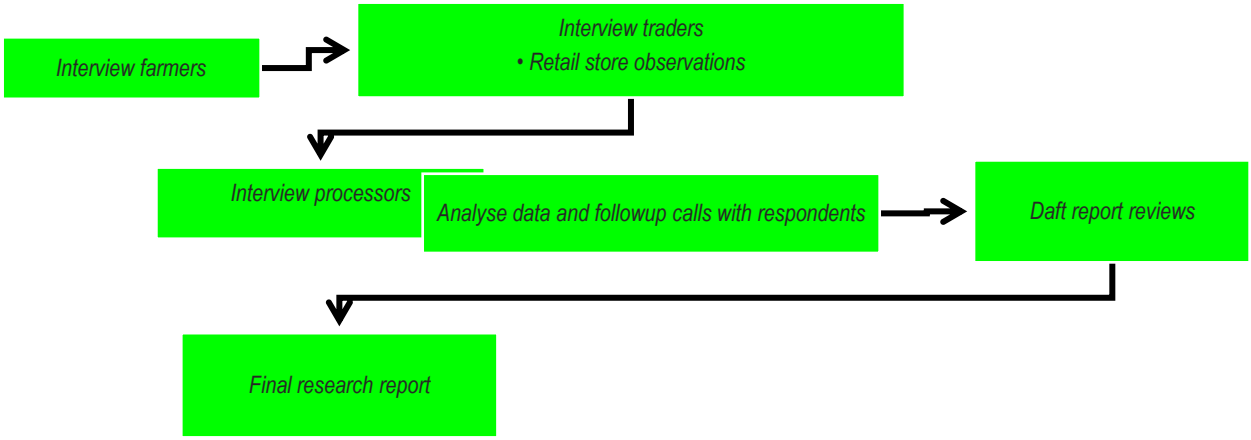


Figure 2: *Field data collection process*

Figure two presents the steps that were taken during the field data collection process. Farmers (25) were interviewed face to face, as well as 21 traders. During traders' interviews, retail shops were observed to identify the agro-processed products that were found on the shelves and trace the suppliers where necessary. Based on referrals by farmers and traders, eight (8) processors were interviewed. Post-field data collection follow-ups, where necessary, were done via telephone, to get more clarifications and contacting processors and traders that were not part of the field data collection sample. Reviews of the draft report were done before finalising the research report.

6. RESULTS AND DISCUSSIONS

This section (6) reports on the overall results obtained by the study to reveal the extent of agro-processing in Namibia and the supply chain aspects that may propel the extent of agro-processing.

6.1 THE EXTENT OF AGRO-PROCESSING IN NAMIBIA

This subsection (6.1) of the report provides research findings on the extent of agro-processing in Namibia. Information such as the identified processors and distributors; the names, status, and volumes of product lines being processed, consumed, imported, and exported are well explained.

6.1.1 Processors and Distributors of Horticultural Produce in Namibia

Some of the agro-processors of fruits and vegetables in Namibia were identified by asking farmers and traders. Only 36% of respondent farmers are aware of some processors in Namibia, whereas, 64% of respondent farmers did not know of any processors of horticultural produce. Seventy-four percent of respondent traders mentioned the processors and distributors of various horticulture-based agro-

processing products. The survey established a tentative list of 24 local processors of horticultural produce.

Table 2: Processors of fruits and vegetables in Namibia (those mentioned during the current study)

No	List of Processors of Fruits And/or Vegetables in Namibia, Products, Town, and Contact Nos. as Mentioned by Study Respondents				
	Company	**Raw materials used**	**Product/s**	**Town**	**Contact No.**
1	Cater Serve Namibia	Tomato paste	Tomato sauce	Windhoek	061227085
2	Elslo	Lemon juice	Dishwashing liquid/ Soap	Windhoek	061382250
3	Namibia Fresh Produce	Cucurbits, root and leafy vegetables	Chilled vegetables (cut, sliced, and diced)	Windhoek	0811440577
4	Etosha Fishing Company	Tomato paste & cayenne pepper powder	Tomato sauce added to fish and beans canning	Walvisbay	064215626
5	Namibia Dairies	Concentrate juice and pulps	Juice (Mango, Guava & Citrus)	Windhoek	061255351
6	Namfoods	Cucurbits, root and leafy vegetables	Chilled vegetables (Cut, Sliced, and Diced)	Tsumeb	0813381683
7	Stampriet Farmers Market	Cucurbits, root and leafy vegetables	Cut vegetables	Windhoek	061245352
8	Agri Chef	Green pepper	Green pepper chutney	Rundu	0812137159
9	Fresh Wise Trading	Cucurbits, root and leafy vegetables	Chilled vegetables (Cut, sliced, and Diced)	Windhoek	061226206
10	Karas Fruit and Veg	Cucurbits, root and leafy vegetables	Chilled vegetables (Cut, Sliced, and Diced)	Keetmanshoop	063225436
11	Coca Cola	Concentrate juice and pulps	Minute maid juice	Windhoek	0613207000
12	Namibia Breweries	Concentrate juice and pulps	Fruit tree juice	Windhoek	0613204202
13	Avagro	Cucurbits, root and leafy vegetables	Chilled vegetables (Cut, Sliced, and Diced)	Swakopmund	Not obtained
14	Lins Vegetables	Cucurbits, root and leafy vegetables	Chilled vegetables (Cut, Sliced, and Diced)	Windhoek	0812701011
15	Agricon Mushrooms	Mushroom	Chilled mushroom (Cut, Sliced)	Okahandja	061225100
16	Go Fresh	Cucurbits, root and leafy vegetables	Chilled vegetables (Cut, Sliced, and Diced)	Swakopmund	064402581
17	CJT	Tomatoes	Sun-dried Tomatoes (Small scale)	Tsumeb	0811299884
18	Interpack	Concentrate Juice	Juice	Windhoek	061236700
19	Klein Aus Vista	Concentrate Juice	Bottled juice nectar	Aus	063258021
20	University of Namibia	Mango	Pulverized mango pulp for juice	Zambezi/ Neudamn	061307013
21	OG Fresh Produce/ Omru Greens	Tomatoes	Tomato sauce and sun-dried tomatoes (Small scale)	Omaruru	064570078
22	NG O' Kennedy Family Trust	Butternuts	Chilled butternuts (Cut, Sliced, and Diced)	Stampriet	063260155
23	Nyango Vegetable	Cabbage, spinach & beetroots	Dried (pre-cooked) cabbage, spinach, and beetroot	Outapi	0812584584
24	Alimentarias de Navarra	Asparagus	Canned and bottled asparagus	Ruacana	0813585865

Table two presents a tentative list of companies or persons mentioned as being processors of horticultural produce in Namibia. The details of the 24 processors, that is, the raw materials they use, the end product, the place where they are located, and contact numbers are provided in the table. Among the 24 identified processors, five (5) are processing vegetables at the farm level and on a small scale. These are mostly dried and pre-cooked vegetables, such as sun-dried tomatoes, dried (pre-cooked) spinach, dried (pre-cooked) cabbage, and dried (pre-cooked) beetroot leaves. The main distributors (importers) of agro-processed products were also mentioned by traders.

Table 3: Some of the importers (distributors) of processed horticultural products in Namibia (identified during the current study)

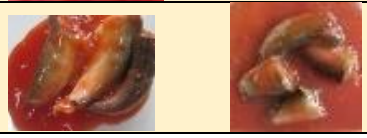
No	List of Companies Importing Agro-Processed Products from Fruits and/or Vegetables as Mentioned by Traders			
	Company	**Product/s**	**Town**	**Telephone**
1	Sea pride	Frozen: Chips and mixed vegetables	Windhoek	061415050
2	Vector	Frozen: Chips, baby carrots, mixed vegetables, sliced sweet potato, crushed garlic, crushed garlic and ginger	Windhoek	061267400
3	CIC Into Atlantic	Tinned/canned vegetables, jams and Simba chips	Windhoek	0612855800
4	Spar Distribution Centre	Frozen chips, mixed vegetables and canned vegetables	South Africa	No obtained

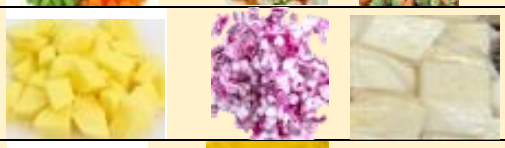
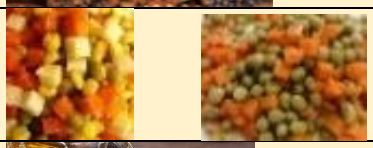
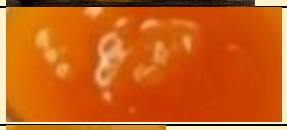
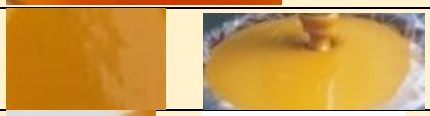
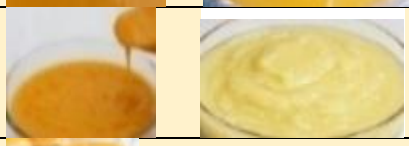
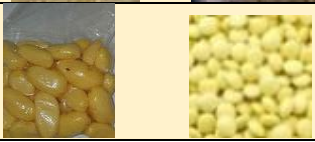
Table three presents the names of companies mentioned as venturing into distribution services of imported horticulture-based agro-processing products to retail shops and catering companies in Namibia. There might be more companies processing or distributing agro-processed products but not mentioned by the survey respondents.

6.1.2 Main Products, Processing, and Trading Status

This sub-section of the report presents the current extent of agro-processing products in Namibia, mainly based on current consumption. “Consumption is the sole and end purpose of production” (Smith, 1776). Hence, through the field survey, numerous products were identified as being traded and consumed in Namibia, either through domestic production or importation. Some products are finished, whereas others are semi-finished.

Table 4: Horticulture-based agro-processed products that are mostly traded in Namibia, whether imported or domestically produced

Product and Processing and Trading Status	Finishing Stage of the Product	Pictures of the Product
Tomato paste: *Imported*	*Semi-finished*	
Cayenne pepper: *Imported*	*Semi-finished*	
Sun-dried tomato: *Domestically processed but on small scales*	*Semi-finished*	
Tomato sauce: *Some are imported, whereas, others are domestically processed but using imported tomato paste*	*Finished*	
Tomato and chilli sauce canned with fish: *Domestically processed but using imported tomato paste and cayenne pepper*	*Finished*	

Tomato sauce canned with baked beans: *Domestically processed but using imported tomato sauce and cayenne pepper.*	*Finished*	
Frozen vegetables (mixtures or single): *Imported*	*Semi-finished*	
Chilled vegetables (mixtures or single): *Cut, sliced, and diced; mixtures or single vegetables*	*Semi-finished*	
Vegetable soup: *Imported*	*Finished*	
Spices: *Imported*	*Finished*	
Canned and bottled fruits and vegetables: *Imported*	*Finished*	
Virgin olive oil and olive oil residues: *Imported*	*Finished*	
Pumpkins and butternut jam or puree: *Imported*	*Finished*	
Fruits concentrate/ nectar: *Imported*	*Semi-finished*	
Fruits pulps: *Imported, whereas, others are domestically processed.*	*Semi-finished*	
Fruits juice: *Most are imported, whereas, others are domestically processed but on a very small scale.*	*Finished*	
Frozen chips: *Imported*	*Semi-finished*	
Peeled baby potatoes: *Domestically processed but on small scales*	*Semi-finished*	

6.1.3 Trade Statistics for Main Agro-Processing Products in Namibia

This sub-section presents tonnages and values of agro-processed products that are produced, exported, and imported by Namibia. Production and export data were obtained from survey respondents

(farmers, processors, and traders). The import and some of the export data were initially planned to be obtained from survey respondents as well. However, some of the targeted respondents were not open to disclosing full information as they regard it as their trade secrets. Some of the targeted processors, for instance, indirectly declined to respond to the survey. Therefore, some of the import and export data were instead obtained from the International Trade Centre (ITC) data hub and, the Food and Agriculture Organisation (FAO) statistics hub. Most of the trade statistics are outlined in the following two tables with explanations thereafter.

Table 5: Summary of domestic production and export of agro-processed products in Namibia

HS	Product Group Description According to the International Trade Centre	Raw Materials	Domestic Production				Exports			
			Products	Disclosed Tons: Produced Annually	Total Value N$	Product Value per Ton N$	Destination Country	Tons Exported	Export Value N$	Export Value per Ton N$
2103200	Tomato ketchup and other tomato sauces	Tomato paste: About 1300 tons are imported annually	Tomato sauce	1691	67,640,000	40,000	Angola	3	120,000	40,000
		Cayenne pepper: About 15 tons are imported annually	Tomato and chilli sauce with fish	Not disclosed	N/A					
7101000	Potatoes, uncooked or cooked by steaming, or by boiling water, Frozen: *But chilled in this case*	Baby potatoes	Baby potatoes peeled	2.6	44,200	17,000	*No exports*			
7108000	Vegetables, uncooked or cooked by steaming or by boiling water Frozen. But chilled in this case: Cut, sliced, diced	Butternuts	Butternuts	28.16	561,623	19,944	*No exports*			
		Pumpkins	Pumpkins	27.51	586,266	21,311	*No exports*			
		Carrots	Carrot	7.8	82,196	10,538	*No exports*			
		Cabbage	Cabbage	59.8	797,313	13,333	*No exports*			
		Onions	Onion	2.86	38,132	13,333	*No exports*			
		Sweet potatoes	Sweet potato	7.8	195,000	25,000	*No exports*			
		Lettuce	Lettuce	0.78	11,700	15,000	*No exports*			
		Mushrooms	Mushroom		-	71,120				
		English cucumber	English cucumber	3.38	45,066	13,333	*No exports*			
7109000	A mixture of vegetables, uncooked or cooked by steaming, or by boiling water, frozen (excluding potatoes, spinach and sweetcorn). *But chilled in this case*	Carrots, butternuts, pumpkins, onions, English cucumber, sweet potato, cabbage, etc.	Mixed vegetables (cut, sliced, or diced)	3.12	63,005.28	20,194				
7103000	Spinach, uncooked or cooked by steaming, or by boiling water, Frozen. *But chilled in this case*	Spinach	Spinach chopped	42.9	1,201,200	28,000				
7102202	Beans, uncooked or cooked in steaming, or boiling water, Frozen. *But chilled in this case*	Green Beans	Cut green beans	7.8	234,000	30,000				

7129 0	Dried vegetables and mixtures of the vegetable whole, cut, sliced, broken, or in powder but not further prepared (excl. dried onion & dried mushroom)	Spinach and mutete	Dried spinach							
		Beetroot	Beetroot leaves							
2009	Fruit juice, incl. grape must, and vegetable juice, unfermented, not containing added spirit	Juice Concentrates/ Nectar (1191 m3) imported	Juice/ nectar (m3)	5,556	52,784,185	9,500				
		Pulps =286.2 tons imported	Juice and yoghurt	286.2						
TOTAL				**9 841**	**162,868,585**			**3**	**120,000**	

Source: *Current study survey respondents*

Table five presents the products that were identified as agro-processed products produced in Namibia and traded in the domestic market or exported. Domestically produced products identified through the current study include but are not limited to, tomato sauce, tomato and chilli sauce added to fish for canning, chilled vegetables (cut, diced, or sliced) that are chilled at above 0Ċ but not more than 8Ċ temperature, dried vegetables, and fruit juice. The most likely HS (Homogenized System) codes and descriptions of product groups under which agro-processed products may fall are indicated in the table, as obtained from the International Trade Centre statistics hub. Tomato sauce is made with over 1,300 tons of imported tomato paste and over 15 tons of imported cayenne pepper powder per annum, according to one of the processors who responded to the survey. The value of the produced tomato sauce including those that went to the fish canning industry is estimated to be nearly N$68 million. Out of 1,691 tons of tomato sauce produced, only 3 tons were disclosed as being exported to Angola in 2021. However, the International Trade Centre statistics hub shows an annual average of 15 tons of tomato sauce exported mainly to Angola, Botswana, and South Africa, and this could be imported bulk tomato sauce packaged in Namibia and exported to other countries.

Various vegetables such as cucurbits (butternuts, pumpkins, and English cucumber), leafy vegetables (cabbage, lettuce, and spinach), onions, carrots, sweet potatoes, and baby potatoes are indicated to be processed as cut, sliced, and diced, and sold as chilled vegetables to the domestic market only. About 195 tons of chilled vegetables (cut, sliced, and diced) were disclosed as being supplied to the local retail shops. The total value of these products is about N$3.9 million. However, this amount could double as one of the main suppliers did not disclose the quantities produced.

Table five further presents dried vegetables as being among the agro-processed products produced by Namibia. Sun-dried tomatoes, dried spinach (pre-cooked), dried mutete (pre-cooked), dried cabbage (pre-cooked), and dried beetroot leaves (pre-cooked) are the products that were mentioned as being processed as dried vegetables, mainly by small-scale farmers. A mere 15% of interviewed farmers indicated that they do on-farm value editions and these are mainly pre-cooked and dried vegetables in minimal quantities. However, dried vegetable processing has no relative volumes and values, as small-

scale producers hardly keep records. Only one farmer indicated that he cuts, slices, and dices vegetables on a small scale. Moreover, about three farmers indicated that they are planning to venture into agro-processing soon. One of them is planning to go for orange juice manufacturing, while the other two farmers are planning to cut, slice and dice. The main reason for farmers intending to process is to get a market for 2nd-grade products, value addition, and market demand.

As further presented in Table five, fruit juice is produced in large volumes within Namibia using imported semi-processed products such as juice concentrates and fruit pulps. According to the information that was collected from respondent processors, an amount of 5,556 litres of juice are produced per annum, with a total estimated value of N$52.7 million. This figure does not include yoghurt and other products that are made out of fruit pulps, as the processors revealed that they import over 286 tons of juice pulp per annum, but the volumes and values of finished products were not disclosed. These figures also exclude one of the juice processors in Namibia who declined the interviews. In total, over 9,000 tons of agro-processed products are produced in Namibia on an annual basis, with an estimated value of more than N$162 million and these figures could be more, as some of the processors were not available for interviews and/or they were not open to disclose their trading data. It is also not clear from FAO statistics whether some of the spices and olive oil exported by Namibia were produced by Namibia or were re-exports, hence they were not included in Table five, but rather they are presented in Table six only.

Table 6: Summary of the import and export of agro-processed products by Namibia (averages for the 2016 to 2020 calendar years)

HS	Product Group Description According to the International Trade Centre	Imports: An Average of 5 years (2016 -2020)				Exports: An Average of 5 years (2016 - 2020)			
		Supplying Country	Tons Imported	Import Value N$	Import Value per Ton N$	Destination Country	Tons Exported	Export Value N$	Export Value per Ton N$
210320	**Tomato** ketchup and other tomato sauces	South Africa 99% and others; China, Zimbabwe (2020 only), Zambia, Italy, Germany, Austria (2020 only) and others (Eswatini, USA, Spain, Egypt, Botswana, Angola)	5112	93,960,800	18,380	Angola (98%), Bermuda, Botswana and South Africa in 2017 only, and others; Spain and China	15	324,750	21,650
7101000	**Potatoes,** uncooked or cooked by steaming, or by boiling using water, **frozen**	South Africa	1892	31,169,400	16,474				
71080	**Vegetables,** uncooked or cooked by steaming, or by boiling using water, **frozen**	South Africa	751.6	17,322,800	23,048				
71040	**Sweetcorn,** uncooked or cooked by steaming, or by boiling using water, **frozen**	South Africa	221.2	3,478,200	15,724				
71090	**A mixture of vegetables,** uncooked or cooked by steaming, or by boiling using water, frozen (excluding potatoes,	South Africa	1192.8	29,336,200	24,594				

	spinach and sweetcorn)								
71030	**Spinach,** uncooked or cooked by steaming, or by boiling water, **frozen**	South Africa	47.8	905,200	18,937				
71022	**Beans,** uncooked or cooked by steaming, or by boiling water**, Frozen**	South Africa	165.4	2,336,800	14,128				
71021	**Peas,** uncooked or cooked by steaming, or by boiling water**, frozen**	South Africa	107.4	1,558,200	14,508				
71029	**Other leguminous vegetables** (excl. beans and peas), uncooked or cooked in steaming, or boiling water, **frozen**	South Africa	10.9	580,000	53,211				
71290	**Dried vegetables and mixtures of the vegetable** whole, cut, sliced, broken, or in powder but not further prepared (excl. dried onion and dried mushroom)	South Africa	93.4	2,661,200	28,493	Germany (100%) and the Netherlands (5%) (in 2018 only)			
910	**Spices**	Supplying countries in 2020: SA (97%), Botswana (2.52%) and the rest China and Germany	4221	168,104,251	39,826	Angola (21%), DRC (21%), Germany (19%), Botswana (15%) and SA (12%) and the rest USA and Czechia (Export destinations in 2020)	19	539,651	28,403
7122040	**Dried onion**	South Africa and others	5.2	35,000	6,731				
7123100	**Dried mushrooms** of the genus "Agricus", whole, cut, sliced, broken, or in powder but not further prepared	South Africa and China - 2016 only	1.6	46,800	29,250				
81190	**Frozen fruit and nuts,** uncooked or cooked by steaming or boiling in water, whether or not sweetened (excluding strawberries, raspberries, black, white or red currants and gooseberries)	South Africa (98.3%) and Portugal (1.7%).	24	847,800	35,325				
81120	**Frozen raspberries, blackberries, mulberries, loganberries, black-, white- or red currants and gooseberries**, uncooked or cooked by steaming or boiling in water, whether or not sweetened	South Africa (99%), and Portugal (1%)	22	1,137,200	51,691				
81110	**Frozen strawberries,** uncooked or cooked by steaming or boiling in water, whether or not sweetened	South Africa (100%)	4	81,400	20,350				
8134090	**Dried fruits**	South Africa over 90% and the rest from Botswana, Belgium, China, Germany and Panama	554	33,931,087	61,248	South Africa, the UK, United Arab Emirates, Netherlands, Saudi Arabia, Botswana, DRC, Angola etc.	12	315,532	26,294
2007	**Jam, fruit jellies, marmalade, fruit or nut puree, and fruit or nut paste** obtained by cooking, whether or	SA 97% & Others; Germany, Zambia, Poland, Eswatini, Egypt, Austria & China	1,748	43,330,600	24,786	Japan	3.6	39,000	10,833

	not containing sugar and other sweeteners								
2009	**Fruit juice,** including grape, must, and vegetable juice, unfermented, not containing added spirit	SA (97%) and others; Germany, Zambia, Poland, Eswatini, Egypt, Austria and China	35854	1,046,919,400	29,200				
200950	**Tomato juice,** unfermented, whether or not containing sugar added or other sweetening matter (excluding containing spirit)	SA (86%), Austria (10%), Italy 3% & others; Germany, Eswatini	41	415,400	10,181				
1509	**Virgin olive oil and olive oil residues**	SA (88%), Spain (4.63%), Portugal (2.72%), Italy 2.09%, Botswana (1.27%), Egypt (2.51%), Belgium (1.58%), Serbia (1.29%) & the rest from Hong Kong and China	753	16,983,486	22,554	DRC (89%), Seychelles (6.85%), Denmark (2.32%) and the rest (Saint Vincent & Grenadines, Areane, Mauritius & Angola)	13	400,085	30,776
Totals			**54,570**	**1,538,471,824**			**63**	**1,619,018**	

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

Table six presents the agro-processing products being imported into Namibia and those exported by Namibia. Most of the data presented in the table were adopted from the ITC and FAO statistics. ITC and FAO data are used as a way to have comprehensive data because the current survey data was based on a sample, where some of the survey respondents did not provide full information. HS codes and product group descriptions are presented in this table, whereas data ranging from the year 2016 to 2020 were averaged.

It is shown in Table six that 5,112 tons of tomato ketchup and other sauces were imported into Namibia, which translates into an average of almost N$94 million per annum, whereas, only an average of 15 tons of tomato ketchup and other sauces were exported per annum by Namibia, with an average value about N$ 324 thousand (ITC, 2020). These include tomato paste as a semi-finished product and tomato puree/sauce as a finished product. According to FAOSTATS (2021), Namibia imported an average (2016-2020) of about 1123 tons of tomato paste, which is valued at N$ 15.9 million.

Frozen vegetables are also presented in the table as one of the major agro-processed products imported into Namibia. These include frozen single vegetables (unspecified), frozen mixtures of vegetables, frozen spinach, frozen sweet corn, frozen beans, frozen peas, and other frozen leguminous vegetables, totalling a five-year average of 4,389 tons worth about N$86.7 million on average, and these were all imported from South Africa. None of the frozen fruits and nuts, nor frozen berry fruit types and strawberries were exported by Namibia over the year under scrutiny.

For dried vegetables, it can be seen in Table six that Namibia imported 93.4 tons on average over the last five years, worth N$2.7 million, as well as 5.2 tons of dried onions, and 1.6 tons of dried mushrooms worth N$35,000 and N$46,800 respectively (ITC, 2020). In terms of exports, ITC statistics show that Namibia has imported about 2,399 per annum, on average over the last five years, worth N$38.6 million.

Fruit jam, puree, and fruit juice are among the products imported by Namibia, as derived from statistics from the ITC (2021). An average of 1 748 tons of jam/jellies/puree and 35 854 tons of fruit juice were imported by Namibia over the past 5 years, worth an estimated value of approximately N$43.3 million and N$1.05 billion respectively. As picked from the survey data of this study, 3.6 tons of jam were exported to Angola, and these could be re-exports. Only 5% of interviewed traders stated that they occasionally re-export frozen vegetables and jam to Angola but no volumes exported were disclosed.

The spices and olive oil presented in Table six were obtained from the FAO statistics hub. FAOStats (2021) shows that Namibia imported an annual average of 4 221 tons of spices valued at more than N$168 million, as well as an annual average of 753 tons of olive oil and olive oil residues valued at nearly N$17 million.

It is also presented in Table six that an average of 24 tons of frozen fruits and nuts valued at an average of N$ 847 800 was imported by Namibia over five years (2016 to 2020). This is in addition to an average of 22 tons of frozen berry fruit types valued at around N$ 1.13 million and in addition to the 4 tons of frozen strawberries valued at N$ 81400 on five-year averages.

Another important group of agro-processing commodities presented in Table six is dried fruits. FAOSTATS (2021) indicates that Namibia imported 554 tons of dried fruits which is an average from 2016 to 2020, worth approximately N$ 33.9 million as converted from the US$ to the N$ on the 17th of September 2022. Only an average of 12 tons was discovered during the study as dried fruits exported by Namibia, valued at N$ 315 532.

In summary, Table six depicts that an aggregated annual average of 54 570 tons of agro-processed products were imported by Namibia, with an annual average value of over N$1.5 billion. South Africa accounts for over 97% or 100% market share for most of the agro-processed products imported into Namibia. Table six also depicts that only a mere 63 tons of horticultural agro-processed products were exported by Namibia per annum which is an average of five years, valued at N$ 1.6 million.

The field survey data revealed that 74% of interviewed traders import agro-processed products from South Africa, while the rest only obtain their purchases through importing traders and distributors. Seventy-five (75%) percent of processors confirmed that they importing semi-processed products for agro-processing, with 67% indicating that they import because there are no local suppliers of such raw materials, whereas, 33% only import when there is no adequate local supply (mainly fresh vegetables). Only 5% of interviewed processors indicated that they occasionally export tomato sauce to South Africa. Moreover, only 16% of the interviewed farmers indicated that they occasionally export 2nd-grade butternuts to South Africa for processing. The 2nd-grade butternuts are however exported at a 40% price below the normal price of the first-grade butternuts.

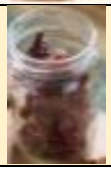
6.2 SUPPLY CHAIN DRIVERS OF AGRO-PROCESSING IN NAMIBIA

To be able to recommend what should be done to stimulate agro-processing in Namibia, it was important to explore current supply chain aspects with the potential to promote the extension of Namibia's agro-processing sector. Therefore, this sub-section of the report presents the supply chain aspects of agro-processing about the handling of raw materials and semi-finished and finished products that could be bottlenecks to agro-processing extension if they are not well investigated and properly addressed. Potential suppliers of raw materials (farmers), traders, and/or processors should be aware of these aspects as they are either success factors or threats if ignored. These include the nature of packaging and labelling, supply contracts and pricing, marketing and transportation, cold storage facilities, quality assurance, and human resource capacity.

6.2.1 Nature of Packaging and Labelling

About 83% of the interviewed traders, as well as 88% of interviewed processors, indicated that they have a specific preference as to how they want their agro-processing products to be packaged. Hence it is of paramount importance for suppliers to familiarise themselves with the common nature of packaging materials for each product. Most of the interviewed traders prefer bulk packaging instead of loose items. It was mentioned by some traders that the packs should be labelled, branded, and barcoded, with some traders indicating that they are prepared to give stickers and/or labels to suppliers at a cost. Interviewed traders cautioned that the agro-processed products should be marked with the production and expiry dates. For instance, frozen vegetables and cut, sliced, diced and chilled vegetables should be in a visibly clear bag. At least 57% of the interviewed farmers are aware of the specific packaging materials that are required by the buyers for raw vegetables.

Table 7: Some identified agro-processing products and their identified common nature of packaging

Product	Product's Finishing Stage	Packaging Descriptions	Picture of Packaging Materials
Tomato paste	Semi-finished	200l steel drum - they should have a vacuum foil bag inside	
Cayenne pepper	Semi-finished	25kg polypropylene plastic bags	
Sun-dried tomato	Semi-finished	1kg, 500g, 175g jars/ bottles	 

Tomato ketchup/ sauce	Finished	700g or 500g glass or plastic bottles packed with 12 or 20 bottles in a box. It may also be packed in a 2l or 4l plastic container	
Canned fish in tomato and chilli sauce	Finished	400g, 250g, or 175g tins packed in 12 and 20 or 24 tins in a box	
Canned baked beans in tomato sauce	Finished	400g, 250g, or 175g tins packed in 12 and 20 or 24 tins in a box	
Frozen mixed or single vegetables	Semi-finished	Vacuum plastics 400g, 500g, 750g, 1kg or 2.5kg. These pre-packs are further packed in bundles of 6, 12, 20, 24, 48, or 65 units in a bundle, depending on the size	
Chilled mixed or single vegetables (cut, slice, and dice)	Semi-finished	Vacuum plastics and commonly packed in 400g and 500g	
Mixed vegetable soup	Finished	Vacuum plastics	
Canned mixed vegetables	Finished	Vacuum plastics	
Fruits concentrate/ nectar	Semi-finished	100l, 50l, or 25l sealed plastic containers/drums	
Fruits pulps	Semi-finished	25-litter boxes with a vacuum foil plastic inside	
Fruits juice	Finished	1kg or 3kg vacuum plastics	
Frozen chips	Semi-finished	Vacuum plastics	
Peeled baby potatoes	Semi-finished	Vacuum plastics	
Olive oil	Finished	Dark or dark green glass bottles	

6.2.2 Supply Contracts and Pricing

Supply contracts and pricing approaches are among the supply chain aspects that were investigated in the study, as they may directly or indirectly influence the success of the business, especially the new entrants to the markets. About 82% of interviewed traders indicated that they don't have supply contracts with their suppliers, but they can rather have business accounts with them. About 75% of interviewed traders expressed willingness to enter into a supply contract with local processors should there be any. The remaining 25% indicated that they are not willing to enter into contracts because prices and market situations are not predictable. The 25% of traders who indicated having contracts were referring to the NAB planting agreement template, which shows the dates, volumes, and prices. About 57% of interviewed processors expressed their willingness to enter into contracts with local producers or primary processors of fruits and vegetables, provided that they meet the same quality and value standards, compared to those imported.

On the other hand, 43% of interviewed processors are not willing to enter into contracts because the market conditions are unpredictable and contracts have risky consequences for both suppliers and buyers. Mainly, processors of chilled vegetables (cut, sliced, and diced) are not willing to enter into any contracts beyond the NAB planting agreement due to market pressure, as these products last for only less than five days. However, processors of tomato sauce and fruit juice concentrate indicated a willingness to enter into supply contracts with any local supplier, should there be any. Only 8% of interviewed farmers indicated having a contract with buyers of fruits and vegetables for processing. However, 83% of the same farmers expressed willingness to enter into a contract should there be processors that are available, whilst 17% of farmers are not willing to enter into supply contacts, either because of the risk of inability to fulfil the commitments or because they are planning to process in future.

In the context of supply contracts, the price could be very sensitive to consumers, especially for new market entrants. During the survey, primary producers, processors, and traders were therefore asked to state who sets the price of products when they are buying and/or selling.

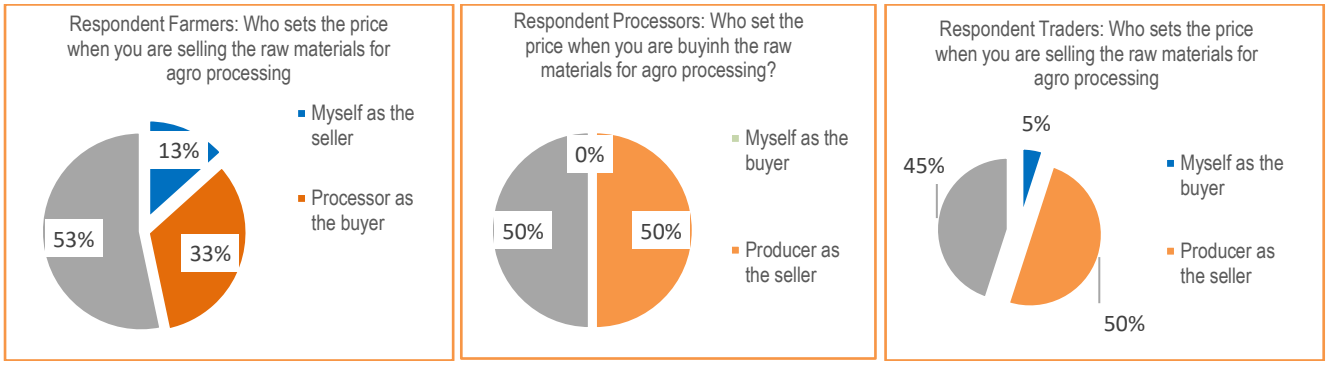


Figure 3: Responses from processors, traders, and farmers on who sets the price when buying and/or selling raw materials for processing

Figure three shows that fifty percent (50%) of processors indicated that they only take the price offered by the supplier and these are mostly the importers of raw materials. The other 50% have to negotiate with the supplier on the price and this is mostly the local processors of raw vegetables. Some processors indicated that agro-processing will not be viable if the prices of raw materials are too high. Fifty-three percent (53%) of respondent farmers negotiate with suppliers, whereas, 33% take whatever the processor has to offer, whilst only 13% set the price. Moreover, only 5% of interviewed traders indicated that they set the price when buying raw materials for agro-processing, 45% negotiate with the seller for the final price, whilst 50% only take the price offered by the seller and these are mostly the importing traders.

Table 8: Satisfaction level of farmers, processors, and traders on the price-setting approaches employed

Business Category	Very Unsatisfied	Unsatisfied	Neutral	Satisfied	Very Satisfied
Farmers	0%	13%	25%	25%	0%
Processors	0%	15%	38%	46%	38%
Traders	0%	0%	59%	41%	0%

Table eight above presents the satisfaction percentages of respondents regarding the pricing approaches as indicated in Figure three. It shows that processors are most satisfied because 38% of processors are very satisfied, mainly because most of the raw materials for processing are purchased from abroad. Farmers are the least satisfied since only 25% of respondents are satisfied and no respondent indicated being very satisfied. At least 41% of respondent traders are satisfied, especially the importers.

6.2.3 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 a business, be it a farm, processing factory, or trading facility, hence these were part of the study.

Table 9: Approach used by farmers, processors, or traders to identify the suppliers and/or buyers

Transport cost-covering options	Farmers	Processors	Traders
Explore and approach suppliers/ buyers directly	50%	71%	32%
Advertisement calling for suppliers or buyers	0%	0%	0%
Suppliers or buyers approach us themselves	40%	14%	50%
Through suppliers'/ buyers' advertisements	0%	0%	0%
Government Growth Agencies (NAB/ AMTA)	10%	14%	18%
Through the Namibian Embassy at importing country	0%	0%	0%

Table nine presents the marketing modalities employed by farmers, processors, and traders to identify trading partners as suppliers or buyers. The approaches used are either the partners being approached and approaching the buyer or supplier directly, and also through the use of NAB and Agro-Marketing

and Trade Agency (AMTA) platforms. None of the survey respondents indicated having advertised or identified partners through advertisement. More so, none of the survey respondents indicated having used opportunities of embassy offices in foreign countries to identify buyers and sellers.

Close to 90% of the 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^{0}C to -20^{0}C and chilled vegetables (fresh cut, sliced, and diced) should also be transported in refrigerated vehicles but they should not exceed 15^{0}C nor below 0^{0}C, whereas, fruit pulps should also be transported in refrigerated vehicles.

The 10% of traders that do not have transportation specifications are the traders of canned vegetables, tomato sauce, tomato paste, juice concentrates/syrup, and dried vegetables that should be transported at room temperature. At least 52% of respondent farmers are also aware of how certain fruits and vegetables and products should be transported, whereas, 86% of respondent processors indicated having specifications on how they want the raw materials for processing to be transported.

Survey respondents were also asked about who covers the transport costs when they are buying or selling raw materials for agro-processing. Processors that import semi-processed materials from overseas countries like China were indicated to have used ships using free onboard, whereby the buyer is responsible for the cost and liabilities once the goods are shipped, and sometimes CIF (cost, insurance and freight), whereby the seller is responsible for the costs and liabilities until the buyer receives the goods.

Table 10: Transport cost-covering options as experienced by a percentage of respondents per business category

Transport Cost-covering Options	Farmers	Processors	Traders
I have my transport and I bear the cost	45%	33%	13%
Suppliers or buyers use their transport and bear the cost	15%	50%	63%
Suppliers or buyers use their transport and I (seller/ buyer) bear the cost	20%	0%	13%
Exporters use their transport and I (seller/ buyer) bear the cost	0%	8%	4%
Exporters use their transport at their own cost	5%	0%	0%
I (seller/ buyer) hire the transport and bear the cost	20%	8%	9%

Table ten above presents the percentage of respondents and the responses cover the issue of transport among farmers, processors, and traders. Famers are in the category that covers most of the transport costs in the agro-processing sector, as evidenced by 45% of respondents having their own transport, 20% indicating that suppliers or buyers use their transport and the seller/ buyer bears the cost, whereas 20% of the respondent farmers hire transport at their cost.

Processors that bear transport costs are mostly those that import raw materials, whereas, traders are the least in terms of the percentage of respondents that bear transport costs. Traders that buy chilled vegetables (cut, diced, and sliced) are the main group of traders that do not bear any transport cost, as the cost is rather paid by distributors.

6.2.4 Cold Storage Facilities

Cold storage is essential, especially for heat-sensitive agro-processed products such as frozen vegetables, chilled (cut, sliced, or diced) vegetables, fruit pulp, some juice, etc. This study revealed that most of the farmers (63% of respondents) do not have cold storage facilities at their farms, whereas 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. All traders of agro-processed products have cold storage facilities at their stores, however, most traders, when asked, are not aware of the exact maximum capacity that their cold storage rooms can hold.

Respondent traders who revealed their maximum storage capacities have an average of 60 tons of cold storage capacity, which depends on the type of products to be stored. On average, cold storage for respondent traders is kept at 73% full all the time. Eighty-six percent (86%) of respondent processors have cold storage facilities at their processing plants, except the 14% that only deal with dry products. Cold storage is described as falling into two types – refrigerators and water coolers, as indicated by one of the surveyed processors.

6.2.5 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. This study, therefore, explored the status quo regarding certifications and inspections of products in Namibia's agro-processing sector.

Actors in the industry were specifically asked to indicate which food safety or standard certifications they require from their suppliers and what type of inspections they conduct when purchasing the products. At least 47% of interviewed traders and 86% of interviewed processors indicated that they require some standard certification from their suppliers of raw materials or agro-processing products.

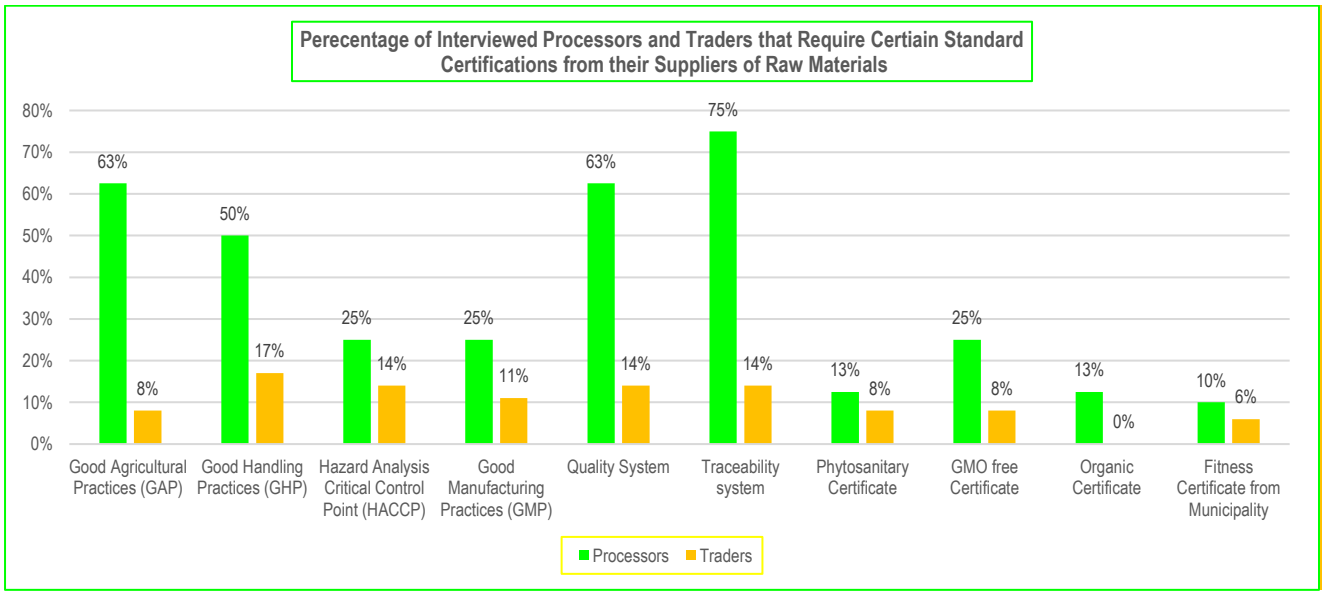


Figure 4: Percentage of respondent processors and traders that require suppliers to have various certifications

Figure four presents the percentage of processors and traders that have indicated the certifications that are required to be possessed by the suppliers of an agro-processed product or their raw materials. Traceability, good agricultural practices, quality systems, or good handling practices are the critical certifications that are required by the processors when buying from suppliers of raw materials.

Environmental fitness, good manufacturing practices, GMO-free, and HACCP (Health Analysis Critical Control Point) certificates are required by a moderate number of processors, whereas phytosanitary and organic certificates are the least certification required by agro-processors. HACCP, Food Safety-Intertek and ISO 9001 – NSI, fitness certificates from municipalities, and quality systems are the certifications mentioned that should be possessed by most agro-processors.

Traders do not demand so many certifications as processors do. However, the critical certifications required by traders when buying from processors are Good Handling Practices, HACCP, quality system, and traceability system. HACCP, Good Handling Practices, Quality System, NAB Inspection certification, NSI Standards, and Fitness certificate from the Municipality are some of the common quality assurance certifications possessed by most traders interviewed.

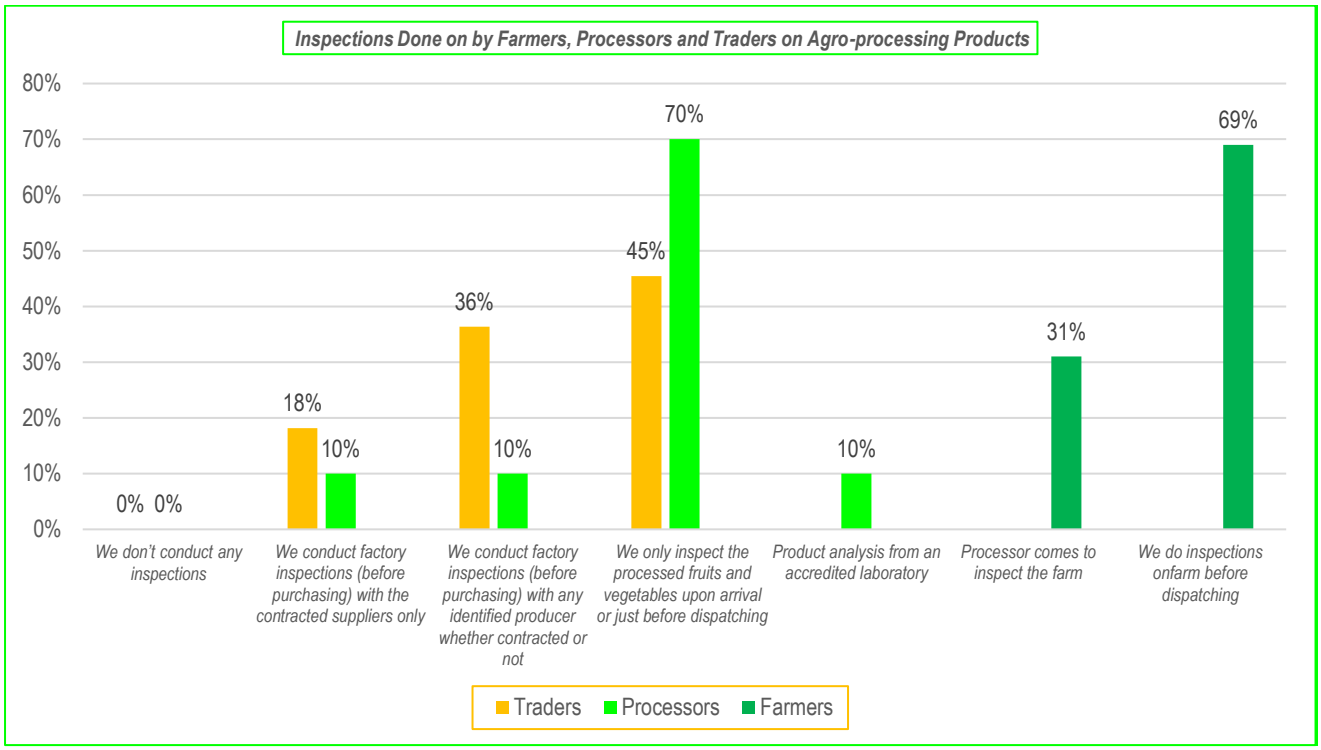


Figure 7: *Inspections are done on raw materials or agro-processed products by farmers, processors, and traders*

Figure seven above presents how inspections are done on agro-processing products or raw materials by farmers, processors, and traders. The majority of interviewed farmers (69%), processors (70%), and traders (45%) only inspect the products upon arrival to the facility and/or just before dispatching from the farm and/or facility. A few of the interviewed processors (10%) and traders (36%) prefer to inspect the farm or facility before they start buying, whereas, other processors (10%) prefer to receive a product analysis report from an accredited laboratory, especially the processors of tomato paste, sauces, and cayenne pepper.

6.2.6 Human Capacity

Another important supply chain aspect that may drive a successful agro-processing sector could be the skills and intellectual capacity of those working in farms, facilities, and market outlets on the quality check. The 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, trained by whom, and when. Eighty-eight percent (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.

Most of the training is provided in-house by the management and also using online platforms like YouTube. A total of 52% of interviewed farmers indicated having trained their staff in-house or through associations, whereas others have outsourced freelance services.

7. OPPORTUNITIES AND BOTTLENECKS IN NAMIBIA'S AGRO-PROCESSING SECTOR

7.1 OPPORTUNITIES FOR AGRO-PROCESSING IN NAMIBIA

Non-sophisticated agro-processed products such as fruit juice, frozen vegetables, pumpkin jam, butternut puree, chilled vegetables (cut, sliced and diced), tomato paste and dried vegetables (sundried tomatoes and cayenne pepper powder) are the products which are perceived to have a high potential for processing in Namibia. These were brainstormed by various respondent farmers, processors, and traders. Farmers felt that agro-processing will rescue them from situations of oversupply of vegetables during inseason and the prevention of post-harvest losses and wastage**.** Export markets for processed products could be lucrative opportunities but these need to be further explored. Fruit pulp and juice concentrates also serve bigger opportunities for Namibia, however, Namibia still lags in terms of fruit production.

Fruit and vegetable canning were other opportunities that were mentioned by various processors and traders, but this may require sophisticated technology. Processors expressed their willingness to support local farmers, should they have the capacity to supply products. One of the farmers indicated that "there are more opportunities if processing can be done with a focus on exporting products to other countries" and helping farmers to get GAP (Good Agricultural Practice) certifications, which will help to unlock the potential to access export markets. Another farmer highlighted that there is a huge opportunity in customer trends as consumers do not want to process any food at home.

7.2 BOTTLENECKS LIMITING THE GROWTH OF NAMIBIA'S AGRO-PROCESSING SECTOR

The lack of guaranteed market opportunities, skills, information, and infrastructure, high prices and costs of transport, certification and import packaging materials, and South Africa's high competitiveness, are major bottlenecks that were mentioned by various farmers, traders, and processors as limiting Namibia's agro-processing prospects. Various survey respondents mentioned climate change, labour costs, pests, capital, and poor farmer coordination as the other additional limiting factors. Processors expressed that inconsistency in supply, diseconomies of scale, lack of transport coordination, poor planning, and low quality of local raw materials are hampering the growth of Namibia's agro-processing sector.

7.3 SUGGESTIONS FOR STIMULATING AGRO-PROCESSING IN NAMIBIA

About 75% of processors surveyed stated that if farmers want to supply beyond the fresh produce market, they should be prepared to be consistent in supply, whereas, productivity has to be increased first, to match with the processors' operating systems. Farmers were also encouraged to diversify their farming activities so that they also produce highly imported commodities such as potatoes and fruits. 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, e.g. tomato paste has to look and taste correct and the texture also needs to be correct", as one of the processors said.

Processors also highlighted that they cannot compromise the quality of their final products at the expense of supporting locals, hence, producers need to keep abreast with international standards. One of the processors indicated that farmers should be organised and coordinated into supplier groups so that processors do not have to deal with many suppliers. Another processor also said that there is a need for continued communication between industry actors, as well as the need for supply chain agreements. Other processors suggested that traders should support local processors provided that the products are of good and competitive quality and prices and that AMTA should have transportation facilities, for example, having trucks for hire at a profit.

Furthermore, at least 75% of the 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 that are involved in processing. Other traders expressed that farmers may only encourage agro-processing if they diversify the range of products, together with consistent supply and quality. Interviewed traders believe that farmers need to acquire more skills and they also need to understand the expectations of the markets at both processor, trader, and consumer levels. Making use of established fresh produce hubs is another opportunity that was mentioned by one of the interviewed traders. A few traders wished that processors could help and advise farmers through awareness and education programmes, and marketing their needs to farmers and signing production contracts with them. "More processors are needed in Namibia and the government should intervene in terms of capacity building", said one of the respondent traders. Another trader said that "increased delivery processes and establishing more distribution agents/branches throughout the country would address the delay challenges in deliveries".

Interviewed farmers suggested that traders should do more promotions on local products and they should provide yearly forecast demand information to the processors, whereas, processors should provide yearly forecast demand information to farmers. Several other farmers also suggested that traders should prioritise purchasing locally processed goods and they should provide market information to farmers and processors through training. If traders would enter into off-take agreements with the producers and processors into off-take agreements with farmers, then the agro-processing investment may be encouraged, as suggested by some of the interviewed farmers. Consumer education is another approach that was suggested by one of the interviewed farmers, as it would propel the development of a market for locally processed products. One farmer advocated for concentrating on goods that Namibia has a competitive advantage on compared to neighbouring countries, and the government should create

a good trading environment for producers to export. Other farmers additionally proposed that there should be a processing plant in the Tsumeb area, where most of the horticultural produce is based, while also emphasising that processors should create brands and awareness campaigns for local products. Finally, training of farmers by processors, establishing consistent order systems, and offering competitive prices were some of the suggestions from other farmers.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

This study explored horticulture agro-processing to provide baseline information for a better understanding that will assist potential investors and policymakers to stimulate horticultural agro-processing in Namibia. Information was obtained from industry actors such as farmers, traders, and agro-processors. However, some of the respondents were not fully open to disclosing information, hence the reported industry figures could have been slightly underestimated. Through a survey approach, at least 24 local processors of fruits and vegetables and products in Namibia were identified, and four (4) main distributors (importers) of agro-processing products were also identified.

The study identified at least sixteen (16) specific main agro-processing products that are traded in Namibia. In total, over **9000 tons** of agro-processed products are produced in Namibia on an annual basis, worth more than **N$162 million**. However, these figures could be more, as some of the processors were not available for interviews and/ or were not open to disclosing their trading data. The study also revealed that Namibia imported an aggregated annual average of **54 570 tons** of horticulture-based agro-processed products with an annual average value of more than **N$1.5 billion**. South Africa accounts for 97 to 100% import share for most of the agro-processed products imported by Namibia, while Namibia exports only 63 tons of processed horticultural products and vegetables worth about **N$ 1.6 million** on average per annum. These comprise of tomato sauce, spices, dried fruits, and olive oil. It is not clear whether these exported products were manufactured locally or were re-exported by Namibia.

It also became apparent that some actors in the agro-processing sector are neither fully aware nor in possession of all supply chain aspects that are critical to the success of an agro-processing sector. These include the nature of packaging and labelling, supply contracts and pricing, marketing and transportation, cold storage facilities, quality assurance, and human resource capacity. However, Namibia has high potential and opportunity to venture into non-sophisticated agro-processed products such as fruit juice, fruit pulp, dried fruits, frozen vegetables, pumpkin jam, butternut puree, chilled vegetables (cut, diced and sliced), spices, tomato paste, tomato sauce, olive oil and dried vegetables (sundried tomatoes, cayenne pepper powder, spices, and vegetable soup).

High prices and costs of transport, storage, labour and certification, lack of guaranteed market opportunities, lack of skills, information, infrastructure and machinery, poor planning and supply chain coordination as well as diseconomies of scale, inconsistency, and South Africa's competitiveness are the major bottlenecks that were voiced by various farmers, traders, and processors as limiting the growth of Namibia's agro-processing sector. Lastly, survey respondents proffered that increased economies of scale, diversified vegetable production, increased fruit production, supply chain agreements and associations, access to skills and information, branding, consumer education, and established processing facilities are the major suggestions that could stimulate the growth of Namibia's agro-processing sector.

8.2 RECOMMENDATIONS

- The NAB should formally register agro-processors and distributors (importers) of horticulture-based agro-processed products as a way to obtain real-time and highly accurate industry data, for effective planning and control. This will as well be in line with Section 46 of the Namibia Food Safety Policy that "food business operators and food-service operators shall register with relevant authorities annually. They shall not operate without such registration. Registration of food business or foodservice operators shall be preceded by suitability inspection and approval of premises for food business premises".
- 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.
- High import values (≥N$ 1.5 billion) versus low export values (>N$ 2 million) and domestic production (>N$ 162 million) revealed in this study necessitate the urgency of Namibia's potential investors to grab import substitution or export opportunities.
- Namibia, without delay, should scale up venturing into horticulture agro-processed products 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).
- Other products for consideration would be canned fruits and vegetables, dry chips, biscuits, spices, colourants, flavourings, etc.
- Diversification of vegetable production and increased fruit production should be a priority, whereas, the production of packaging materials is another investment opportunity in Namibia.
- There should be a national horticulture agro-processing sector development agenda through propelling the supply chain aspects discussed in this report, which could address the bottlenecks identified by this study.
- Exposure visits through embassies to well-off countries like South Africa and beyond could be helpful to Namibia.

- 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).
- Food businesses should therefore ensure compliance with food supply chain aspects stipulated in the food safety policy such as “traceability and withdrawal procedures of products in their possession, make use of reference laboratories, food hygiene, training of workers, apply HACCP system principles, use permitted packaging materials and apply food labelling instructions”.
- Finally, traders and processors should provide forecast demand information and product specifications to farmers and processors to resolve the market challenges. 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).

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