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A world-class regulator of a vibrant, diversified and sustainable crop industry

AGRONOMY AND HORTICULTURE MARKET DEVELOPMENT DIVISION

RESEARCH AND POLICY DEVELOPMENT SUBDIVISION

BASELINE STUDY REGARDING THE STATUS QUO OF FRUIT PRODUCTION IN NAMIBIA



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TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	3
1. INTRODUCTION AND BACKGROUND.....	4
2. PROBLEM STATEMENT.....	6
3. JUSTIFICATION OF THE STUDY	6
4. RESEARCH OBJECTIVES.....	6
5. RESEARCH METHODOLOGY	7
5.1 STUDY DESIGN AND LOCATION	7
5.2 POPULATION AND SAMPLING PLAN.....	7
5.3 DATA COLLECTION AND ANALYSIS	10
6. RESULTS AND DISCUSSIONS	10
6.1 PRODUCTION AND OUTPUT INFORMATION ABOUT FRUITS PRODUCTION IN NAMIBIA	11
6.1.1 Fruits production - Producer's perspective	11
6.1.2 Fruits production - Seedlings Supplier's (Nursery owners) perspective	16
6.1.3 Fruits production - Traders' (formal) perspective.....	19
6.1.4 Availability of fruit tree seedlings.....	21
6.2 REGULATORY COMPLIANCE AND INDUSTRY PROTECTION	23
6.2.1 Phytosanitary issues	23
6.3 MARKET INFORMATION	25
6.4 BUSINESS FINANCING INFORMATION	28
6.5 TRAINING AND INDUSTRY AFFILIATION	29
6.6 CHALLENGES AND OPPORTUNITIES IN THE NAMIBIAN FRUIT PRODUCTION INDUSTRY	31
6.6.1 Challenges	31
6.6.2 Opportunities	32
6.7 POSSIBLE SUGGESTIONS TO ENHANCE FRUITS PRODUCTION IN NAMIBIA.....	33
7. CONCLUSIONS AND RECOMMENDATIONS	34
7.1 CONCLUSIONS	34
7.2 RECOMMENDATIONS	35
8. REFERENCE	36

EXECUTIVE SUMMARY

Although Namibia is a net exporter of fruits, this is mainly due to the high production of table grapes that are targeted for export markets. Namibia has a very small market share in the fruits domestic market which is a mere 4% (732 tons) versus an import share of 97% (20,282 tons) (NAB, 2019). Based on these alarming figures, the NAB commissioned a study, using a survey approach, to investigate the status quo of fruit production in Namibia. The study's main aim is to quantify the current status of fruit production, storage, value addition, and marketing in Namibia.

A sample size of 62 fruit producers, 27 traders, and 17 nurseries or seedlings suppliers were interviewed, and the data were analysed using Microsoft Excel and Word. The study results revealed that only 15% of the total land available for fruit production is currently under actual production and over 230,000 trees are grown over this land. This indicates a potential to grow more than 1.1 million trees on the remaining 85% of available land. An average of over 41,000 fruit tree seedlings are imported into the country yearly whilst around 40,000 is being grown locally. Based on the interviewed traders in this study, an average of 680 tons of fruits is purchased from local fruit producers per year in comparison to over 18,000 tons of fruits imported per year.

In terms of food safety, the study revealed that the majority of fruit producers (except grape producers) are mostly sourcing their planting materials or fruit tree seedlings from uncertified nurseries and or seedlings producers, hence compromising the safety of the fruits produced in the country. The majority of producers also do not have any food system in place, especially those from the communal production zones (Zambezi, Kavango, and North Central). Very few producers are doing value addition to their fruits like processing lemons and mangos into juice or jam as well as grapes and olives into raisins and olive oil respectively. The study found that most small-scale farmers, especially those farming in communal areas, lack the understanding and experience in fruit production on a commercial basis.

Based on the study findings and objectives, the study recommended that a complete regulation be extended to the fruit production industry to access reliable data about the industry and provide better support that is based on reliable statistics. The regulations aspect includes but is not limited to compulsory registration of fruit producers, fruit processors, and nurseries with the Namibian Agronomic Board (NAB), the provision of mentorship and extension services to the current fruit producers, and many other strategies to increase fruit production.

1. INTRODUCTION AND BACKGROUND

Besides the high export of grapes and dates from the southern regions of Namibia, fruit production in general lags in Namibia. Namibia has an extremely low market share in the fruits domestic market, with a mere 4% (732 tons) versus an import share of 97% (20 282 tons) during 2018/19, excluding watermelons and sweet melons (NAB data, 2019). South Africa accounted for 97% of the fruits and nuts imported by Namibia, whereas, 3% was imported from Spain, and the rest from Israel, Botswana, Zambia, China, Angola, Germany, Panama, Portugal, and Vietnam (ITC, 2020). On average, China has been the fastest-growing import market for fruits and nuts for the last three years. Nigeria and Senegal are the only African countries appearing in the top ten (10) world's fast-growing import markets of fruits and nuts in terms of value, whereas, Namibia is the 23rd country on the list of the world's import-growing markets (ITC, 2020).

On the other hand, Namibia is a net exporter of fruits, mainly due to the high production of table grapes that are targeted for export markets. However, several various fruit tree seedlings have recently been imported into the country for commercial production, and yet there is a lack of information regarding Namibia's current fruit production status. Namibia imported N\$385.2 million worth of fruits and nuts (including peeled citrus and melons) from the world in 2019, increasing from N\$163,5 million in 2010 (ITC, 2020). Additionally, Namibia was the 20th country with high export growth in 2019, having exported about N\$944,4 million worth of fruits and nuts, dominated by grapes, and slightly by mangoes, a growth of 26% lower than the export growth of 35% obtained in 2018, but higher than 18% growth in 2017 but tremendously grew from an export growth of negative 23% in 2011 (ITC, 2020).

Table 1 indicates that a total value of about N\$194 million in value of the top ten fruits was traded in Namibia over the last four years, of which only N\$7,7 million (about 4%) is a value from local trade. Most fruits consumed in Namibia such as apples, pears, and bananas are seldom produced in Namibia. Amongst others, oranges and grapes were the most supplied fruits from local producers on average over the last three years. Except for grapes (28 483 tons) and slightly mangoes (81 tons), the export of fruits is not much advanced in Namibia (NAB, 2018/2019).

Table 1: Namibia - Formal Market Trade for Top 10 Fruits: Average Annual Tonnage and Value

Fruit Name	Average Annual Local Tonnage	Average Annual Import Tonnage	Average Annual Consumption Tonnage	Tonnage Average Annual Export	Average Annual Total Local Production	Average Local Value N\$	Average Import Value N\$	Total Consumption Value N\$
Apples	-	6,883	6,883	0	-	-	70,084,018	70,084,018
Bananas	-	4,599	4,599	0	-	-	46,979,602	46,979,602
Oranges	324	2,576	2,900	0	324	2,591,179	21,113,293	23,704,472
Grapes	282	854	1,135	28,483	28,765	4,038,477	11,309,705	15,348,182
Avocados	-	808	808	0	-	-	940,095	9,400,975
Pears	-	796	796	0	-	-	8,948,702	8,948,702
Lemons	32	480	512	0	32	457,664	5,957,397	6,415,062
Nartjies	18	429	447	0	18	191,580	4,094,355	4,285,935
Pineapples	-	302	302	0	-	-	3,487,623	3,487,623
Mangoes	26	308	334	81	107	380,032	4,522,510	4,902,542
Totals	683	18,034	18,717	28,564	29,247	7,658,932	185,898,181	193,557,113

Source: NAB (2018/19)

Based on this information, the NAB conducted this in-house study to investigate and take stock of the status of fruit production in terms of fruit producers, fruit tree seedlings suppliers (nurseries), as well as the extent of fruit trade in Namibia. It is important for the NAB and Namibia at large to have statistics in terms of how many fruits are produced in Namibia and the extent to which they are being traded in Namibia and beyond. Given the reality of over 90% of imports of fruits in Namibia, the statistics provided in this study can enable policymakers to make informed decisions on how to best stimulate the growth of Namibia's fruit production industry.

The study employed a survey research approach, whereby 107 key stakeholders involved in the fruit industry were interviewed face-to-face. These key stakeholders comprised producers and traders of fruits, as well as nurseries involved in trading fruit trees or seedlings, and all these were sampled from all the production zones in Namibia (North Central, Kavango, Zambezi, Karst, Central, and South and Orange River). Although researchers encountered several challenges in terms of the provision of information from some of the respondents, the study managed to get an estimated number of various fruit trees produced in Namibia, the volumes of fruits purchased from Namibian producers versus imported as well as the quantified estimate of several fruit trees imported into Namibia.

2. PROBLEM STATEMENT

Atkinson (2013) alludes that the true definition of competitiveness is the ability of a region or country to export more in value-added terms than imports. Porter (1990) proffers that competitiveness should be explained by standards of living, raised wages, and high shareholder value creation through productivity. By definition, thus, Namibia's fruits sector is not competitive, given its manifestly high annual import shares of about 93% of the formal domestic market (NAB, 2019/20), whilst informal market trades are unrecorded. As a consequence, the availability of baseline information on the fruits sub-sector is hence necessary to sensitise investment (in production and value addition), policy interventions, and future research. The baseline information will close the existing information gap on what should be done to stimulate the growth of the fruits sub-sector in Namibia.

3. JUSTIFICATION OF THE STUDY

In addition to Namibia importing over 90% of its fruits, the country also imported live trees (including fruit trees) worth over N\$77,052,000 in 2021 (ITC, 2022). With this positive development in the fruit industry, the level of fruit production is still unclear in terms of hectares planted, the number and types of fruit trees, yields, etc. Therefore, this study primarily aimed to collect data about fruit production to provide statistics for evidence-based interventions that are aimed at developing the fruit industry in Namibia.

4. RESEARCH OBJECTIVES

The specific objectives of the study are to:

- a) Quantify the current status quo for fruit production, storage, value addition, and marketing in Namibia;
- b) Examine and understand important production constraints and identify opportunities for improving fruit production, storage, value addition, and marketing; and
- c) Suggest recommendations on what should be done to stimulate the growth of the fruits industry in Namibia.

5. RESEARCH METHODOLOGY

5.1 STUDY DESIGN AND LOCATION

As an exploratory form of research/study, both qualitative and quantitative methods of collecting primary data were used. Primary data were collected through a survey (face-to-face interviews) using a structured questionnaire with both structured and unstructured questions. The questions covered both aspects of fruit production including input supplies-related issues. The study also interviewed individual fruit producers, fruit traders, and nursery owners from all production zones, namely; North Central, Kavango, Zambezi, Karst, Central, South, and Orange River production zones. Additional or secondary information from previous studies, reports, and online data from other relevant institutions was also reviewed and utilised to support the primary data collected from the survey. The data collected were analysed using descriptive statistics and thematic analysis with Micro-Soft Excel.

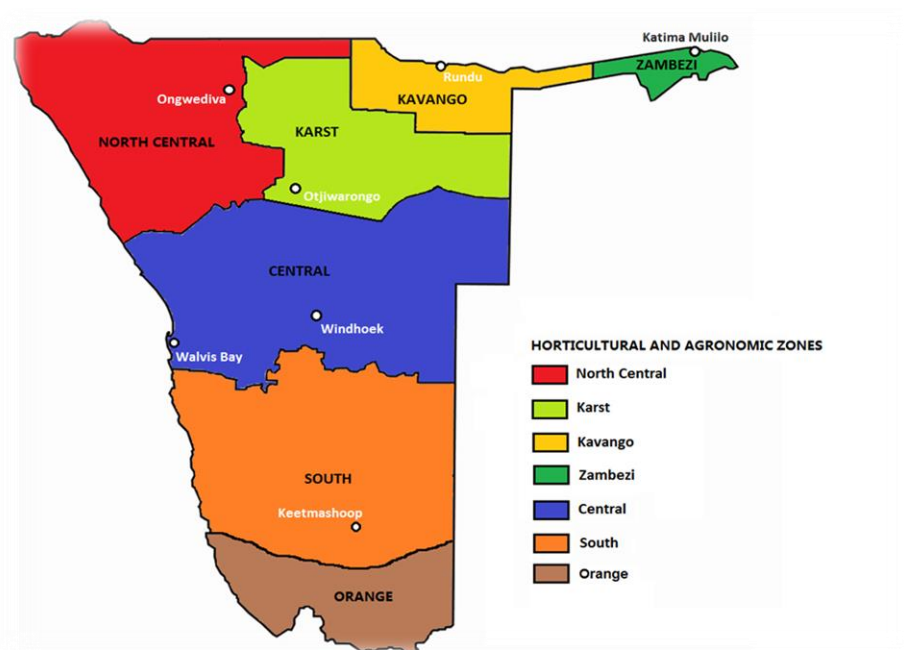


Figure 1: Namibia horticultural and agronomic production zones map

5.2 POPULATION AND SAMPLING PLAN

There are 68 suppliers of fruits registered with the NAB, and in addition, there are about 121 unregistered growers of fruits situated in the North Central, Kavango, and Zambezi production zones (obtained from the Directorate of Forestry) that formed part of the study population. From this population

of producers, a total of 62 producers were interviewed for this study from a targeted sample of 57 producers. Additionally, the actual number of nurseries (seedlings suppliers) was not known at the time of sampling, however, about 10 nurseries that were known to the researchers (although not registered or listed anywhere) were targeted to form part of the study population, of which the study interviewed 18 nurseries.

Out of the population of formal traders (65) registered with the NAB from all seven (7) horticultural production zones in Namibia, the study targeted to interview 23 formal traders, however, the study ended up interviewing 27 traders. The study interviewed 107 key stakeholders out of a population of 264 stakeholders, representing a 40% sample size (Table 2). Table 2 illustrates how the overall stakeholder sample size of 90 respondents (30% of the population size) was achieved.

Table 2: Sampling plan for each targeted production/trading zone

Production /Trading Zone	Population (Registered Producers)	Targeted Sample (Registered Producers)	Population (Unregistered Producers)	Targeted Sample (Unregistered Producers)	Population (Formal Traders)	Trader Sample (Formal)	Population (Seedling Suppliers)	Seedling Suppliers Sample
South and Orange River Area	20	10	0	0	4	3	0	0
North Central	3	3	43	6	12	4	5	5
Kavango	0		21	6	4	2	1	1
Zambezi	20	10	57	6	3	2	1	1
Karst	16	10	0	0	11	3	1	1
Central	9	6	0	0	31	9	2	2
Total	68	39	121	18	65	23	10	10
TOTAL TARGETED SAMPLE (PRODUCERS, SEEDLING SUPPLIERS & TRADERS)								90

Figure 2 illustrates a comparison of the sampled respondents to the actual number of respondents interviewed for the study, of which the study interviewed more stakeholders than what was sampled/targeted.

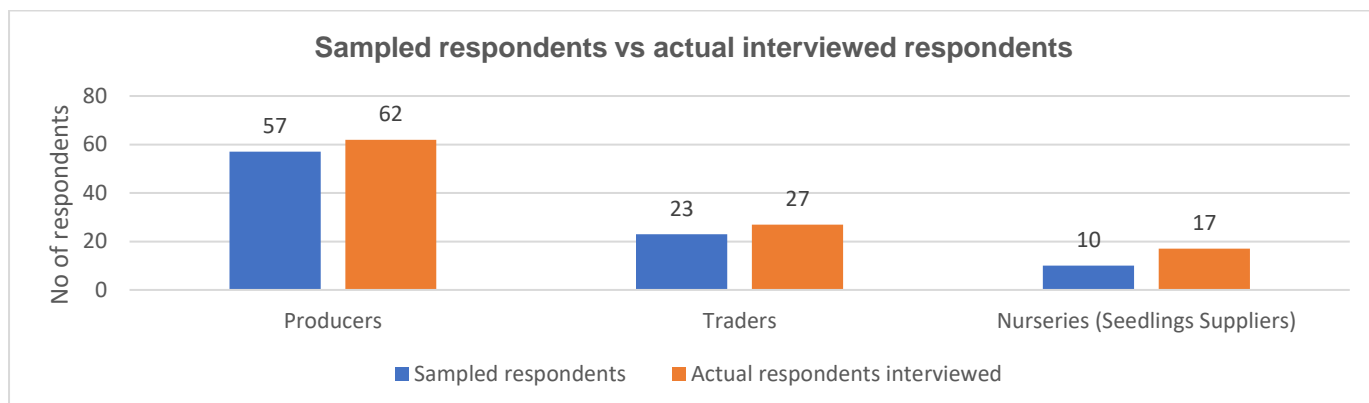


Figure 2: Composition of the sampled/targeted number of respondents vs the actual number of interviewed respondents (Survey data, 2022)

Figure 3 shows that of the producers interviewed, 43 were male, and the remaining 19 were female; for the traders, 21 were male and 6 were female. The study also interviewed 10 male nursery owners/managers and only 7 female nursery owners/managers.

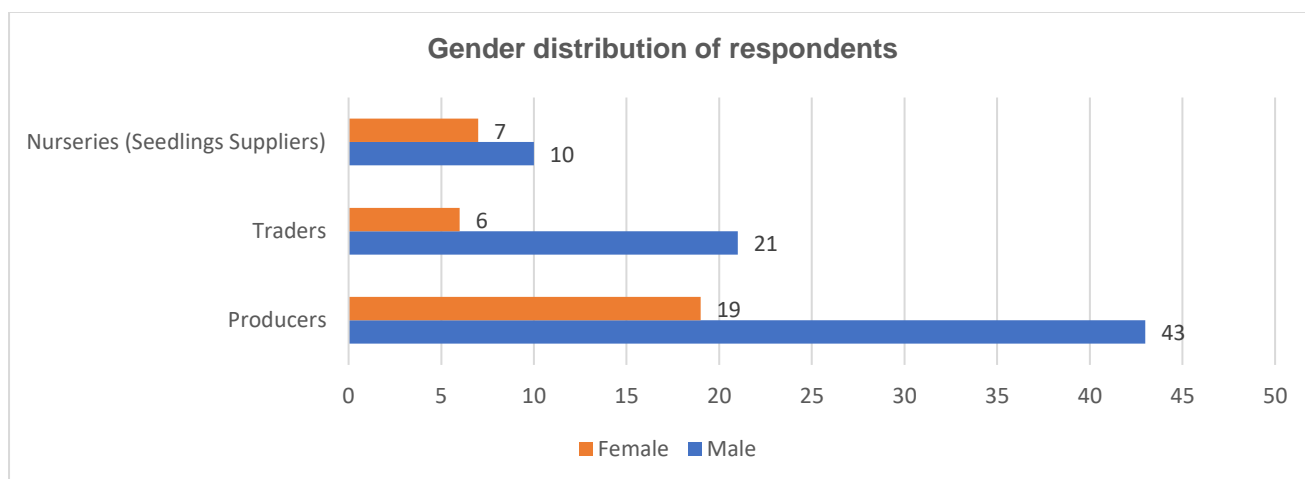


Figure 3: Gender distribution of the respondents (Survey data, 2022)

Figure 4 indicates that of the producers interviewed, the highest number of respondents was between 40 and 49 (18). The majority of traders interviewed were aged between 31 and 39 years (13), followed by those aged between 40 and 49 years respectively. The highest number of nursery owners interviewed were aged between 40 and 49 years (6) of age.

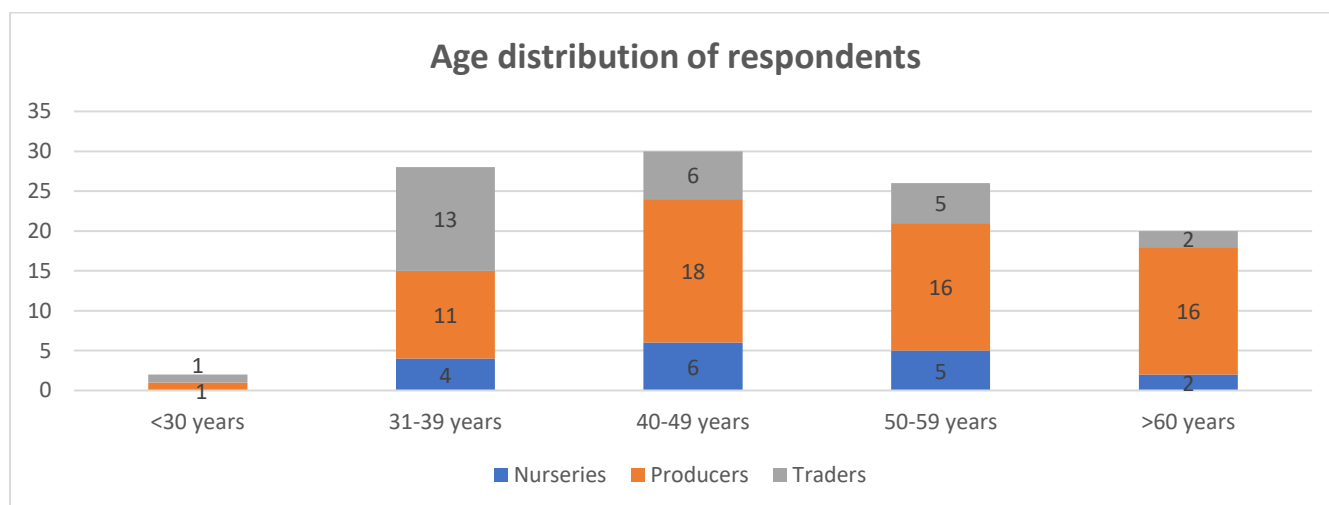


Figure 4: Age distribution of the respondents (Survey data, 2022)

5.3 DATA COLLECTION AND ANALYSIS

After structured questionnaires were prepared, telephonic (calls or SMS communications) appointments were made with the fruit producers, traders, and nursery owners upon which oral interviews were conducted. The questionnaire was structured and based on seven (7) main themes:

- A. General/Demographic information (as presented under 5.1 & 5.2 above),
- B. Production and output information,
- C. Regulatory compliance and protection information,
- D. Market information,
- E. Financing information,
- F. Training and industry affiliation, and
- G. Constraints and opportunities.

The data collected through the interviews by using the set questionnaire that was based on the above themes were then captured into Microsoft Excel and Microsoft Word for data analysis and report writing. Descriptive statistics were used to present the results in tables and figures presented in this report.

6. RESULTS AND DISCUSSIONS

Section 6 presents and discusses the survey findings and it is divided into seven (7) subsections based on the themes of the questionnaire structure. These are (1) Production and output information about fruit production in Namibia; (2) Regulatory compliance and industry protection; (3) Market information; (4) Business financing information; (5) Training and industry affiliation; (6) Challenges and opportunities

in the Namibian fruit production industry; and (7) Possible suggestions to enhance fruits production in Namibia.

6.1 PRODUCTION AND OUTPUT INFORMATION ABOUT FRUITS PRODUCTION IN NAMIBIA

One of the objectives of this study was to quantify the current status quo of fruit production, storage, value addition, and fruit marketing in Namibia. This subsection presents the findings of production from all sampled stakeholders' perspectives (producers, nurseries, or seedlings suppliers and traders).

6.1.1 Fruits production - Producer's perspective

The survey investigated the average size of land available for fruit production as well as the average size of land that is currently under actual fruit production.

As indicated in Figure 5, respondents in all production zones are currently producing fruits on less than 50% of their available land. More than 50% of the land is still available for fruit production, of which Karst and Zambezi have the largest land size available, with over 90% compared to what is currently under production. Of the overall total land sizes from all production zones, only 15% (1,168 hectares), is currently under production, whilst 85% (6,704 hectares) is unutilised although available.

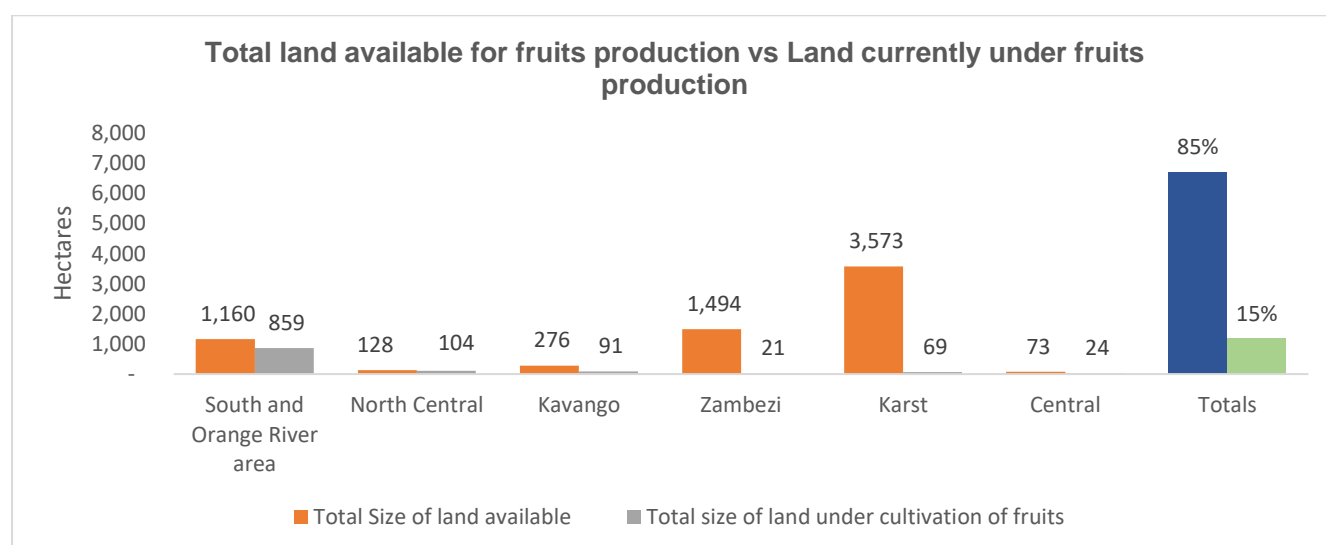


Figure 5: Land under fruit production vs overall total land size available for fruit production (Survey data, 2022)

Table 3 indicates that the highest number of fruit trees from the sampled respondents is grapes (over 59,000 vines), which are mostly grown in the South and Orange River production zones. Orange trees

are the second highest with about 29,000 trees of which the majority of orange trees are in the Karst production zone. The next highest fruit trees grown in Namibia are mangoes and the highest number of trees (over 24,000 trees) was recorded from the North Central production zone.

Table 3: Average number and types of fruit trees grown in Namibia (survey data, 2022)

Number of Trees per Production Zone							
Fruit tree type	South and Orange River area	North Central	Kavango	Zambezi	Karst	Central	Totals
Mango	650	11,956	6,841	4,163	1,160	5	24,125
Lemon	120	5,954	89	90	434	4	6,691
Orange	50	3,453	586	54	25,280	4	29,427
Pomelo	50	0	0	0	2100	0	2,150
Kumquat	0	0	0	0	0	0	0
Lime	10	1	0	2	2,162	0	2,175
Grapefruit	0	0	3	1	53	0	57
Nartjies	4	541	532	10	20,409	0	21,496
Guava	0	4,097	82	566	137	10	4,892
Paw Paw	0	210	176	1,602	4,927	9	6,924
Avocado	0	0	128	7	66	0	201
Pineapple	0	30	0	0	0	0	30
Strawberry	0	1	0	0	0	0	1
Blueberries	0	0	60	0	0	0	60
Banana	0	2	512	207	0	0	721
Apple	19,000	27	1	2	3,500	0	22,530
Custard apple	0	38	9	10	59	0	116
Pomegranate	0	10	13	3	3	0	29
Cashewnuts	0	5	0	4,816	0	0	4,821
Pecan nuts	6,000	0	0	0	46	0	6046
Mulberry	0	0	0	0	0	3	3
Dates	22,683	0	0	0	800	0	23,483
Grapes	54,900	2	0	0	4,060	100	59,062
Olives	0	3	0	0	0	11,000	11,003
Figs	0	0	2	0	53	3	58
Peaches	3,735	0	0	0	0	0	3,735
K-apples	0	1	0	0	56	0	57
Tangelos	0	0	0	0	100	0	100
Dragon fruit	0	0	0	0	74	0	74
Passion Fruit	0	0	0	0	7	0	7
Granadilla	0	0	0	0	0	0	0

Number of Trees per Production Zone							
Fruit tree type	South and Orange River area	North Central	Kavango	Zambezi	Karst	Central	Totals
OVERALL TOTAL NUMBER OF TREES							230,074

Figure 6 shows that the South and Orange River production zones recorded the highest number of fruit trees at 107,202 trees which are grown over an area of about 850 hectares. Kavango production zone recorded the least number of fruit trees (9,034 trees) produced on a land size of 91 hectares.

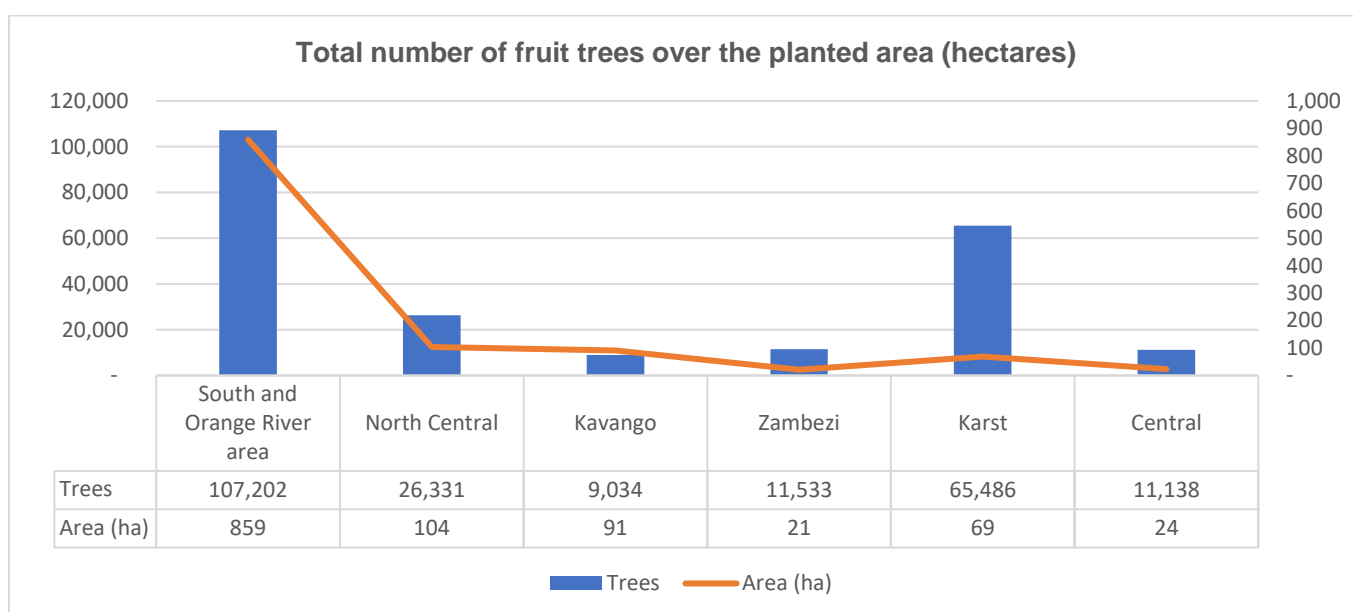


Figure 6: Overall number of fruit trees over the planted area (Survey data, 2022)

In terms of yield (Figure 7), based on the fruit producers that were interviewed for this study, it was revealed that the most produced fruit in Namibia is lemons which recorded an average yield of 1,438.99 tons per year for each interviewed producer. The second most yielding fruit is grapes, which recorded an average yield of 511.55 tonnages per producer per year. Mangoes, blueberries, and oranges are the third, fourth, and fifth most-yielding fruits with an average of 574.18 tons, 480 tons, and 428.45 tons per producer per year respectively. Other fruits such as figs, k-apples, pecan nuts, pomegranates, custard apples, strawberries, and avocados are rarely produced and yield an average of less than one ton per producer per year.

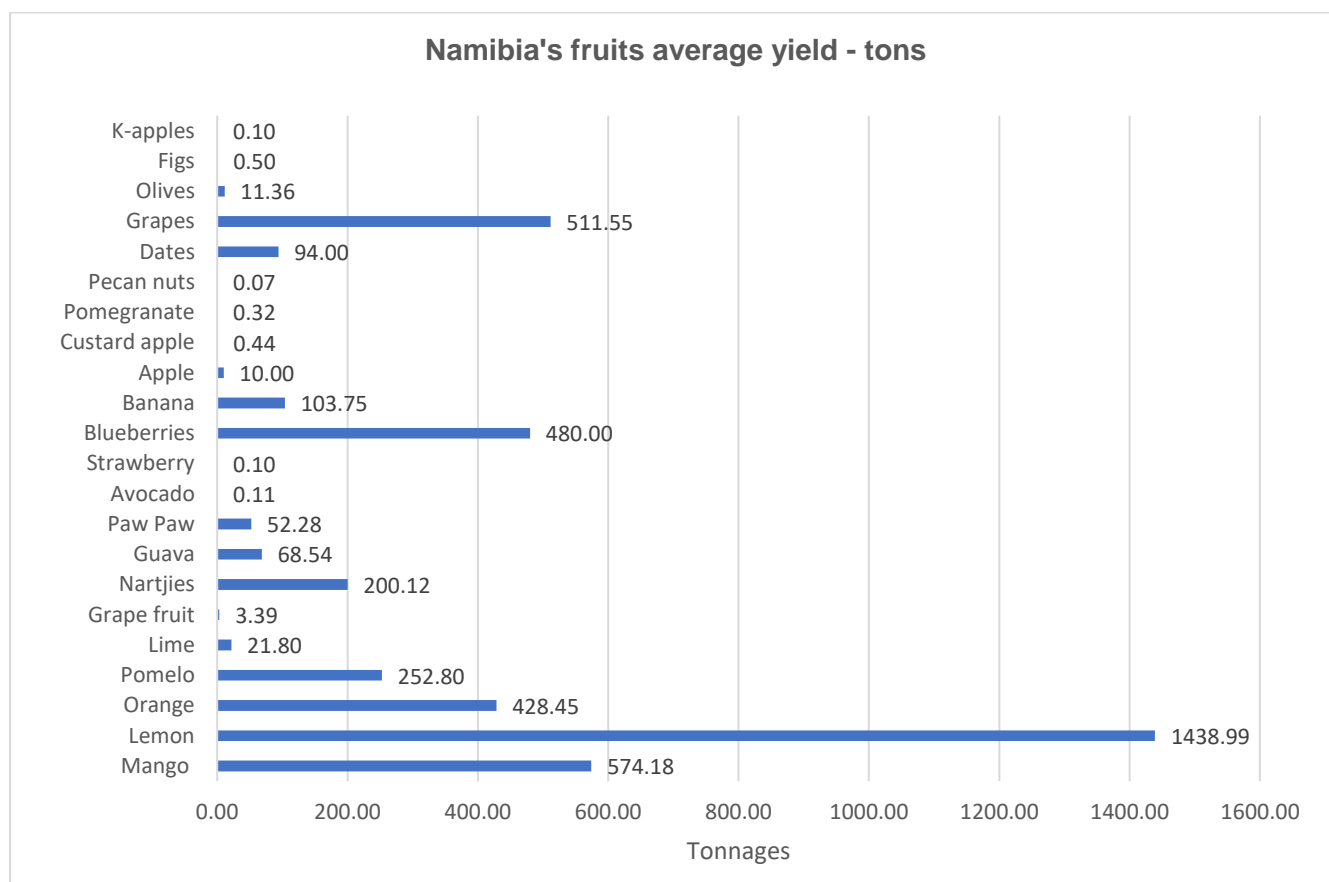


Figure 7: Overall average yield of fruits in Namibia (Survey data, 2022)

As indicated in Figure 8, at least 55% of the respondents (producers) indicated that they produce their fruits organically of which the highest number are producers in the Zambezi and North Central production zones. Only 18% of the producers indicated strictly using chemical fertilisers for fruit production, whereas the remaining 27% use a mix of both chemical and organic fertilisers.

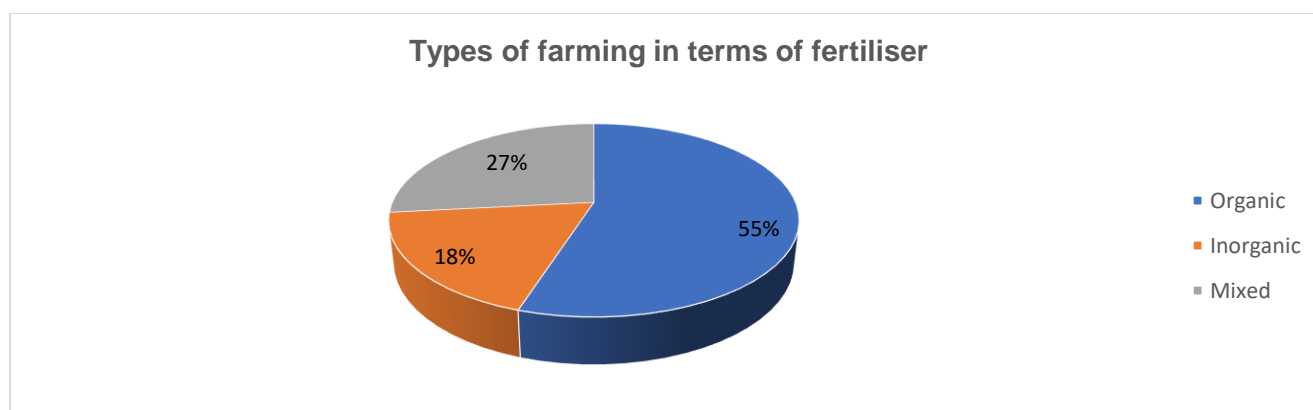


Figure 8: Types of fertiliser systems used in fruit production in Namibia (Survey data, 2022)

Figure 9 shows that the majority of the producers water their fruit trees through a manual hose pipe, especially those in communal areas of the Zambezi, North Central, and Kavango production zones. Centre pivot and furrow irrigation systems are hardly used to irrigate fruit trees or orchards.

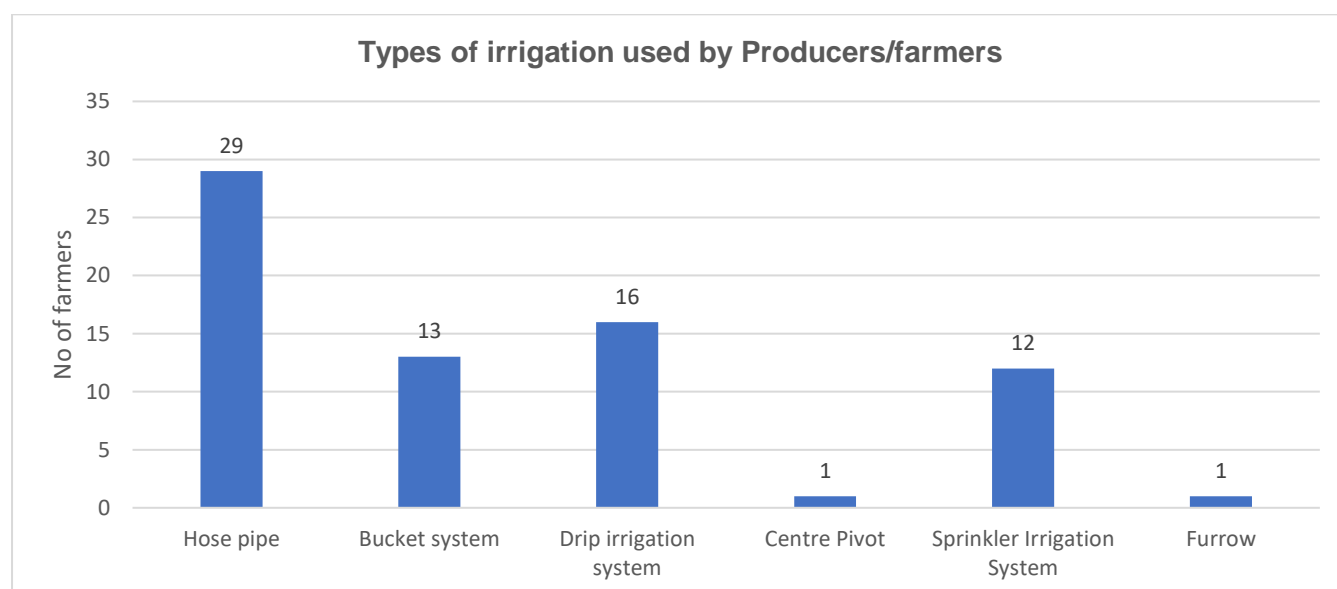


Figure 9: Type of irrigation method (Survey data, 2022)

Out of the producers interviewed, 55% indicated that the costs of fruit production are high whilst 36% indicated the costs to be moderate. A low 9% of the producers perceive the fruit production costs to be low or otherwise very affordable to grow fruits (Figure 10).

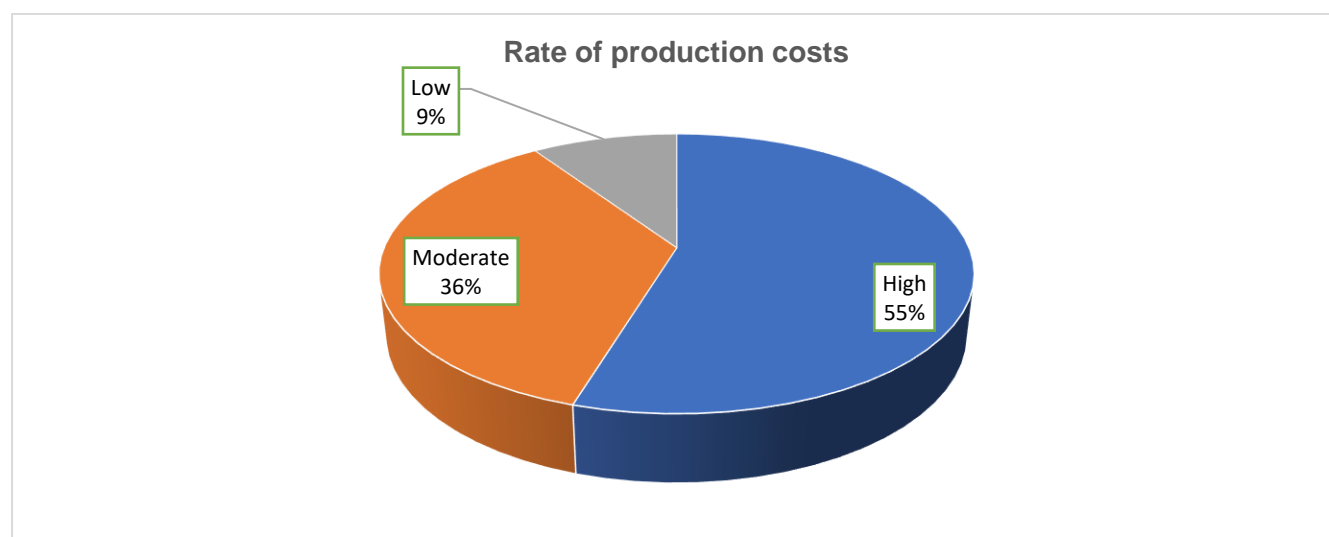


Figure 10: Perception of the production cost of fruits (Survey data, 2022)

6.1.2 Fruits production - Seedlings suppliers (Nursery owners) perspective

The study also investigated the extent to which fruit tree seedlings are available in Namibia. The below information indicates statistics about the sizes of nurseries and the average number of fruit trees that such nurseries provide or are selling to Namibian fruit tree producers.

Figure 11 depicts that on average, the Central production zone has the largest size of nursery space of about 2 hectares, but only utilises 0.27 hectares. Of the interviewed nursery owners in the Karst production zone, they all utilise their nursery space which is about 0.07 hectares. There were no nursery owners that were interviewed from the South and Orange River production zones as the study did not target to interview any of them.

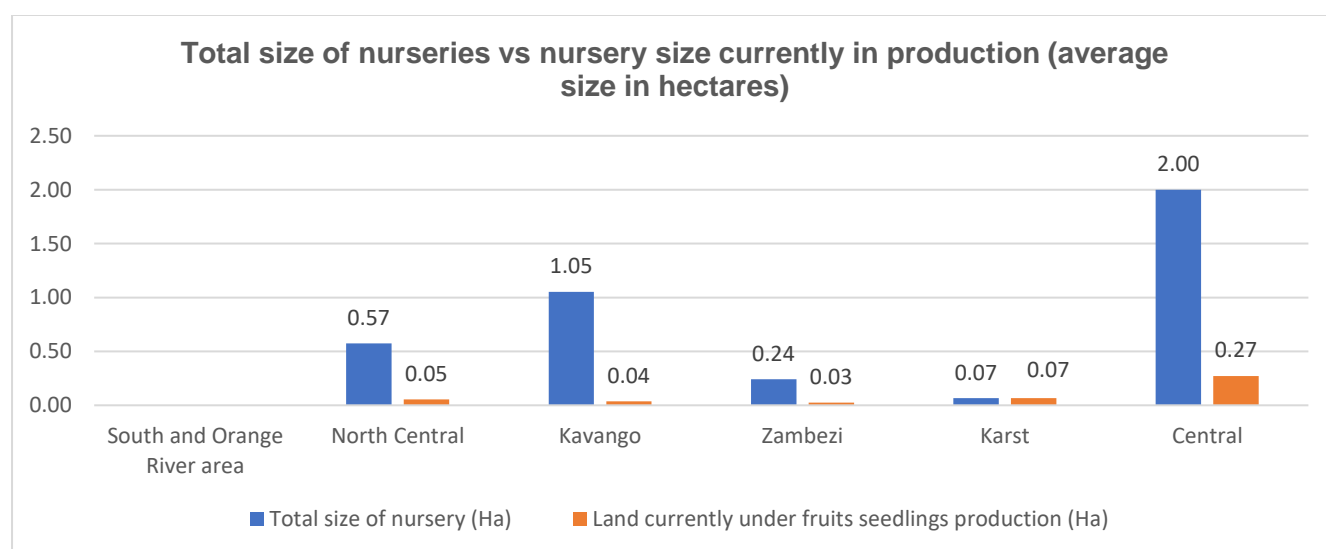


Figure 11: Average size of nurseries vs the average size of nurseries currently in production (Survey data, 2022)

Table 4 indicates the total number of fruit tree seedlings that were sold by the nurseries that were sampled for this study. The highest number was for mangoes (13,877 seedlings) sold were grown locally and only about 2,000 seedlings were imported. On average, however, the country imported more fruit tree seedlings (41,561 tree seedlings) compared to those grown or prepared locally (40,664 tree seedlings). In terms of average price per fruit tree seedling, persimmons were found to be more expensive, costing about N\$735.00 per seedling. Overall, fruit tree seedlings that are grafted and imported cost much more than those directly grown from seedlings locally.

Table 4: Number and types of fruit tree seedlings sold by the nurseries in Namibia (Survey data, 2022)

No.	Fruit tree type	Quantity locally grown (Per year)	Quantity imported (per year)	The selling price of each fruit tree seedling (N\$/seedling)
1	Mango	13,877	2,060	69.65
2	Lemon	7,841	3,056	119.88
3	Orange	585	6,575	196.27
4	Pomelo	-	-	-
5	Kumquat	-	-	-
6	Lime	-	600	240.00
7	Grapefruit	-	275	260.00
8	Nartjies	1,188	2,075	137.95
9	Guava	4,073	1,036	83.27
10	Paw Paw	5,043	236	54.07
11	Avocado	143	1,206	194.38
12	Pineapple	50	50	35.00
13	Strawberry	500	5,000	27.50
14	Blueberries	-	2,000	295.00
15	Banana	106	2,796	174.72
16	Apple	125	4,225	254.22
17	Custard apple	3,750	500	14.67
18	Pomegranate	500	1,236	128.89
19	Cashewnuts	1,000	2,000	187.50
20	Pecan nuts	-	-	365.00
21	Mulberry	500	-	30.00
22	Dates	60	-	30.00
23	Grapes	1,048	1,250	180.25
24	Olives	-	200	400.00
25	Figs	100	236	329.17
26	Peaches	-	2,075	247.50
27	K-apples	-	-	-
28	Tangelos	-	150	625.00

No.	Fruit tree type	Quantity locally grown (Per year)	Quantity imported (per year)	The selling price of each fruit tree seedling (N\$/seedling)
29	Dragon fruit	-	-	-
30	Passion Fruit	-	-	-
31	Granadilla	175	-	65.00
32	Pears	-	150	360.00
33	Quinces	-	150	200.00
34	Prunes	-	200	250.00
35	Kiwi	-	150	180.00
36	Litchis	-	150	320.00
37	Apricots	-	600	285.00
38	Plums	-	350	290.00
39	Nectarines	-	850	280.00
40	Persimmons	-	125	735.00
Total		40,664	41,561	

According to the International Trade Centre (ITC, 2022) Trade Map, Namibia imported live trees worth US\$4,506,000 (N\$77,052,600) in 2021, of which 97% of these trees were imported from South Africa (Figure 7). Very small amounts were also sourced from Spain, Germany, and other countries.

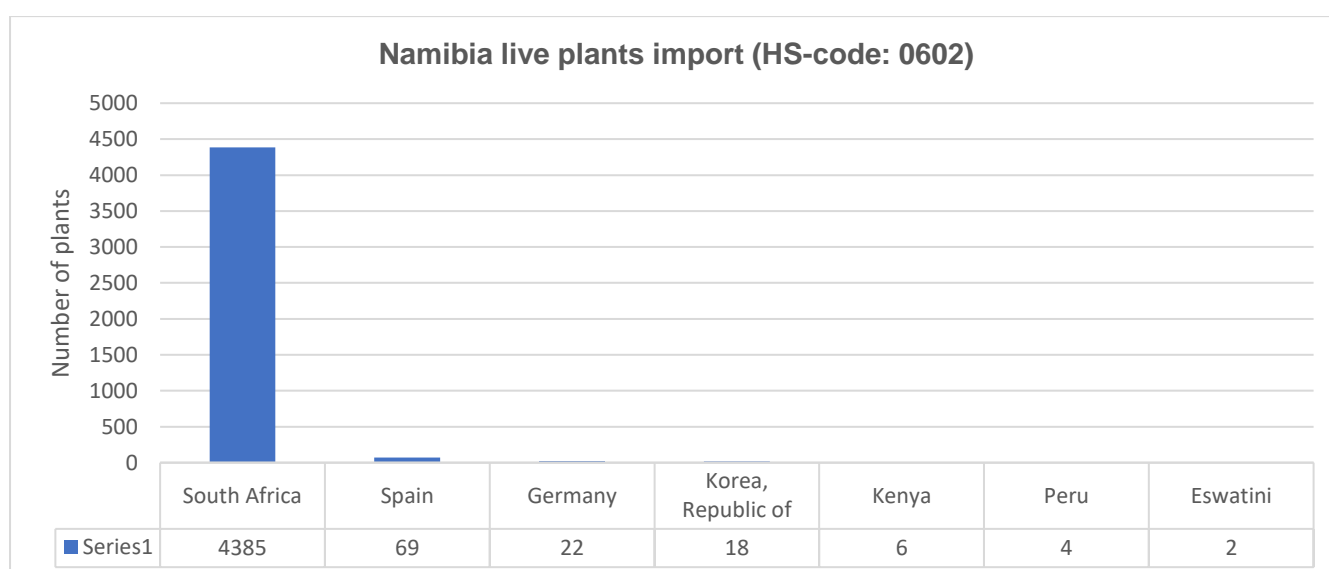


Figure 12: Namibia's live plant imports overview (ITC, 2022)

6.1.3 Fruits production - Traders' (formal) perspective

The study also sampled some formal traders involved in fruit production which gave an estimate of the type and quantity of fruits they purchase from the local producers in comparison to what they import from other countries. Table 5 summarises the types and quantities of fruits traded by the sampled local traders.

Table 5 indicates that the interviewed traders mostly acquire mangoes (average of 183.96 tonnes per year) from local farmers, followed by oranges (122.10 tonnes/year) and thirdly grapes (31.35 tonnes/year). This implies that the above are the top three locally produced fruits in Namibia. The same traders also indicated having imported an average of 1,525.78 tonnes of apples per year, 1,375.29 tonnes of oranges per year, 1,082.92 tonnes of grapes per year, and 803.18 tonnes of bananas per year respectively.

Table 5: Types and quantity of fruits traded (sampled formal traders) in Namibia (Survey data, 2022)

Type of fruits	Average local purchase in tonnes/year	Average imports in tonnes/year
Mangoes	183.96 (200)	501.96 (76,800)
Oranges	122.10	1,375.29 (96,000)
Dates	3.72	0.52
Grapes	31.35	1,082.92
Lemons	18.96	472.03
Pomegranates	0.24	-
Watermelons	21.60 (8,100)	- (12,000)
Spanspeck	16.80 (11,000)	- (14,400)
Apples	6.48	1,525.78
Pears	2.40	178.21
Blueberries	2.63	1.62
Bananas	4.80	803.18
Nartjies	1.30	95.76
Paw Paw	3.50	17.00
Litchis	Litchis	-
Avocadoes	5.10	17.32 (111,600)
Grapefruits	0.16	-
Strawberries	7.20	9.85
Prickly	1.08	0.60
Wintermelon	- (600)	-
Pineapples	-	16.20 (45,576)
Plums	-	251.10
Apricots	-	

Type of fruits	Average local purchase in tonnes/year	Average imports in tonnes/year
Figs	-	0.08
Granadilla	-	1.00
Guavas	-	0.50
Peaches	-	1.38
Prunes	-	0.14
Kiwi	-	-
Coconut	-	3.00
Total	433.38 (19,900)	6,355.43 (356,376)

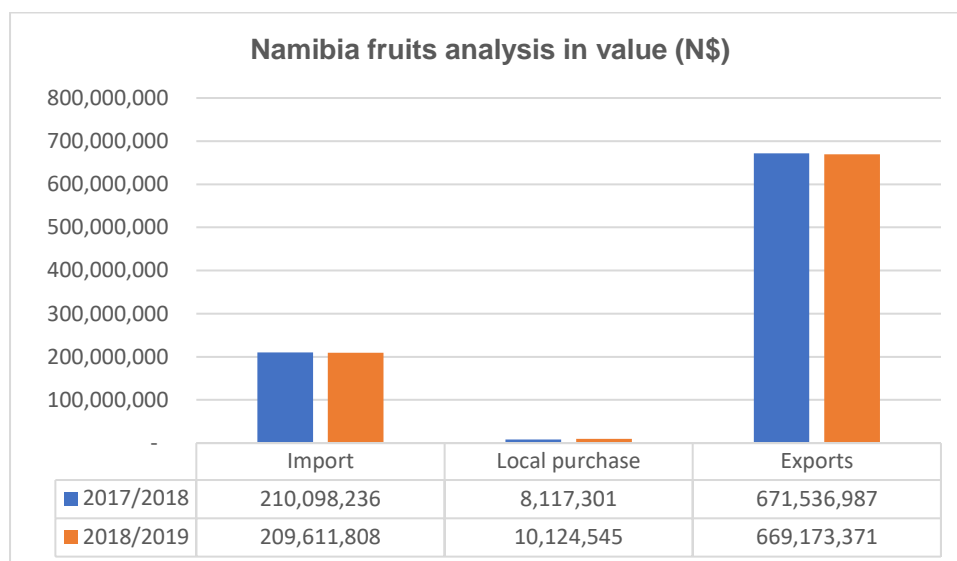
NB: Figures in brackets refer to the number of other fruits in single counts (i.e. 8,100 watermelons)

During the 2018/2019 financial year, Namibia imported over 8,300 tonnes of apples, 5,084 tonnes of bananas, 3,347 tonnes of oranges, 1,114 tonnes of pears, and 998 tonnes of grapes (Table 6).

Table 6: Top 5 fruit imports in Namibia during the 2018/2019 financial year (NAB, 2022)

Fruit type	Tonnage	Proportion %
Apples	8,327	44%
Bananas	5,084	27%
Oranges	3,347	18%
Pears	1,114	6%
Grapes	998	5%
Total	18,870	100%

Figure 13 depicts that Namibia imported fruits worth about N\$210 million in 2017/2018 and N\$209 million in 2018/2019. The top three imported fruits were apples, bananas, and oranges (Table 6). The country also exported a significant amount of fruits of over N\$600 million in both years, however over 85% of these exports were grapes alone, and only a little of about 15% exports of date fruit, blueberries, and a few mangoes (Figure 13).



Out of the total exports, grape exports alone contributed
95% - 2017/18
89% - 2018/19

Figure 13: Namibia fruits analysis for the 2017/2018 & 2018/2019 financial year (NAB, 2022)

6.1.4 Availability of fruit tree seedlings

To ensure a successful fruit production industry, commercial fruit producers need to ensure that they have access to good quality and stable supply of fruit tree seedlings or seed varieties. Fruit seedlings availability in Namibia is a challenge because there are no seedlings suppliers who are producing seedlings from scratch locally. Most of the fruit farmers in the country procure their seedlings directly from nurseries outside of Namibia, or otherwise from local nurseries that also import these seedlings from other countries.

As indicated in Figure 14, of the interviewed producers, 36% indicated that they purchase their fruit tree seedlings from local suppliers, while 25% raise their trees from locally purchased seeds. It is worth noting that these producers are mostly from the Zambezi and North Central production zones where fruit production is scarcely practised commercially. Furthermore, the 36% that purchase their seedlings from local suppliers include purchases from suppliers or nurseries who are also importing these seedlings from other countries. Approximately 20% of the producers also indicated importing their fruit tree seedlings and these are from the Karst, Central, South and Orange River production zones where fruits are largely produced on a commercial basis.

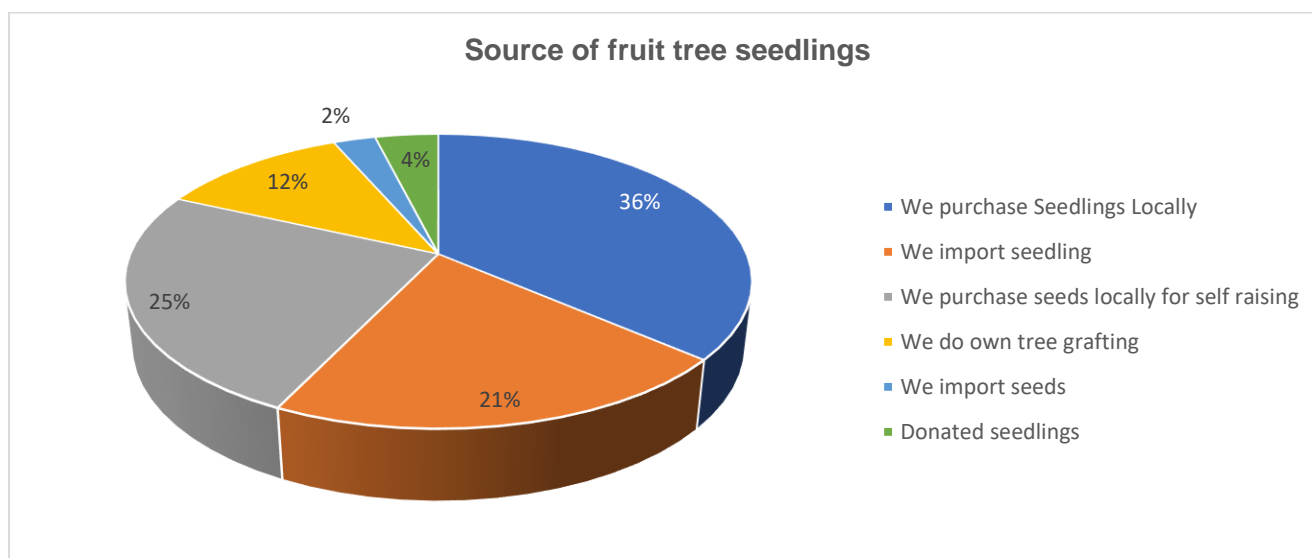


Figure 14: Source of fruit tree seedlings – Producers/farmers (Survey data, 2021)

Table 6 indicates the average cost of seedlings for each fruit type. The locally produced seedlings are relatively cheaper in comparison to those imported. This is partly because of the differences in production costs or activities involved, i.e. imported trees and mostly grafted whilst the locally produced ones are grown from seeds. Furthermore, the costs of imported seedlings are much higher due to the administration costs incurred to import the seedlings into Namibia.

Table 6: Average cost of seedlings nurseries (Survey data, 2022)

Type of fruit tree	Average cost per seedling (N\$/seedling) - locally produced trees	Average cost per seedling (N\$/seedling) – imported trees
Mango	55.72	291.25
Lemon	105.69	268.33
Orange	196.27	306.70
Pomelo	N/A	N/A
Kumquat	N/A	N/A
Lime	N/A	240
Grapefruit	N/A	260
Naartjies	33.25	295
Guava	22.11	175
Paw Paw	20.67	104.2
Avocado	33.75	355
Pineapple	35	N/A
Strawberry	30	25

Type of fruit tree	Average cost per seedling (N\$/seedling) - locally produced trees	Average cost per seedling (N\$/seedling) – imported trees
Blueberries	N/A	295
Banana	180	172.10
Apple	16	373.30
Custard apple	14.67	N/A
Pomegranate	25	180.80
Cashewnuts	10	365
Pecan nuts	N/A	365
Mulberry	30	N/A
Dates	30	N/A
Grapes	55.50	305
Olives	N/A	400
Figs	N/A	329.20
Peaches	N/A	247.50
K-apples	N/A	N/A
Tangelos	N/A	625
Dragon fruit	N/A	N/A
Passion Fruit	N/A	N/A
Granadilla	10	92.50
Pears	N/A	360
Quinces	N/A	200
Prunes	N/A	250
Kiwi	N/A	180
Litchis	N/A	320
Apricots	N/A	285
Plums	N/A	290
Nectarines	N/A	280
Persimmons	N/A	735

NA – Cost not provided

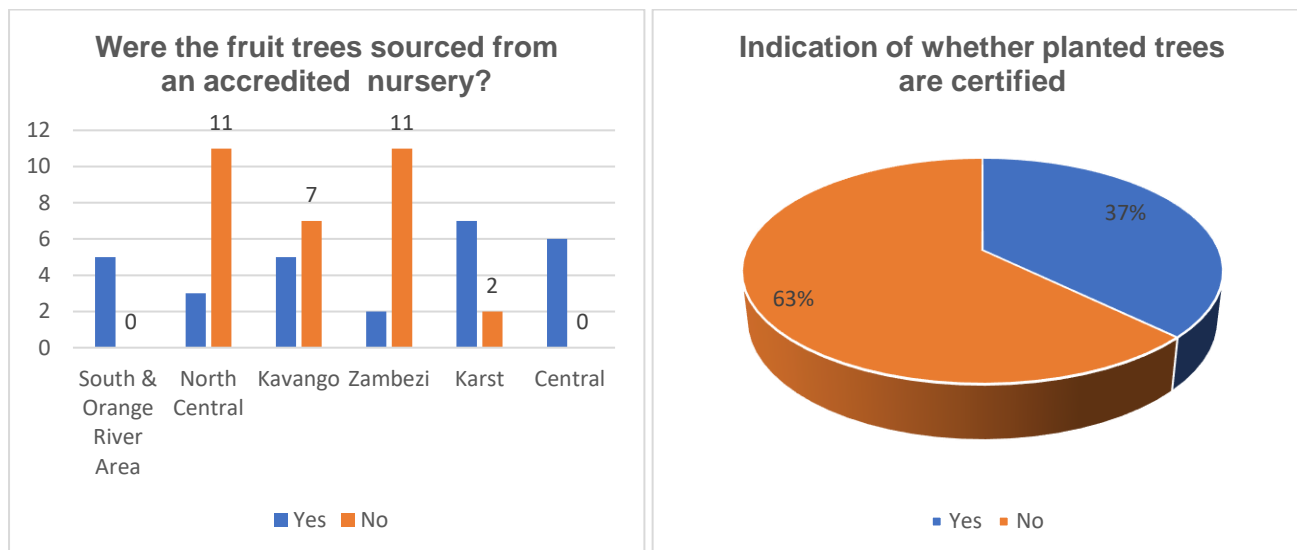
6.2 REGULATORY COMPLIANCE AND INDUSTRY PROTECTION

6.2.1 Phytosanitary issues

The fruit industry is one of the most delicate industries that are susceptible to phytosanitary challenges such as pests (i.e. fruit flies) and chemical levels in fruits. International markets require strict conformation to sanitary and phytosanitary standards.

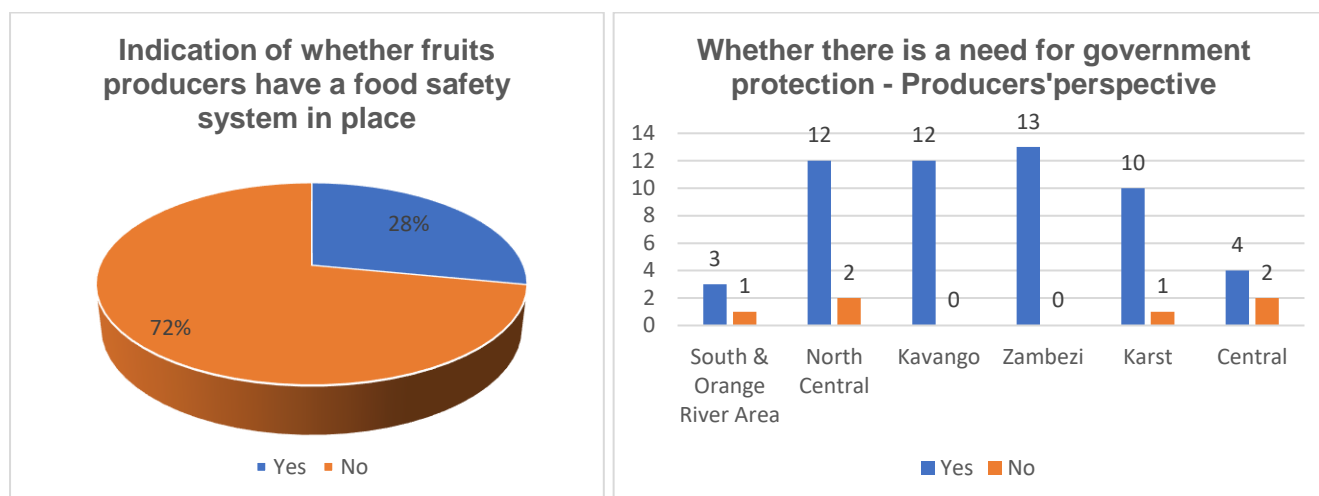
The study revealed that the majority of respondents in communal areas, i.e. Zambezi, North Central, and Kavango, do not source their fruit tree seedlings from accredited nurseries (Figure 15a). This

therefore may create challenges for secured markets, especially international markets due to standards requirements that are related to phytosanitary issues. Furthermore, as indicated in Figure 15b, 63% of the respondents, which is more than half of the interviewed producers indicated that their fruit trees currently under production were not certified. It is further worth noting that some of these respondents were not sure whether the seedlings were certified or not.



Figures 15a & b: Phytosanitary issues on the planted fruit trees currently in production (Survey data, 2022)

Figure 16a indicates that a majority (72%) of the interviewed producers admitted to not having or implementing any food safety systems in their place of production. The majority of these producers are also from the communal regions of Zambezi, Kavango, and North Central. In addition, the majority of the producers from the same production zones also wish for some type of government protection for the fruit production industry, especially with regard to marketing (Figure 16b).



Figures 16a & b: Phytosanitary issues and government support for industry protection (Survey data, 2022)

6.3 MARKET INFORMATION

The study also investigated the average quantities of various fruits being sold through informal, formal, and export markets.

Table 7 indicates that the majority of fruits being sold through formal markets (including export markets) also seem to be attracting fairly high prices in comparison to those that were sold through the informal market.

Table 7: Average quantities sold through various markets (Survey data, 2022)

Fruit type	Average Quantity Sold (kg)			Prices (N\$/kg)		
	Informal traders	Formal (local) traders	Export markets	Informal	Formal (local)	Export markets
Mango	75,775	4,149	79,590	13.92	14.06	7.56
Lemon	23,546	19,974.67	-	11.56	13.33	-
Orange	16,2275.3	694,624	-	12.47	12.35	-
Pomelo	7,000	245,000	-	10	25	-
Kumquat	-	-	-	-	-	-
Lime	972	21,588	-	15	16.75	-
Grape	367	3,023	-	8.83	-	-
Nartjies	2,576	-	-	14.13	-	-
Guava	10,441	-	-	6.83	6	-
Paw Paw	40,460	63,000	-	11.33	8.5	-
Avocado	110	-	-	42.08	-	-

Fruit type	Average Quantity Sold (kg)			Prices (N\$/kg)		
	Informal traders	Formal (local) traders	Export markets	Informal	Formal (local)	Export markets
Pineapple	-	-	-	-	-	-
Strawberry	-	-	-	20	-	-
Blueberries	1	9	210	80	80	160
Banana	7,700	-	-	10	-	-
Apple	2,000	8,000	-	8	15	-
Custard apple	2,310	-	-	15	-	-
Pomegranate	360	-	-	-	-	-
Cashewnuts	360	-	-	-	-	-
Pecan nuts	70	-	-	15	-	-
Mulberry	-	-	-	-	-	-
Dates	5,000	21,000	86,000	20	50	45
Grapes	11,346.5	66,636	1,456,668	58.33	89	70.44
Olives	7,815	14,100	-	170.83	200	-
Figs	300	-	-	8	-	-
Peaches	-	-	-	-	-	-
K-apples	100	-	-	15	-	-
Tangelos	-	-	-	10	-	-
Dragon fruit	-	-	-	-	-	-
Passion Fruit	-	-	-	-	-	-
Granadilla	-	-	-	-	-	-

As shown in Figure 17, over 70% of the interviewed respondents (producers) indicated that they are not doing any value addition to their fruits. This is in correlation with the high post-harvest losses normally experienced by crop farmers, and fruit producers are not exempted (Parveen et al., 2014). Value addition, therefore, ensures maximum benefits from all the harvests and minimises post-harvest losses, thus improving production.

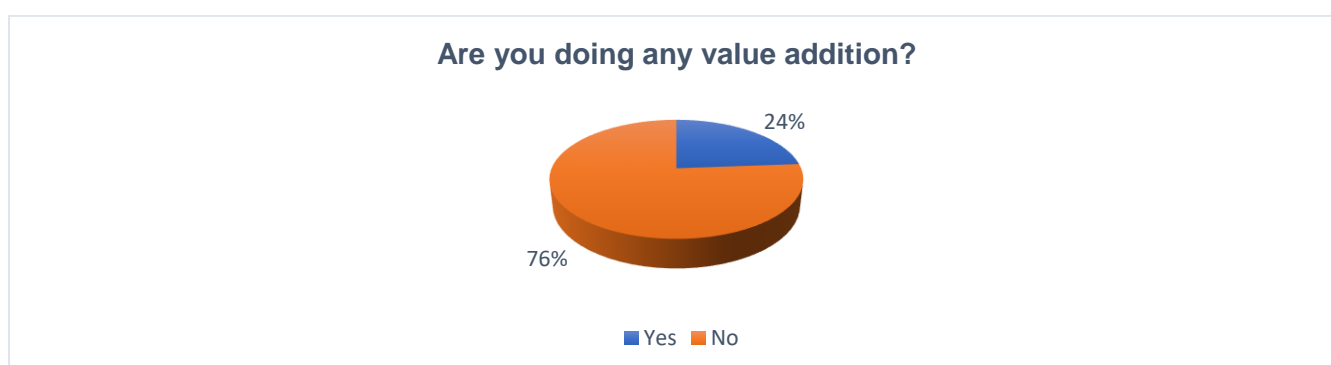


Figure 17: Status of fruits value addition (Survey data, 2022)

A few (24%) (Figure 17) of the interviewed producers doing value addition are processing lemons into juice, drying and processing grapes for raisins and jam, oil pressing olives to make olive oil as well as processing mango into juice and jam (Table 8).

Table 8: Type of value addition on fruits done in Namibia (Survey data, 2022)

Fruit type	Form of Value addition	End/finished product	Production zone
Lemon	Processing	Juice	North Central; South & Orange River
Grapes	Drying & processing	Raisins & jam	South & Orange River
Olives	Oil pressing	Oil	Central
Mango	Processing	Juice & jam	North Central

As presented in Figure 18, the majority of fruit producers in the communal areas of Zambezi, North Central, and Kavango production zones do not have any cold storage facilities for their fruits. Cold storage facilities are a necessity for reducing post-harvest losses, increasing shelf life as well as playing an important role in food processing, including fruit processing (Hassan, 2021).

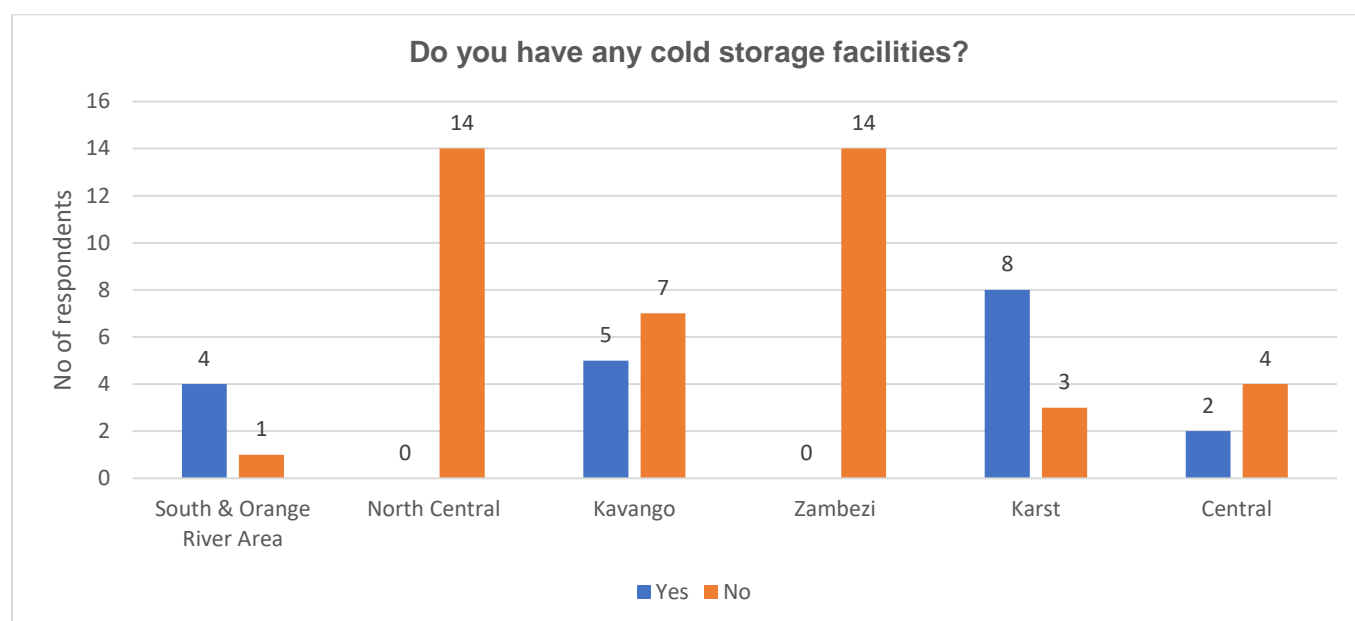
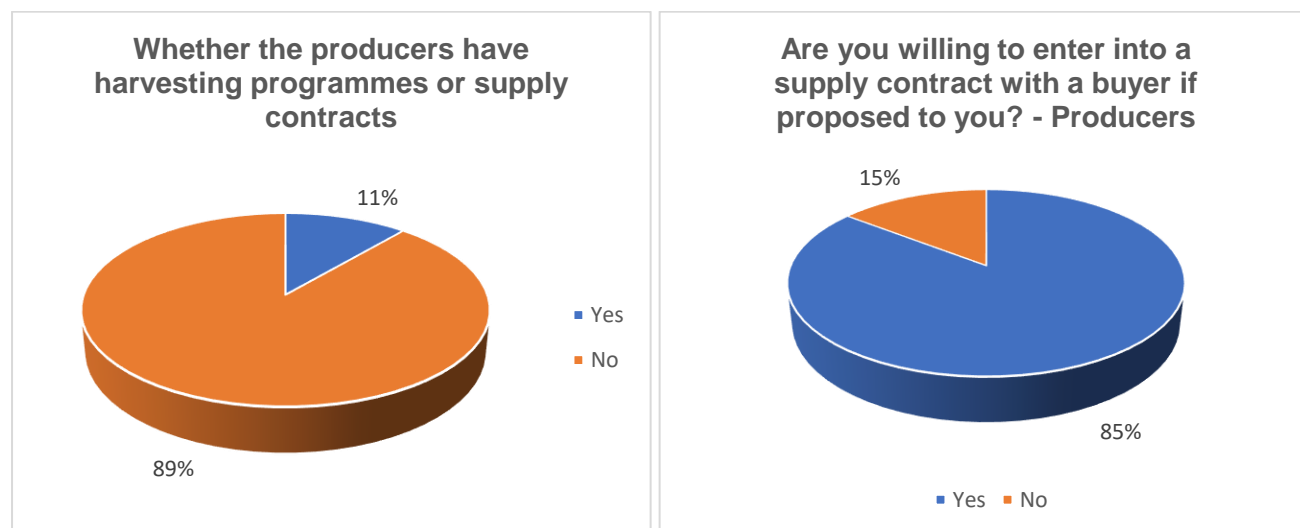


Figure 18: Cold storage facilities at farm level (Survey data, 2022)

Out of the interviewed fruit producers and as indicated in Figure 19a, only 11% of them have supply contracts with traders or buyers whilst 89% do not have any contracts. Of those who do not have any

supply contracts, 85% (Figure 19b) indicated their willingness to have supply agreements with buyers in the future.



Figures 19a & b: Status of supply contracts or harvesting programmes (Survey data, 2022)

6.4 BUSINESS FINANCING INFORMATION

According to Miller (2013), agricultural finance is defined as a subset of rural finance dedicated to financing agriculture-related activities such as inputs, production, storage, processing, and marketing of goods. Namibia has several banking institutions that finance agriculture-related business activities and the Agribank of Namibia is one of the entities whose main mandate is to advance money to persons or financial intermediaries to promote agriculture and activities related to agriculture (Agribank, 2022).

To understand the financial support and repayment conditions of agricultural loans (specifically for fruit production), the producers were also interviewed with regard to what was their source of start-up capital for fruit production. The majority of producers (45) indicated that they used their funds to invest in fruit production and only four (4) were financed through banking institutions. Those financed by banking institutions also indicated that they have an agreement with the bank for flexible payment arrangements and being a diversified farmer affords them affordable interest rates (Figure 20).

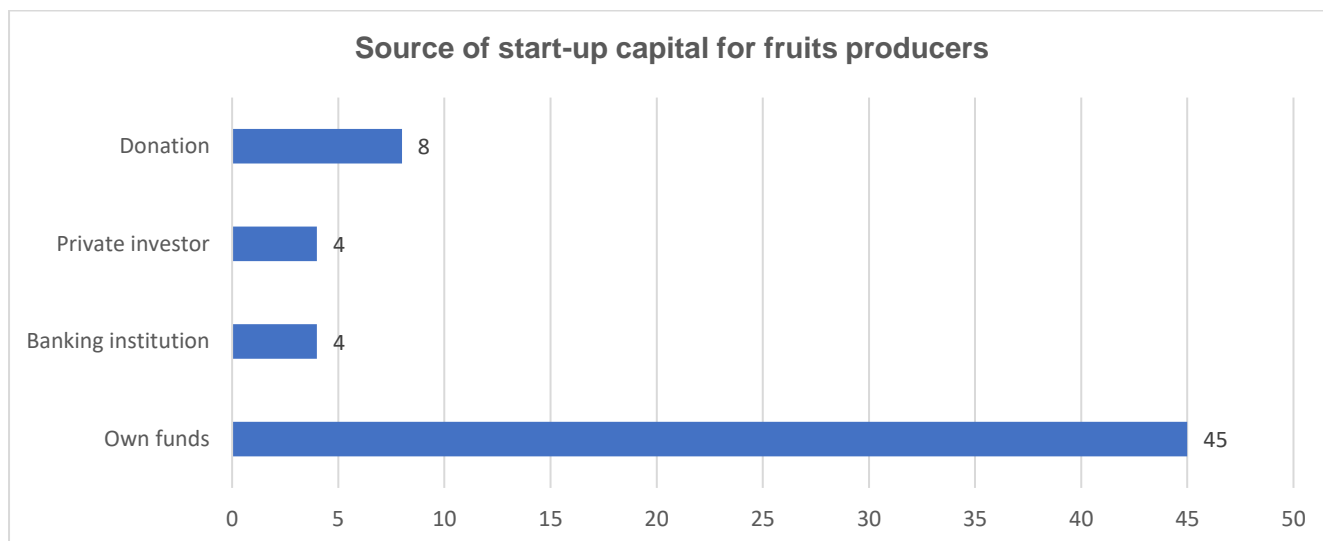


Figure 20: Source of start-up capital (Survey data, 2022)

6.5 TRAINING AND INDUSTRY AFFILIATION

Access to information and regular training allows farmers to stay relevant and updated with the latest developments in the farming industry and adjust farming principles and increase yields (International Federation of Library Associations and Institutions (IFLA), 2017).

According to Opportunity International (2022), farmers' training results in increased yields; improved skills in farm management; increased income, and; an improved local economy. The study, thus, investigated whether fruit producers are members of any associations involved in fruit production through which they receive training and information related to fruit production.

Figure 21 indicates that the majority of producers interviewed are not members of any unions or associations dealing with fruit production. This is so, especially in the North Central, Kavango, and Zambezi production zones which are considered to be more on communal setup.

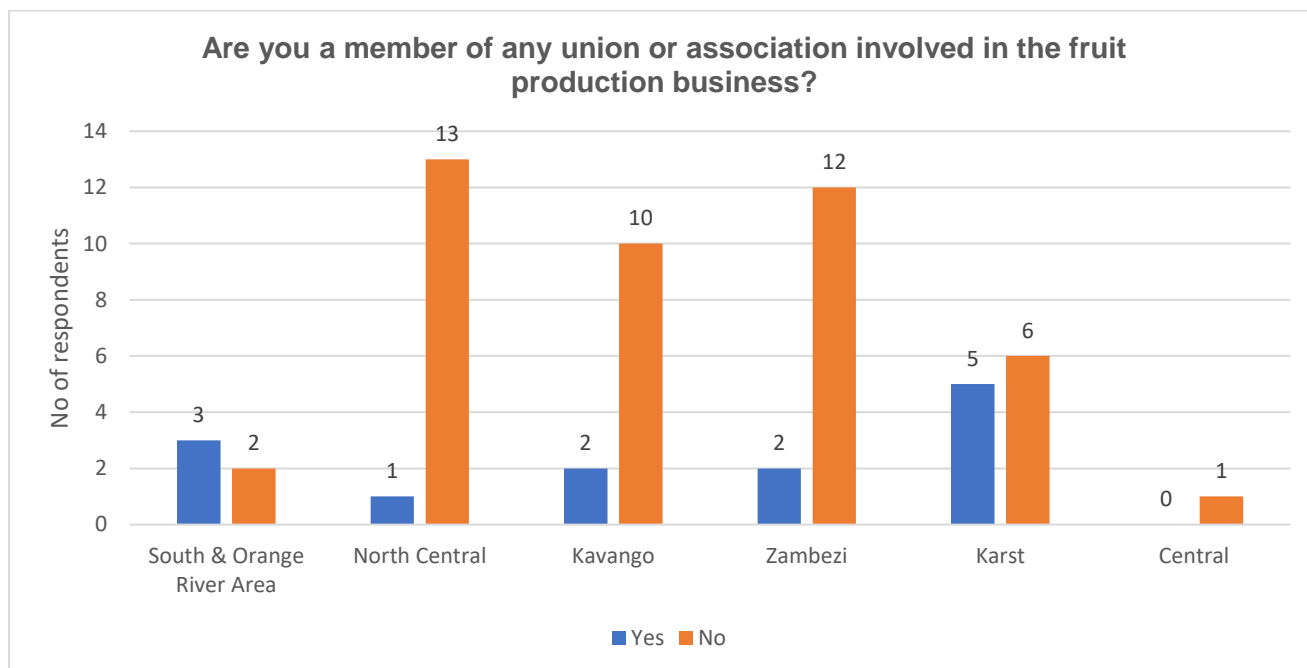


Figure 21: Associations or union membership status (Survey data, 2022)

As indicated in Figure 22, about 72% of the fruit producers do not receive any form of government support in terms of extension services. This implies that many fruit producers are left to operate in a vacuum with minimal support from government offices. This further explains why many of the producers are planting uncertified fruit trees and do not have any food safety systems in place as shown in Figures 15a-b and 16a-b.

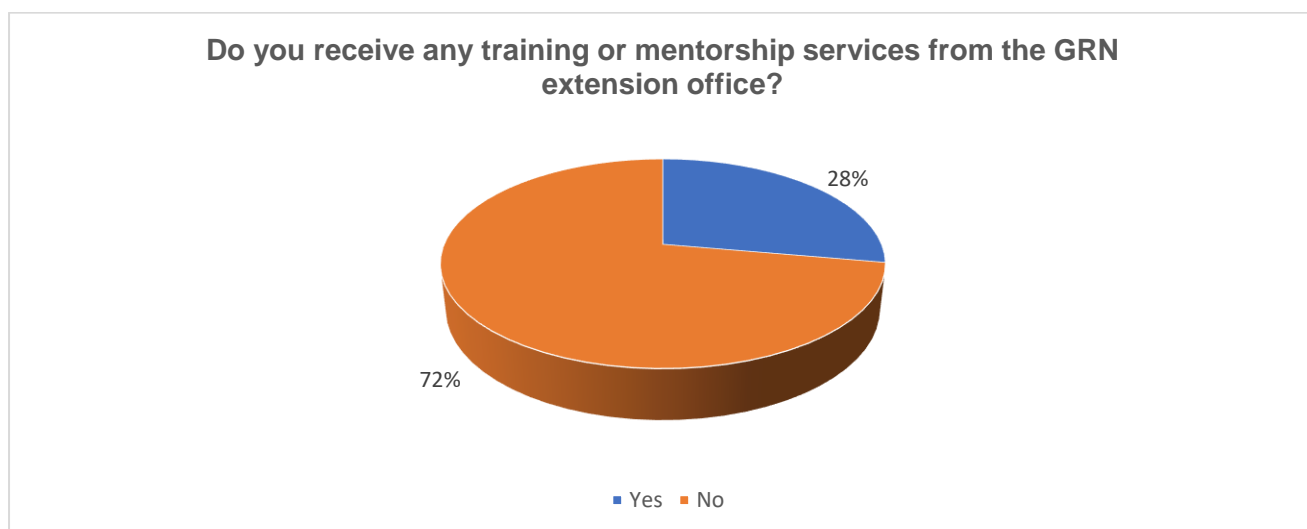


Figure 22: Government extension services (Survey data, 2022)

6.6 CHALLENGES AND OPPORTUNITIES IN THE NAMIBIAN FRUIT PRODUCTION INDUSTRY

Owing to the very low production of fruits in Namibia, there are bound to be constraints hindering the development and perhaps reducing interest in commercial fruit production. However, the country's high production of fruits such as grapes, dates, and blueberries which are of international standards indicates that there is potential for the country to produce other fruits on a large scale. This section, therefore, highlights the challenges currently being experienced as well as possible opportunities as proposed by the sampled stakeholders (producers, traders, and nursery owners) involved in the fruits industry.

6.6.1 Challenges

Farming of any kind is always characterised by various challenges that affect the enterprise throughout the different stages of farming. To understand Namibia's fruit industry further, this study also investigated the possible challenges affecting the fruit production aspect. Both stakeholders (producers, traders and nurseries) were asked about the possible challenges they experience.

6.6.1.1 Challenges by Fruit Producers

Below are a few challenges experienced from the producers' perspective:

- a) Weather damage due to heavy rain and sometimes heat. Heavy rain can cause a lot of damage to crops, thereby causing yield losses;
- b) High costs of production inputs such as fertilizers, labour, water, and equipment (shade nets, water tanks, packaging materials, fencing, irrigation, electricity, fuel, etc.);
- c) Lack of viable seeds/seedlings (no established standard nurseries);
- d) Pests and diseases i.e. fruit flies, birds, powdery mildew, etc.;
- e) Unsuitable high soil PH and lime make it unsuitable for some fruit trees;
- f) Lack of proper knowledge or expertise in fruit production;
- g) Lack of proper market facilities, long distance to markets, and lack of market information;
- h) Lack of financial support and resources to produce on a commercial basis (no collateral for loans etc.);
- i) High post-harvest losses due to lack of preservation and proper storage opportunities;
- j) Inadequate knowledge of propagation techniques (grafting, budding, air layering, etc.);
- k) Lack of coordination and support amongst fruit producers;
- l) Lack of access to formal markets (limitation to transport mangoes from the Zambezi over the red line, unfair competition from imported mangoes from Zambia and Angola); and

- m) Lack of government support in terms of financing, extension services, market access, and market protection.

6.6.1.2 Challenges by Fruit Traders

Fruit traders also experience challenges and among the major challenges are:

- a) Low-quality fruits from local fruit producers;
- b) Logistical challenges - producers are not able to deliver their products to the traders on time;
- c) Supply inconsistency and limited varieties due to low production and diversity from local producers;
- d) Over-regulations at the borders for fruit imports result in spoiled fruits; and
- e) Unregistered (with NAB) fruit suppliers.

6.6.1.3 Challenges by nurseries/ fruit seedlings suppliers

Nurseries also experience various challenges when it comes to the fruit industry and such include:

- a) Lack of grafting materials and quality seeds to produce high-quality fruit trees;
- b) High input costs such as electricity, transport, water, labour, pest control, etc.; and
- c) Cumbersome customs requirements, i.e. import permit (phytosanitary certificate) and customs clearance.

6.6.2 Opportunities

The study also investigated the available opportunities that can be used as interventions to improve the fruit production industry in Namibia. Such opportunities include:

- a) Water and land are largely available, especially along the rivers in the Kavango, Orange River, and Zambezi production zones which can be taken advantage of to produce crops on a commercial and large-scale basis.
- b) Communities have a high interest in farming, and fruit production is one of the fully untapped farming operations.
- c) Fruit production has an opportunity to create more employment and improve the country's economy. Thus, there are high opportunities to invest in establishing nurseries that will be producing high-quality planting materials for commercial fruit production.
- d) There is a high demand for fruits and over 90% of fruits consumed in Namibia are imported hence creating an opportunity to venture into fruit production.

- e) There are high investment opportunities in value addition, cold storage, and fruit processing. Investments in these areas also open up doors for increased fruit production.
- f) Establish a fruit producer's association for a better-coordinated fruit industry that will enhance production.
- g) Availing of government support in terms of extension services, mentorship, market protection, and financing can be a catalyst for fruit production development in Namibia.
- h) There are high opportunities for exploring export markets, especially for fruits such as mangoes that are currently being wasted after harvest.

6.7 POSSIBLE SUGGESTIONS TO ENHANCE FRUITS PRODUCTION IN NAMIBIA

One of the objectives of this study was to suggest recommendations on what should be done to stimulate the growth of the fruits industry in Namibia. Based on the findings highlighted in Section 5, the study recommends strategies below for possible adoption to improve fruit production in Namibia.

- a) Local fruit producers can produce provided they are given the much-needed support. Forming linkages amongst the small-scale farmers throughout the value chain has the potential to link all these smaller farmers to lucrative market opportunities. This includes support in terms of production inputs, mentorship, food safety and phytosanitary, etc.
- b) Encourage the establishment of nurseries as well as propagation services in Namibia to increase access to quality planting materials.
- c) Raise awareness of health benefits derived from consuming fruits to encourage fruit consumption, especially during harvesting and marketing seasons.
- d) Some fruits such as apples, peaches, and pears require certain minimal cold temperatures and they may be a challenge to produce in an uncontrolled environment. It is therefore suggested that the country encourages the production of tropical fruits such as mangoes, bananas, citrus, etc. which may not be affected by warmer temperatures associated with Namibia.
- e) Increase investment in value addition and processing facilities, through finance availing, which will even highly encourage production given the increased fruit uptake.

7. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings and objectives of this study, this last section summarises the findings in the form of a conclusion as well as suggestions of possible recommendations to be considered to stimulate the growth of the fruit industry in Namibia.

7.1 CONCLUSIONS

The main objective of the study was to quantify the current status quo for fruit production, storage, value addition, and the fruit market in Namibia. Upon conclusion of data collection through a survey approach and finally data analysis, the study was able to quantify an estimated size of land available for fruit production as well as that which is currently under actual fruit production. The study also quantified the average number of fruit trees per production zone and over the planted area. Additionally, the study was able to provide an estimate of the average yields of each fruit tree type in Namibia based on the sample size of respondents used in the study.

The study further established the number of nurseries as well as the estimated land size of such nurseries per production zone. Also established was the quantity of fruit tree seedlings sold to the producers, whether locally grown or imported. Finally, as per the objective of the study, which was to examine and understand the production challenges and opportunities in the fruit production industry, the study was able to summarise different challenges encountered by the current fruit producers, nursery owners, and fruit traders. Based on the identified challenges, the same stakeholders were also able to identify opportunities within the Namibian fruits industry.

Finally, the study found that most small-scale farmers especially those farming in communal areas of Zambezi, Kavango, and North Central production zones lack the understanding and experience in fruit production on a commercial basis. This is mainly because the majority of them are planting their fruits from seeds and are not sourcing seedlings from certified suppliers. Another challenge is that there are limited seedlings suppliers and certified nurseries in Namibia hence making it difficult to successfully develop the fruit industry and this leaves the small-scale farmers to produce for small markets and thereby earn little revenue.

7.2 RECOMMENDATIONS

It is obvious from the results of the study that fruit production in Namibia is relatively low, especially in many other fruit types apart from grapes. All stakeholders (producers, nurseries, and traders) showed some interest in improving the fruit production industry, however, support is essential for them to realise their potential. Based on the findings presented in Section 5 above, the study makes the following recommendations:

- a) Stakeholders involved in the fruit production industry are encouraged to keep proper records to ensure that such records are used to draw accurate and reliable statistics on the status quo of the industry.
- b) Most of the companies involved in agronomic and horticultural food processing are only registered with the Business and Intellectual Property Authority (BIPA), thus making it difficult for the NAB to identify and quantify the level of processing of horticulture products. It is therefore recommended that just as the grain processors are registered with the NAB, horticulture processors should also be registered to ensure proper monitoring of the industry and the provision of reliable data that is necessary for the development of the industry.
- c) In terms of support, it is recommended that the MSP rules and support currently applied to horticulture producers also be extended to all other fruit types (apart from grapes) to encourage investment in fruit production in Namibia.
- d) The NAB needs to encourage all stakeholders to keep records for correct and accurate reporting. Some of the respondents provided the quantities in an inconsistent format. Some reported quantities in kg or tonnage whilst others could not provide the quantities in units of measurement (dual/single counts), therefore, making it difficult to quantify the real total value of fruits in terms of kgs or tons.
- e) According to the stakeholders, the demand for fruit trees and fruit tree seedlings is very high hence the demand is quite good. Increased awareness would attract investments in the fruit production industry, be it during production, value addition, etc., which will eventually increase farmers' income and contribute to national economic growth through job creation.
- f) The NAB is urged to do a follow-up census or call for the registration of all fruit producers in the country and to register and submit data to the NAB as a way to create a database with much more reliable data on the overall status of fruit production in the country on which any policy-related interventions will be based on.

8. REFERENCE

Agribank of Namibia. 2022. <https://agribank.com.na/page/aims-and-objectives/>

Hassan M. 2021. Cold storage; is a safe approach for mitigating post-harvest losses and achieving food and nutrition security in the world. <https://agribusinessedu.com/cold-storage-a-safe-approach-for-mitigating-post-harvest-losses-and-achieving-food-and-nutrition/>.

International Federation of Library Associations and Institutions (IFLA). 2017. Development and Access to Information 2017. <https://da2i.ifla.org/wp-content/uploads/da2i-2017-chapter3.pdf>.

International Trade Centre (ITC). 2022. Trade Map. https://www.trademap.org/Country_SelProductCountry.aspx?nvpm=1%7c516%7c%7c%7c%7c0602%7c%7c%7c4%7c1%7c2%7c1%7c1%7c1%7c2%7c1%7c1%7c1.

Miller C. 2013. Agricultural Finance. https://elibrary.worldbank.org/doi/10.1596/978-0-8213-8927-0_ch10#:~:text=Defines%20agricultural%20finance%20as%20a,processing%2C%20and%20marketin g%20of%20goods.

Namibian Agronomic Board (NAB). 2018/2019. Trade Statistics, Windhoek, Namibia.

Namibian Agronomic Board (NAB). 2020. Market Share Promotion Rules and Procedures.

Nembwaya H. 2020. The Namibian Newspaper. Dated 20.11.2020

Opportunity International. 2022. Training for farmers. <https://opportunity.org/what-we-do/agriculture-finance/training-for-farmers#:~:text=Through%20training%2C%20farmers%20learn%20how,Improve%20the%20local%20economy>.

Parveen, Saima & Ishfaq, Bushra & Humaira, Kausar & Shazia, Saeed & M, Azhar. 2014. Value Addition: A Tool to Minimize the Post-harvest Losses in Horticultural Crops. *Greener Journal of Agricultural Sciences*, 4, 195-198. 10.15580/GJAS.2014.5.042914208.

Shaanika H. 2019. New Era Newspaper. Dated 09.01.2019

Shigwedha A. 2021. The Namibian Newspaper. Dated 15.01.2021