

Promotion of Regional Opportunities for Produce Through Enterprises and Linkages (PROPEL)

MARKET STUDY - TRINIDAD & TOBAGO CHF CARIBBEAN COMMISSIONED REPORT



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Glossary

Bdl	- Bundle
CARDI	- Caribbean Agricultural Research & Development Institute
CARICOM	- Caribbean Community
CHF	- Canadian Hunger Foundation
CSO	- Central Statistical
DFATD	- Department of Foreign Affairs, Trade and Development
Office EU	- European Union
Ha	- Hectares
HVB	- High Value Buyers
HVM	- High Value Market
MALMR	- Ministry of Land and Marine Resources
N/A	- Not Available
NAMDEVCO	- National Agricultural Marketing and Development Company
NAMIS	- National Agricultural Market Information System
PROPEL	- Promotion of Regional Opportunities for Produce through Enterprises and Linkages
T&T	- Trinidad and Tobago
USDA	- United States Department of Agriculture

1 INTRODUCTION

This report presents the empirical findings and analysis of the PROPEL Market Study consultancy assignment for the island of Trinidad and Tobago (T&T). As indicated in the Terms of Reference (TOR), the contents of this deliverable includes a summary of the demand by the selected buyers segmented by type of buyer and product, with recommendations of which products to investigate and their potential and recommendations to secure trading linkages between farmers and buyers. The synthesis of all the knowledge materials revealed that there were ten commodities recommended for further product analysis in stage three of the consultancy assignment. These ten (10) products are tomato, lettuce, sweet pepper, sweet potato, hot pepper, pimento, watermelon, cucumber, cabbage and papaya.

2 RESEARCH METHODOLOGY

The consultancy assignment is divided into three stages, as follows:

1. Stage One - Map and Selection of Buyers
2. Stage 2- Demand by High Value Market (HVM) Buyers
3. Stage 3- Product Analysis

In **Stage One**, the research approach focused on conducting a literature review of relevant studies such as: a Report To Identify Market Opportunities For Protected Agriculture Vegetables and Herbs (CARDI 2011); The National Food Production Action Plan 2012-2015 by the Ministry of Food Production, Land and Marine Affairs; and Market Profiles on Tomato, Cucumber and Sweet Pepper (CARDI, 2013), to ground the research process and to glean information to craft a relevant research design plan. The outcome of this process was a segmentation profile of the HVM Buyers into several groups – Supermarkets, Restaurants, Hotels, Caterers, Agro-processors, Exporters and Wholesaler/Distributors.

In **Stage Two** the research approach focused on an empirical component with the use of a survey instrument to evaluate the demand of the HVM Buyers. This questionnaire was developed with the following themes:

1. Identification Characteristics to create a profile to archive the project database. This included contact information and type of business activity.
2. General Supply Information to determine patterns in the supplier relationships including import/local production ratios, collection zones, contractual arrangements and purchasing indices.
3. Purchasing Patterns, Product & Volume to determine preference, quantity and frequency of purchase on specific product lines – tropical fruits, vegetables and root crops.
4. Future Demand Requirements to determine future consumption patterns for new products and trends in the market place.

The questionnaire utilised close ended questions in order to easily solicit answers for the questions provided and to reduce the complexity of data analysis. In some cases, open discussions were also held with interviewees, which provided additional insights.

The selection process for the survey of buyers included the largest business (based on volume purchases) and other well established businesses in each buyer segment. A few of the businesses initially listed, were not receptive and had to be replaced by other well established businesses.

However, the largest business in each buyer segment always co-operated. This eventually resulted in a sample size of thirty-eight (38) businesses. Informal discussions were held with two (2) mini-marts; one (1) agro processor; and two (2) distributors, for additional insights on their buying habits. In addition, discussions were held with two (2) national stakeholders, the Supermarket Association of Trinidad & Tobago and the National Agricultural Marketing and Development Company (NAMDEVCO). The latter is a state owned organization that assists farmers to market their fresh produce; collects wholesale prices from the wholesale markets; and also undertakes an assessment of fresh produce farms for certification, which is accepted by other CARICOM countries. The duration of the survey was from November 8th, 2014 to December 2nd, 2014.

An inductive approach was utilized for data analysis, which involved beginning with specific observations and measures; identifying patterns and regularities; and then developing general recommendations. The survey data, for purchase volumes, were recorded on an excel database and subsequently relevant data was extracted and incorporated into tables within the data analysis section of the report. The analytical framework disassembled the four sections of the questionnaire and these sections provided the tangible avenue to discuss research findings/implications and form the basis of the go-forward strategy.

Stage Three focused on an empirical research process to undertake the product potential analysis. A questionnaire was developed to generate a production profile of the farmers who were currently cultivating one or more of the ten products under study. The data outputs from the survey instrument include: gender configurations; education levels; number of years in farming; location; area under production; primary and secondary crop cycle flows; target markets; farming practices; production challenges; and supply capability.

The questionnaire used close ended questions, in order to easily solicit answers for the questions provided and to reduce the complexity of data analysis. In some cases, open discussions were also held with interviewees which provided additional insights. A farmer listing was sourced from NAMDEVCO and a random sampling method employed to acquire survey participants. The farmers were sourced from NAMDEVCO's database, since this listing has a high proportion of certified farmers, who would have the latent potential to serve the HVM segments. The duration of the survey was from December 15th, 2014 to January 2nd, 2015 and a total of twenty-six (26) respondents participated in the survey.

3 BUYER SEGMENT ANALYSIS

3.1 Supermarket Segment

The supermarket sector in Trinidad and Tobago is well developed and comprises of: a) large chains that are geographically dispersed with economies of scale, e.g. Massy Stores, Tru Valu, Xtra Foods and JTA Supermarket; b) medium sized establishments with 1-2 locations, e.g. Penny Savers Supermarket, Low Cost Supermarket and Maharaj Westside Supermarket; and c) small/micro mini-marts that serve villages with a "Mom & Pop" business model. The country has one known online supplier (Market Movers) of supermarket items, which was included in the survey.

Customers demand for one stop shopping has resulted in the growth of fresh produce sales in supermarkets. All of the major chains maintain a large area dedicated to fresh produce sales. The representative body for the sector is the Supermarket Association of Trinidad and Tobago. This association currently has a membership of 190 and the head of the association estimates that there are currently 300 supermarkets in T&T. A summary matrix of the data and key findings from the supermarket segment is illustrated in Table 1 as follows:

Table 1: Summary Matrix Supermarket Segment

Supermarket	Source of Purchase	Approximate % Grown Locally	Payment Terms	Most Important Purchasing Criteria	Are Contracts Offered To Farmers?
Massy Stores (18 Retail Outlets)	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributor	50%	1 week	1st quality 2nd price 3rd consistency 4th delivery	No – farmers are not reliable business persons
Tru-Valu (Trincity Branch)	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributors	60%	2 weeks	1st quality 2nd price 3rd consistency 4th delivery	No-farmers sell elsewhere when prices increase
JTA Supermarket (4 branches)	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributors	50%	1 week	1st quality* 2nd price 3rd consistency 4th delivery	No- freedom to choose based on quality & price
Low Cost Supermarket	<input type="checkbox"/> From Wholesale Market <input type="checkbox"/> Direct From Farmers	50%	cash	1st quality 2nd price 3rd consistency	No- freedom to choose based on quality & price
Xtra Foods	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributors	80%	1 month	1st quality 2nd price 3rd consistency 4th delivery	No- freedom to choose based on quality & price
Maharaj Westside	<input type="checkbox"/> From Wholesale Market <input type="checkbox"/> Direct From Farmers	70%	1 month	1st quality 2nd price 3rd consistency 4th delivery	No – Farmers do not keep promises
Penny Savers (Tobago)	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributors	50%	1 month	1st quality 2nd price 3rd consistency 4th delivery	No – prefer to identify reliable farmers
Market Movers (Online supermarket)	<input type="checkbox"/> From Wholesale Market <input type="checkbox"/> Distributors <input type="checkbox"/> Direct From Farmers	80%	cash	1st quality 2nd consistency	Yes- to keep reliable suppliers

*Quality refers to freshness, consistency in shape, color and free from dirt, pests and chemical residue

The significant learning points from the above are as follows:

1. All of the respondents/supermarkets (100%) surveyed are receptive to being approached by new farmers to source produce, since this is viewed as an opportunity to provide an avenue for wider choice options, with respect to quality, price and consistent supply.

2. Three quarters (75%) of the supermarket respondents indicated, that delivery of the fresh produce to their retail outlet is an important purchasing criterion. While supermarkets agree that there are high fluctuations in the price of fresh produce, they also prefer suppliers, who give two to four weeks advance notice, before increasing their prices.
3. Supermarkets purchase fresh produce on a weekly basis, which provides a more reliable source of sustainable income for producers/farmers.
4. All of the respondents/supermarkets (100%) changed some of their fresh produce suppliers over the past 24 months. Sixty-two percent (62%) changed a small number, while 38% changed a high number of their suppliers. The main reasons for these changes were, one or more of the following: poor quality; higher prices; and/or inconsistent supply. This suggests that the supplier relationships are not static and there is room for new farmers to serve supermarkets.
5. There was consensus, among the supermarkets, that the current trends in the market are that customers are becoming much more health conscious and appreciate more sustainably and/or organically grown fresh produce. There is also an increasing demand for convenience items, which requires light processing/pre-packaging and which can provide opportunities for upstream value chain linkages in the sector.

The following Tables 2 and 3 represent the volumes and the average price paid by supermarkets for their major vegetables and fruit. A comparison is also made, between the prices that the farmers obtain by selling directly to supermarkets, as opposed to selling at the wholesale market.

Table 2: Main Fresh Vegetables Purchased Weekly By Supermarkets Surveyed

No.	Fresh Produce	Average Quantity Purchased (kg) Weekly	Average Price Paid by Supermarket (TT\$) per kg	Average Wholesale Price For 2013 (TT\$) per kg source :	Average Price Benefit By Selling Directly To Supermarkets	Benefit in TT\$ (Col 3 by Col 6 e.g. Tomato = 26,134 kg by \$3.93)
1.	Tomato	26,134 kg	18.70	14.77	\$3.93 or 27%	102,707 (1st)
2.	Lettuce	24,618 hd	5.50	4.22	\$1.28 or 30%	31,511 (5th)
3.	Cucumber	21,951 kg	10.00	7.13	\$2.87 or 40%	62,999 (2nd)
4.	Cabbage	18,213 kg	11.00	8.45	\$2.55 or 30%	46,443 (3rd)
5.	Plantain	13,316 kg	12.98	10.14	\$2.84 or 28%	37,817 (4th)
6.	Sweet Pepper	8,016 kg	18.00	15.12	\$2.88 or 19%	23,086 (6th)
7.	Sweet Potatoes	6,645 kg	10.00	7.72	\$2.28 or 30%	15,150 (8th)
8.	Cauliflower	6,502 hd	15.00	Not Available (N/A)	N/A	N/A
9.	Pimento	25,730	0.35 each	0.27ea	\$0.08 or 30%	2,058(13th)
10.	Hot Peppers	pimentos 44,808 hot	0.45ea	0.35ea	\$0.10 or 29%	4,480 (12th)
11.	Pumpkin	23,829 kg	4.00	3.24	\$0.76 or 23%	18,110 (7th)
12.	Patchoi	4,957 bdl	7.00 bundle	5.48/ bundle	\$1.52 or 28%	7,535 (10th)
13.	Ochro	22,500 ochroes	0.30 / ochro	0.25 / ochro	\$0.05 or 20%	1,125 (14th)
14.	Shadon beni	5,150 bdl	6.00 / bundle	N/A	N/A	N/A
15.	Eggplant	2,647 kg	11.00	8.00	\$3.00 or 27%	7,941 (9th)
16.	Caraille	2,267 kg	10.00	7.38	\$2.62 or 36%	5,939 (11th)
17.	Eddoes	2,530 kg	16.00	13.42	N/A	N/A
18.	Chive	3,345 bdl	6.00	N/A	N/A	N/A

*Quality refers to freshness, consistency in shape, color and free from dirt, insects and chemical residue.

Table 3: Main Fresh Fruit Purchased By Supermarkets Surveyed

No.	Fresh Produce	Average Quantity Purchased Weekly (kg)	Average Price Paid by Supermarket (TT\$) per kg	Average Wholesale Price For 2013 (TT\$) per kg source : NAMDEVCO	Average Price Benefit By Selling Directly To Supermarkets	Benefit in TT\$ (Col 3 by Col 6)
1.	Watermelon	20,928 kg	8.70	5.74	\$2.96 or 52%	61,946 (1st)
2.	Papaya	7,991kg	11.00	7.75	\$3.25 or 42%	25,970 (2nd)
3.	Bananas imported from CARICOM Countries	8,732 kg	10.00	8.81	\$1.19 or 14%	10,391 (4th)
4.	Pineapple	3,818 kg	14.00	10.96	\$3.04 or 28%	11,606 (3rd)
5.	Orange	7,150 oranges	2.00 per orange	1.66	\$0.34 or 20%	2,431 (6th)
6.	Lime (medium)	24,067 limes	1.50 per lime	1.07	\$0.43 or 40%	10,349 (5th)
7.	Grapefruit	700 grapefruits	2.00 per grapefruit	N/A	N/A	N/A

The significant learning points from the above are as follows:

1. There is a clear opportunity for farmers to obtain higher prices for their fresh produce by selling directly to the supermarkets and bypassing wholesalers and distributors.
2. In order to serve this market segment successfully, farmers must understand the purchasing criteria used by supermarkets and adhere to the same. Simple business etiquette; ability to conduct basic market research among supermarkets; and preparing a cover letter and a price list, would also be advantageous.
3. Supermarkets determine acceptable prices by mainly comparing prices from their different suppliers, and occasionally, by browsing the website of NAMDEVCO.
4. The commodities listed in the aforementioned tables; do not include vegetables and fruit imported from non CARICOM countries, such as broccoli, onions, garlic, apples and grapes. There have been attempts to grow broccoli and onions in T&T, but with minimal success so far.

The research process, also revealed tantalizing, prospective trends and opportunities for produce and fruits in high demand by the supermarket segment, which are not easily available.

This information is illustrated in Table 4 as follows:

Table 4: Fresh Produce With Substantial Demand By Supermarkets But Not Easily Available

No	Fresh Produce	Approximate Additional Weekly Demand By Supermarkets Surveyed
1.	Locally grown Cantaloupe	2,000 kg
2.	Julie Mangoes	1,200 mangoes
3.	Starch Mangoes	4,000 mangoes
4.	Portugal	1,500 portugals
5.	Sapodilla	500 sapodillas
6.	Soursop	1,000 kg
7.	Lemons (rough skin) variety	5,000 lemons
8.	Avocado	5,000 avocados
9.	Breadfruit	N/A

3.2 Restaurant Segment

A study, undertaken by Invest Trinidad and Tobago in 2013, states that the thriving food and beverage sector in T&T supports 11,000 jobs and represents the largest non-energy manufacturing sector. The study further suggests that in spite of the global economic crisis, the fast food and quick service restaurant sub sector, consisting of international franchises and domestic businesses, has remained strong, because they offer convenience and value for money.

Likewise, full service, owner-operated restaurants have maintained a steady growth. This growth is being driven by an increase in disposable incomes and a demand by consumers for greater choice. Strong patronage and a culture of fine dining have further boosted this sector.

The Minister of Trade and Industry, The Honorable Stephen Cadiz in July 2012 stated that T&T has a vibrant food service and retail food sector. Growth in this sector is driven by an expanding population; more sophisticated consumer tastes; and changing demographics. A report compiled by the USDA Foreign Agriculture Service, estimated that this country's retail food sector is valued over US \$617 million.

Minister Cadiz further indicated that the varied culture of T&T has resulted in an eclectic mix of cuisines, from street vendors selling doubles and corn soup to high-end establishments, specializing in Creole, Italian, Mediterranean, Chinese, Thai and Korean food. The Ministry of Trade and Industry has estimated that there are over 195 fast-food restaurants and this number is steadily growing. Table 5 provides a summary matrix of the data gathered for this segment.

Table 5: Summary Matrix Restaurant Segment

Restaurant	Source of Purchase	Approximate % Grown Locally	Payment Terms	Most Important Purchasing Criteria	Are Contracts Offered To Farmers / Distributor?
Apsara Restaurant	<input type="checkbox"/> Distributor	80%	Cash	1st quality 2nd price 3rd consistency 4th delivery (2 times per week)	No – Verbal arrangements have been working for us
TGI Friday	<input type="checkbox"/> Distributors	75%	2 weeks to 1 month	1st quality 2nd price 3rd consistency 4th delivery (3 times per week)	No – Verbal arrangements have been working for us
Soong's Great Wall	<input type="checkbox"/> Distributor	75%	1 week	1st quality 2nd price 3rd consistency 4th delivery (3 times per week)	No- We have been dealing with current distributor for 15 years
Jenny's Wok	<input type="checkbox"/> Distributor	70%	2 weeks	1st quality 2nd price 3rd consistency 4th delivery (2 times per week)	No- We have been dealing with current distributor for 10 years
Ru Street	<input type="checkbox"/> Distributors	80%	1 month	1st quality 2nd price 3rd consistency 4th delivery (3 times per week)	No- freedom to choose based on quality & price
Little Lai's Chinese Restaurant	<input type="checkbox"/> From Wholesale Market	50%	Cash	1st quality 2nd price	No- freedom to choose based on quality & price
Subway (45 retail outlets)	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributors	15%	1 month	1st quality 2nd price 3rd consistency 4th delivery (3 times per week)	No – in the past farmers violated contract when prices increased
Papa John's	<input type="checkbox"/> Distributors	75%	Cash	1st quality 2nd price 3rd consistency 4th delivery (3 times per week)	No – High fluctuation in fresh produce prices
Mario's Pizza	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributors	10%	2 weeks	1st quality 2nd price 3rd consistency 4th delivery (3 times per week)	No – Based on relationship

The significant learning points from the Table above are as follows:

1. Fifty-six % (56%) of the restaurants surveyed are receptive to being approached by new farmers, as this activity will allow for wider choice with respect to quality, price and consistent supply. The restaurants, which were not receptive to being approached by new suppliers, stated one or more of the following reasons: satisfied with current suppliers; and farmers are not reliable. The onus is therefore on the farmers, to adopt the appropriate modes of operation to satisfy this segment, if they want to develop and retain transactional relationships.
2. Eight of the nine restaurants surveyed, indicated that delivery of the fresh produce to their retail outlet is an important purchasing criterion. Restaurants purchase fresh produce, on an average, three times per week because of their limited storage capacity.
3. Fifty six percent (56%) of the restaurants changed some of their fresh produce suppliers over the past 24 months. Forty four percent (44%) kept all of their existing suppliers. The main reasons for the changes were, one or more of the following: poor quality; higher prices; and inconsistent supply. These gaps can be addressed through farmer training or by farmers adapting to meet the emerging demand.
4. Restaurants have a preference, for suppliers who can supply more than one item, as this is more convenient for them and results in greater operational efficiency. Farmers can position themselves to diversify their produce; and develop arrangements to supply a diverse product line.
5. Most of the established restaurants are being supplied with locally grown fresh produce by distributors. This adds an extra layer in the value chain and depresses positive value for the farmers, by way of indirect transactions and limited access to high value buyers (HVB). An opportunity exists, to compress the distribution chain, if perceptions of the players change and clear sourcing guidelines and pricing models are formulated.
6. The preferred purchasing criteria are standard among this segment, based on a ranking system of: quality; price; and consistency of supply. A go forward strategy can be, to disseminate these informal standards/requirements, to educate farmers in order to strengthen their production to be better perceived as an attractive direct source of produce for the restaurants.

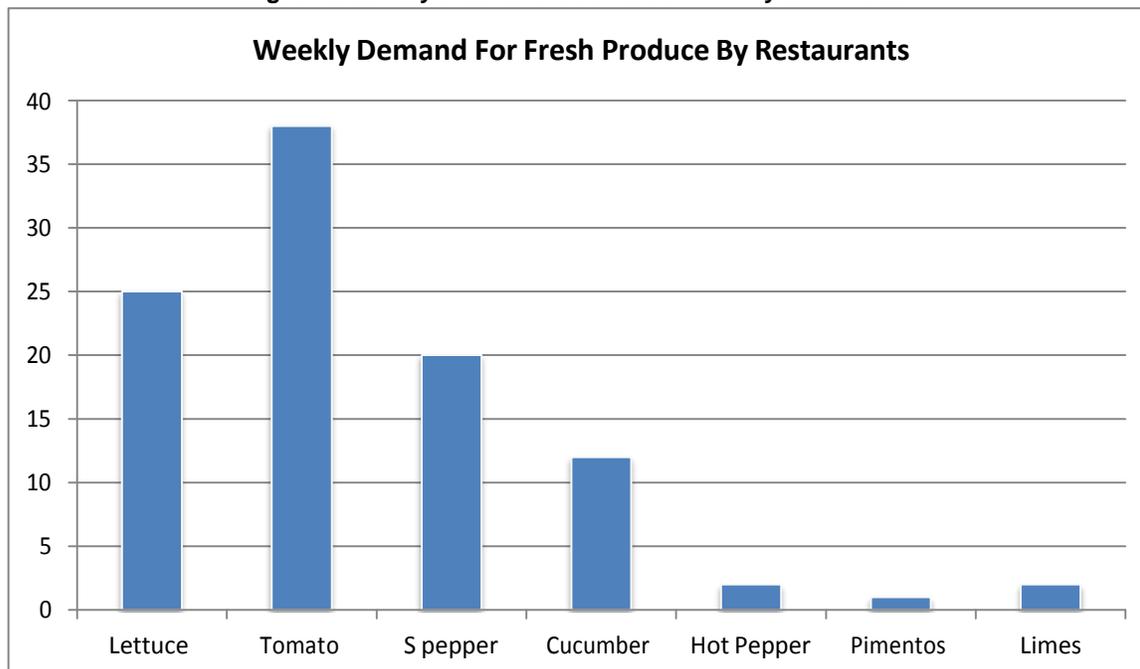
With respect to the volume of produce purchased by restaurants, Table 6 shows the main types of produce purchased by restaurants with a comparative analysis to wholesale market prices for the same products.

Table 6: Main Fresh Produce Purchased By Restaurants Surveyed

No .	Fresh Produce	Quantity Purchased (kg)	Average Price Paid by Restaurants (TT\$) per kg	Average Wholesale Price For 2013 (TT\$) per kg source : NAMDEVCO	Average Price Benefit By Selling Directly To Restaurants	Benefit in TT\$ (Col 3 by Col 6)
1.	Lettuce	27,996 heads	6.00 per head	4.22 (locally grown)	\$1.78 or 42%	\$49,832 (1 st)
2.	Tomato	6,629 kg	19.80	14.77	\$5.07 or 34%	\$33,344 (2 nd)
3.	Sweet pepper	3,790 kg	19.80	15.12	\$4.68 or 31%	\$17,737 (3 rd)
4.	Cucumber	2,062 kg	11.00	7.13	\$3.87 or 54%	\$7,980 (4 th)
5.	Hot Pepper	2,200 hot peppers	0.50/hot pepper	0.35	\$0.15 or 43%	\$770 (6 th)
6.	Pimento	800 pimentos	0.40 / pimento	0.27	\$0.13 or 48%	\$104 (7 th)
7.	Limes (medium)	5,520 limes	1.75 / lime	1.07	\$0.68 or 39%	\$3,754 (5 th)

A graphical representation of the quantities purchased by restaurants on a weekly basis for various commodities can be seen in Figure 1.

Figure 1: Weekly Demand for Fresh Produce by Restaurants



Note: For comparison purposes pimento and hot peppers were converted to kg. using an estimate of 40 units per kg. Limes were converted at 20 limes per kg and lettuce at 6 heads per kg.

The significant learning points from the above are as follows:

1. There is a clear opportunity for farmers to obtain higher prices for their fresh produce by selling directly to the restaurants and bypassing wholesalers and distributors. For example, they can obtain an average of \$1.78 more for a head of lettuce and \$3.87 more for a kilogram of cucumber, which are substantial differences. According to Trip Advisor, there are 99 established restaurants in Port of Spain, 22 in San Fernando and 12 in Chaguanas. Several more established restaurants can be found in the other major towns and boroughs such as Arima, Point Fortin, Sangre Grande, Rio Claro, Couva and Princes Town. The restaurant sector represents a viable market that farmers can engage in direct selling and the establishment of long lasting relationships.
2. In order to serve this market segment successfully, farmers must understand the purchasing criteria and requirements used by restaurants and adhere to them. Simple business etiquette; the ability to conduct basic market research; and to prepare a cover letter and a price list. These steps would help change the perceptions of the restaurant buyer towards the farmers in a positive manner and would increase their inclination to do business directly with the producers.
3. Subway which has 45 outlets in T&T currently imports 26,252 heads of lettuce on a weekly basis. In previous years, this fast food restaurant purchased most of its lettuce from local farmers. However, due to inconsistent supply and non adherence to contracts, when the price of lettuce increased on the wholesale market, Subway decided to import all of its lettuce for greater stability in its operations. Subway continues to purchase all of its cucumber (2,045 kg per week) from local farmers.
4. One third of the restaurants surveyed accepted the prices charged by their distributors. These restaurants have a long standing relationship with their distributors. Fifty six percent (56%) of the restaurants compare prices of their suppliers and occasionally visit NAMDEVCO's website to determine an acceptable price while 11% visit the wholesale market to obtain price information. Subway also checks a website (www.freshpoint.com/) to obtain information on international fresh produce prices. This means that the restaurant buyers are well informed. Farmers therefore need to be operating with the same level of market knowledge and information, if they are to level the playing field in the restaurant supply market space.

3.3 Hotel Segment

Trinidad and Tobago currently has an accommodation capacity of approximately 7,500 rooms, of which roughly 47% are located in Trinidad. Most of the rooms in Trinidad comprise luxury and medium range hotels, guest houses and bed and breakfast establishments. In Tobago, room types comprise the aforementioned as well as villas, apartments and condos. Luxury hotels in Trinidad are centered in the capital city of Port-of-Spain and include international chains such as HYATT Regency, Hilton and Radisson. There are also small eco resorts that cater to the HVM niche eco tourists. Trinidad attracts more business tourists and Tobago attracts more holiday tourists. These resorts are located in rural or coastal areas.

Table 7 provides a summary matrix of the data gathered for this segment.

Table 7- Summary Matrix Hotel Segment

Hotel	Source of Purchase	Approximate % Grown Locally	Payment Terms	Most Important Purchasing Criteria	Are Contracts Offered To Farmers / Distributor?
Hilton Trinidad	<input type="checkbox"/> Distributors	70%	2 weeks	1st quality 2nd price 3rd consistency 4th delivery (4 times per week)	No – we have short-listed 4 distributors and utilize a weekly bidding process
Hyatt Regency Trinidad	<input type="checkbox"/> Distributors	30%	1 month	1st quality 2nd price 3rd consistency 4th delivery (4 times per week)	No – we have 3 farmers and 2 distributors and utilize a weekly bidding process
Cara Suites Hotel	<input type="checkbox"/> Distributors	65%	1 month	1st quality 2nd price 3rd consistency 4th delivery (2 times per week)	No- we prefer to build relationships.
Kapok Hotel	<input type="checkbox"/> Distributor	80%	2 weeks to 1 month	1st quality 2nd price 3rd consistency 4th delivery (2 times per week)	No- We have been dealing with 2 distributors for many years
Grafton Beach Resort (Tobago)	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> From Wholesale Market <input type="checkbox"/> Distributor	75%	2 weeks to 1 month	1st quality 2 nd price 3 rd consistency 4th delivery (3 times per week)	No- we prefer to build relationships
Ambassador Hotel	<input type="checkbox"/> From Wholesale Market <input type="checkbox"/> Distributors	80%	cash	1st quality 2nd price	No- freedom to choose based on quality & price

The significant learning points from the above include the following:

1. Fifty percent (50%) of the hotels surveyed including the 2 largest in the sector, the Hilton and Hyatt, are receptive to being approached by new farmers, as this will allow for wider choice with respect to quality, price and consistent supply. However, Hyatt specified that the prospective local farmer must be certified by NAMDEVCO. The 50% of hotels, which were not receptive to being approached by new suppliers, said that they are satisfied with their current supply arrangements.
2. Eighty-three percent (83%) of the hotels surveyed, indicated that delivery of the fresh produce to their retail outlet is an important purchasing criterion. Hotels purchase fresh produce on average three times per week because of their limited storage capacity and desire for very fresh items. While a source of possible income and trading opportunities exist, there needs to be further research into the capacity of farmers to engage in a reorientation to secure supply arrangements.

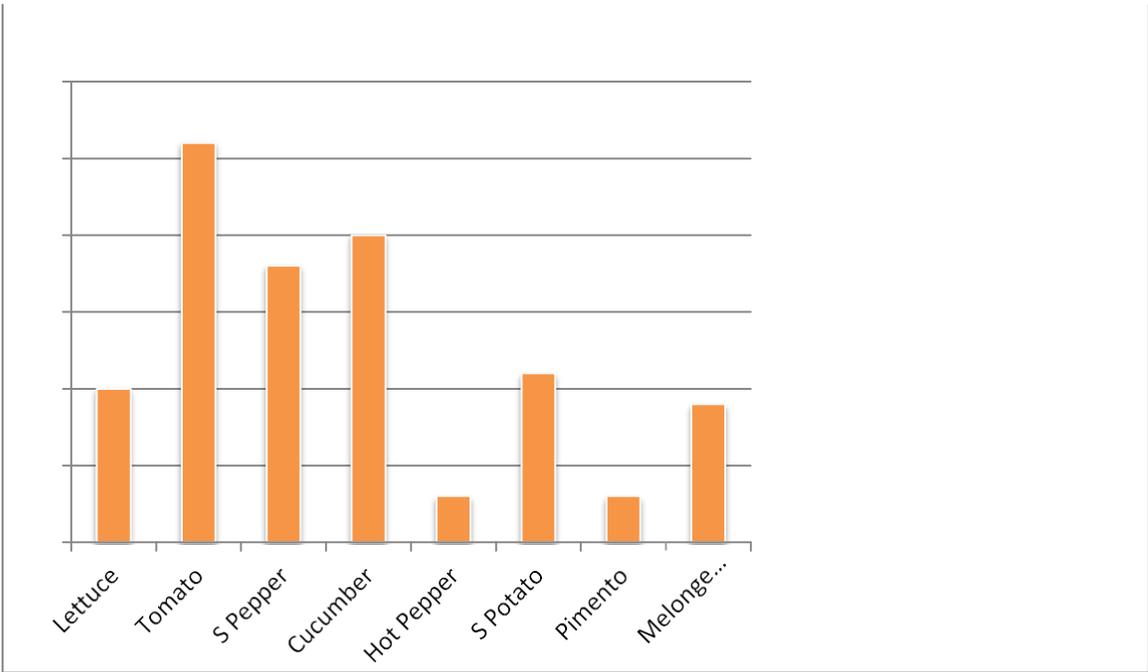
3. Fifty percent (50%) of the hotels changed suppliers over the past 24 months; 33% added new suppliers to their existing database, but did not change any of their existing suppliers. The main reasons for the changes were one or more of the following: poor quality; higher prices; and inconsistent supply. This suggests that the hotel sector have very high standards and are receptive to the engagement of new suppliers once specific terms and conditions can be met.
4. Hotels have a preference for suppliers who can supply more than one item as this is more convenient for them and results in greater operational efficiency and reduced processing time for the hotels.
5. Sixty seven (67%) of the hotels surveyed, determine an acceptable price to buy their fresh produce by comparing prices charged by their suppliers. 83% of the hotels surveyed, also occasionally browse the NAMDEVCO's website for up-to-date wholesale prices while 17% actually visit the wholesale and farmers' markets and compare prices and quality.
6. At the start of each week, the 4 distributors who supply the Hilton, are required to submit price lists to facilitate the bidding process. Table 8 shows the volume of fresh produce purchased by hotels and also an analysis of prices paid in comparison to the wholesale market.

Table 8: Main Fresh Produce Purchased Weekly By Hotels Surveyed

No.	Fresh Produce	Quantity Purchased Weekly (kg)	Average Price Paid by Hotels (TT\$) per kg	Average Wholesale Price For 2013 (TT\$) per kg source : NAMDEVCO	Average Price Benefit By Selling Directly To Hotels	Benefit in TT\$ (Col 3 by Col 6)
1.	Lettuce	1,806 heads	5.00 (locally grown)	4.22 (locally grown)	\$0.78 or 16%	1,409 (4th)
2.	Tomato	889 kg	20.90	14.77	\$6.13 or 42%	5,450 (1st)
3.	Sweet pepper	612 kg	22.00	15.12	\$6.88 or 46%	4,211 (2nd)
4.	Cucumber	667 kg	9.90	7.13	\$2.77 or 39%	1,848 (3rd)
5.	Hot Pepper	3,415 hot peppers	0.40 / hot pepper	0.35	\$0.05 or 14%	171 (9th)
6.	Sweet Potatoes	356 kg	10.78	7.72	\$3.06 or 40%	1,089 (5th)
7.	Pimento	4,525 pimentos	0.35 / pimento	0.27	\$0.08 or 30%	362 (8th)
8.	Eggplant	300 kg	11.00	8.00	\$3.00 or 38%	900 (6th)
9.	Yam	172 kg	11.00	7.65	\$3.35 or 44%	576 (7th)
10.	Dasheen	140 kg	14.20	13.80	\$0.40 or 3%	56 (10th)
	FRUIT					
1.	Watermelon	2,415 kg	8.25	5.74	\$2.51 or 44%	6,062 (1st)
2.	Limes (medium)	5,520 limes	1.80 / lime	1.07	\$0.73 or 68%	4,030 (2nd)
3.	Pineapple	1,507 kg	13.20	10.96	\$2.24 or 20%	3,376 (3rd)
4.	Papaya	1,001 kg	11.00	7.75	\$3.25 or 42%	3,253 (4th)
5.	Bananas (imported from other CARICOM countries)	717 kg	10.00	8.81	\$1.19 or 14%	853 (5th)

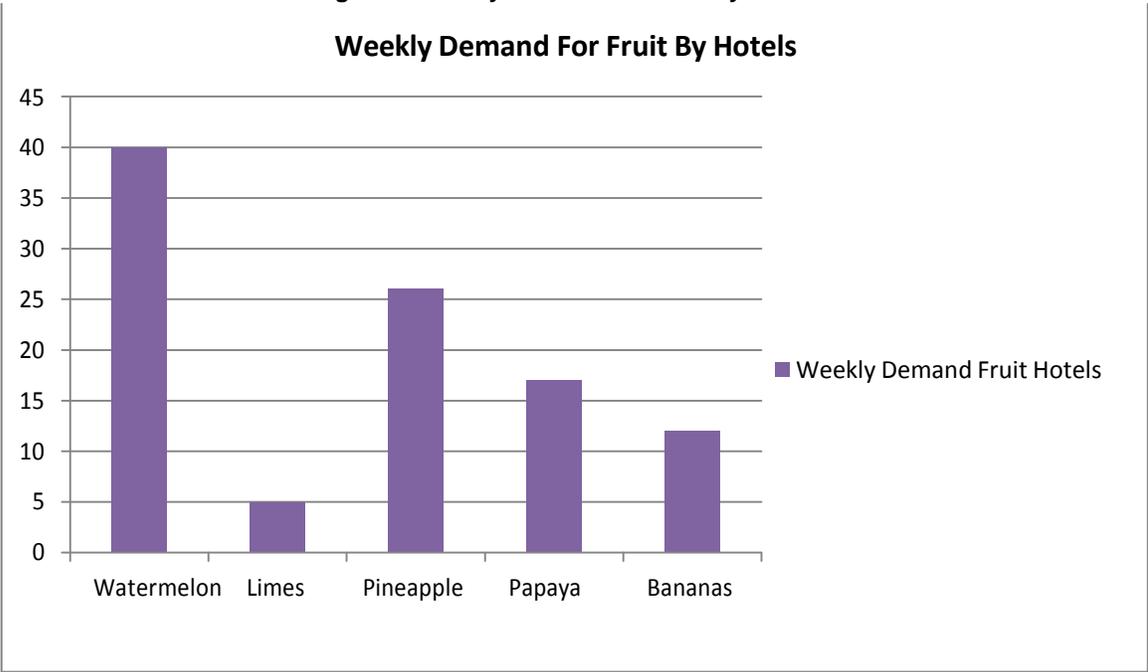
For another perspective the weekly demand for fresh produce by hotels is represented graphically in Figure 2.

Figure 2: Weekly Demand For Vegetables By Hotels



The weekly demand by hotels for fruit is presented in Figure 3 below, to illustrate the overall demand for fruit.

Figure 3: Weekly Demand For Fruit By Hotels



The key learning points from the above include the following:

1. There is a distinct opportunity for farmers to obtain substantially higher prices for their fresh produce by selling directly to the hotels and bypassing wholesalers and distributors. For example, they can obtain an average price of: 42% more per kilogram for tomatoes; 30% more for sweet peppers; and 42% more for papaya.
2. According to Trip Advisor, there are 52 established hotels in Trinidad. There are also over 35 established hotels in Tobago. However, from the survey, it was found that some hotels are more price sensitive than others. For instance, the bidding process at Hilton Trinidad is very competitive when compared to HYATT Trinidad. Farmers therefore need to conduct basic market research to identify their best opportunities. In spite of the bidding process, prices obtained at Hilton Trinidad are still better than those farmers obtain when selling on the wholesale market and can still be viewed as a viable business opportunity.
3. In order to serve this market segment successfully, farmers must understand the purchasing criteria used by hotels and ensure they can adhere to those on an ongoing basis. Simple business etiquette, the ability to conduct basic market research and prepare a cover letter and a price list would be simple steps they can take to access the HVM opportunity hotels represent.
4. Hotels are also demanding more tropical fruit, especially papaya, avocados and Julie mangoes. They did not give actual quantities, but from discussions, it has been estimated that the additional demand per week by the hotels surveyed is approximately 300 kg for papaya; 40 avocados; and 40 Julie mangoes. These figures would be substantially higher when applied to all the hotels.

3.4 Catering Segment

The catering sector in T&T operates mainly with small scale business enterprises dispersed throughout the country. There are three large commercial enterprises – Boomerang; Food Etcetera; and Kater Serv, which are considered the market leaders. Over 65% of the small caterers are involved in the Government's School Nutrition Feeding Programme on a daily basis.

A summary matrix of the information received from this sector is illustrated in Table 9:

Table 9: Summary Matrix Catering Segment

Food Caterer	Source of Purchase	Approximate % Grown Locally	Payment Terms	Most Important Purchasing Criteria	Are Contracts Offered To Farmers?
Boomerang Caterers	<input type="checkbox"/> From Wholesale Market <input type="checkbox"/> Distributor	50%	cash	1st quality 2nd price 3rd consistency 4th delivery	No- freedom to choose based on quality & price
Food Etcetera	<input type="checkbox"/> From Wholesale Market (most purchases are from wholesalers at the market not farmers)	50%	cash	1st quality 2nd price 3rd consistency	No- freedom to choose based on quality & price
Kater Serv	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributors	85%	2 weeks	1st quality 2d price 3rd consistency 4th delivery	No- freedom to choose based on quality & price
B&B Enterprises Ltd.	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributors	95%	1 week	1st quality 2 price 3rd consistency 4th delivery	No- farmers do not honour contracts

The significant learning points are as follows:

1. Seventy-five (75%) of the food caterers surveyed are interested to being approached by new farmers as this can provide a wider choice with respect to quality, price and consistent supply from a direct source. However, 25% indicated that farmers are not reliable and consistent with the price and quality of their produce and would not be interested in purchasing from farmers.
2. All 100% of the caterers surveyed, purchased varying percentages (5% to 50%) of imported fresh produce, in preference to the same local items. These include cabbage and cauliflower, which they indicated are of better quality to the locally grown ones, because there is no pesticide residue and consequently a better taste. Fifty percent (50%) of the caterers surveyed purchased imported tomatoes for their salads. The imported tomatoes were described as larger and better for slicing. One of the large food caterers, Food Etcetera, preferred to purchase yam, dasheen and eddoes imported from St. Vincent, because of their cleaner appearance and better taste. These imported items are usually sold for approximately TT\$1 to TT\$2 more per kilogram than the local ones.
3. Food caterers purchase fresh produce on an average twice per week which represents a good and reliable stream of sales and income for farmers if they can make the necessary connections with the food caterers.

With respect to the volume of produce and fruit purchased by caterers, Tables 10 and 11 present the volumes as well as the differential pricing between what caterers pay and the prices on the wholesale markets.

Table 10: Main Fresh Vegetables Purchased Weekly By The Food Caterers Surveyed

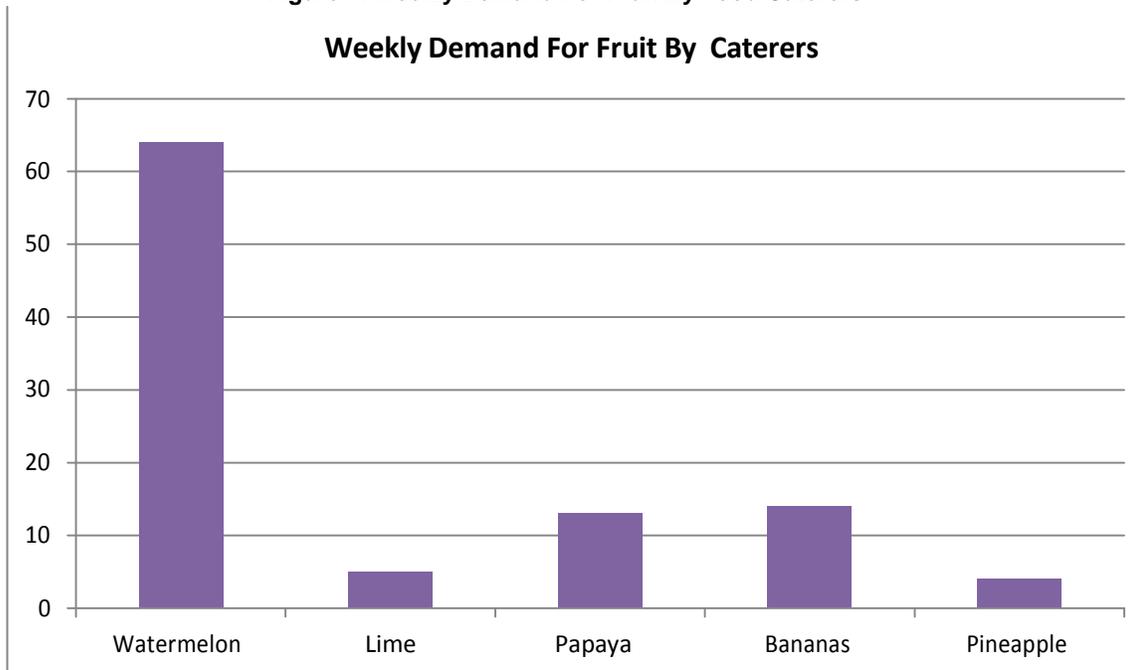
No.	Fresh Produce	Average Quantity Purchased Weekly (kg)	Average Price Paid by Food Caterers (TT\$) per kg	Average Wholesale Price For 2013 (TT\$) per kg source	Average Price Benefit By Selling Directly To Food Caterers	Benefit in TT\$ (Col 3 by Col 6)
1.	Tomato	898 kg	19.80 /kg	14.77	\$5.03 or 34%	\$4,517 (1st)
2.	Lettuce	1,375 heads	5.50 / head	4.22 / head	\$1.28 or 30%	\$1,760 (2nd)
3.	Cucumber	421 kg	8.80 / kg	7.13	\$1.67 or 23%	\$703 (6th)
4.	Cabbage	732 kg	9.90 / kg	8.45	\$1.45 or 17%	\$1,061 (4th)
5.	Pumpkin	1,498 kg	4.00 / kg	3.24	\$0.76 or 23%	\$1,138 (3rd)
6.	Sweet Pepper	582 kg	16.00 /kg	15.12	\$0.88 or 6%	\$512 (8th)
7.	Sweet Potatoes	190 kg	10.00 / kg	7.72	\$2.28 or 30%	\$433 (10th)
8.	Dasheen	238 kg	14.00 / kg	13.80	\$0.20 or 1%	\$48 (13th)
9.	Cauliflower	230 kg	15.00 / kg	N/A		N/A
10.	Plantain	270 kg	12.00 / kg	10.14	\$1.86 or 11%	\$502 (9th)
11.	Pimento	9,860	0.35 each	0.27each	\$0.08 or 30 %	\$789 (5th)
12.	Hot Peppers	1,100 kg	0.40 each	0.35each	\$0.05 or 14 %	\$55 (12th)
13.	Calaloo Bush	450 bundles	5.50 / kg	5.08	\$0.43 or 8 %	\$194 (11th)
14.	Patchoi	355 bundles	5.50 bundle	5.48 bundle	Almost 0%	Almost 0%
15.	Christophene	168 kg	13.65/ kg	13.63	Almost 0%	Almost 0%
16.	Yam	167 kg	11/ kg	7.65	\$3.35 or 44%	\$559 (7th)

Table 11: Main Fresh Fruit Purchased Weekly By The Food Caterers Surveyed

No.	Fresh Produce	Average Quantity Purchased Weekly (kg)	Average Price Paid by Caterers (TT\$) per kg	Average Wholesale Price For 2013 (TT\$) per kg source : NAMDEVCO	Average Price Benefit By Selling Directly To Food Caterers	Benefit in TT\$ (Col 3 by Col 6)
1.	Watermelon	1,745 kg	7.7	5.74	\$1.96 or 34%	\$3,420 (1st)
	Lime (medium)	2,400 limes	1.2	1.07	\$0.18 or 14%	\$432 (3rd)
2.	Papaya	357 kg	11.0	7.75	\$3.25 or 42%	\$1,160 (2nd)
3.	Bananas imported from other CARICOM countries	370 kg	9.9	8.81	\$1.09 or 12%	\$403 (4th)
4.	Pineapple	113 kg	14.0	10.96	\$3.04 or 28%	\$344 (5th)

A graphical representation of the quantities purchased by food caterers on a weekly basis for various commodities can be seen in Figure 4.

Figure 4: Weekly Demand For Fruit By Food Caterers



The main learning points from the catering sector analysis are as follows:

1. There are opportunities for farmers to obtain higher prices for specific items of fresh produce by selling directly to food caterers and bypassing wholesalers and distributors. For example, the average price paid by these buyers for tomatoes is 34% more than selling this commodity on the wholesale market; 30% more for lettuce; and 42% more for papaya.
2. According to Searchin TT 2014 website, there are 57 food caterers (excluding the School Feeding Programme) in T&T. These caterers serve corporate, private and wedding events. A few of them are also involved in the School Feeding Programme. The School Feeding Programme currently has over 72 caterers. They serve breakfast and lunch meals to over 120,000 school children daily, five days a week.
3. In order to serve this market segment successfully, farmers must understand the purchasing criteria used by food caterers and ensure they adhere to those criteria. Simple business etiquette, ability to conduct basic market research, negotiate and prepare a cover letter and a price list would be advantageous.
4. Fifty percent (50%) of the food caterers surveyed determine acceptable prices by checking the website of NAMDEVO, which provides information on current wholesale prices. The other 50% visit the wholesale market and interact with the sellers.

3.5 Exporters Segment

The advent of globalization and trade liberalization has resulted in increased growth in the trade in agricultural products.

Trinidad & Tobago's export activities are shown in Table 12:

Table 12: Exporting Profile by Product and Market Source NAMDEVCO Exporting Guide 2013

COUNTRIES	LIST OF ITEMS PURCHASED / SHIPPED
Barbados	Cabbage, Okra, Tomato, Sweet Pepper, Watermelon, Squash, Pumpkin, Pineapple, Cucumber, Cauliflower, Christophene, Citrus, Egg plant, Papaya
St. Lucia	Peas and beans, Melons, Cucumber, Pumpkin, Tomato, Peppers
United States	Mainly Hot Peppers and Pumpkin
Canada	Pumpkins, Eggplant, Hot Peppers, Sweet Potatoes, Mangoes

Table 13 presents a summary matrix for the information gained for this segment from the survey as follows:

Exporter	Source of Purchase	Approximate % Grown Locally	Payment Terms	Most Important Purchasing Criteria	Are Contracts Offered To Farmers?
Shahadat Ramlakhan	<input type="checkbox"/> Farmers	100%	1 week	1st quality 2nd price 3rd consistency 4th Delivery	No-farmers sell elsewhere when prices increase and violate contract.
Challenge Marketing Limited	<input type="checkbox"/> Farmers <input type="checkbox"/> Wholesalers	100%	Varies from cash to 1 month depending on supplier	1st quality 2nd price 3rd consistency	Yes
Tropical Harvesting Company Limited	<input type="checkbox"/> Farmers	100%	Varies from cash to 1 month depending on supplier	1st quality 2nd price 3rd consistency	No- farmers do not adhere to contracts when prices of their produce increase
King's Foods	<input type="checkbox"/> Farmers	100%	2 weeks to 1 month	1st quality 2nd price 3rd consistency	No-farmers sell elsewhere when prices increase and violate contract.
A&D Export &	<input type="checkbox"/> Direct From Farmers	100%	3 weeks to	1st quality	No
Import Limited			1 month	2nd price 3rd consistency	No – Farmers make excuses and sell elsewhere when prices increase.

The key learning from this segment includes the following:

1. Sixty-seven percent (67%) of the exporters surveyed are receptive to being approached by new farmers, as this activity will allow for wider choice with respect to quality, price and risk management during fluctuations and scarcity.
2. Thirty-three (33%) indicated that they already have adequate farmers on their database. Also, 33% of the exporters only transact business with local farmers, certified by NAMDEVCO, as their export market (within CARICOM) specifies this condition. This opens a channel for farmers to connect with this state agency, in order to leverage and increase their competitiveness.

3. All the exporters surveyed changed suppliers over the past 24 months. The main reasons for the change were one or more of the following: poor quality; higher prices; and inconsistent supply.
4. Exporters are receptive to purchasing their fresh produce supplies at farm gate, if required. However, they usually negotiate for a lower price when this is done, which can be a disadvantage for the farmers.

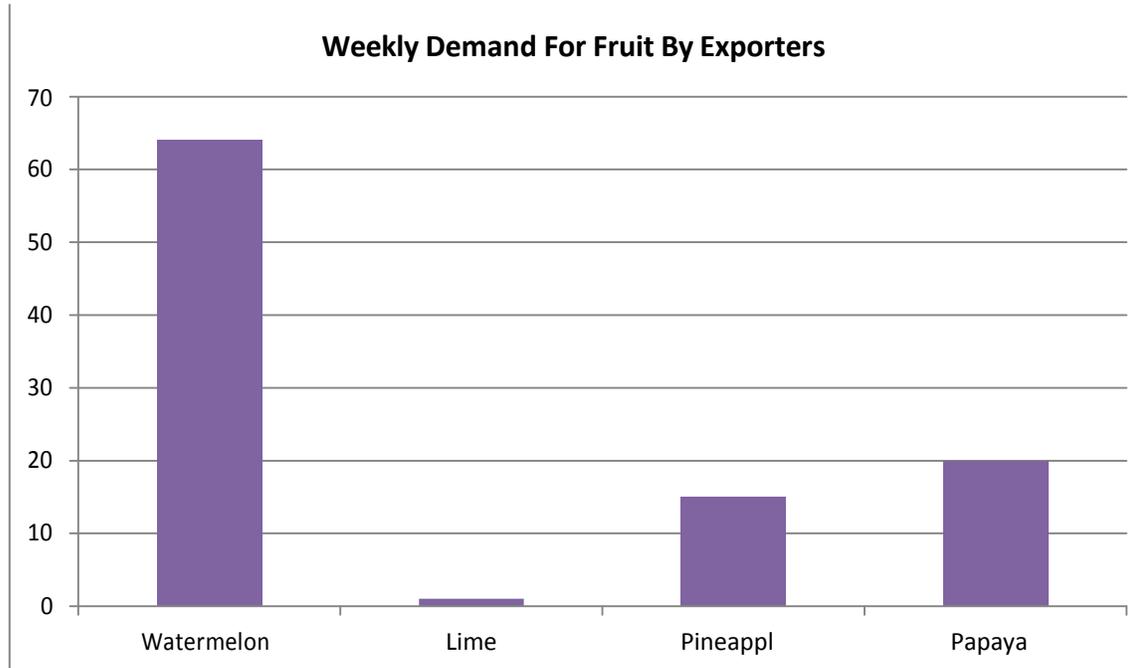
With respect to the volume of produce purchased by Exporters Table 14 shows the main types of produce exported as well as a price comparison between prices the exporters pay and the prices at the wholesale market.

Table 14: Main Fresh Produce Purchased Weekly By Exporters Surveyed

No	Fresh Produce	Quantity Purchased Weekly by Exporters (kg)	Average Price Paid by Exporters (TT\$) per kg	Average Price Obtained By Farmers At Wholesale Market For 2013 (TT\$) per kg (source : NAMDEVCO)	Average Price Benefit By Selling Directly To Exporters
1.	Pumpkin	44,750 kg	3.00	3.24	Loss
2.	Pimento	31,800 pimentos	0.25	0.27	Loss
3.	Squash	1,500 kg	9.00	9.46	Loss
4.	Cucumber	2,450 kg	6.60	7.13	Loss
5.	Cabbage	1,450	8.82	8.45	4%
6.	Tomato	700 kg	15.00	14.77	2%
7.	Sweet pepper	500 kg	15.00	15.12	Loss
8.	Calaloo Bush	700 bundles	3.50	5.08	Loss
9.	Christophene	300 kg	14.00	13.63	2%
10.	Eggplant	246 kg	6.01	8.00	Loss
	FRUIT				
1.	Watermelon	6,200 kg	6.60	5.74	15%
2.	Limes (medium)	1,500 limes	1.00	1.07	Loss
3.	Pineapple	1,400 kg	9.60	10.96	Loss
4.	Papaya	1,950 kg	9.00	7.75	16%

A graphical representation of the quantities purchased by exporters on a weekly basis for fruit can be seen in Figure 5.

Figure 5: Weekly Demand For Fruit By Exporters



The main learning from this segment includes the following:

1. This is generally not a viable buyer segment for farmers. For most fresh produce items, farmers would obtain a slightly better price at the wholesale market. One hundred percent (100%) of the exporters surveyed are not willing to pay higher than the wholesale price and they want farmers to keep their prices for 3 months. Twenty percent (20%) of exporters indicated that they negotiate to purchase produce from farmers for a price 20% below the wholesale price. NAMDEVCO confirmed this research finding and also stated that farmers have made complaints on the low prices paid by exporters. The exporter's justification for their low prices is that there is a high risk in exporting fresh produce, due to spoilage and non-payment by the importer.
2. The advantage of this buyer segment is that the exporters purchase high volumes for the main export items including: pumpkin; hot peppers; pimento; papaya; pineapple; and dasheen leaves. It is therefore a fast way for farmers to dispose of their sizeable harvests, which is an attraction for the farmers that sell to exporters.
3. Information from NAMDEVCO's website revealed that there are 29 exporters of fresh produce. However, NAMDEVCO stated, that many exporters on this list are not currently active, because this year (2014) has been affected by drought for the 1st half of the year and by heavy rains and floods during the 2nd half. These adverse weather conditions have resulted in high price fluctuations and inconsistency in supplies.

3.6 Agro-processors Segment

An article by the Center of Innovation Technology & Global Entrepreneurship (2014) suggests that the establishment of agri-business enterprises in T&T can offer significant investment opportunities, particularly for manufacturers who utilize unique regional agro-products to develop refined goods. In light of the increased access to global markets and North America's

appreciation and desire for exotic foods, as well as the growth of gourmet lifestyles in more developed metropolitan communities, the agro-processing sector has an opportunity to create and innovate in the production of specialty items for regional, international and local markets.

Table 15 presents a summary matrix of the information received for this segment.

Table 15: Agro-Processors Summary Matrix

Agro – Processors	Source of Purchase	Approximate % Grown Locally	Payment Terms	Most Important Purchasing Criteria	Are Contracts Offered To Farmers?
National Canners Ltd.	<input type="checkbox"/> Farmers <input type="checkbox"/> Import	25%	7 days	1st quality 2nd price 3rd consistency 4th delivery	No- farmers do not honor contract when prices increase and they do not have a consistent supply.
D'Farmers Ltd.	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> From Wholesale Market (most purchases are from wholesalers at the market not farmers)	90%	cash	1st quality 2nd price 3rd consistency	No- freedom to choose based on quality & price
Turban Marketing Ltd.	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Distributors <input type="checkbox"/> Wholesale Market	85%	2 weeks	1st quality 2nd price 3rd consistency 4th delivery	No- freedom to choose based on quality & price
Network of Rural Women Producers Trinidad & Tobago	<input type="checkbox"/> Grow Own Crops <input type="checkbox"/> Wholesale Market	100%	cash	1st quality 2nd price	No- freedom to choose based on quality & price

The significant learning from this segment is as follows:

1. Fifty percent (50%) of the processors surveyed are receptive to being approached by new farmers, as this will allow for a wider choice with respect to quality, price and consistent supply. National Canners Ltd., which is by far the largest food & agro processor in the country, stated that they have an adequate number of suppliers and are not looking to expand their supplier network in the near future. The Network for Rural Women Producers of Trinidad & Tobago, buy fresh produce from within their membership (over 100 members) or from the wholesale market. They prefer a model where they grow their own inputs/produce, which is then supplemented by purchases from the wholesale markets.
2. National Canners Ltd. imports 70 % of its fresh produce requirement mainly from Central America, due to inconsistencies in local supply. The company also has cold storage facilities and purchases large volumes on the local market when prices are low. That inventory is then used when there are produce shortages and/or prices of produce increase.
3. Processors purchase fresh produce on an average of once per week from local farmers, but generally do not enter into any contractual arrangements with the farmers. This is because of a lack of consistent supply and that farmers have a tendency to violate contracts when prices increase over the agreed contract price.
4. Processors source their produce mainly from wholesalers and farmers. Small scale

processors usually cultivate their own produce for use in their agro-processing activities and/or visit the wholesale market to buy at times when prices are low.

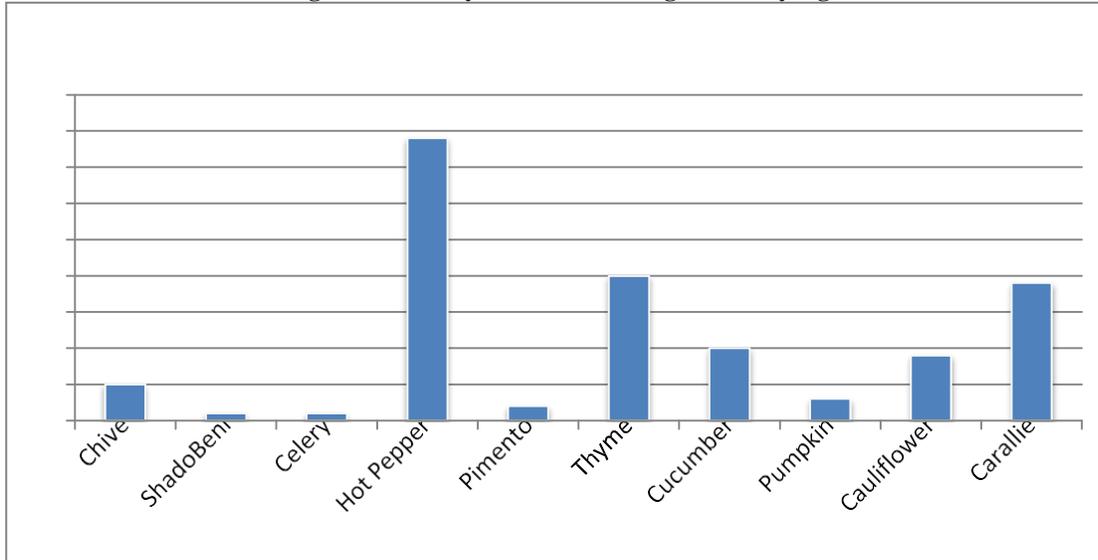
With respect to the volume of produce purchased by exporters, Table 16 shows the produce as well as the prices paid for by exporters in comparison to the wholesale market price.

Table 16: Main Fresh Vegetables Purchased weekly By Agro - Processors Surveyed

No.	Fresh Produce	Quantity Purchased Weekly (kg)	Average Price Paid by Agro-Processors (TT\$) per kg	Average Price Obtained By Farmers At Wholesale Market For 2013 (TT\$) per kg (source : NAMDEVCO)	Average Price Benefit By Selling Directly To Agro - Processors
1.	Hot Peppers	289,891 hot peppers	0.25	0.35	Loss
2.	Pimentos	6,833 pimentos	0.25	0.27	Loss
3.	Chive	13,646 bundles	4.00	N/A	N/A
4.	Thyme	5,320 kg	11.00	N/A	N/A
5.	Shadon Beni	5,570 bundles	4.50	N/A	N/A
6.	Cucumber	2,303 kg	5.50	7.13	Loss
7.	Pumpkin	444 kg	2.75	3.24	Loss
8.	Cauliflower (local)	2,292 kg	13.20	N/A	N/A
9.	Carallie	2,752 kg	9.90	7.38	34%
10.	Celery	1,010 bundles	4.00	N/A	N/A
		FRUITS			
1.	Mango (Long & Rose)	25,040 mangoes		N/A	N/A
2.	Papaya	5,328 kg	5.00	7.75	Loss

A graphical representation of the quantities purchased by agro-processors on a weekly basis for various commodities can be seen in Figure 6.

Figure 6: Weekly Demand For Vegetables By Agro-Processors



The significant learning from the agro-processing sector is as follows:

1. This is generally not a viable buyer segment for farmers. For most of the fresh produce items, farmers would obtain a better price at the wholesale market. All (100%) of the exporters surveyed, are not willing to pay higher than the wholesale price and they want farmers to maintain their prices for 3 to 6 months.
2. Processors justification for their low prices is that their final products are being sold in very competitive markets and they are unable to raise their prices easily. This is a standard position held by agro-producers, which is difficult to challenge and change.
3. The advantage of the agro-processing sector is that medium and large processors purchase sizeable volumes, making it easier for farmers with large volumes of the appropriate crop to quickly sell their products to one buyer on a weekly basis.
4. Based on Information from NAMDEVCO's website, there are over 35 agro-processors in T&T. This segment comprises large processors, such as National Canners, Coconut Growers Association and mainly SMEs. National Canners Ltd. purchases a large quantity of tomatoes and pineapples, but in crushed form which is imported, as it is not available locally.

3.7 Wholesalers Segment

NAMDEVCO manages the two wholesaling markets in T&T for fresh produce. These markets are The Norris Deonarine Northern Wholesale Market in Macoya and the Southern Wholesale Market in Debe.

These markets are open to farmers to sell their produce and to buyers who purchase in sizeable quantities such as wholesalers, distributors, hotels, restaurants, supermarkets and caterers. Farmers are the main sellers at these markets, but some distributors also have stalls at these wholesale markets. They buy from farmers and also sell to the aforementioned buyers. Wholesalers are experienced business people who purchase large quantities for cash and therefore have strong bargaining power. On many occasions they buy out all the supplies from the early farmers for low prices and then compete with the remaining farmers in selling to the various buyers. Some wholesalers also sell imported fresh produce from other CARICOM countries as well as from USA and Canada. These imported items include carrots, broccoli, tomatoes, cauliflower, cabbage, lettuce, sweet peppers, zucchini, honeydew melon, cantaloupe, apples, grapes and pears from North America and bananas, dasheen, yam, eddoes, ginger and plantain from St. Vincent and to a lesser extent Guyana, St. Lucia and Suriname. These commodities compete directly with local farmers' tomatoes, sweet peppers, lettuce, cabbage, cauliflower, dasheen, yam, eddoes, ginger and plantain.

Table 17 presents a Summary Matrix of the information received from this segment.

Table 17: Information on Wholesaler and Distributor Segment

Wholesaler / Distributor	Source of Purchase	Approximate % Grown Locally	Payment Terms	Most Important Purchasing Criteria	Are Contracts Offered To Farmers / suppliers?
Distributor 1 (Established wholesaler based at the Macoya Wholesale Market)	<input type="checkbox"/> Farmers in Trinidad <input type="checkbox"/> Import large quantities from St. Vincent. Sells to distributors, hotels, supermarkets, caterers and restaurants who visit the Macoya Wholesale market	20%	1 to 2 weeks	1st quality* 2nd price 3rd consistency 4th delivery by local farmers and imports are collected at the port	No- high fluctuation in prices. Develop long lasting relationship with suppliers.
Distributor 2 (Established wholesaler / distributor for Papaya and Bananas)	<input type="checkbox"/> Direct From Farmers <input type="checkbox"/> Purchase from importers who import bananas from St. Vincent, St. Lucia and Suriname	50%	Cash and 1 week for some farmers	1st quality 2nd price 3rd consistency	No-due to inconsistent supply and farmers not honoring contracts when prices increase
Distributor 3 (Established distributor in Tobago)	<input type="checkbox"/> Purchase from wholesaler in Trinidad and distributes to most of the supermarkets in Tobago, some hotels and roadside vendors	60%	7 days	1st quality 2nd price 3rd consistency 4th ship from Trinidad to Tobago	No- develop long lasting relationship

Table 18 represents the commodities and average quantities which these buyers purchase on a weekly basis for resale.

Table 18: Main Fresh Vegetables Purchased Weekly By The Wholesalers And Distributors Surveyed

<i>Vegetables</i>					Total
Tomato - Local	Kg	4091	0	454	855
Tomato - Imported	Kg	1818	0	0	1818
Cucumber - Local	Kg	1818	0	454	2272
Cucumber - Imported	Kg	0	0	0	0
Sweet Pepper - Local	Kg	1591	0	225	1816
Sweet Pepper - Imported	Kg	0	0	0	0
Pumpkin	Kg	0	0	1363	1363
Squash	Kg	0	0	0	0
Lettuce - Local	Heads	300	0	300	600
Lettuce - Imported	Heads	0	0	0	0
Cabbage - Local	Kg	1644	0	225	1869
Cabbage - Imported	Kg	0	0	0	0
Cauliflower - Local	Heads	0	0	0	0
Cauliflower - Imported	Heads	0	0	0	0
Patchoi	Bundles	0	0	0	0
Eggplant	Kg	0	0	0	0
Carallie	Kg	0	0	0	0
Christophene	Kg	0	0	45	45
Ochro	Kg	0	0	1000	1000
Callaloo Bush	Bundles	0	0	100	100
Bodi	Bundles	0	0	20	20
Plantain	Kg	4545	0	227	4772
<i>Spices</i>					
Pimento	Kg	0	0	6000	6000
Hot peppers	Kg	0	0	1500	1500
Shadon Beni	Bundles	0	0	80	80
Celery	Bundles	0	0	0	0
Chive	Bundles	0	0	25	25
<i>Root Crops</i>					
Sweet Potatoes	Kg	9000	0	227	9227
Dasheen	Kg	6818	0	91	6909
Yam	Kg	4545	0	23	4568
Cassava	Kg	1136	0	0	1136
Eddoes	Kg	4545	0	0	4545
Ginger	Kg	1772	0	0	1772
<i>Fruit</i>					
Watermelon	Kg	0	0	273	273
Cantaloupe - Imported	Kg	0	0	0	0
Papaya	Kg	0	5455	45	5500

Pineapple	Kg	0	0	0	0
Bananas - Imported	Kg	0	7272	20	7292
Limes	Kg	0	0	500	500
Oranges	Kg	0	0	300	300
Grapefruit	Kg	0	0	200	200
Portugal	Kg	0	0	0	0
Mango	Kg	0	0	0	0

The main learning points from this segment include the following:

1. One hundred percent (100%) of the wholesalers/distributors surveyed are receptive to being approached by new farmers, as this activity will allow for a wider choice with respect to quality, price and consistent supply.
2. The female wholesaler interviewed said that she will only purchase dasheen, eddoes and yam from St. Vincent because her clientele prefers those varieties for taste and they are cleaner in appearance than the local supplies. Sweet potatoes and plantain are purchased from farmers in Trinidad, except when there are shortages in Trinidad. She buys at the current wholesale price and may negotiate for a lower price, if the farmer has a large volume to sell. Wholesalers try to buy out the farmers' supplies as fast as possible on any given wholesale market day and then mark-up their prices for supermarkets, hotels, restaurants, caterers and distributors (HMs). Many farmers prefer to dispose of their fresh produce as fast as possible, to return to their farms and hence they sell to wholesalers rather than staying in the market to sell directly to customers in smaller quantities, but at potentially higher prices to supermarkets, hotels, restaurants and caterers. Farmers make a lower profit when they sell to wholesalers but save on time.
3. The biggest distributor of fresh produce to supermarkets in Tobago was interviewed. He is also a major distributor to hotels and roadside vendors. He acquires most of his supplies from one wholesaler in Trinidad, who ships the goods to him by boat each week. At present there is no wholesale market in Tobago. He pays an average price of 10% higher than the Trinidad wholesale prices for his fresh produce. Distributors based in Trinidad visit the wholesale markets and mostly buy directly from farmers at the current wholesale price.
4. A wholesaler/distributor for locally grown papaya was interviewed. He has developed a relationship with 4 farmers and purchases all of their papaya at farm gate on a weekly basis. He pays an average price of \$4.40 per kilogram which is substantially lower than the wholesale price (\$7.75) obtained at the wholesale market.

Based on the observed buying habits of wholesalers and distributors, they represent a lower profit option for farmers to sell their fresh produce. Wholesalers and distributors are committed as a segment of the market to pay the lowest possible price for produce and also have developed an import strategy and network. This buyer segment should only be targeted by farmers who have an excess supply to sell.

4 CRITERIA/Framework for Product Analysis

The process for selecting commodities for further analysis for the market study was based on the consideration of three factors: results from the empirical research; the NAMDEVCO's Market classification system; and the National Food Production Action Plan 2012-2015 produced by the Ministry of Food Production.

The synthesis of the research data included the following actions:

1. Examination of the volume for each commodity in each HVB Segment. The commodities with the highest volumes traded for each buyer segment as captured from the survey were transferred from the excel sheets to the analytical tables in the body of the report (refer to Table 2 as an example).
2. A price comparison analysis was undertaken for each commodity in each HVB Segment with the wholesale market price (refer to Appendix 3) for the respective commodity. This determined the surplus price (additional revenue that could be obtained, if any) by selling the commodity to that particular buyer segment as opposed to selling the commodity on the wholesale market.
3. Commodities in each HVB segment were subsequently ranked using the 2 variables of volume and surplus price. Refer to final column in Table 2 under the Supermarket Buyer segment as an example.

The next step in selecting commodities for further analysis was to classify the commodities into groups using NAMDEVCO's classification of fresh produce as a guide. The categories are vegetables, leafy vegetables, spices, root crops and fruit. Based on the ranking of commodities in the aforementioned item 3, commodities that were the highest ranking were placed in their respective groups. This procedure yielded a summary matrix of the produce in each commodity group with best potential from each buyer segment. This matrix (Table 19) is illustrated as follows:

Table 19: Summary Matrix of the Produce in each Commodity Group with Best Potential from each Buyer Segment

Buyer Segment	Ranking	Vegetables Group	Leafy Vegetables	Root Crops	Spices	Fruit
Supermarkets	1st	Tomato	Lettuce	Sweet Potato	Hot Peppers	Watermelon
	2nd	Cucumber	Cabbage	Eddoes (based on volume)	Pimento	Papaya
	3rd	Plantain	Patchoi		Shadon Beni (based on volume)	Pineapple
	4th	Sweet Pepper			Chive (based on volume)	Banana
Restaurants	1st	Tomato	Lettuce	Sweet Potato	Hot pepper	Limes
	2nd	Sweet Pepper	Cabbage	Cassava	Pimento	
	3rd	Cucumber	Patchoi			
	4th	Christophene				
Hotels	1st	Tomato	Lettuce	Sweet Potato	Pimento	Watermelon

	2nd	Sweet Pepper		Yam	Hot Peppers	Limes
	3rd	Cucumber		Dasheen		Pineapple
	4th	Eggplant				Papaya
Food Caterers	1st	Tomato	Lettuce	Sweet Potato	Pimento	Watermelon
	2nd	Pumpkin	Cabbage	Dasheen	Hot Pepper	Papaya
	3rd	Cucumber	Callaloo Bush	Yam		Lime
	4th	Sweet Pepper				
Exporters	1st	-	-	-	-	Watermelon
	2nd	-	-	-	-	Papaya
Agro-Processor	1st	Caraille	-	-	-	-
	2nd	-	-	-	-	-

These rankings were then mapped against those commodities that have been earmarked for support and future research under the National Food Action Plan to ensure that there is some level of alignment with the proposed products and the Governmental Policy for Development.

4.1 Recommended Products For Future Analysis

Based on the information in the summary matrix and the aforementioned process, the following products and their rankings are noted:

- **Tomato**- ranked first by Supermarkets, Hotels, Restaurants and Food Caterers Segments in the Vegetables Group.
- **Cucumber**- ranked second in the Supermarket segment and third in the Restaurant, hotel and Food Caterer Segments in the Vegetables Group
- **Sweet Peppers** – ranked fourth by Supermarkets, second by Hotels, second by Restaurants and fourth by Food Caterers.
- **Lettuce** – ranked first by Supermarkets, Hotels, Restaurants and Food Caterers Segments in the Leafy Vegetable Group
- **Cabbage**- ranked second for 3 segments in the leafy vegetables group
- **Sweet Potato** - ranked first by Supermarkets, Hotels, Restaurants and Food Caterers in the Root Crops Group
- **Hot Pepper**- ranked first by the Supermarket and Restaurant Segments and second in the Hotel and Food Caterer Segments for the Spices Group
- **Pimento**- ranked first in the Hotel and Caterer Segments and second in the Supermarket and Restaurant segments in the Spices Group
- **Watermelon**- ranked first in the Supermarket, Hotel, Food caterer and Exporter in the Fruit group
- **Papaya**- Ranked second for the Supermarket, Food Caterer and Exporter Market segments in the Fruit group

Therefore for the purpose of this market study, the selected products for further analysis were:

1. Tomato
2. Lettuce
3. Sweet Potato
4. Hot Pepper
5. Pimento
6. Watermelon
7. Cucumber
8. Cabbage
9. Papaya
10. Sweet Pepper

The aforementioned fresh produce are priority commodities, listed in this country's National Food Production Action Plan for further development, in an effort to reduce this country's food import bill.

5 SUMMARY

As a result of the research and analysis undertaken, there are viable opportunities for the ten (10) identified commodities in one or more of the following buyer segments: Supermarkets, Restaurants, Hotels and Food Caterers. There are also some isolated opportunities in the Agro-processor and Exporter segments, but the research revealed that these segments are highly sensitive to prices and the prices farmers obtain from these segments are often lower than the wholesale benchmark price.

6 POTENTIAL BY PRODUCT

This section of the report presents the product potential analysis for the ten selected products in the market study.

6.1 General Survey Information

Table 20 presents general survey information for the twenty-six (26) farmers surveyed as follows:

No.	Name Of Farmer; Sex; Age & Farm Location	Main Crop; Variety & Acreage	Secondary Crops Cultivated	Target Market	Farmer's Response On Consistent Supply Over Last 2 Years
1.	Farmer 1 – Female; 37yr; East Trinidad	Papaya - Tainung No. 2 Variety; 0.4 ha.	Hot Pepper; Pimento	Wholesale Market; Previously exported but stopped due to dishonest importers	No – Personal problem
2.	Farmer 2 – Female; 55yr; North Trinidad	Tomato – Delhi; 0.2 ha & Cucumber – Atlantis; 0.4 ha.	Eggplant	Wholesale Market	No - Flood & Labor Shortage
3.	Farmer 3 – Female; 28yr; South Trinidad	Lettuce – Eden & Trinity 0.1 ha; Hot Pepper – West Indies Red; 0.1 ha.	Patchoi, Cabbage & Chive	Supermarket & also retail at the Farmers' Market	Yes – Consistent Supply
4.	Farmer 4 – Female; 46yr; East Trinidad	Pimento – 0.2 ha.	Nil	Wholesale Market & Exporters. Prefer to sell to exporter at farm gate for slightly lower price	No – Pest & Disease
5.	Farmer 5 – Female; 44yr; South Trinidad	Papaya - Tainung No. 2 Variety; 0.4 ha.	Eddoes; Patchoi; Lettuce & Pigeon Peas	Retail at Farmers' Market	No – Disease; Flood
6.	Farmer 6 – Female; 42 yr; East Trinidad	Papaya - Tainung No. 2 Variety; 0.4 ha; Watermelon – Palladin; 0.8 ha.	Nil	Wholesale Market	Yes – Consistent Supply
7.	Farmer 7 – Female; 59yr; North Trinidad	Cucumber – 0.1 ha; Papaya – 0.4ha.	Nil	Cucumber – Wholesale Market; Papaya - Retail	No – Adverse weather
8.	Farmer 8 – Male; 58yr; East Trinidad	Watermelon; Sentinel & Tropical Gold; 2ha. Hot Pepper (yellow & red); 1.2ha.	Tomato	Middleman & Retailers at farm gate and excess at wholesale market.	No - Flood

9.	Farmer 9 – Male; 34yr; Central Trinidad	Sweet Potato – Chicken Foot; 1.6 ha; Papaya – No. 1 Tainung; 1 ha Watermelon	Pumpkin	Middleman at farm gate; Occasionally retail at roadside; Previously sold to an exporter but he wanted best quality for lower than the wholesale price.	No – flood & Labour shortage
10.	Farmer 10 – Male; 51yr; South Trinidad	Cabbage – Tropicana; 0.2 ha; Tomato – NS 501 variety; 0.4 ha.	Nil	Middleman because of cash payment although the price obtained is lower than wholesale price	No – Labor shortage; Praedial larceny
11.	Farmer 11 – Male; 42yr; North Trinidad; Tertiary education	Lettuce – Lyra or iceberg variety; hydroponics system on 0.2 ha. Pimento – Hybrid; 0.1 ha. (open land)	Papaya; Celery.	Supermarkets & Distributors; Obtain higher price for lettuce than wholesale price because of consistent high quality due to the hydroponic system	Yes – Hydroponic is more reliable than open land for high quality and consistent production level
12.	Farmer 12 – Male; 52yr; South Trinidad; Secondary Level Education	Cabbage – Tropicana; 0.2 ha.	Cantaloupe	Middleman	No – Adverse Weather
13.	Farmer 13 – Male; 54yr; East Trinidad; Primary Level Education	Lettuce – Eden; 0.8 ha.	Hot Pepper	Sell to distributors at farm gate who sell to restaurants. Price obtained is lower than wholesale price	No – Adverse Weather
14.	Farmer 14 – Male; 73yr; South Trinidad; Primary Education	Sweet Potato; 0.4 ha.	Pigeon Peas; Plantain; Cassava	Wholesale Market	No - Labor Shortage
15.	Farmer 15 – Male; 34yr; South Trinidad; Primary Education	Hot Pepper – Moruga Red & Yellow; 0.4 ha.	Pimento; Pumpkin; Cucumber	Retail at the Farmers' market and also wholesale to vendors & middleman	Yes – Consistent Supply
16.	Farmer 16 – Male; 36yr; South Trinidad; Secondary Level Education	Tomato – Delhi; 0.2 ha.	Bodi & Ochro	Wholesale Market	No – Crop damage by animals
17.	Farmer 17 – Male; 58yr; West Trinidad; Post Secondary Level	Cucumber – Expedition; 0.1 ha Greenhouse; Tomato – Dianne; 0.1 ha Greenhouse	Sweet Pepper; Lettuce; Pachoi; Celery	Sell cucumber to Subway Chain of Restaurants via a Distributor and obtain less than wholesale price; Also retail at the Farmers' Market and wholesale to Roadside Vendors.	No – Initially purchased a defective Greenhouse system but cucumber production is now continuous and quality is consistent
18.	Farmer 18 – Male; 56yr; Central Trinidad	Sweet Pepper – California Wonder; 0.4 ha. Greenhouse	Nil	Supermarket	Yes – Consistent Supply & Quality due to protected system
19.	Farmer 19 – Male; 54yr; Central Trinidad	Sweet Potato - Chicken Foot Vareity; 8ha.	Watermelon; Papaya; Corn; Pumpkin	Middleman At Farm gate	Yes – Consistent Supply

20.	Farmer 20 – Male; 37yr; North Trinidad	Hot Pepper – Hood Variety; 0.6 ha.	Corn & Pumpkin	Hot Pepper – Processor Corn & Pumpkin – Wholesaler	No - Flood
21.	Farmer 21 – Male; 35yr; South Trinidad	Sweet Pepper – 0.4 ha.	Nil	Wholesale Market	No – Adverse Weather (contemplating a protected system)
22.	Farmer 22 – Male; 40yr; East Trinidad	Tomato – Delhi Variety; 0.8 ha;	Sweet Pepper	Wholesale Market & Roadside Vendors	No - Flood
23.	Farmer 23 – Male; 65yr; East Trinidad	Cucumber – Expedition Variety 0.1 ha; Tomato – Delhi & Dianne; 0.1 ha.	Bodi, Ochro & Cabbage	Wholesale Market	No - Flood
24.	Farmer 24 – Male; 54yr; East Trinidad	Watermelon – Sentinel; 4.8 ha.	Ochro & Cucumber	Sold to a wholesaler at Farmgate	Yes – Consistent Supply
25.	Farmer 25 – Male; 58yr; East Trinidad	Lettuce – 0.1 ha; Iceberg	patchoi	Sold at the wholesale and farmer's markets	No – adverse weather
26.	Farmer 26 – Female; 35yr; Central Trinidad	0.8 ha. Pimento	Cassava	Sold at the wholesale market	No – Irrigation problems; labor shortage

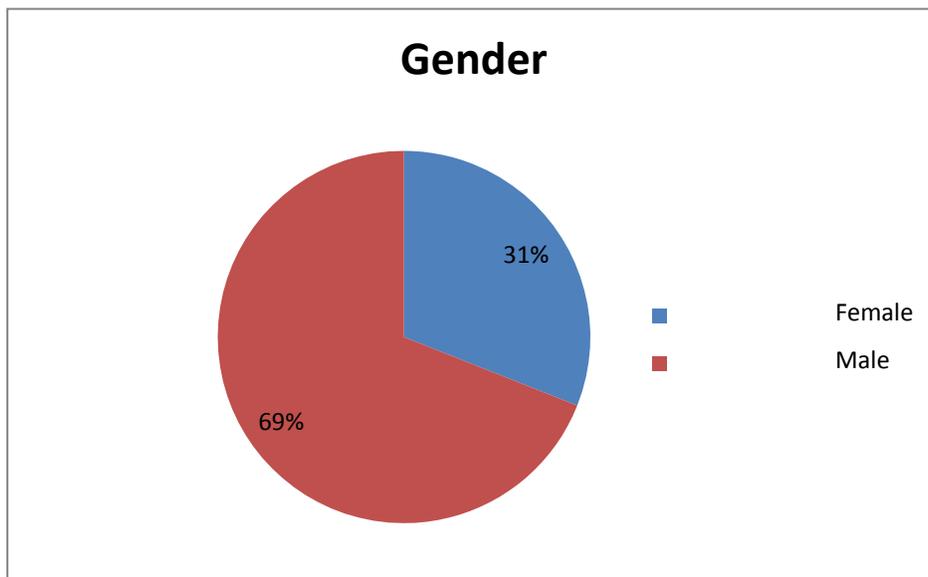
- Names of farmers interviewed have been withheld for privacy reasons

The key learning points are as follows:

- Only twenty-eight percent (28%) of the farmers surveyed have been able to produce a consistent supply throughout the year. Fifty percent (50%) said that they have not been able to produce a consistent supply throughout the year because of flood or adverse weather conditions. Labor shortage was the next major factor for being unable to produce a consistent supply throughout the year.
- The farmers surveyed indicated that they chose crops to cultivate based on a combination of factors, with the main factor being, knowledge & experience in the crops cultivated. Other important factors in choosing the type of crops to cultivate are: to supply orders; crops which require less labor; and crops which have strong year round demand.
- Sixty-eight percent (68%) of these farmers are willing to cultivate crops which they are not currently cultivating, if they are guaranteed prices higher than wholesale prices. Seventy seven percent (77%) of the farmers currently cultivate more than one crop.

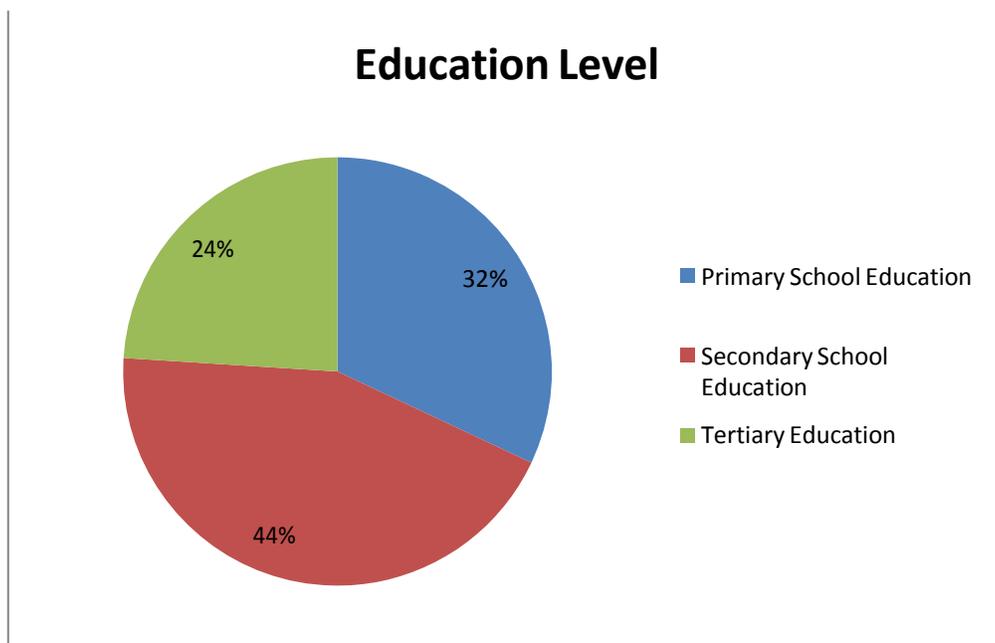
In terms of gender, 31% of farmers were female while 69% were male as illustrated in Figure 7:

Figure 7: Gender Composition of Farmers Who Participated in the Survey



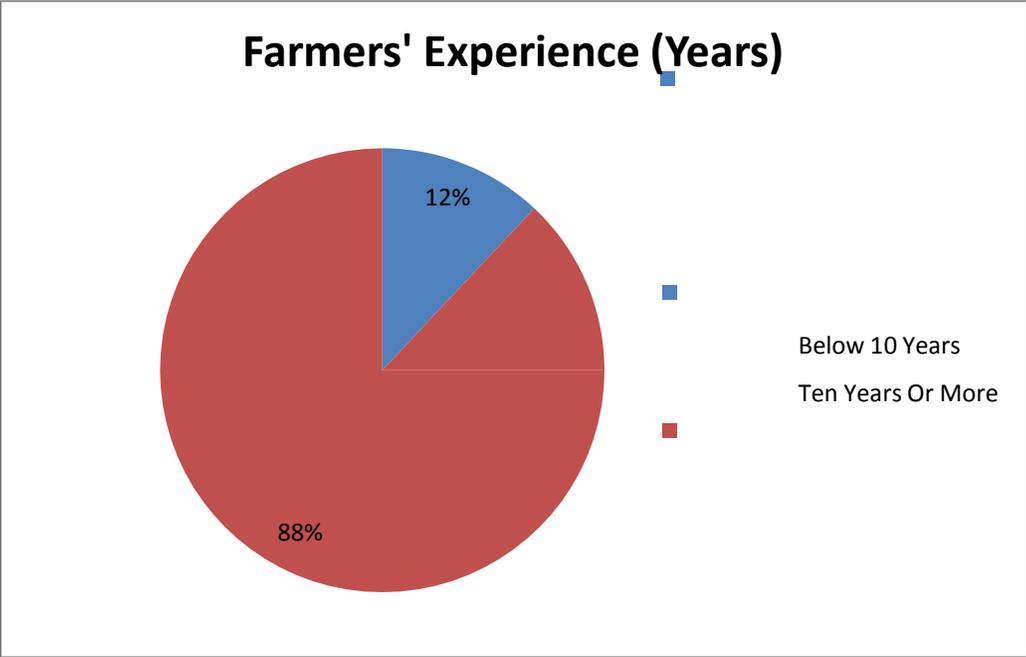
The education level of farmers who participated in the survey was varied with 32% having primary school education only, 44% having secondary education and 24% having tertiary level education. This is represented in Figure 8:

Figure 8: Education Level of Farmers Who Participated in the Survey



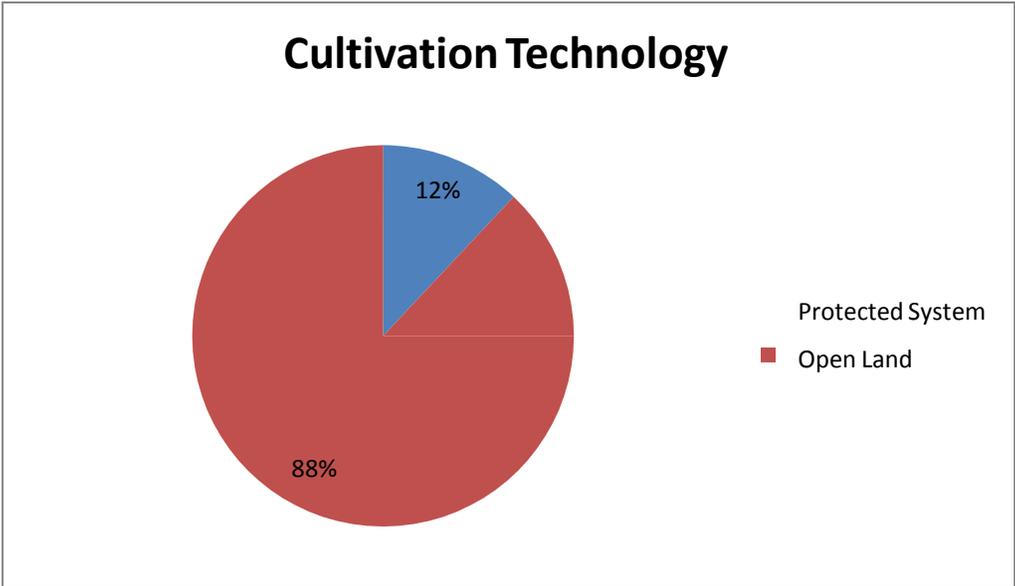
In terms of farmers experience in farming, 12% have been involved in farming for less than ten years, while 88% have been farming for 10 years and over. This information is represented in Figure 9:

Figure 9: Experience (years) of Farmers Who Participated in the Survey



With respect to cultivation technology, 12% of farmers surveyed used protected or semi protected systems (greenhouse and hydroponics) while 88% used open land cultivation systems. This is illustrated in Figure10:

Figure 10: Cultivation Technology Utilized By Farmers Surveyed



6.2 Product Potential – Sweet Potatoes



Sweet Potato is rich in Vitamins A, C and B6 and has a high fiber content. More than 130 million tones are produced per year, with China supplying about 80 per cent of the world's production. Nearly half of the sweet potatoes produced in Asia are used for animal feed, with the remainder are primarily used for human consumption. Most sweet potato varieties are ready for harvesting 4 to 5 months after planting.

6.2 a Production Trends

From the survey of farmers, three (3) farmers cultivated sweet potato as one of their primary crops. One of these farmers has been able to maintain a consistent annual supply, while the other two have not been able to maintain a consistent supply, mainly due to labor shortages and floods.

Sweet Potato is a targeted crop in the National Food Production Action Plan of Trinidad and Tobago. An increase in production has been projected as 13,090 tones at the end of 2015. To achieve this goal, 121 hectares have been allocated to be distributed to farmers for sweet potato cultivation. Most of these lands have already been distributed. There are also plans for the research and development of high yielding, pest resistant, varieties of sweet potato with seven new varieties expected to be introduced. Other aspects of the action plan for sweet potato include: the development of investment profiles to assist farmers and entrepreneurs in making investment decisions on the crop; and the introduction of specific post-harvest technology, which includes the provision of cold storage and curing facilities specifically for root crops like sweet potato.

6.2 b Varieties

Farmers try to choose varieties which are high yielding, have good shelf – life, and are resistant to pests and diseases. The Ministry of Food Production has over 55 varieties in its possession. The most popular variety grown in T&T is Chicken Foot. The shape of its leaf resembles a chicken foot. The farmers who were surveyed also cultivated this variety.

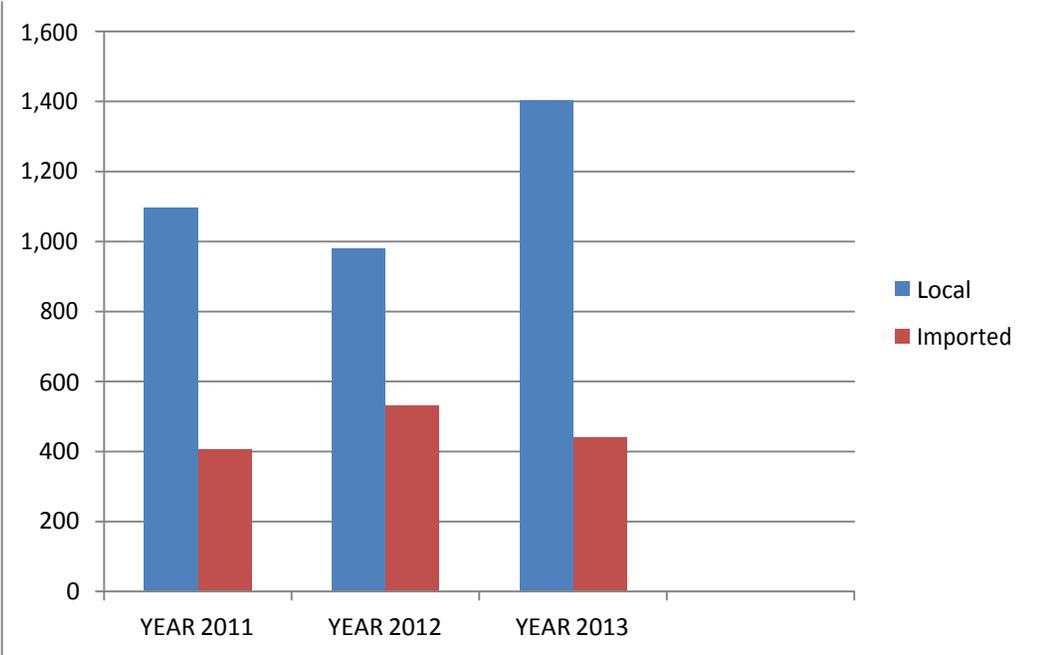
6.2 c Competition

Sweet potatoes are on the front burner these days in a variety of trendy foods, from sweet potato fries to sweet potato bread, cookies, muffins and smoothies. Local farmers receive competition from sweet potatoes imported from St. Vincent, Guyana and Suriname. Because these imported supplies are from CARICOM countries, no import duty or taxes are applied.

Figure 11 shows that there is a sizeable market for the imported sweet potato, but this is to provide for excess demand, for which there is insufficient local supply. There is no evidence from the data, that imported sweet potato is replacing the locally produced sweet potato. Figure 12 demonstrates that the local price is substantially lower (between 20 % - 30%) than the imported price. From the survey of buyers in the previous phase, some buyers said that they preferred the yam and dasheen from St. Vincent, but those same buyers said that they preferred the local variety of sweet potato. However, there was consensus among buyers that the imported root

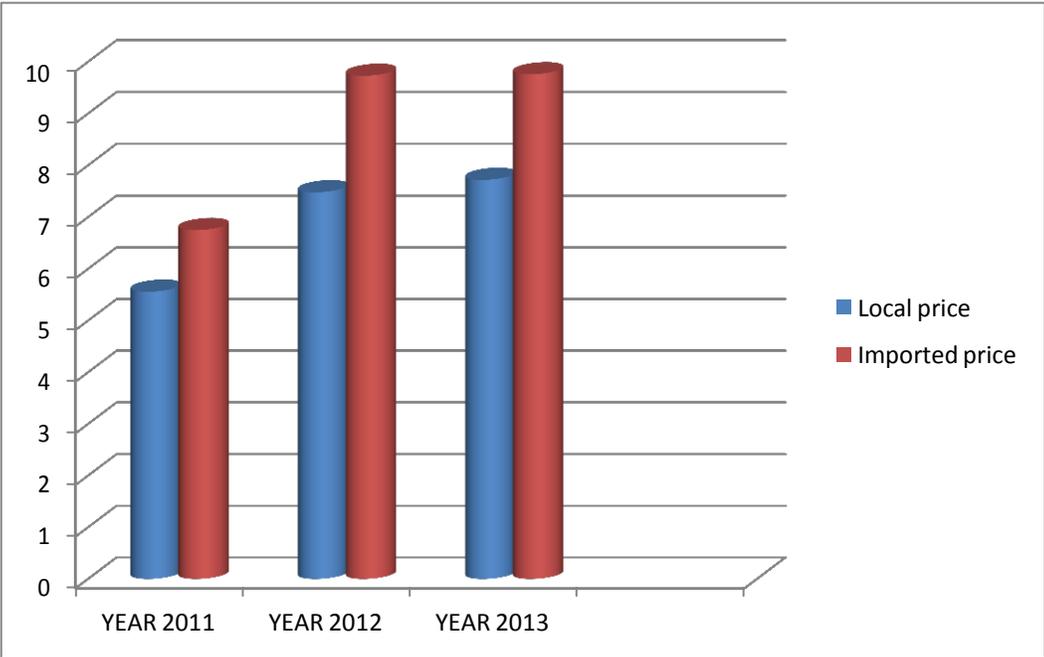
crops were better prepared for the market than the local root crops, especially in terms of cleanliness. This clearly demonstrates that local sweet potato farmers need to pay closer attention to post harvest activities to enhance their product quality.

Figure 11: Comparison of Local and Imported Sweet Potato by Quantity Between 2011 and 2013 at The Norris Deonarine Wholesale Market



Source: NAMDEVCO (2014)

Figure 12: Comparison of Prices for Local & Imported Sweet Potato between 2011 And 2013 at The Norris Deonarine Wholesale Market



Source: NAMDEVCO (2014)

6.2d Size of Production Base for Sweet Potato

Recent information from NAMDEVCO revealed that there are 122 farmers cultivating sweet potato in Trinidad with 53% of the farmers based in the county of Caroni and 32% in the county of Victoria.

6.3 Product Potential – Watermelon



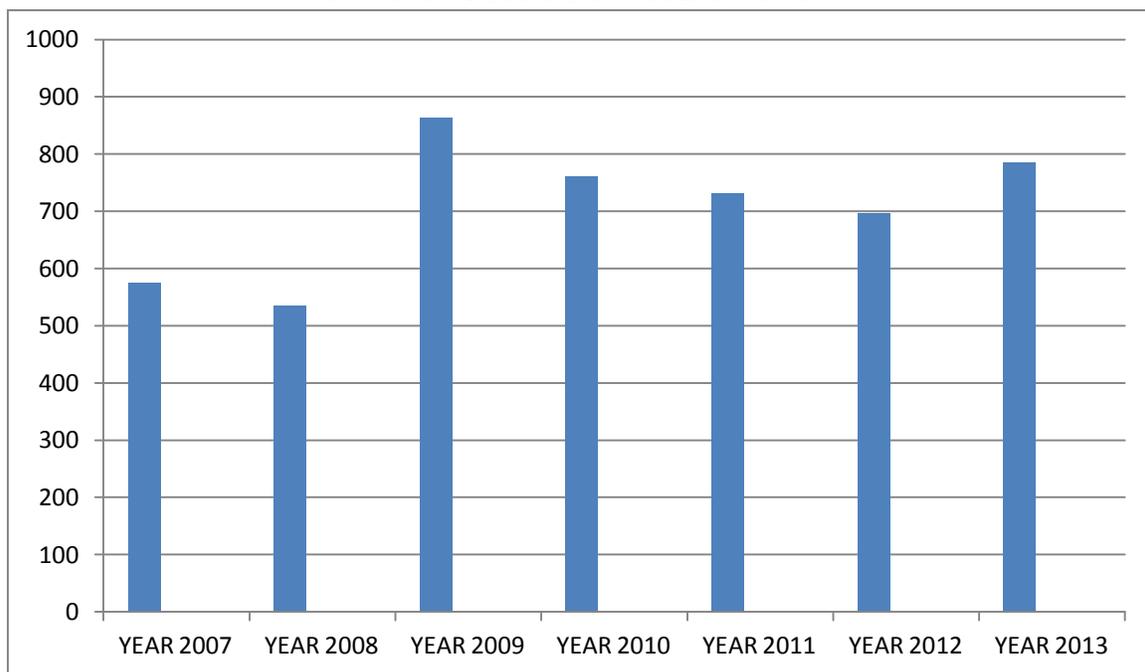
There are more than 500 varieties of watermelon grown worldwide. Watermelon is a member of the cucurbitaceous family and is related to the cantaloupe, squash and pumpkin. This commodity is harvested approximately 80 to 90 days after transplanting. Watermelons are not only delicious, but extremely healthy as well. They are rich in potassium, vitamin C and a valuable source of lycopene. Research indicates that lycopene is helpful in reducing the risk of cancers. Qualified farmers are being allocated 20 hectares for increased watermelon production under the National Food Production Action Plan.

6.3 a Production Trends

From the survey of farmers, four (4) farmers cultivated watermelon as one of their primary crops and one farmer cultivated it as a secondary crop. Sixty percent (60%) of these farmers have been able to maintain a consistent annual supply, while forty percent (40%) have not been able to maintain a consistent supply, mainly due to labor shortages and floods.

Figure 13 reveals that there is moderate fluctuation in the availability of watermelon for sale at the Norris Deonarine Wholesale Market, which is the larger of the two wholesale markets in T&T. This variation in quantity is mainly due to adverse weather in the respective years.

Figure 13: Quantity of Watermelon Sold Between 2007 and 2013 at The Norris Deonarine Wholesale Market



Source: NAMDEVCO (2014)

6.3 b Varieties

Sentinel is the most popular variety of watermelon grown in T&T and also among the farmers surveyed. This variety has a deep red interior with a crisp, juicy flesh. It is a high yielding variety with vigorous vines that produce uniform fruit, weighing an average of 10 to 12 kilograms. Its thick rind and oblong-blocky shape make Sentinel a good long distance shipper. The color of the skin of the Paladin variety is green with dark-green stripes. The fruit is oblong with bright red flesh. The thick density of skin means it can be transported easily and it is tolerant to disease. The Top Gun variety has excellent seedling vigor and matures in approximately 83 days, with a globe-shaped fruit and bright red flesh (average weight 10 kg). Tropical Gold is another known variety, among local farmers.

6.3 c Competition

Competition in watermelon sales is limited to local farmers. Competition emerges, mainly in the dry period, when there is a substantial increase in production. During the rainy season, production falls because of adverse weather and therefore price increases. Competition from imports is negligible, as only a small quantity of muskmelons and honeydew melons are imported. Most of the restaurants, hotels, supermarkets and caterers either do not purchase these imported commodities or utilize small quantities. The farmers surveyed indicate that cultivation of watermelon generates much profit, but there is high risk of floods and losses during the period from June to January.

6.3 d Size of Production Base for Watermelon

Recent information from NAMDEVCO revealed that there are 230 farmers cultivating watermelon in T&T, with the highest concentration in the counties of Nariva/Mayaro (31%) and Victoria (31%), both of which are located in South Trinidad.

6.4 Product Potential – Papaya (Paw-paw)



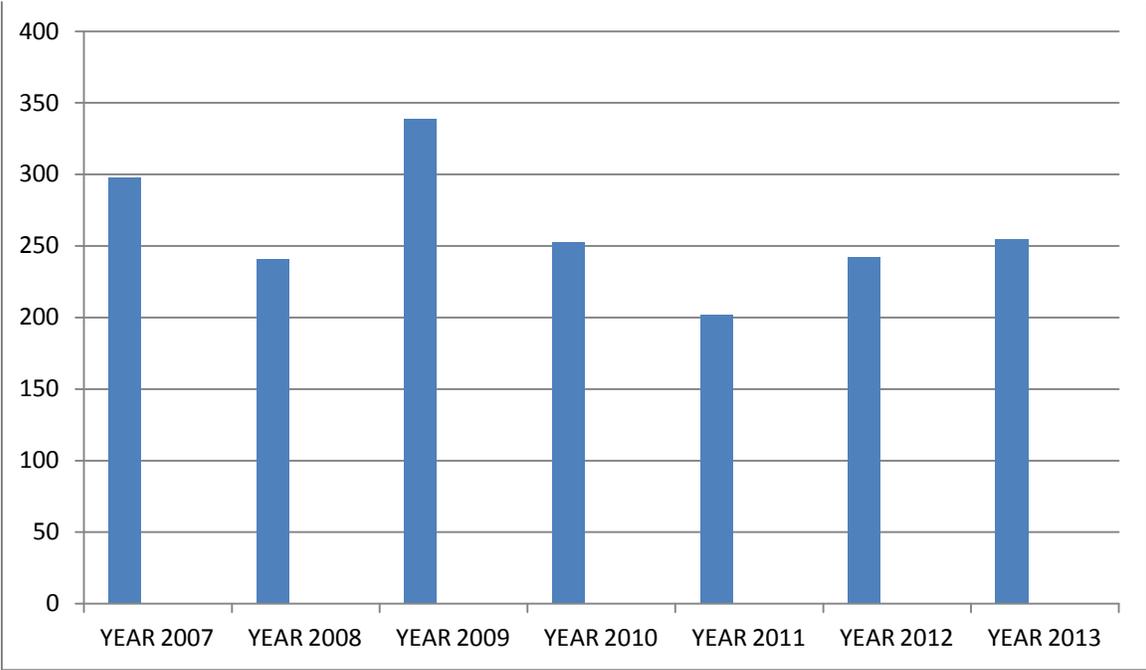
Papaya, also known as paw-paw, is popularly grown in the tropics. The fruit has a sweet taste, high levels of antioxidant and is rich in vitamin C and amino acids. Fruit maturity occurs approximately 8.5 months after seed germination.

6.4 a Production Trends

From the survey of farmers, six (6) farmers cultivated papaya as one of their primary crops. Fifty percent (50%) of these farmers have been able to maintain a consistent annual supply while the

other fifty percent have not been able to maintain a consistent supply mainly due to labor shortages and floods. Figure 14 demonstrates that the level of production available for sale has fluctuated from year to year between 2007 and 2013 mainly because of adverse weather and floods. Papaya farmers are being allocated 20 hectares of land for additional cultivation under the National Food Production Action Plan.

Figure 14: Quantity Of Papaya Sold At The Norris Deonarine Wholesale Market ('000 kg)



Source: NAMDEVCO (2014)

6.4 b Varieties

Many varieties of papaya are grown in T&T, but the popular ones are Tainung No.1, Tainung No. 2 and Red Lady. Tainung No. 1 is used in the fresh fruit market and also for processing. It is similar to Tainung No. 2, except that it has a tougher skin. Tainung No. 2 is the preferred variety for the fresh fruit market. It is medium size; oblong shaped and has an average weight of 1.1 kg. This variety is also an early bearer, maturing in six months. Red Lady is large; oval shaped and has an average weight of 1.8 kg. It is an excellent variety for processing.

6.4 c Competition

In 2011, imports of papaya to the region were recorded at 0.2 million kg, whereas exports amounted to 65.1 million kg. The major exporting country being Belize, which accounted for 98.1% of the quantity exported. Barbados, the Bahamas and Antigua and Barbuda were the major importers during the period 2004 – 2008 with imports of 83.2, 81.5 and 15.7 thousand kg respectively.

The Competitiveness and Industry Development Strategy (Sing, R.H., Seepersaud, G and Rankine, L. B. - 2007) commissioned by the CARICOM Regional Transformation Programme for Agriculture on Papaya, found that the USA and the European Union dominated global imports, accounting for 38% and 33% respectively. Canada imported a relatively smaller quantity, accounting for 5% of global imports in value terms. Although opportunities exist in these markets, the USA is clearly the most important market for CARICOM producers to target, given

the size of the market (USD 58.3 M), growth trends, and close proximity. The size of the European Union market is estimated at USD 59 M. Within the EU, the United Kingdom market is the most attractive for CARICOM exporters, due to a higher level of demand in comparison to other EU countries and considering transportation logistics and cost. Canada also offers opportunities for CARICOM producers, as it imports an estimated USD 10 M of papaya on an annual basis.

Regional demand for papaya remains undersupplied. Papaya is viewed as an exotic fruit, and is in demand by both the local population as well as the tourism sector. The potential opportunities of exports within the regional market, is substantial. In T&T, during the survey of buyers, Hilton Trinidad stated that from time to time they experience difficulty in procuring an adequate supply of papaya.

6.4d Size of Production Base for Papaya

Recent information from NAMDEVCO revealed that there are 184 farmers cultivating papaya in Trinidad with the highest concentration in the county of Victoria (30%) which is located in South Trinidad. The county of Caroni which is located in Central Trinidad has 21% of the farmers, which is the second highest.

6.5 Product Potential – Hot Pepper



Hot Peppers contain capsaicin which is used in a variety of medicines to treat arthritis, cancer, pain and a variety of other ailments.

Peppers are also high in vitamins A, B and C.

The pungent taste in hot pepper is due to the chemical, capsaicin and the 'hotness' in a variety is measured by 'Scoville units'.

T&T is known for producing some of the hottest peppers in

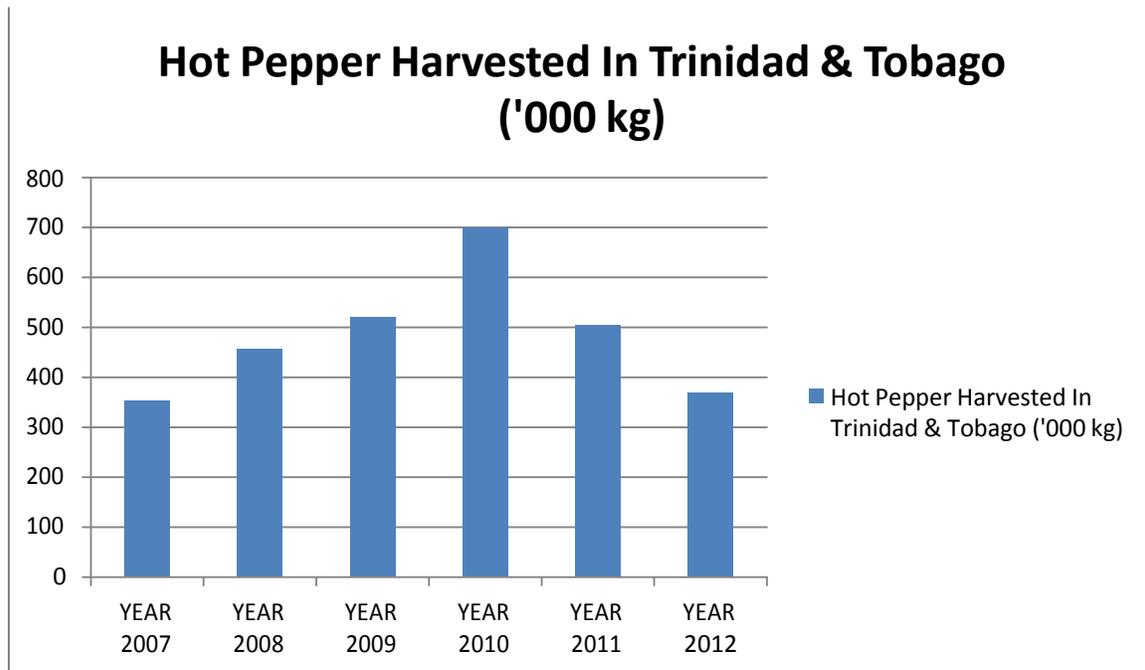
the world, with over 100,000 Scoville units. Hot pepper is also one of this country's most profitable export crops. The National Food Production Action Plan has projected that hot pepper production would increase from 710 tons to 1,800 tones and has allocated 20 hectares to farmers to increase production levels.

6.5 a Production Trends

From the survey of farmers, four (4) farmers cultivated hot pepper as one of their primary crops and two (2) others cultivated it as a secondary crop. One-third of these farmers have been able to maintain a consistent annual supply, while two-thirds have not been able to maintain a consistent supply, mainly due to adverse weather conditions and floods.

Figure 15 demonstrates how the production of hot pepper fluctuated in T&T between 2007 and 2012. There was a steady increase between 2007 and 2010, but this was followed by a sharp fall between 2010 and 2011 and 2011 and 2012.

Figure 15: Hot Peppers Harvested in Trinidad & Tobago Between 2007-2012



Source: Central Statistical Office, 2014

6.5 b Varieties

The West Indies Red and Hood are popular varieties cultivated by the farmers surveyed and are also recommended by the Ministry of Food Production. Other varieties recommended by the Ministry of Food Production are: Scotch Bonnet, CARDI Green and Faria Series.

6.5 c Competition

A large market exists for locally grown hot peppers in North America where more than 1,000 metric tons were exported over a ten-year period, according to local databases (Trinidad Express Newspaper, 2010). Several research papers have stated that hot pepper from T&T has a competitive advantage in international markets because of its high pungency.

A high demand exists for local hot peppers by the HVB surveyed for this study. Imported chili peppers are the main competitor for the local hot peppers but the chili peppers are more expensive and were not in high demand by the buyers surveyed. The level of competition is stronger on the international markets.

6.5 d Size of Production Base for Hot Pepper

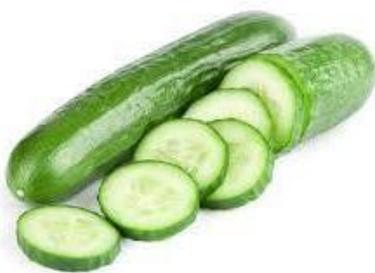
Recent information from NAMDEVCO revealed that there are 491 farmers cultivating hot peppers in Trinidad, with the highest concentration in the county of Victoria (25%) which is located in South Trinidad. The county of St. Andrew, which is located in East Trinidad, has 22% of the farmers, which is the second highest.

A farmer from Caparo, said that he lost 1.6 hectares of hot peppers in the flood. "The peppers were growing very well and it was almost time for harvesting when the rains came and the land became waterlogged," he said. Jankie concluded the article, by deducing that local farmers are willing to participate in shared initiatives, however, external conditions such as adverse weather play a critical role in the success of these efforts to formalize the sector.

6.5e Case Study - Managing the Risks

A perspective on the efforts to increase the production base of hot peppers and develop contractual relationships with HVBs was examined by Journalist, Ariti Jankie in 2010 in an Article: *Pepper Farmers Face the Heat* and published in the Trinidad & Tobago Daily Express. Jankie explained that a value chain arrangement set up by NAMDEVCO to supply hot peppers on the international market suffered a serious setback, as a result of flooding in July 2010. The value chain approach to production started with the farmers who were given a guaranteed price of \$8.80 per kilogram to supply hot peppers for the export market. A price of \$6.60 per kilogram was set for rejected peppers. The value chain began with the establishment of a Hot Pepper Value Chain Committee, in collaboration with the Inter-American Institute for Cooperation on Agriculture (IICA), at the start of the year. Quality seeds were distributed to nursery producers, who supplied healthy plants to farmers. Hot pepper harvests were set to be collected at the farm gate and taken away for packaging and export. However, Jankie elaborated that tragedy struck, due to adverse weather conditions the fledging programme was severely impacted. A Barrackpore farmer, who was a participant in the programme, lost most of his crop in the May flood, along with 0.75 hectares of cucumbers and 2 hectares of watermelon. Another farmer expressed the view that the most difficult part of hot pepper production was the labor required to pick the peppers.

6.6 Product Potential – Cucumber



Cucumber is a popular crop which can be grown throughout the year in T&T. Cucumbers belong to the same plant family as squash, pumpkin, and watermelon (the Cucurbitaceae family) and are ready for harvest 50 to 70 days from planting. Cucumber is a nutritious vegetable with vitamins C, B and K, plus copper, manganese and potassium. Over 95% of the crop is grown under the open-field system. The average farm size is about 0.25 hectare (CARDI, 2013). The traditional use of cucumbers in the market include: fresh and

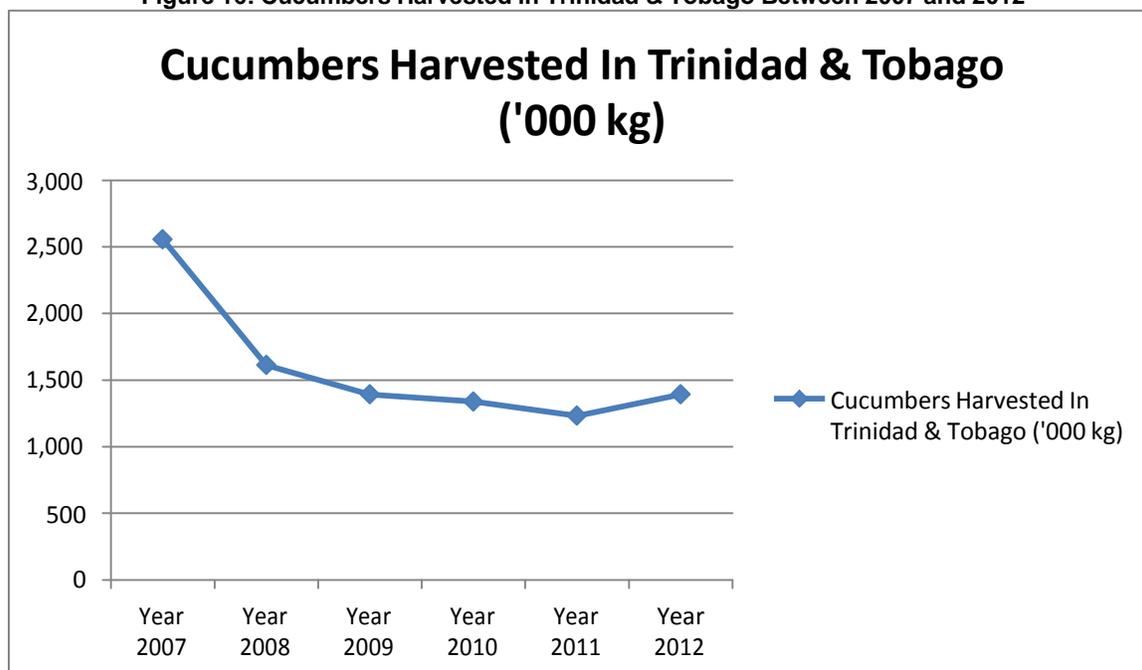
grilled salads; garnishes; and pickled preparations. The cucumber produce is in demand by all the HVB segments.

6.6 a Production Trends

From the survey of farmers undertaken for this study, sixty-seven percent (67%) of the farmers cultivating cucumber indicated that they have not been able to maintain a consistent supply because of floods or adverse weather, and to a lesser extent, labor problems. One farmer, who sells to the Subway chain of restaurants via a distributor, indicated that he moved from open land cultivation to the greenhouse system to alleviate these difficulties and this has allowed him to provide a consistent supply of cucumbers, both in quantity and quality. However, initially he encountered problems by purchasing an inappropriate greenhouse design, which had to be rectified. CARDI (2014) stated that many farmers have not been able to achieve the potential of protected agriculture because of purchasing inappropriate designs of protected structures for the climatic conditions of the region and production practices.

Figure 16 demonstrates how the production of cucumber in T&T fluctuated from year to year mainly due to adverse weather conditions. Production also decreased substantially from 2,557,000 kg in 2007 to 1,232,000 kg in 2011 with a gradual rise in 2012 to 1,392,000 kg.

Figure 16: Cucumbers Harvested in Trinidad & Tobago Between 2007 and 2012



Source: Central Statistical Office, 2014

6.6 b Varieties

According to CARDI (2013), the popular varieties in this country are the local type (slicing type) followed by Ashley and Gemini. The farmers surveyed cultivated the Expedition variety.

6.6 c Exports

T&T is not a major importer of cucumbers. All of the supermarkets, hotels, restaurants and Caterers that participated in the survey purchased locally produced cucumbers. The National Food Action Plan postulates that cucumber is a produce with export potential. In addition, the National Plan has projected cucumber production of 17,600 tons in 2015 and has allocated 10 hectares for protected cucumber cultivation. Trinidad continues to export a sizeable amount of cucumbers mainly to Barbados as follows:

Year	2006	2007	2008	2009	2010
Kilograms	43,000	190,000	245,000	299,000	249,000

Source: UN International Trade Centre, 2013

The main problem affecting the ability of local cucumber farmers to serve the HVB is lack of a consistent supply due to floods or adverse weather. As a result, the HVB prefer to transact business with distributors, who search and source the commodity from the wholesale markets or from farmers not affected by the floods.

6.6 d Size of Production Base for Cucumber

Recent information from NAMDEVCO revealed that there are 266 farmers cultivating cucumbers in T&T, with the highest concentration in the county of St. Andrew (44%) which is located in East Trinidad. The county of St. George which is located in North Trinidad has 19% of the farmers which is the second highest.

6.7 Product Potential – Cabbage



Cabbage Growing In A Greenhouse In Trinidad



Cabbage is classified as a leafy vegetable and is usually green or purple in color. It is a good source of dietary fiber, vitamins A, B6, C and K, as well as folate, potassium, calcium, magnesium and iron. Cabbage has a fairly short crop cycle of 12 weeks after transplanting and is therefore an excellent cash crop for farmers. The traditional use of cabbage includes: fresh and chilled salads; coleslaw; and additions to other vegetable side dishes in HVB operations.

6.7a Production Trends

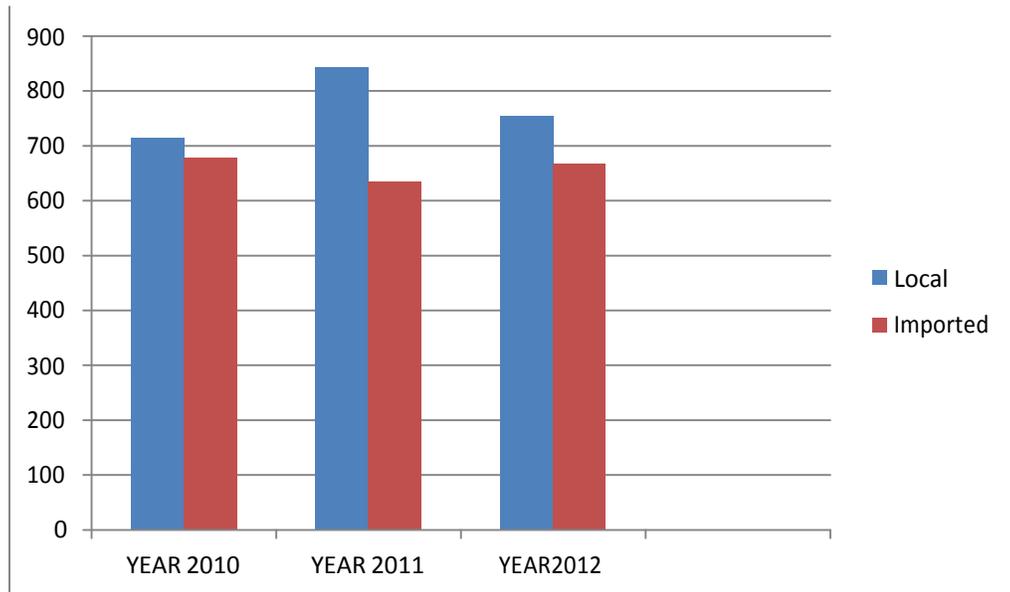
Two of the farmers surveyed cultivated cabbage as their main crop and two other farmers cultivated cabbage as a secondary crop. Seventy-five (75%) of the farmers indicated that they have not been able to produce a continuous supply throughout the year, because of adverse weather, labor shortage and in one case, praedial larceny. All the farmers surveyed had open land cultivation as the main method of cultivation.

6.7 b Competition

Figures 17 and 18 demonstrate the strong competition between locally produced cabbage and imported cabbage. In 2010, the amount of imported cabbage sold at the country's largest wholesale market represented 95% of the total quantity of domestic cabbage sold (i.e. almost the same amount was imported as was produced locally). In 2011 and 2012 it was 87%. The reasons for the large quantities of imported cabbage are: to meet shortages in domestic supply; and that imported cabbage is available at a lower price than the local cabbage. From the survey of buyers, at least 50% showed a preference for imported cabbage from the USA and Canada over the local cabbage, because of better shelf life and no pesticide residue.

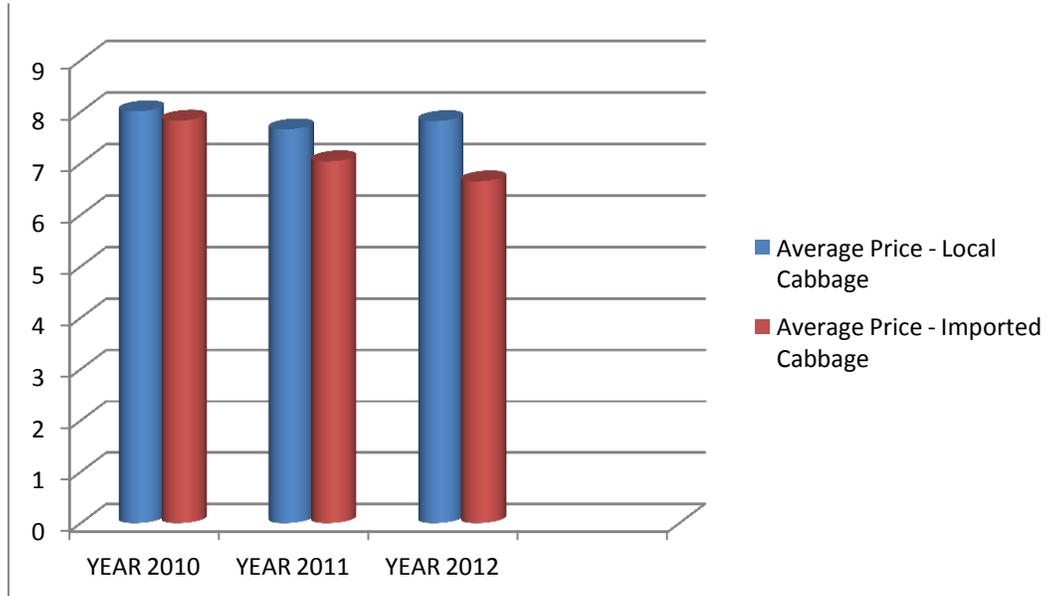
Cabbage has not been included as a priority crop for increased production under the country's National Food Production Plan for 2015.

Figure 17: Quantity of Local Cabbage Versus Imported Cabbage Sold at the Norris Deonarine Wholesale Market Between 2010 and 2012



Source: NAMDEVCO, 2013

Figure 18: Price of Local Cabbage Versus Imported Cabbage Sold at the Norris Deonarine Wholesale Market Between 2010 and 2013



Source: NAMDEVCO, 2013

6.7 c Varieties

Tropicana was the most popular variety grown among the farmers surveyed. Tropicana is well adapted to tropical areas. The cabbage head is green, semi flat and compact. The crop matures in approximately 65 days after transplanting.

6.7d Size of Production Base for Cabbage

Recent information from NAMDEVCO revealed that there are 118 farmers cultivating cabbage in T&T with the highest concentration in the county of St. George (47%) which is located in North Trinidad.

6.8 Product Potential – Lettuce



Hydroponics uses water & minerals rather than soil to grow plants

Lettuce has a short crop cycle, usually harvested 4 to 6 weeks after transplanting, and is therefore an excellent cash crop. Lettuce belongs to the family, Asteraceae and is not related to the Cruciferae groups such as cabbage and broccoli. It is a good source of dietary fiber, calcium, iron and vitamins A, B, C and E. Traditional use of lettuce in T&T includes: fresh and chilled salads; and garnishes.

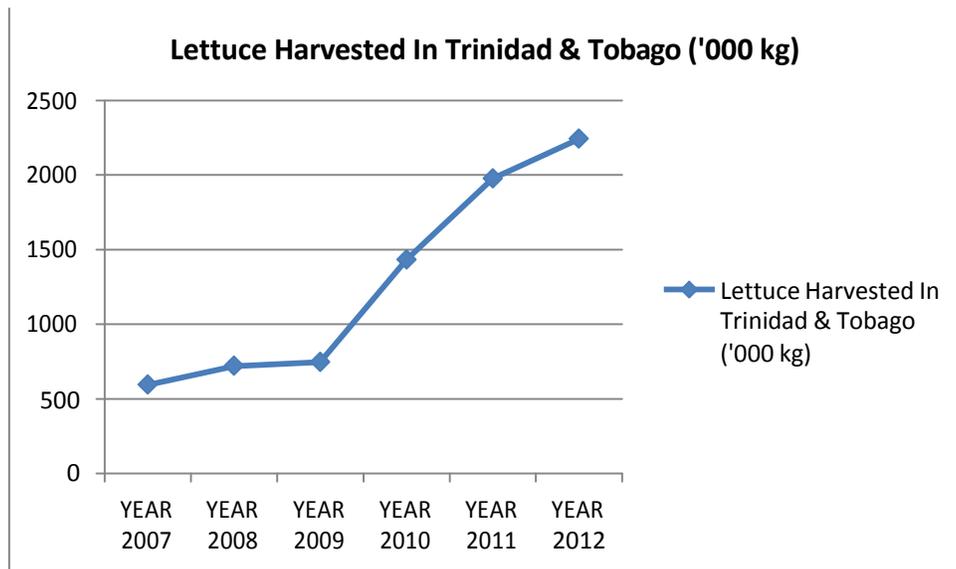
6.8 a Production Trends

Three of the farmers surveyed cultivated lettuce as their main crop, and two other farmers cultivated lettuce as a secondary crop. Sixty (60%) of the farmers indicated that they have not been able to produce a continuous supply of lettuce throughout the year because of adverse weather. These farmers cultivate lettuce on open land and often experience problems such as flooding. One farmer, who utilizes the hydroponic technology, said that this system has allowed him to achieve a consistent supply both in terms of quantity and quality.

The local Guardian Newspaper (2012) highlighted a father and son success story in the cultivation of lettuce. These farmers transformed their lettuce farm from open land cultivation to the hydroponic system on 0.6 hectares land. In 2012, they produced 40,000 heads of lettuce per month and supplied this country's established supermarkets and restaurants. They said that the hydroponic system allowed for greater control of the plant and thus final product quality is better. This differentiation has given them a clear advantage over other farmers. They also attributed their marketing skills and post-harvest techniques as other advantages. For example, their lettuce is placed in a clear plastic bag with their own brand label for identification as well as a barcode, which is an added advantage when selling to supermarkets.

Figure19 demonstrates how the production of lettuce in T&T has consistently increased from 2007 to 2012. This rising production in lettuce could be due to the gradual increase in farmers who are cultivating lettuce under protected systems as opposed to open land cultivation.

Figure 19: Production of Lettuce Between 2007-2012 in Trinidad and Tobago



Source: Central Statistical Office, 2014

6.8 b Competition

All of the HVB have a strong demand for lettuce to use in their operations. Lettuce has been identified, in the National Food Production Action Plan, as a crop to increase production for local consumption to meet the increasing demand. The proposed production target is from 1,394 tons to 1,500 tons at the end of 2015. To achieve this target, the plan has included an allocation of 5 hectares for cultivation of lettuce under protected agriculture.

The average price obtained for lettuce, at the Norris Deonarine Wholesale Market in 2013, was: \$3.06 for a small head of cabbage; \$4.22 for a medium head; and \$5.23 for a large head. Imported lettuce was not sold at the wholesale market. However, Subway which is the largest purchaser of lettuce in Trinidad, imports most of its requirement because in the past the business complained of inconsistent supplies from local farmers. Farmers are seeing the opportunity to generate substantial profit from lettuce cultivation and an increasing number are investing in protected systems and hydroponic systems.

6.8c Lettuce Varieties

There are two major types of lettuce, namely Loose-leaf and Crisp head (Iceberg) types. Examples of loose-leaf varieties are: Green Mignonette; and Bronze Mignonette. Some common crisp head or iceberg varieties are: Trinity; Trinity Star; Lyra; Emperor; and Sahara. Farmers surveyed cultivated the following varieties: Trinity; Lyra; and Eden.

6.8d Size of Production Base for Lettuce

Recent information from NAMDEVCO revealed that there are 172 farmers cultivating lettuce in T&T, with the highest concentration in the county of St. George (67%) which is located in North Trinidad.

6.9 Product Potential – Pimento



In T&T, pimento is known as a seasoning pepper and it is frequently used for making mild sauce, salsa and in cooking preparations. Pimento production commences approximately 2 months after transplanting. The crop can last for over one year depending on the level of maintenance undertaken. However, the size of the pepper gradually decreases after six months. Pimento farmers either choose a well-developed pimento from a previous crop or utilize their seeds for setting up nurseries, or, they purchase hybrid seeds from the agricultural shops. Technisem is the most popular hybrid seed for pimento

production on the local market and is known for producing a sizeable pimento.

6.9 a Production Trends

Three of the farmers surveyed cultivated pimento as one of their main crops, and two other farmers cultivated pimento as a secondary crop. Forty percent (40%) of the farmers have been able to maintain a consistent production over the last two years, and sixty percent (60%) indicated that they have not been able to produce a continuous supply throughout the year because of labor shortages, pest and disease, and in one case, personal problems. All the farmers surveyed cultivated the pimento on open land. The buyers, surveyed in the previous phase of this project, were satisfied with the quality of pimentos being supplied to them. In most cases, they are supplied by distributors who purchase from local farmers.

6.9 b Competition

Pimentos are not 'hot' and therefore do not compete with hot peppers. The primary substance that controls "hotness" in peppers is called capsaicin, and it is found in very small amounts in pimento. Pimento has a unique taste and has no direct competition. It is a high demand seasoning pepper by local supermarkets, hotels, restaurants, caterers, certain exporters and households. The price paid by supermarkets, hotels, restaurants and caterers, are in most cases, higher than the price obtained at the wholesale market.

6.9 c Varieties

Information from the farmers surveyed revealed that seeds for planting pimento nurseries are obtained from two sources. They are a hybrid variety available at the agro shops and seed extracted from a previous crop.

6.10 Product Potential – Tomatoes



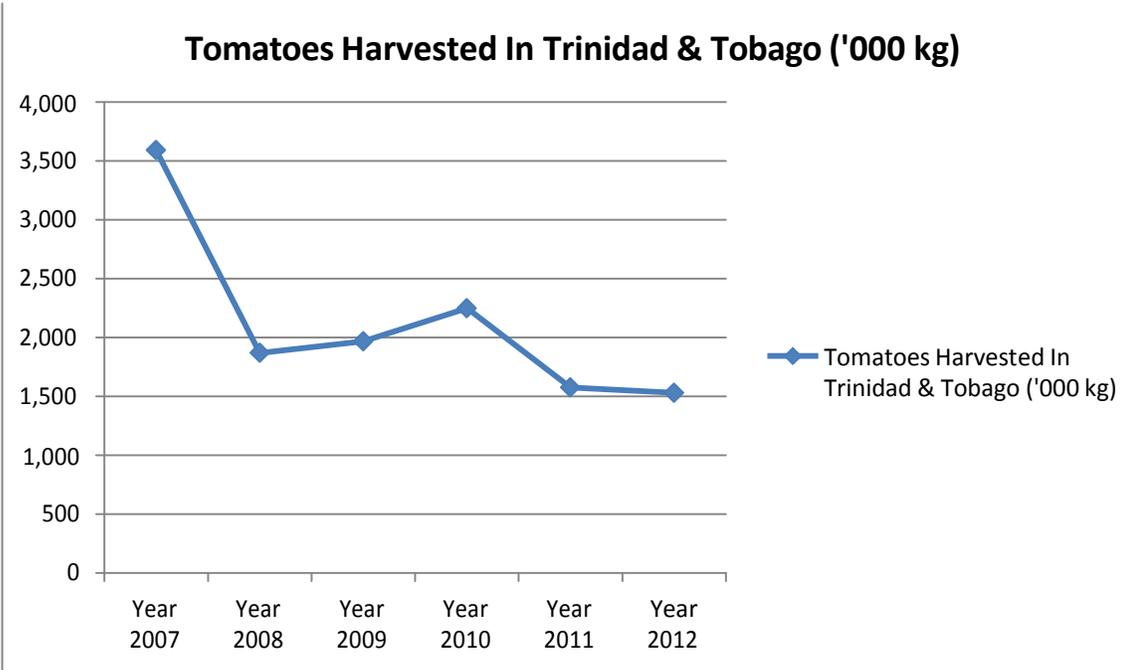
Tomato is a major crop, which can be grown throughout the year, in T&T. It is harvested 8 – 9 weeks after being transplanted, and one plant can yield 4 – 6 kg of fruit. Tomatoes are rich in vitamins A and C and lycopene. Most of the crop is grown under an open-field system, but over the last few years, there has been some production utilizing protected systems. The average area cultivated by an individual farmer is about 0.5 hectare (CARDI, 2013).

6.10 a Production Trends

The production of tomato in T&T fluctuates from year to year, mainly due to adverse weather conditions. From the survey of farmers undertaken for this study, seventy-five percent (75%) of the farmers cultivating various crops indicated that they have not been able to provide a consistent supply of fresh produce because of one or more of the following reasons: flood, adverse weather (prolonged period of high temperature or excessive rainfall), labor shortages and to a lesser extent pest and disease.

Figure 20 illustrates the level of fluctuation in tomato production between the years 2007 and 2012.

Figure 20: Production of Tomatoes Between 2007-2012 in Trinidad and Tobago



Source: Central Statistical Office, 2014

In 2007, the amount of tomato harvested was 3,589,000 kilograms followed by a significant drop in 2008 when only 1,867,000 kilograms were harvested. A similar pattern continued in subsequent years. Tomato is grown on various plot sizes from 0.1 hectare to 2 hectares.

From the survey of farmers it was found that 100% of the farmers who cultivated tomato, as their main crop, used a phased strategy, in an effort to achieve continuous production. Their bearing plots ranged from 0.1 hectare to 0.8 hectare. The varieties cultivated by the farmers in the survey are Delhi, Dianne and NS501. However, CARDI (2013) stated that the most popular variety of tomato grown in the country was Hybrid 61, followed by Heat Master. The Ministry of Food Production has recommended the following varieties for local production: Royal Pearl; Royal Gold; Chandini; Dianne; Hybrid 61; and Akash.

6.10 b Imports

Available import statistics reveal that the amount of tomato imported by T&T between 2006 and 2010 is as follows:

Year	2006	2007	2008	2009	2010
Kilograms	218,000	509,000	436,000	389,000	955,000

Source: UN International Trade Centre, 2013

Tomato farmers indicated that most of the importation of tomatoes occurs during periods of shortage, caused mainly by floods, which result in sharp price increases for the commodity. Over 95% of the imports are from the USA, and to a lesser extent Canada. Local production is more reliable in the dry period between February and May. Floods can occur anytime between June and January. The average price of tomato in the dry period is usually about 50% less than in the wet season. As a result, only a minimal quantity is imported during this period.

6.10 c Exports

T&T also exports tomato to other countries in the Caribbean Common Market (CARICOM), mainly Barbados. The tomatoes exported to Barbados must be sourced from farms certified by NAMDEVCO, which is a condition under the Agricultural Trade Protocol between T&T and Barbados. The following tomato exports have been undertaken between 2006-2010:

Year	2006	2007	2008	2009	2010
Kilograms	237,000	179,000	293,000	322,000	493,000

Source: UN International Trade Centre, 2013

The main problem affecting the ability of local farmers to serve the HVB is lack of a consistent supply which is strongly supported by the aforementioned statistics from the Central Statistical Office, as well as the survey results undertaken for this study.

6.10 d Size of Production Base for Tomato

Recent information from NAMDEVCO revealed that there are 121 farmers cultivating tomato in T&T.

6.11 Product Potential – Sweet Peppers

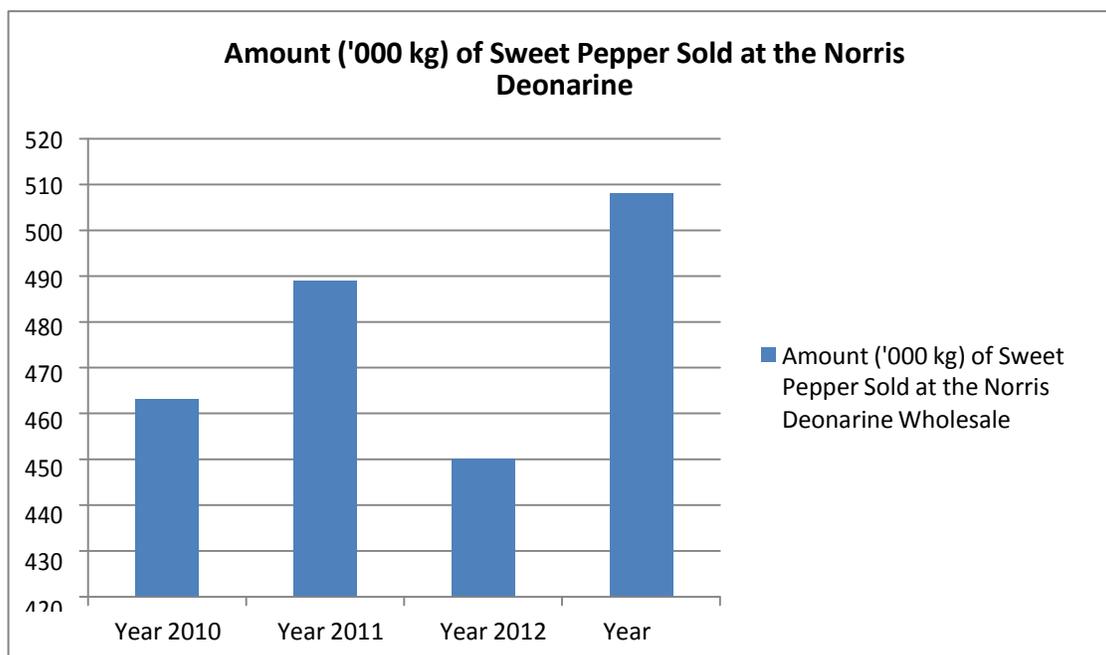


Sweet pepper is one of the major crops grown in T&T. Most of the crop is grown under the open-field system, but over the last few years, there has been some production in greenhouses. The average area cultivated by an individual farmer is about 0.31 hectares (CARDI, 2013). The sweet pepper is a crop identified in the National Food Action Plan to increase production from 343 tons to 2,623 tones; and 20 hectares have been identified and being allocated to farmers for sweet pepper production.

6.11 a Production Trends

The amount of sweet peppers purchased directly by wholesalers, distributors, roadside vendors and to a lesser extent other buyers at the Norris Deonarine Northern Wholesale Market in 2013 was 508,312 kg. Figure 21 illustrates the fluctuation in the amount of sweet pepper sold at this wholesale market between 2010 and 2013.

Figure 21: Quantity Of Sweet Pepper Sold Between 2010 and 2013 at The Norris Deonarine Wholesale Market



Source : NAMDEVCO (2013)

6.11 b Imports

Available import statistics reveal that the amount of sweet pepper imported by T&T between 2006 and 2010 is as follows:

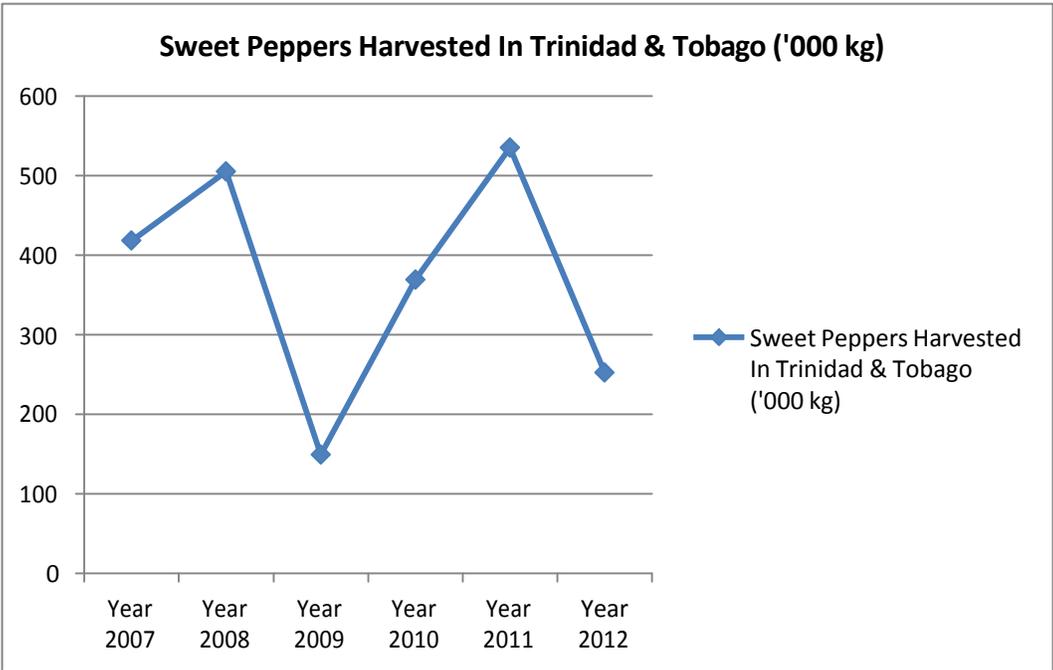
Year	2006	2007	2008	2009	2010
Kilograms	75,000	121,000	176,000	201,000	285,000

Source: UN International Trade Centre, 2013

The import data reveals that there is a consistent increase in imports from 2006, which is an indication of the increasing demand for sweet peppers in this country. Over 90% of the imports are from the USA and to a lesser extent Canada and Jamaica. The majority of the imports occur in the wet season. The average price of locally produced sweet peppers at the Norris Deonarine Wholesale market in 2013 were \$11.23/kg for small, \$13.96/kg for medium and \$16.21/kg for large. The average price of the imported sweet peppers, at this same market in 2013, was \$16.47/kg. Over 70% of the buyers in the survey purchased the local sweet peppers. The buyers who purchased the imported sweet pepper mainly sought the red and yellow colors/varieties. Those buyers said that red and yellow are in limited supply in this country, as most farmers grow the green variety.

Statistics on the annual quantity of sweet pepper harvested in T&T reveal that there is high fluctuation from year to year. From the survey of farmers undertaken for this study, seventy-five percent (75%) of the farmers indicated that they have not been able to provide a consistent supply of fresh produce because of one or more of the following reasons: flood; adverse weather (prolonged period of high temperature or excessive rainfall); pest and disease; and labor shortage. This is illustrated in Figure 22:

Figure 22: Sweet Peppers Harvested in Trinidad & Tobago Between 2007-2012



Source: Central Statistical Office, 2014

CARDI (2013) stated that King Henry is by far the most common variety grown in T&T, followed by Paladin and King Arthur. From the survey undertaken for this study, one established greenhouse farmer, who supplies a supermarket chain, cultivates the California Wonder. CARDI (2013) also revealed that eighty-one percent (81%) of the sweet peppers purchased by supermarkets, hotels and restaurants are Green followed by Mixed (11%), Red (4%) and Yellow (4%).

The main problem affecting the ability of local farmers to serve the high value buyers is lack of a consistent supply which is strongly supported by the aforementioned statistics from the Central Statistical Office, as well as the survey results undertaken for this study.

6.11 c Size of Production Base for Sweet Pepper

Recent information from NAMDEVCO revealed that there are 245 farmers cultivating sweet pepper in T&T, with the highest concentration in the county of St. George (49%) which is located in North Trinidad followed by the Victoria County (29%).

7 ENVIRONMENTAL CHALLENGES & OPPORTUNITIES

The following constraints and challenges were noted from the research:

1. **Production Constraints:** Inconsistent supply due to adverse weather, floods, labor shortages, pest and disease, and to a lesser extent praedial larceny and irrigation. In many cases cultivation is done in areas that are prone to flooding. Deputy Director at the Ministry Of Food Production stated that farmers should use NAMDEVCO's packing houses to store produce when there is high production, as this will help to ensure consistency of supply to customers during periods of shortage on their farm. At present NAMDEVCO have two packing houses, one in North East Trinidad and one in the South. Several more are in the process of being established, including one soon to be opened in Central Trinidad.
2. **Product Quality:** 81% of the producers/farmers surveyed are certified by NAMDEVCO, which is an indication that they are among the better farms in the country. Most of these farmers pay attention to basic quality issues and post harvest activities. Although there is room for improvement, their produce is generally of acceptable quality. However, Deputy Director at the Ministry Of Food Production stated that a major problem among the wider population of farmers is poor post-harvest management, which results in bruising of the produce which causes a poor quality final product.
3. **Marketing:** Thirty-one percent (31%) of the farmers surveyed sell to a HVB or tried to obtain a higher price than the wholesale price by retailing at the Farmers' Market. Sixty-nine percent (69%) of the farmers either sold at the existing wholesale price or below the wholesale price, in order to dispose of their produce speedily. These statistics indicate that farmers are not making an adequate marketing effort to maximize their profit. In order to change this mindset, farmers need mentors who can work with them on a one-to-one basis.
4. **Record Keeping:** Thirty-five (35%) of the farmers surveyed kept written financial and production records. There is a correlation, in that the 31% of farmers, who try to maximize their profit by obtaining prices higher than the wholesale price for their produce, also fall within this 35% category. Sixty-five percent (65%) of the farmers do not calculate their unit cost of production. They determine their profit or loss mentally. Mentors can help farmers to develop a business approach to managing their farms.
5. **Challenges In Selling To High Value Buyers (From The Farmers' Perspective):** Nineteen percent (19%) of the farmers, who previously sold to high value buyers, said that they had adverse experiences as follows: a credit period of one month or more affects the farmers' cash flow; refusal to accept agreed volumes during periods of low demand, such as just after Christmas causes farmers to suffer losses; long waiting time when deliveries are being made; and disagreement on acceptable quality. These farmers want these contentious issues clarified before any relationship can be developed. Twelve percent (12%) of the farmers stated that there should be a clause in the agreement between buyers and sellers to cater for periods when the farmer is unable to supply because of circumstances beyond their control such as floods and praedial larceny. However, 81% of the farmers surveyed are receptive to selling to the HVB, if they can obtain a substantially higher price than the prevailing wholesale price.

6. T&T has experienced boom and bust cycles. The country has enjoyed an economic boom for the past twelve (12) years, facilitated by high energy prices. This strong purchasing power within the economy has led to a rapid expansion of HVB and consequently, a greater demand for fresh produce. The sharp decreases in oil and gas prices, over the past three (3) months, can have a dampening effect on the country's economy, if this trend continues. In such a situation, farmers may have to modify their business models and pursue export opportunities to maximize their profits. Caribbean countries currently have Free Trade Agreements with the USA, Canada and the European Union.

7.1 Environmental Enablers & Opportunities

The following enablers and opportunities can inspire further development in the local agricultural sector:

1. **Strategic Plan for The Agricultural Sector** - The Government of Trinidad and Tobago has stated that improving the country's food security is a top priority. The Ministry of Food Production, Land and Marine Affairs has developed and implemented components of the National Food Action Plan 2012-2015. Significant initiatives include: land allocation; provision of planting materials; investments in post-harvest technology and systems; encouragement for the use of protected systems; improving the farm certification process; and improving agricultural and marketing infrastructure. Subsidies are also granted to farmers for the purchase of farm vehicles, farm equipment and land preparation.
2. **Institutional Support** - The support for agricultural ecosystems is diverse and spans public and private sector agencies. The main agency supporting the marketing needs of the sector is NAMDEVCO. Apart from its NAMIS system, NAMDEVCO is the implementation arm for farm certification, which is a prerequisite for exporting. It also conducts marketing research and provides storage/packing facilities. NAMDEVCO is posited to play an important role in the further advancement of the sector. The organization is currently expanding the number of packing and cold storage facilities closer to production areas. There is potential for NAMDEVCO to establish a centralized database for the identification of certified farmers. These farmers can then be connected to HVBs to initiate the trading process and the agency can act as a trainer/project manager of the trade process. The Agricultural Development Bank is another major support agency that provides low interest loans, up to 80% financing for: start-up agricultural projects; expansion and rehabilitation of an existing project; construction of farm buildings; and infrastructure development.
3. **Regulatory Factors** - Local agricultural production is protected by an import duty of 40% on supplies from extra-regional sources. Imports from within CARICOM are free of duties; however, they are subject to phyto-sanitary and other measures as stipulated by the agricultural trade protocols in place and also plant quarantine regulations. The export of agricultural produce to CARICOM countries are subject to meeting the entry requirements of the respective countries. Currently, T&T has agricultural trade protocols with Barbados, Guyana and Antigua & Barbuda, which regulate the trade in agricultural products with these countries. The protocol with Antigua and Barbuda has not operated for a number of years because of an agricultural trade suspension by that country due to the outbreak of Black Sigatoka disease of *Musa* spp. in Trinidad. Agricultural produce can only be exported to these countries providing it comes from farms certified and monitored by NAMDEVCO. Under various free trade agreements, exporting fresh produce from this country to the USA, Canada and European Union does not attract import

duties for many commodities. However, there are regulatory requirements. The USA requires that the exporter registers with the Food and Drug Administration. Exporting to the European Union requires a certificate of origin and there are also strict requirements set out by the Canadian Food Inspection Agency similar to the sanitary requirements of the USA and European Union.

8 RECOMMENDATIONS FOR PARTNERS AND PRODUCTS

- **Buyers and Products with the best potential** - The following nine (9) commodities have been found to have the best potential for further expansion and leveraging with the HVBs sweet potato; papaya; watermelon; lettuce; hot pepper; cucumber; pimento; sweet pepper; and tomato. These products were selected because there has been a trend of high demand over the past five years across all HVB segments. There is a cumulative learning curve/experience by farmers in these produce sectors which can lend itself to ramp up production. These produce have short – medium crop cycles so farmers can see the immediate benefits of focusing on them and reaping profits. Farmers are interested in shifting or upgrading their operations to facilitate these crops as a primary activity. Although papaya has a slightly longer crop cycle, research has shown that it has strong local demand among the HVBs and has excellent export potential.
- **Conditions required to make the products competitive** - In suggesting conditional changes to improve produce competitiveness, there needs to be both internal and external context changes.
 - A) Internal (from the farmer perspective) require a shift of models from a subsistence player to an active entrepreneur who invests resources on profit based projections. Farmers would have to be trained in basic entrepreneurial and management skills and have access to mentors. This will improve their operations on a consistent basis and will help develop characteristics of a credible producer in order to woo and sustain business relationships with the HVB. Another internal enabler is the gradual shift to protected agriculture among the farmers who are willing to enter HVB relationships. From the empirical research, it was revealed that farmers, who employ greenhouses and hydroponics as methods of production, have higher yields and better qualities. Farmers can be encouraged to take advantage of incentives that are being offered by the Ministry of Food Production and the Agricultural Development Bank to introduce greenhouse methodologies in their operations.
 - B) External enablers will include ongoing educational campaigns to “Buy Local” and foster a sense of pride in local produce and inputs. Farmers can also be profiled and NAMDEVCO’s centralized database for grouping farmers by produce, volume, time of harvest & price points can be updated to facilitate the value chain process. Post-harvest techniques and quality assessments need to be built into the operations of farming enterprises to ensure there is consistency of quality, quantity and reliability of production in order to secure contracts.
- **Conditions to build sustainable linkages between buyers and producers** - Further research/study needs to be undertaken within the produce specific sectors to identify and engage both farmers and HVB as parties that are interested in participating in specific contractual obligations under required terms and conditions.

9 APPENDIX ONE

Survey Instruments Utilized for the Market Study

MARKET SURVEY QUESTIONNAIRE

For

**Promotion of Regional Opportunities for Produce through Enterprises
and Linkages**

Funded by:

Canadian Department of Foreign Affairs, Trade & Development (DFATD) and the
Canadian Hunger Foundation (CHF)

November, 2014

2 a. Is most of the fresh produce purchased by your company grown locally or imported?

Local Imported Not sure

2 b. If you know the answer to question 2, approximately what % is local?

3. Is the fresh produce purchased by your company delivered or collected and in what form?

a) Delivered to your business

b) Collected from the farm gate

c) Bulk Packaged

d) Graded

e) Labeled

4 a. Does your company offer a contract to suppliers?

Yes No

4 b. If no, please state reason (s)

5. How many suppliers your company changed over the last 24 months?

6. What are your company's payment terms?

Cash on Delivery Yes No

Credit- Duration 2weeks monthly Other_____

7. Does your company pay a fixed price for fresh produce?

Yes No

8. If the answer to the above question is yes, for what period of time is the price fixed?

Monthly Quarterly Semi-annually Annually

9. If the answer is no, then how does your company determine your price?

10. What are the factors influencing your company's purchasing decision:

Prices Quality of produce Consistency of supplies

Payment terms Packaging options Delivery to outlet

Grading Other _____

11. How does your company access information relating to the fresh produce market?

12. Does your company currently purchase any of the following items? If yes, kindly indicate your company's preference, quantity and frequency of purchase?

ITEMS	Description	WEEKLY DEMAND	Percentage Imported	Average price	FREQUENCY OF PURCHASE
a) Tomato	Slicing Cooking	kg kg			
b) Sweet Pepper	Red Yellow Green	kg kg kg			
c) Cabbage					
d) Pumpkin					
e) Squash					
f) Eggplant		Kg			
g) Caraille		Kg			
h) Pigeon Peas		Kg			
i) Christophine					
j) Pimento					
k) Hot Peppers					

l) Banana	<input type="checkbox"/> <input type="checkbox"/> Long type	kg kg			
m) Patchoi		Bundle			
n) Lettuce	Bronze Iceberg Other	Head Head Head			
o) Cauliflower		Kg			
p) Shadon Beni		Bundle			
q) Cilantro		Bundle			
r) Thyme		Bundle			
s) Yam		Kg.			
t) Sweet Potatoes		Kg.			
u) Dasheen		Kg.			
v) Cassava					
w) Dasheen Leaves					
x) Cantaloupe		Kg.			
y) Pineapple		Kg.			
z) Limes					
aa) Papaya		Kg			
Watermelon		Kg			
Plantain		Kg			
Cooking Fig		Kg			

13. Are there any other tropical vegetables or fruit that you currently purchase?

Description	Weekly Demand	Average price per unit	Frequency of Purchase

14. Are there any other items, that your company would be interested in purchasing?

Item	Description	Weekly Demand	Average price per unit	Frequency of Purchase

15. Would your company be interested in linking directly with local farmers as part of the value chain to purchase produce?

Yes No

Why? _____

16. Can you provide us with any trends you have observed regarding consumer demand for fresh produce or general information on the market conditions for fresh produce?

FARMERS SURVEY QUESTIONNAIRE

For

**Promotion of Regional Opportunities for Produce through Enterprises
and Linkages**

Funded by:

**Canadian Department of Foreign Affairs, Trade & Development (DFATD) and
the Canadian Hunger Foundation (CHF)**

December, 2014

I. IDENTIFICATION CHARACTERISTICS

A. NAME OF FARMER:

B. Male Female

C. Education : Primary Secondary Tertiary

D. ADDRESS:

E. TEL : FAX : EMAIL _____

F. How many years have you been involved in farming? _____

II. GENERAL INFORMATION

1. Type of Crops

NO.	Type of Crop	Acreage Cultivated	Average Production Per Acre	Number Of Times Crop Cultivated Per Year	Average Price Per lb. or kg. Obtained	Where is the Produce Sold
1.						
2.						
3.						
4.						
5.						
6.						

2. What technology do you utilize in your farming operations?

Open Land Cultivation Grow Box System Greenhouse Other _____

3. How do you decide which crops to cultivate?

Knowledge & Experience In Cultivating Crop(s) To Supply Orders To Fulfill Contract

Based On Market Research Easy To Cultivate & Maintain Crop (s)

Favorite Crop (s) Other Reason _____

4. Would you be interested in growing any of the following commodities if you are currently not growing it? Tomato Sweet Pepper Cucumber Lettuce Cabbage Pimento

Hot Pepper Sweet Potato Papaya Watermelon

Please state reason (s) _____

5. Have you ever sold fresh produce to one or more of the following buyer segments?

Supermarkets Hotels Restaurants Food Caterers
 Exporters Agro-Processors

6. If your answer to question 5 is no, why?

7. If your answer is yes to question 5, what was your experience regarding the following :

Price Paid _____

Payment Terms _____

Quality of Produce _____

Frequency of Purchase _____

Delivery of Fresh Produce _____

Price Changes _____

8. Have you ever supplied fresh produce under a contract arrangement? Yes No

9. If your contract was terminated or not renewed state reasons?

10. What are the differences in selling your produce to the wholesale market and selling to a Supermarket, Restaurant, Hotel or Food Caterer?

11. Do you know of NAMDEVCO's Farm Certification Programme? Yes No

12. Is your farm certified by NAMDEVCO or any other institution? Yes No

13. If No, why? _____

14. Do you know the benefits of having your farm certified?

15. What types of farm records do you keep?

Sales Expenses Production Other _____

16. Do you calculate any of the following?

Cost of production per lb. or kg. for each crop Profit earned per crop

17. How do you decide at what price to sell your fresh produce? _____

18. Over the last 2 years, have you been able to produce a consistent supply? Yes No

If no, state reasons _____

19. What post harvest activities do you undertake? (State emphasis using a score from 0 to 10 with 10 being the highest)

Procedure For Handling Produce With Care Washing/Cleaning Grading

Proper Storage Labeling Packaging Avoid bruising in transportation

20. Have you ever attended any formal training courses in the cultivation or marketing of vegetables or fruits? _____

21. Would you be interested in linking directly with supermarkets, hotels, restaurants or food caterers as part of the value chain to sell produce? Yes No

Why? _____

22. Are you interested in being trained in one or more of the following areas?

Record Keeping Marketing & Sales Post Harvest Management Costing & Pricing

23. Do you produce your crops at a competitive cost when compared with local farmers and imports?

Yes No

24. How do you know? _____

25. What are some of the current problems that you experience?

Flooding Financing Labor shortage Obtaining Buyers Irrigation
Other _____

26. What support do you need to improve your current production levels?

27. What would be the expected terms and conditions that you would like reflected in a supplier contract with a Buyer?

10 APPENDIX TWO

List of Survey Participants

High Value Buyers (HVB) Surveyed

No.	Name of Buyer	Business Activity	Research Conducted
1.	A&D Export & Import Ltd.	Exporter	Survey participant
2.	Challenge Marketing Ltd.	Exporter	Survey participant
3.	Tropical harvesting Company Ltd.	Exporter	Survey participant
4.	King's Foods (Tobago)	Exporter	Survey participant
5.	Shahadat Ramlakhan	Exporter	Survey participant
6.	Hilton Trinidad & Conference Centre	Hotel	Survey participant
7.	Grafton Beach Hotel (Tobago)	Hotel	Survey participant
8.	Kapok Hotel	Hotel	Survey participant
9.	Cara Suites Hotel	Hotel	Survey participant
10.	Ambassador Hotel	Hotel	Survey participant
11.	Hyatt Regency Trinidad	Hotel	Survey participant
12.	Massy Stores (formerly Hi Lo Food Stores)	Supermarket	Survey participant
13.	Penny Saves Supermarket (Tobago)	Supermarket	Survey participant
14.	Tru Valu		Survey participant
15.	JTA Supermarket	Supermarket	Survey participant
16.	Maharaj Westside Supermarket Ltd.	Supermarket	Survey participant
17.	Low Cost Supermarket	Supermarket	Survey participant
18.	Market Movers	Online Supermarket	Survey participant
19.	Xtra Foods		Survey participant
20.	Apsara Restaurant	Restaurant	Survey participant
21.	Mario's Pizza	Pizza Restaurant	Survey participant
22.	Soong's Great Wall Restaurant	Restaurant	Survey participant
23.	Jenny's Wok	Restaurant	Survey participant
24.	Subway	Fast Food (Sandwiches) Restaurant	Survey participant
25.	TGI Friday	Restaurant	Survey participant
26.	Papa John's	Pizza Restaurant	Survey participant
27.	Little Lai's Chinese Restaurant	Restaurant	Survey participant
28.	Ru Street	Restaurant	Survey participant
29.	Low Wing Greens & Fruits	Wholesaler	Survey participant
30.	Indra Samaroo	Wholesaler	Survey participant
31.	SMJ	Distributor To Massy Stores	Interview on sourcing and marketing fresh produce
32.	Hemraj's Wholesale & Distribution	Wholesaler / Distributor	Interview on sourcing and Marketing fresh produce
33.	Melvin Dubrie (Tobago)	Distributor	Survey participant
34.	Boomerang Caterers	Food Caterer	Survey participant
35.	Food Etcetera Ltd.	Food Caterer	Survey participant

36.	Kater Serv (formerly Allied Caterers)	Food Caterer	Survey participant
37.	B&B Enterprises Ltd.	Food Caterer	Survey participant
38.	National Cannery Ltd.	Agro- Processor	Survey participant
39.	D'Farmer's Company Ltd.	Agro-Processor	Survey participant
40.	Turban Marketing	Agro-Processor	Survey participant
41.	Chief Brand Products	Agro-processor	Interview on buying habits of fresh produce
42.	Michelle's Mini Mart	Roadside Fruits & Vegetable Outlet	Interview on sourcing fresh produce
43.	Pilgrim's Mini Mart	Roadside Fruits & Vegetable Outlet	Interview on sourcing fresh produce
44.	National Agricultural Marketing And Development Company	State Organization	Interview on the buying habits of exporters
45.	Supermarket Association Of Trinidad & Tobago	Representative body for supermarkets	Interview on the size of this sector and general trends

Farmers Surveyed

No.	Name Of Farmer; Sex; Age & Farm Location	Main Crop; Variety & Acreage	Secondary Crops Cultivated
1.	Farmer 1 – Female; 37yr; East Trinidad	Papaya - Tainung No. 2 Variety; 0.4 ha.	Hot Pepper; Pimento
2.	Farmer 2 – Female; 55yr; North Trinidad	Tomato – Delhi; 0.2 ha & Cucumber – Atlantis; 0.4 ha.	Eggplant
3.	Farmer 3 – Female; 28yr; South Trinidad	Lettuce – Eden & Trinity 0.1 ha; Hot Pepper – West Indies Red; 0.1 ha.	Patchoi, Cabbage & Chive
4.	Farmer 4 – Female; 46yr; East Trinidad	Pimento – 0.2 ha.	Nil
5.	Farmer 5 – Female; 44yr; South Trinidad	Papaya - Tainung No. 2 Variety; 0.4 ha.	Eddoes; Patchoi; Lettuce & Pigeon Peas
6.	Farmer 6 – Female; 42 yr; East Trinidad	Papaya - Tainung No. 2 Variety; 0.4 ha; Watermelon – Palladin; 0.8 ha.	Nil
7.	Farmer 7 – Female; 59yr; North Trinidad	Cucumber – 0.1 ha; Papaya – 0.4ha.	Nil
8.	Farmer 8 – Male; 58yr; East Trinidad	Watermelon; Sentinel & Tropical Gold; 2ha. Hot Pepper (yellow & red); 1.2ha.	Tomato
9.	Farmer 9 – Male; 34yr; Central Trinidad	Sweet Potato – Chicken Foot; 1.6 ha; Papaya – No. 1 Tainung; 1 ha Watermelon	Pumpkin
10.	Farmer 10 – Male; 51yr; South Trinidad	Cabbage – Tropicana; 0.2 ha; Tomato – NS 501 variety; 0.4 ha.	Nil
11.	Farmer 11 – Male; 42yr; North Trinidad; Tertiary education	Lettuce – Lyra or iceberg variety; hydroponics system on 0.2 ha. Pimento – Hybrid; 0.1 ha. (open land)	Papaya; Celery.
12.	Farmer 12 – Male; 52yr; South Trinidad; Secondary Level Education	Cabbage – Tropicana; 0.2 ha.	Cantaloupe
13.	Farmer 13 – Male; 54yr; East Trinidad; Primary Level Education	Lettuce – Eden; 0.8 ha.	Hot Pepper
14.	Farmer 14 – Male; 73yr; South Trinidad; Primary Education	Sweet Potato; 0.4 ha.	Pigeon Peas; Plantain; Cassava
15.	Farmer 15 – Male; 34yr; South Trinidad; Primary Education	Hot Pepper – Moruga Red & Yellow; 0.4 ha.	Pimento; Pumpkin; Cucumber
16.	Farmer 16 – Male; 36yr; South Trinidad; Secondary Level Education	Tomato – Delhi; 0.2 ha.	Bodi & Ochro
17.	Farmer 17 – Male; 58yr; West Trinidad; Post Secondary Level	Cucumber – Expedition; 0.1 ha Greenhouse; Tomato – Dianne; 0.1 ha Greenhouse	Sweet Pepper; Lettuce; Patchoi; Celery
18.	Farmer 18 – Male; 56yr; Central Trinidad	Sweet Pepper – California Wonder; 0.4 ha. Greenhouse	Nil
19.	Farmer 19 – Male; 54yr; Central Trinidad	Sweet Potato - Chicken Foot Variety; 8ha.	Watermelon; Papaya; Corn; Pumpkin

20.	Farmer 20 – Male; 37yr; North Trinidad	Hot Pepper – Hood Variety; 0.6 ha.	Corn & Pumpkin
21.	Farmer 21 – Male; 35yr; South Trinidad	Sweet Pepper – 0.4 ha.	Nil
22.	Farmer 22 – Male; 40yr; East Trinidad	Tomato – Delhi Variety; 0.8 ha;	Sweet Pepper
23.	Farmer 23 – Male; 65yr; East Trinidad	Cucumber – Expedition Variety 0.1 ha; Tomato – Delhi & Dianne; 0.1 ha.	Bodi, Ochro & Cabbage
24.	Farmer 24 – Male; 54yr; East Trinidad	Watermelon – Sentinel; 4.8 ha.	Ochro & Cucumber
25.	Farmer 25 – Male; 58yr; East Trinidad	Lettuce – 0.1 ha; Iceberg	patchoi
26.	Farmer 26 – Female; 35yr; Central Trinidad	0.8 ha. Pimento	Cassava