

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

## MARKET STUDY - JAMAICA CHF CARIBBEAN COMMISSIONED REPORT



**Final Report Submitted by:  
Brac Consultants**

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## ***LIST OF ACRONYMS***

AIBGA	All Island Banana Growers Association
APHIS	Animal and Plant Health Inspection Service (USDA)
CARICOM	Caribbean Community
CIF	Cost Insurance Freight (Costs)
CET	Common External Tariff
CFIA	Canadian Food Inspection Agency
CHF	Canadian Hunger Foundation
CROSQ	CARICOM Regional Organization for Standards and Quality
FDA	Food and Drug Administration (US)
DEFRA	Department for Environment, Food & Rural Affairs (UK)
DFATD	Department of Foreign Affairs, Trade and Development
FMSA	Food Safety Modernization Act ( US FDA)
FSS	Food Safety Systems
GAP	Good Agricultural Practices
GOJ	Government of Jamaica
HVM	High Value Market
IPPC	International Plant Protection Convention
JEA	Jamaica Exporters Association
JHTA	Jamaica Hotel and Tourist Association
JMA	Jamaica Manufacturers' Association
JP	Jamaica producers Group Ltd
JSLC	Jamaica Survey of Living Conditions
MOA	Ministry of Agriculture
MRLs	Maximum Residue Levels
NTB	Non-Tariff Barriers
NVM	High Value Market
PAHO	Pan American Health Organization
RTC	Ready-to-Cook
RTE	Ready-to-Eat
SPS	Sanitary / Phyto-Sanitary
TPDA	Tourism Product Development Agency
US	United States
USDA	United States Department of Agriculture

## EXECUTIVE SUMMARY

The Promotion of Regional Opportunities for Produce through Enterprises and Linkages project (PROPEL) commissioned this consultancy to obtain an overview of the High Value Market (HVM) buyers in Jamaica, their demand and the production capacity to meet this demand. The approach taken focused on a sample of buyers representing agro-processors, hotels, restaurants (specifically fast food), supermarkets and exporters. A sample of 50 buyers was developed based on: size of buyers; age of business entity; geographical distribution; coverage and diversity.

### Profile and Demand by Buyers

- **Agro-processors**

As of January 2015, there were approximately 150 active agro-processors operating in Jamaica. They were engaged in the manufacture of various products such as beverages, juices, jams, jellies, spices and sauces, and confectioneries for the local and export markets. In some cases they operate under contract for other manufacturers or marketing companies.

The estimated value of purchases by agro-processors is J\$10.3 billion (US\$ 91.7 million). The products of interest by agro-processors include: carrots; scallion; hot (red) peppers and yellow (Scotch Bonnet) peppers; pimento; ginger; cassava; and herbs (peppermint, lemon grass, cerasee). They currently purchase 84% of the local supply of hot peppers (5,600 tonnes). For tomatoes, carrots and scallion, they purchase approximately 13,000 tonnes, or 20-33% of available supplies. A growing segment is the processing of spices, herbs, teas and nutraceuticals.

The local raw material supply base is mainly 200,000 small -scale (under 5 acres) producers operating in a predominantly mixed cropping and rain-fed farming system. Purchases of fresh produce occur year round, but peak purchases coincide with the seasons in which important local raw materials are available. Products are purchased weekly or monthly, from farmers directly or on contract, from formal distributors, or, where necessary, imported. Purchases are in cash or on credit terms. The factors affecting purchases include demand for finished products, price of local raw material, regularity and reliability of the supply, delivery time, quality and availability of local supply.

- **Hotels**

There are approximately 2,000 hotels, villas and guest houses in Jamaica, representing a total room stock of 36,000 rooms. The total demand of the hotel sector for the selected fresh produce is projected to reach US\$ 31.48 million by 2017, from an estimated US\$ 27.97 million in 2013. Irish potatoes, papayas, cantaloupe and yams would make up the bulk of this demand. The level of demand is very high for items such as cantaloupe, of which hotels purchase nearly 80% of available supplies.

The pattern of demand for fresh produce closely follows the seasonal pattern of visitor arrivals. Peak demand for fresh agricultural produce occurs in the latter half of the year. Factors influencing purchases include quality, price, delivery time, regularity/reliability, packaging and seasonality. Larger hotels usually have contractual arrangements with suppliers, while the smaller hotels tend to source directly from farmers, informal suppliers or parish markets. Payment terms are usually on 30-day credit.

- **Restaurants**

Restaurants are of two types: fast food services; and traditional (casual and fine dining). The local fast food chains account for the bulk of the sector's demand for local fresh agricultural produce. The demand for local produce by foreign-based chains is currently low, as these entities import most of their inputs. The annual demand of the restaurant sector for fresh produce is estimated at 6,000,000 kg. valued at approximately J\$ 792 million (US\$ 7.0 million).

Demand for fresh produce in the restaurant sector is fairly continuous, with variable peaks during seasonal holidays when customer demand increases and additional services are offered. Price, food safety and quality are important considerations in purchasing. Large restaurants usually purchase fresh produce weekly on contract from farmers or middlemen. Smaller establishments also buy from parish markets.

- **Supermarkets**

This segment is comprised of five leading chain stores, accounting for over 40 supermarket outlets island-wide. These supermarkets carry over 400 different produce items of which over 90 % are sourced locally. To do this, the leading chains all have well developed infrastructure, including facilities for handling fresh produce such as chill rooms, refrigerated trucks, packaging and pre-processing equipment. A recent trend is a shift to ready to eat products from produce.

The main products of interest are: carrot; tomato; cauliflower; green and red cabbage; corn; callaloo; celery; pumpkin; bananas; string bean; cho-cho; iceberg lettuce; hot peppers; escallion; fresh fruit (watermelon, cantaloupe, oranges, papaya); Irish potatoes; and ground provisions (yams). The main products imported are onions, red kidney beans, and corn. The aggregated volume of 17 selected items passing through supermarkets stood at 2,773 metric tonnes at a suppliers value of J\$ 421.7 million (US\$ 3.8 million) in 2013.

Factors influencing purchases include: price; consistency of supply; and honouring of delivery contracts. The direct purchase from farmers is preferred. Frequency of purchase depends on the shelf-life and the rate of turnover of the crop.

- **Exporters**

The products of greatest interest to exporters are: yam; dasheen; pumpkin; sweet potato; hot peppers; turmeric; mangoes; breadfruit; coco; callaloo; thyme; scallion; ginger; and pimento. Currently these items are marketed in the niche markets of the Diaspora with the United States (US), Canada and the

United Kingdom. Yams are the largest export with the US being the dominant market. The top 10 fresh produce items exported (excluding cocoa, coffee, papaya and citrus) in 2012 totaled US\$32 million.

Currently exporters account for a small share of available domestic supplies. Exporters' demand coincides with the seasonal supply of various crops. Purchases take place weekly or monthly depending on the crops. Factors influencing purchases include: quality; price; packaging; and delivery time. Exporters of fresh agricultural products need to meet specific international standards and therefore must deal with farmers that can meet these requirements. Fresh produce is purchased weekly from farmers or distributors. Payment terms are usually cash or credit.

### **Products with Potential for Expansion**

Nineteen products were identified as having potential for expansion of supply to various HVMs buyers.

- Cantaloupe – Hotels, supermarkets, restaurants
- Bananas – Hotels, supermarkets
- Oranges – Hotels, supermarkets
- Papaya – Hotels, restaurants
- Callaloo – Supermarkets, restaurants, exporters
- Yams – Hotels, supermarkets, restaurants, exporters
- Sweet Potatoes – Hotels, restaurants, exporters
- Dasheen - Exporters
- Cassava - Processors
- Irish Potato – Hotels, supermarkets, restaurants
- Hot Peppers - Hotels, supermarkets, restaurants, processors, exporters
- Escallion - Processors
- Onions – Hotels, supermarkets, restaurants
- Turmeric - Processors, exporters
- Ginger – Processors, exporters
- Pimento - Processors, exporters
- Lemon Grass - Processors
- Cerasee - Processors
- Peppermint - Processors

A series of factors were examined to determine the ability to meet the demand in these products. A number of products had potential for substantial increases in production including cantaloupes, onions and ginger, assuming interest could be generated from producers. The growing export market for yams and sweet potatoes was attracting producers to increase their supply and relationships between producers and exporters were found to be strong. However, both products are facing strong domestic and international competition which requires the producers to improve their productivity and reduce production costs. Other products were very profitable such as Irish potatoes and this was reflected in the producers' interest in further expansion. However, here the competition from imports is strong with imported products available year round and having traditionally been of a higher quality.

The producers indicated a number of overall obstacles to expansion: availability or cost of suitable, irrigated lands; production technology; pests and diseases; financing; marketing; and absence of an organized supply chain. To be competitive, the producers will need to: lower production costs; increase productivity; improve the quality of products; and improve the efficiency of supply chains and marketing of produce.

These changes are possible with support to producers in areas such as: improving the application of agronomic research to develop improved varieties; training in agronomic practices; improving water management to deal with drought conditions; and implementing measures to reduce seasonality. In addition, producers' capacity to meet required standard specifications needs to improve, along with the overall quality of production. The application of Good Agricultural Practices (GAP) would improve yields, reduce post-harvest losses and reduce the production costs.

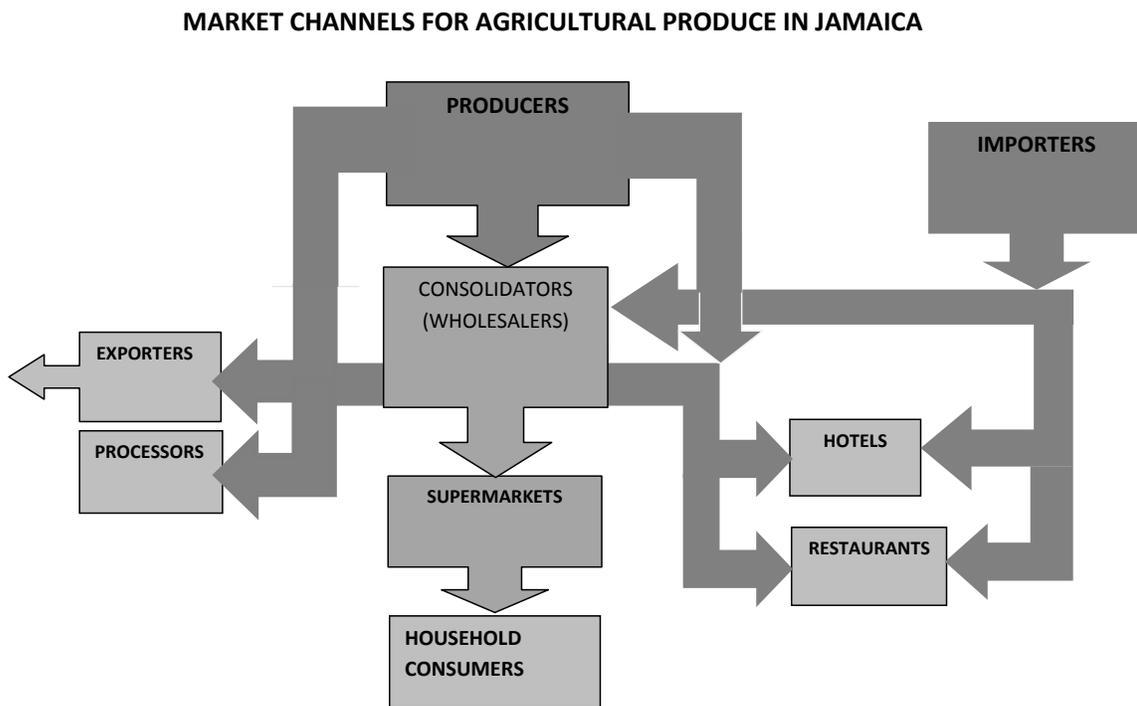
## 1. OVERVIEW OF HIGH-VALUE MARKET (HVM) BUYERS

### 1.1. Overview of Buyers

#### 1.1.1. HVM Market Channels

The supply chain may differ for various commodities and may also be differentiated where multiple modes coexist (e.g. informal, traditional and modern marketing channels). Table 2 below provides a summary of the HVM products, buyers and market channels.

Figure 1: Market Channels for Agricultural Produce



**General fresh produce:** Fruit, vegetables, tubers and condiments. The main channel for these products is through the parish markets. Higglers or informal traders play a major role in the movement of these products from the producers and their distribution to household consumers. Other consumers include hotels, restaurants and institutions, who purchase either from parish markets or from middlemen (e.g. consolidators, importers and distributors).

**Produce for processing:** these products include fruit, vegetables, spices and meats required for processing into manufactured products including: juices, jams and jellies, meat preparations and snack foods. Agro processors generally source raw materials directly from producers or through consolidators who collect from farmers and sell to the factories. Some processors may collect produce directly from the producers.

**Fresh produce for export:** usually include a specific range of products that have access to overseas markets (e.g. ginger, pimento, yams, papaya and sweet potato). Exporters usually collect the produce from producers and or from consolidators and maintain suitable quality control systems to ensure that the produce meets the required standards for entry into overseas markets.

## 2. HVM BUYERS

### 2.1 Agro-processors Market Segment

**Profile of the Agro processing Sub-sector.** As at January 2015, there are some 150 active agro processing factories operating in Jamaica. These factories are located island-wide including in the rural townships, but the vast majority are located in the urban centres of Kingston, St. Andrew and St. Catherine. This subsector is well over 50 years old and has grown tremendously from the early years when it was engaged in the processing of just a few products (mainly citrus, pineapples and peppers) to at least fifty products today. The local raw material supply base is mainly 200,000<sup>1</sup>, small-scale (under 5 acres) producers operating in a predominantly mixed cropping and rain-fed farming system.

Agro-processors are engaged in the manufacture of various beverages, juices, jams, jellies, spices and sauces and confectioneries for local and export markets. In some cases, they are under contract for other manufacturers or marketing companies. They account for significant percentage of purchases of agricultural produce, which include: fruit, vegetables and spices.

### 2.2 The Hotel Market Segment

**Profile of this sector:** There are some 2,000 hotels, villas and guest houses in Jamaica, representing a total room stock of 36,000 rooms. Annual visitor arrivals are in excess of 3 million cruise and stop-over passengers, with this figure having grown steadily over the past decade. In terms of room capacity and visitor arrivals, the Jamaican tourism industry is one of the largest in the Caribbean region. Cruise tourism capacity and visitors have grown significantly in recent years, with the upgrading and construction of large cruise ship ports on the island's north coast.

### 2.3 Restaurants

**Profile of this sector:** Restaurants (apart from hotel-based restaurants) are of two types: fast food services and traditional (casual and fine dining). This report focuses on fast food services as it is the largest portion of this market segment.

### 2.4 Supermarkets

**Profile of the Supermarket Market.** The major buyers of fresh agricultural produce in terms of volume are supermarket chains and buyers' clubs. In 2014, the supermarket segment in Jamaica entailed five leading chain stores. Together these five chains accounted for just over 40 supermarket outlets island-wide. These outlets are distributed among five main chains as shown in Table 1 over.

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<sup>1</sup>2007 Agricultural Census

**Table 1: Leading Supermarket Chains**

<i>Leading Supermarket Chains</i>	<i>No. of Outlets</i>	<i>Estimated % of Market Share</i>
<i>Chain # 1</i>	<i>20</i>	<i>55</i>
<i>Chain # 2</i>	<i>13</i>	<i>35</i>
<i>Chain # 3</i>	<i>4</i>	<i>5</i>
<i>Chain # 4</i>	<i>3</i>	<i>3</i>
<i>Chain # 5</i>	<i>2</i>	<i>2</i>

Located in the parish capitals and major rural towns, they provide convenience shopping for the majority of the population. These outlets are strategically located to reach the most densely populated areas, as well as to target the various income groups nationally. In 2014 the number of fresh produce items carried by these supermarkets stood at just over 400 in which well over 90% were sourced locally. The leading chains all have well developed marketing infrastructure, including facilities for handling fresh produce such as chill rooms, refrigerated trucks, packaging and pre-processing equipment.

Over the last 10 years, there has been a growing trend among supermarket outlets to develop value-added products from fresh produce in order to boost sales and fight the competition that exists among the chains. These products include Ready-To-Eat (RTE) and Ready-To-Cook (RTC) preparations. This trend is expected to continue on an upward path as consumers are moving away from the traditional methods of food preparation.

### **2.5 The Non-traditional Exporters Market Segment**

**Profile of the Exporters Sub-sector:** Exporters are registered locally with JAMPRO and the Ministry of Agriculture. They must comply with the regulations of country of import and show to their importing buyer evidence of having documented food safety systems (FSS) in their operations. Exports are sent to over 30 countries globally.

### **2.6. Rationale for Selection of High Value Market Buyers**

A total of 194 purchasers were identified in the Ministry of Agriculture (MOA) database. Additional potential buyers were identified in the list of registered hotels maintained by the Tourism Product Development Agency (TPDA - the licensing entity for tourism), the Jamaica Hotel and Tourist Association (JHTA), the Jamaica Exporters Association (JEA) and the Jamaica Manufacturers' Association (JMA). From this, a sample of 50 buyers has been targeted, based on the following criteria to the greatest extent possible:

- **Large and medium-sized buyers:** these have more reliable data and are more likely to be sustainable markets.
- **Age of business entity:** older, more established companies were targeted, as these are likely to have more reliable data and more likely to be sustainable as markets.
- **Geographical distribution:** Entities with wide geographic presence to ensure island wide coverage, serving major producing areas.
- **Coverage/Diversity:** Entities purchasing of all or most of the HVM products.

### **Application of the selection Criteria**

Entities on the list provided by the MOA, TPDA, JHTA, JEA and JMA were assessed in terms of: **Size** (estimated employees, capitalization and gross sales); **Age of the business** (at least five years in operation); **Geographical distribution** (entities operating in Kingston as well as in rural parishes); **Products purchased** (fruit and vegetables, roots & tubers, spices and condiments); and **Coverage / diversity**. The entities that were assessed to be large or medium-sized, over five years in operation, located in Kingston and producing parishes and purchasing targeted products were selected for further investigation.

### 3. DEMAND BY HVM BUYERS

#### 3.1. Agro-Processors

**Products of interest:** carrot, scallion, hot (red) pepper, yellow (Scotch Bonnet) pepper, pimento, ginger, cassava, herbs (peppermint, lemon grass, cerasee, moringa).

##### 3.1.1. Volume and Value

The main items purchased traditionally by agro-processors are hot peppers, tomatoes, carrots and scallion. The demand for hot peppers is high as the agro-processors purchase approximately 5,600 tonnes (up to 84% of available supplies). For tomatoes, carrot and scallion they purchase approximately 13,000 tonnes, or 20-33% of available supplies.

A growing segment is the processing of spices, herbs, teas and nutraceuticals. Currently, local processors of spices and herbal teas rely heavily on imports for up to 90% of their raw materials, as in some cases the required varieties are not available locally, or the level of production may be too low. The leading processors of teas, for example, source raw materials including peppermint, lemon grass, cerasee, and sorrel from Germany, Egypt, the USA and Canada. Local manufacturers/processors of seasoning and herbs also import items such as ginger and turmeric.

The estimated value of purchases by agro-processors of selected agricultural produce, based on 2013 Farm Gate Prices is J\$ 10.3 billion (US\$ 91.7 million). A breakdown of demand for selected items is shown in Table 2.

**Table 2: Agro Processors Demand for Selected Products**

Items	Farm gate price/ kilo	Agro-processor Demand of selected buyers-(Kilo)	Estimated Value (J\$)
Oranges	209	40,000	8,360,000
Cassava	44.1	8,000	352,800
Hot Peppers	208.75	5,620	1,173,175
Escallion	110.33	2,304	254,200
Ginger	170.65	500	85,325
Turmeric	88	286	25,168
Pimento	264	100	26,400
Lemon grass (dried)	1,116.07	14	15,625
Cerasee (dried)	440	25	11,000
Peppermint (dried)	792	80	63,360
<b>Total</b>		<b>56,929.00</b>	<b>10,367,053</b>

### 3.1.2 Seasonality of Demand and Supply, Including Trends

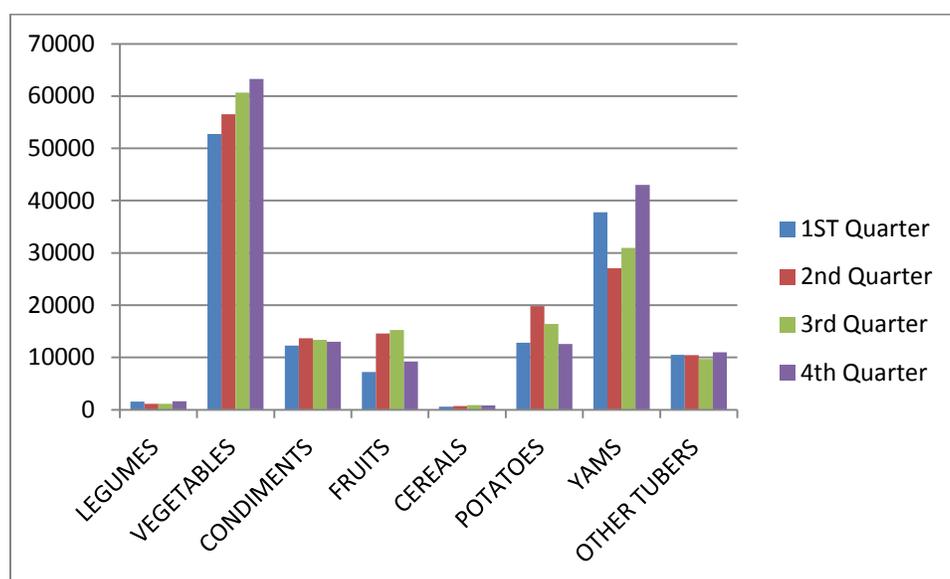
Agro-processors purchase fresh produce raw materials all year round, but peak purchases coincide with the seasons in which important local raw materials are available (e.g. ackee, mango, oranges). As shown in Table 3 and Figure 1 below, the supply of agricultural produce varies with the type of crop: vegetables are in greater supply during the last quarters of the year; potatoes peak closer to mid-year; and yams are in greater supply in the early and late quarters of the year. The larger processors often have refrigeration facilities to enable them to store raw materials if supply conditions warrant this, but most resort to imported raw materials in processed or semi-processed form (e.g. purees) where local supplies are inadequate.

**Table 3: Production of Selected Domestic Crops by Quarter -2013**

<i>Units: Tonne</i>					
<b>CROPS</b>	<b>1<sup>st</sup> Quarter</b>	<b>2<sup>nd</sup> Quarter</b>	<b>3<sup>rd</sup> Quarter</b>	<b>4<sup>th</sup> Quarter</b>	<b>ANNUAL</b>
LEGUMES	1568.3	1169.4	1129	1634.1	5500.7
VEGETABLES	52728.6	56551.1	60656	63290.6	233226.3
CONDIMENTS	12254.4	13688	13370.3	12982.1	52294.8
FRUITS	7254.8	14574.8	15254.7	9240.8	46325.1
CEREALS	598.1	707.1	871.4	819.2	2995.8
POTATOES	12851	19824.4	16407.2	12562	61644.5
YAMS	37775.8	27037.9	30985	43035.2	138833.9
OTHER TUBERS	10523.3	10475.1	9696.9	10974.7	41670
SORREL	396.5	76.6	124.7	885.6	1483.3
<b>GRAND-TOTAL</b>	<b>139676.9</b>	<b>150140.2</b>	<b>158559.6</b>	<b>166535</b>	<b>614911.7</b>

Source: Ministry of Agriculture

**Figure 2: Production of Domestic Crops by Quarter - 2013**



### 3.1.3 Buying Practices of Agro-Processors

- 1) **Frequency of Purchase:** Daily, weekly or monthly, depending on the product.
- 2) **Source of Products:** Products are purchased from farmers directly or on contract from formal distributors or, where necessary, are imported.
- 3) **Methods of Procurement.** Purchases are in cash or on credit terms.
- 4) **Standards Required - Including Varieties**

#### General Factors Affecting Purchases

- i. Demand for finished products
- ii. Price of local raw materials
- iii. Regularity/reliability
- iv. Delivery time
- v. Quality
- vi. Availability of local supply.

Agro-processors demand for fresh agricultural produce is influenced by the demand for their finished products, which in turn is influenced by their price to distributors. As local processors face competition from domestic as well as regional and international manufacturers, demand for their products is price-sensitive. Price is therefore the single most important factor influencing the demand for local raw material. The price of local agricultural raw materials is linked first to farmers' cost of production as well as to the prevailing prices in other market segments.

Other factors influencing the quantities of raw materials purchased include shortages and seasonality of production (which affects regularity of supply and timeliness of deliveries that are critical issues given the processors' need to meet production schedules).

Quality of produce is also an important consideration, although processors do not require "export grade" fresh inputs. Specifications and regulatory constraints are also considerations for processors using certain agricultural products, which must have specific characteristics (e.g. flavours) required by the market such as hot peppers, scallion and ginger. The list of raw materials for which processors reported that demand is affected by these factors are:

**Specific products:** Carrots, ginger, Hot Peppers, scallion, pimento:

- Production schedules
- Seasonality of produce
- Customer demand
- Reliability of supply
- Regulatory constraint

### 3.2 Hotels

**Products of interest:** Lettuce; cabbage; sweet pepper; onion; sweet potato; Irish potato; cucumber; pineapple; squash; red sweet pepper; yellow sweet pepper; tomato carrots, watermelon; cantaloupe; yam; scallion; and hot pepper.

### 3.2.1 Volume and Value of Demand

The total demand from the hotel sector for the selected fresh produce is projected to reach US\$ 31.48 million by 2017, from an estimated US\$ 27.97 million in 2013. Irish potatoes, papayas, cantaloupe and yams would make up the bulk of this demand. Table 4 below provides the projected volume of demand for selected products in the hotel market segment.

**Table 4: Projected Hotel Demand for Selected Fresh Produce 2013-2017 (kg)**

<i>Item</i>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<i>Hot Peppers</i>	66,280	68,268	70,316	72,426	74,598
<i>Onions</i>	1,296,135	1,335,019	1,375,070	1,416,322	1,458,811
<i>Cantaloupe</i>	5,468,069	5,632,111	5,801,075	5,975,107	6,154,360
<i>Papaya</i>	6,156,641	6,341,340	6,531,580	6,727,528	6,929,354
<i>Yams</i>	3,129,871	3,223,767	3,320,481	3,420,095	3,522,698
<i>Sweet Potatoes</i>	3,475,078	3,579,330	3,686,710	3,797,311	3,911,231
<i>Irish potato</i>	6,812,073	7,016,435	7,226,928	7,443,736	7,667,048
<i>Escallion</i>	61,861	63,717	65,628	67,597	69,625
<i>Bananas</i>	2,754,287	2,836,915	2,922,023	3,009,684	3,099,974
<i>Oranges</i>	5,022,523	5,173,199	5,328,395	5,488,246	5,652,894
<b>TOTAL</b>	<b>34,242,818</b>	<b>35,270,101</b>	<b>36,328,206</b>	<b>37,418,052</b>	<b>38,540,593</b>

Table 5 below provides the projected value of hotel purchases for the period 2013 to 2017

**Table 5: Projected Hotel Demand for Selected Fresh Produce 2013-2017 (US\$)**

<i>Item</i>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<i>Hot Peppers</i>	122,442	126,115	129,898	133,796	137,808
<i>Onions</i>	1,682,337	1,732,807	1,784,792	1,838,336	1,893,485
<i>Cantaloupe</i>	5,271,606	5,429,754	5,592,647	5,760,426	5,933,239
<i>Papaya</i>	6,010,625	6,190,944	6,376,672	6,567,972	6,765,012
<i>Yams</i>	3,786,313	3,899,902	4,016,900	4,137,407	4,261,529
<i>Sweet Potatoes</i>	2,844,643	2,929,983	3,017,882	3,108,418	3,201,671
<i>Irish potato</i>	8,196,190	8,442,075	8,695,337	8,956,198	9,224,884
<i>Escallion</i>	60,399	62,211	64,077	66,000	67,980
<b>TOTAL</b>	<b>27,974,556</b>	<b>28,813,791</b>	<b>29,678,206</b>	<b>30,568,553</b>	<b>31,485,608</b>

Hotels purchase about 3% of total domestic food production. Significant gains can be made in local consumption of agricultural produce as hotels often opt for direct and fresh supplies over imported goods. The requirement of the hotel sector for selected fresh agricultural produce is estimated at 34.2 million kg. The level of demand is very high for items such as: cantaloupe (of which hotels purchase

nearly 80% of available supplies); papaya; potatoes and oranges; for carrots, tomato and watermelon (hotels purchase close to 25% of available supplies); and for escallion, yam and hot peppers, 1-2%.

The quantities of fresh produce demand for the hotel sector were estimated based on information provided by individual hotels in the survey, as well as key informants. The formula used in a recent study<sup>i</sup> to estimate hotel purchases was adapted and updated in the calculation of the overall estimate of hotel demand. Table 6 provides the estimated annual requirements of the hotel sector using the parameters and assumptions as shown.

**Table 6: Estimated Annual Demand of Hotels for Selected Fresh Produce**

<i>Item</i>	<i>Average serving size (grams)</i>	<i>Number of servings / day</i>	<i>Conversion factor (raw equivalent)</i>	<i>Average monthly arrivals</i>	<i>Average length of stay (days)</i>	<i>Estimated monthly requirement (kg)</i>	<i>Estimated annual requirement (kg)</i>
<i>Hot Peppers</i>	3	1	1.2	172,631	9.1	5,655	67,865
<i>Onions</i>	32	2	1.1	172,631	9.1	110,594	1,327,132
<i>Cantaloupe</i>	450	0.33	2	172,631	9.1	466,570	5,598,838
<i>Papaya</i>	152	2	1.1	172,631	9.1	525,323	6,303,876
<i>Yams</i>	136	1	1.25	172,631	9.1	267,060	3,204,722
<i>Sweet Potatoes</i>	151	1	1.25	172,631	9.1	296,515	3,558,184
<i>Irish potato</i>	148	2	1.25	172,631	9.1	581,249	6,974,983
<i>Escallion</i>	2.8	1	1.2	172,631	9.1	5,278	63,340
<i>bananas</i>	136	1	1.1	172,631	9.1	235,013	2,820,155
<i>oranges</i>	248	1	1.1	172,631	9.1	428,553	5,142,636

*Source: Various databases (e.g. CFNI, USDA, PAHO.org, Nutritiondata.self.com) and applied to current (2013) tourism statistics supplied by the Jamaica Tourist Board.*

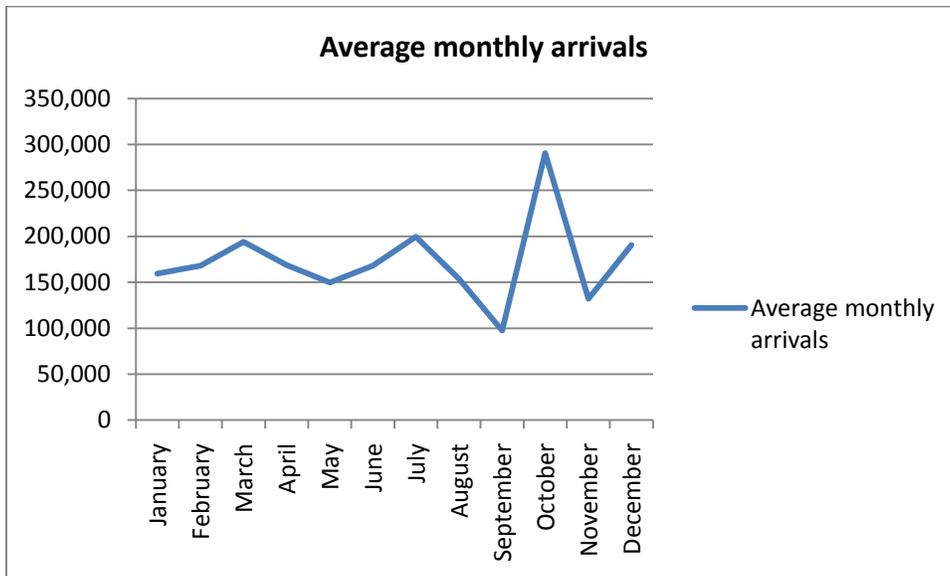
### 3.2.2 Seasonality of Demand in the Hotel Sector

The pattern of demand for fresh produce closely follows the seasonal pattern of visitor arrivals. As shown in Table 7 and Figure 3, visitor arrivals peak during the October-December quarter, the official “winter” tourism season commencing in mid-December. On the average, visitor arrivals between May and December are nearly twice as high as arrivals between January and April. Peak demand for fresh agricultural produce should therefore occur in the latter half of the year.

**Table 7: Monthly Visitor Arrivals 2008-2012**

	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>Average monthly arrivals</b>
<b>January</b>	142,861	148,886	161,094	174,144	169,355	<b>159,268</b>
<b>February</b>	156,831	160,282	167,462	175,114	180,595	<b>168,057</b>
<b>March</b>	184,267	175,929	201,378	204,046	204,724	<b>194,069</b>
<b>April</b>	152,199	164,090	166,955	179,444	180,511	<b>168,640</b>
<b>Jan.-Apr.</b>	<b>636,158</b>	<b>649,187</b>	<b>696,889</b>	<b>732,748</b>	<b>735,185</b>	<b>690,033</b>
<b>May</b>	141,236	153,443	149,775	146,583	157,233	<b>149,654</b>
<b>June</b>	161,958	168,561	164,205	166,545	179,814	<b>168,217</b>
<b>July</b>	185,447	195,940	204,526	202,493	209,824	<b>199,646</b>
<b>August</b>	142,467	152,573	159,408	155,133	157,863	<b>153,489</b>
<b>September</b>	92,037	95,263	97,010	98,280	104,360	<b>97,390</b>
<b>October</b>	106,104	108,820	14,699	1,112,536	111,253	<b>290,682</b>
<b>November</b>	122,250	125,494	134,320	139,721	138,395	<b>132,036</b>
<b>December</b>	179,614	181,816	200,846	197,713	192,158	<b>190,429</b>
<b>May - Dec.</b>	<b>1,131,113</b>	<b>1,181,910</b>	<b>1,224,789</b>	<b>1,219,004</b>	<b>1,250,900</b>	<b>1,201,543</b>
<b>Jan. - Dec.</b>	<b>1,767,271</b>	<b>1,831,097</b>	<b>1,921,678</b>	<b>1,951,752</b>	<b>1,986,085</b>	<b>1,891,577</b>

**Figure 3: Average Monthly Arrivals - 2013**



### 3.2.3 Hotel Buying Practices

The general guidelines to hotel buying practices in general and by a sample of specific fresh produce items are set out as follows:

**a) General:**

- i. Quality
- ii. Price
- iii. Delivery time
- iv. Regularity/reliability
- v. Packaging
- vi. Production schedule
- vii. Seasonality

**b) Specific products:**

- i. Tomato: large tomatoes are required
- ii. Carrots: large carrots, similar varietal characteristics, well trimmed, firm, clean, well-coloured, well-formed, undamaged.
- iii. Watermelon, Cantaloupe: large fruit, not soggy inside, mature at harvest.
- iv. Sweet Peppers: large red, yellow and green bell peppers required.

#### Sources of Supply and Methods of Purchase

1. Source of products: Larger Hotels usually source from major distributors, while the smaller hotels tend to source directly from farmers or from informal suppliers or parish markets.
2. Methods of Procurement: Contractual arrangements with suppliers; payment terms are usually on 30-day credit.

### 3.3 Restaurants

**The main products of interest are:** yams, tomato, carrots and hot peppers. *Opportunities may also exist for farmers to supply callaloo and packchoi to the food service sector.*

#### 3.3.1 Volume & Value

The local chains (Juicy Patties, Island Grill, Mother's and Tastee) account for the bulk of the sector's demand for local fresh agricultural produce. The demand for local produce by foreign-based chains (e.g. KFC and Burger King) is currently low, as these entities import most of their inputs. The demand for the selected fresh agricultural produce by fast food restaurants is low, relative to the available supply. Restaurants account for less than 1.0 % of total supplies of agricultural produce. The annual fresh produce demand by the restaurant sector is estimated at 6,000,000 kg valued at approximately J\$792 million (US\$ 7.0 million).

### 3.3.2 Seasonality

Demand for fresh produce in the restaurant sector is fairly continuous, with variable peaks during holiday seasons (e.g. Christmas, summer and Easter), when customer demand increases and additional services are offered.

### 3.3.3 Buying Practices of Restaurants

#### General:

- 1) Price is most important
- 2) Shelf life food safety and quality are important (farmers should indicate chemicals used, traceability and GAPs)
- 3) Importance of traceability recognized
- 4) Prefer to purchase from producers who use approved agronomy practices

#### Restaurants source of supply:

Large restaurants usually purchase fresh produce on contract from farmers or middlemen.  
Small establishments also buy from parish markets.

**Frequency of purchase:** Weekly for most fresh agricultural produce.

### 3.4 Supermarkets

**The main products of interest are:** carrot, tomato, cauliflower, green and red cabbage, corn, callaloo, celery, pumpkin, bananas, string bean, cho-cho, iceberg lettuce; hot peppers, scallion, fresh fruit, watermelon, cantaloupe, oranges; ground provisions (yams) . The main products imported include onions, red kidney beans, and corn. These are usually sourced through major importers.

#### 3.4.1 Volume and Value of Supermarket Purchases

The volumes of fresh produce sold by supermarkets provide a rough but useful guide to the demand of fresh produce by these outlets. Discussions with the procurement managers of the leading supermarket chains reveal that there are many factors along the value chain that impact the demand for fresh produce (these factors are discussed in detail further below). An earlier study of supermarket's demand for fresh produce had estimated demand of fresh produce to be 513 tonnes (See Persaad, 2009). However, the result of this study show that the aggregated volume of 17 selected items passing through supermarkets stood at 2,773 metric tonnes at a suppliers value of J\$ 421.7 million in 2013. Table 8 and Table 9 below provide the quantities of selected fresh produce for the years 2012 and 2013.

**Table 8: Supermarket Sales of Selected Fresh Produce-2012 (J\$)**

<b>Fresh Produce</b>	<b>Chain 1</b>	<b>Chain 2</b>	<b>Chain 3</b>	<b>Chain 4</b>	<b>Chain 5</b>	<b>Total Qty</b>	<b>Av Retail Price</b>	<b>Total Sales Value</b>	<b>Av. Purchase Price</b>	<b>Total Purchase Value</b>
Ripe Banana	337,651	214,869	30,696	18,417	12,278	613,911	164	100,681,474	123	75,700,357
Irish Potato	174,276	110,903	15,843	9,506	6,337	316,866	254	80,483,891	191	60,514,204
Papaya	172,061	109,494	15,642	9,385	6,257	312,839	176	55,059,624	132	41,398,213
Onion Local	129,413	82,354	11,765	7,059	4,706	235,296	202	47,529,740	152	35,736,647
Pepper Scotch Bonnet	115,769	73,671	10,524	6,315	4,210	210,489	95	19,996,414	71	15,034,898
Callaloo - Shredded	85,517	54,420	7,774	4,665	3,110	155,486	90	13,993,714	68	10,521,590
Green Banana	96,161	61,193	8,742	5,245	3,497	174,838	107	18,707,638	80	14,065,894
Plummy Tomato	91,633	58,312	8,330	4,998	3,332	166,605	224	37,319,437	168	28,059,727
Pumpkin Local	75,669	48,153	6,879	4,127	2,752	137,581	164	22,563,214	123	16,964,822
Fresh Oranges Bags	72,066	45,860	6,551	3,931	2,621	131,029	203	26,598,800	153	19,999,098
yellow Yam	50,908	32396	4,628	2,777	1,851	92560	237	21,936,720	178	16,493,774
Sweet potato	60,795	38688	5,527	3,316	2,211	110537.1	201	22,217,966	151	16,705,237
Escallion	30,547	19439	2,777	1,666	1,111	55540	380	21,105,200	286	15,868,571
Pimento	15,365	9778	1,397	838	559	27937.14	62	1,732,103	47	1,302,333
Dasheen	6,174	3929	561	337	225	11225.71	213	2,391,077	160	1,797,802
Cantaloupe	2,554	1625	232	139	93	4642.857	439	2,038,214	330	1,532,492
Ginger	7,922	5041	720	432	288	14402.86	560	8,065,600	421	6,064,361

**Table 9: Supermarket Sales of Selected Fresh Produce-2013 (J\$)**

<b>Fresh Produce</b>	<b>Chain 1</b>	<b>Chain 2</b>	<b>Chain 3</b>	<b>Chain 4</b>	<b>Chain 5</b>	<b>Total QTY ( KG)</b>	<b>Av Retail Price</b>	<b>Total Sales Value</b>	<b>Av. Purchase Price</b>	<b>Total Purchase Value</b>
Ripe Banana	244,429	155,546	22,221	13,333	8,888	444,417	185.6	82,483,822	140	62,017,911
Irish Potato	174,947	111,330	15,904	9,543	6,362	318,086	315.8	100,451,469	237	75,527,420
Papaya	167,473	106,574	15,225	9,135	6,090	304,497	218	66,380,377	164	49,910,058
Onion Local	127,300	81,009	11,573	6,944	4,629	231,454	233.9	54,137,157	176	40,704,630
Pepper Scotch Bonnet	120,613	76,754	10,965	6,579	4,386	219,297	104.4	22,894,622	78	17,214,001
Callaloo -Shredded	110,984	70,626	10,089	6,054	4,036	201,789	105.3	21,248,337	79	15,976,193
Green Banana	109,419	69,630	9,947	5,968	3,979	198,943	149.2	29,682,274	112	22,317,499
Plumy Tomato	89,592	57,013	8,145	4,887	3,258	162,894	270.2	44,014,036	203	33,093,260
Pumpkin Local	88,482	56,307	8,044	4,826	3,218	160,877	149.2	24,002,870	112	18,047,270
Fresh Oranges Bags	78,912	50,217	7,174	4,304	2,870	143,477	245.2	35,180,595	184	26,451,576
Yam	67,006	42,640	6,091	3,655	2,437	121,829	231.3	28,178,949	174	21,187,179
Sweet Potato	70,895	45,115	6,445	3,867	2,578	128,900	231.8	29,879,020	174	22,465,429
Escallion	34,183	21,753	3,108	1,865	1,243	62,151	31.5	1,957,770	24	1,472,008
Pimento	18,210	11,588	1,655	993	662	33,109	63.2	2,092,462	48	1,573,279
Dasheen	6,718	4,275	611	366	244	12,214	254.9	3,113,421	192	2,340,918
Cantaloupe	6,102	3,883	555	333	222	11,094	444.8	4,934,738	334	3,710,330
Ginger	9,612	6,117	874	524	350	17,477	587.3	10,264,326	442	7,717,538
<b>Total</b>						<b>2,772,506</b>				<b>421,726,500</b>

### 3.4.2 Buying Practices of Supermarkets

- (1) Price is very important especially in the Jamaica's Present economic environment and in the food retail business where competition is intense
- (2) Fresh produce delivered loose and packed in-house
- (3) Cleanliness, wholesomeness and appearance
- (4) Prefer direct purchase from farmers
- (5) Consistency of supply
- (6) Honouring of contract for delivery
- (7) Frequency of purchase depends on the shelf-life (e.g. twice a week purchase for lettuce with a short shelf life). Frequency of purchase also depends on the rate of sale or turnover of the crop (e.g. ripe banana has a rapid turnover and purchase is daily)

### 3.5 Exporters

**Products of interest:** yam, dasheen, pumpkin, sweet potato, hot peppers, turmeric, mangoes, breadfruit, coco, callaloo, thyme, scallion, ginger and pimento.

Jamaica Exporters Association database shows that the top 10 fresh produce items (excluding cocoa, coffee, papaya and citrus) that were exported in 2012 had an FOB value of US\$32,141,496, and a volume of 15,653,773 Kg. These include roots and tubers, vegetables, spices, herbs and condiments.

#### 3.5.1 Volume and Value of Purchases by Exporters

Currently exporters account for a small share of available fresh produce supplies. For example, in 2012 10,425 tonnes of yams, the largest export, only accounted for approximately 8.5% of available supplies. In view of the expanding export market opportunities, the potential for increased local production of selected agricultural crops for export is considerable. Table 10 shows volumes of the top 10 non-traditional agricultural produce items exported over a 5 year period 2007-2012.

**Table 10: Top Ten Non-Traditional Fresh Produce Exports 2007-2012**

	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
<i>Yams</i>	10,196,772	8,167,067	9,863,497	10,606,367	9,599,332	10,425,469
<i>Sweet Potato</i>	1,280,632	151,588	1,129,101	1,198,549	1,189,685	1,405,942
<i>Dasheen</i>	1,073,694	804,822	893,899	831,103	980,899	866,578
<i>Breadfruit</i>	455,509	560,815	561,975	528,775	625,504	643,205
<i>Mango</i>	414,051	590,488	643,054	620,776	527,594	523,625
<i>Pimento</i>	453,043	476,299	669,370	940,677	433,516	504,969
<i>Pepper</i>	113,257	102,925	167,387	172,677	162,530	191,294
<i>Coco</i>	179,218	170,507	139,564	149,558	203,501	157,851
<i>Callaloo</i>	214,260	230,130	251,062	227,975	209,057	155,638
<i>Turmeric</i>	58,234	66,455	75,453	76,229	101,610	120,779

Currently these items are marketed in the niche markets of the Diaspora, with the United States, Canada and the United Kingdom being the dominant markets. The table shows that yams, exports of which were 10.4 million kg in 2012, account for 70% of export demand of 15 million kg. Over 60% of yam is marketed in the USA. Sweet potato and dasheen are also major export items, accounting for 9% and 6% respectively of total demand, while export demand for breadfruit, mangoes and pimento is significant.

### 3.5.2 Seasonality

Exporters purchase fresh produce when supplies are available. The demand therefore coincides with the seasonal supply of various crops. Purchases take place weekly *or monthly depending on the crop*.

### 3.5.3 Exporters Buying Practices and Characteristics

Factors influencing buying practices are as follows:

#### General:

- i. Quality
  - ii. Price
  - iii. Packaging
  - iv. Delivery time
  - v. Exporters of fresh agricultural products need to meet specific standards (e.g. FMISA, FDA, USDA require traceability, record-keeping and GAPs by farmers).
- b. Specific products:
- i. Yams - demand by customer; need to compete with yams from Costa Rica, Brazil, Columbia and Ghana.
  - ii. Mangoes: Variety – Julie & East Indian
  - iii. Sweet Potatoes: Better transportation handling in field crates instead of bags from harvesting to delivery to avoid damage; Grow the varieties best for export

**Source of products:** *Fresh produce is purchased from farmers or informal distributors.*

**Methods of Procurement;** *Payment terms are usually cash and credit.*

## 3.6 Summary of Demand for HVM Buyers

Table 11 summarises the estimated demand for each product by type of product relative to available supply.

**Table 11: Demand for Selected Produce by HVM Buyers**

Items	A	B Imports	C Exports	Availability	Farm gate price/ kilo	Demand of selected buyers- tonnes (% available supply)				TOTAL Demand *(tonnes)
	Production (tonnes)			A+B-C		Agro-processor	Supermarket	Hotel	Restaurant	
Cantaloupe	3,469	260		3,729	108.94	-	28	2,381	-	2,409
bananas	37,211	-	112	37,099	55.10		613	372	100	1,197
oranges	79,178	-	1,589	77,589	209.00	40,000	131	5,000	1,000	47,720
Callaloo	15,840	-	155	15,685	68.40		201	1,000	1,000	2,356
Papaya	8,382	-	1,621	6,761	110.32		304	6,000	1,200	9,125
Yams	95,334	-	10,425	84,909	136.70	13	107	2,164	74	12,783
Sweet Potatoes	44,224	-	1,406	42,818	92.50		129	3,558	3,000	8,093
Irish potato	17,421	3,913	-	21,334	135.96		316	6,974	1,400	8,690
dasheen	15,140	-	866	14,274	115.15		12			878
cassava	11,621	-		11,621	44.10	8,000				8,000
Hot Peppers	15,204	251	191	15,264	208.75	5,620	219	54	57	6,141
Escallion	10,841	1	26	10,816	110.33	2,304	62	50	49	2,491
Onions	680	8,666	32	9,314	146.67		231	1,296	260	1,819
Ginger	1,198	91	106	1,183	170.65	500	17	5	1	629
Turmeric *	329	125	168	286	88.00	286				454
pimento	724	50	724	50	264.00	100				824
Lemon grass (dried)	70	8	76	2	1,116.07	14				90
cerasee(dried)	30	25	30	25	440.00	25				55
Peppermint (dried)	66	71	137	137	792.00	80				217

Sources: Ministry of Agriculture (2013); ITC Database (2013);

\* Imports are dried/grounded

## 4. SELECTION OF KEY PRODUCTS TO FOCUS ON

### 4.1 Analysis of products that are demanded by HVM buyers

The following is a list of products for which market opportunities exist and which are recommended for further study:

1. Fruit: Cantaloupe, Bananas, Oranges and Papaya
2. Vegetables: Callaloo
3. Roots & Tubers: Yams, Sweet Potatoes, Dasheen, Cassava and Irish Potato
4. Spices & Condiments: Hot Peppers, Escallion, Onions, Turmeric, Ginger and Pimento
5. Herbs: Lemon Grass, Cerasee, Peppermint and Moringa.

**Target markets:** Table 12 below lists the likely target markets for the selected products, based on the demand patterns of the type of buyers analyzed.

**Table 12: Recommended Products and Target Markets**

<b>Agricultural Products</b>	<b>Target Markets</b>					<b>Rationale for Selection</b>
	<b>Hotels</b>	<b>Supermarkets</b>	<b>Restaurants</b>	<b>Processors</b>	<b>Export</b>	
<i>Cantaloupe</i>	X	X	X			<i>High demand</i>
<i>Bananas</i>	X	X				<i>Ripe and green bananas ranked #1 and # 6 on supermarket top 10 sales annually. The supply is dominated by one or two very large companies and the retail price is very high. Banana has been the single most important crop in the traditional farming system for food security and an all- year round source of income farm households.</i>
<i>Oranges</i>	X	X				<i>Among top ten items purchased by supermarkets</i>
<i>Callaloo</i>		X	X		X	<i>Supermarkets require shredded callaloo</i>
<i>Papaya</i>	X		X			<i>Export market</i>
<i>Yams</i>	X	X	X		X	<i>Local consumption and exports</i>
<i>Sweet Potatoes</i>	X		X		X	<i>Export market</i>
<i>Irish potato</i>	X	X	X			<i>Hotels, restaurants and supermarkets</i>
<i>Dasheen</i>					X	<i>Export market</i>
<i>Cassava</i>				X		<i>Consistently high demand for this product for processing and household consumption</i>
<i>Hot Peppers</i>	X	X	X	X	X	<i>Among top ten items purchased</i>

<i>Escallion</i>				X		<i>Processors experience shortages</i>
<i>Onions</i>	X	X	X			<i>Opportunities for import replacement</i>
<i>Ginger</i>		X		X	X	<i>In demand by supermarkets, processors and exporters</i>
<i>Turmeric</i>				X	X	<i>Export market opportunities</i>
<i>Pimento</i>				X	X	<i>Processors currently experience shortages; traditional export market</i>
<i>Lemon grass</i>				X		<i>Growing market for processing into teas</i>
<i>Cerasee</i>				X		<i>Growing market for processing into teas</i>
<i>Peppermint</i>				X		<i>Growing Market for processing into teas</i>

#### 4.2 Criteria for selection of products for further investigation

The selection of products for further study was based on:

- a) Products of interest (currently purchased) by various buyers. Products of interest to the CHF/PROPEL project (small and medium sized farmer crops)
- b) The “priority list” of the Ministry of Agriculture (Farmers producing these items are currently supported by the MOA through various programmes.)
- c) An assessment of market prospects based on:
  - i. Current level of demand relative to available supplies
  - ii. Price trends
  - iii. Type and degree of constraint that may affect expansion of production.
- d) Products that are part of the traditional farming system of the vast majority of Jamaican small-scale farmers.

## 5. ANALYSIS OF THE MARKET POTENTIAL FOR THE SELECTED PRODUCTS.

### 5.1 The production base for selected products

#### 5.1.1 Characteristics of producers currently growing product

- **Cantaloupe:** Currently grown mainly in South St. Elizabeth under a combination of irrigation and rain-fed conditions.
- **Bananas:** Traditionally, the production of banana in Jamaica is carried out by small medium and large estate farmers. Small famers have less than 20 acres, medium farmers 20 to less than 100 acres and large estate farms have 100 acres and over. In 2012 a case study of the local Banana industry commissioned by the Banana Board, reported that there were 102,000 farmers growing banana across the island. In that same year the Banana Board reported that there were 723 farmers cultivating 1,300 hectares of banana and plantain of which a total of 151, being certified, were considered as "elite" famers. The average size of the farm for these elite farmers was calculated to be 3.5 hectares. However the vast majority of farmers growing banana operate on less than one hectare. While banana has been grown in all parishes, there are six parishes which are traditionally known as the major banana producing areas. These are St. Thomas, Portland, St. Mary, St. James, Clarendon and St. Catherine's. The crop does best in the high rainfall areas.

The vast majority of banana farmers are small-scale poor farmers applying low levels of production technology under rain-fed conditions. Nevertheless, banana is undoubtedly the number one ranked crop in order importance to farmers in the banana growing areas. This is because the crop is indeterminate in nature and therefore provides a steady source of income and positive cash flow throughout the year. It is not surprising therefore, that since the collapse of the banana industry in the mid 1980s; the Jamaica Survey of Living Conditions (JSLC) has been reporting that there is an increase in rural poverty compared with urban poverty. An assured market provides strong incentives for increased production in these areas.

- **Callaloo:** Currently produced in the parishes of St. Catherine, St. Thomas, Portland, and St. James.
- **Papaya:** Papaya is grown in Jamaica by all categories of famers, small-scale poor farmers, and medium sized and large estates farmers. It is also grown under both rain-fed and irrigated conditions. In the case of small-scale farmers, the crop is usually grown in a mixed farm cropping system, while medium and large farmers grow the crop in pure stand cultivation. The crop is produced in all parishes, but St. Elizabeth, St. Mary and St. James are currently the main producing parishes.

- **Yams:** Yellow yam is traditionally grown in Jamaica by small-scale poor farmers in a rain-fed farming system and on hillside farms. The size of farms is typically less than one acre (0.4 hectare). While the crop is grown in all parishes, the major areas of production are in the parishes of Trelawny, St Ann, Manchester and Clarendon.
- **Sweet potato:** Sweet potato is traditionally grown in Jamaica by small-scale poor farmers in a rain-fed farming system and on hillside farms. The size of farms is typically less than one acre (0.4 hectare) while the crop is grown in all parishes, Manchester and St Ann are the leading areas of production.
- **Irish potato:** Irish potato is traditionally grown in Jamaica by small-scale poor farmers in a rain-fed farming system and on hillside farms. The size of farms is typically less than one acre (0.4 hectare) while the crop is grown in at least seven parishes, the major areas of production are in the parishes of Manchester and St. Catherine. The country consumes some 15 million kilograms (33 million pounds) of 'table' Irish potato per annum. Despite the capacity to produce all of this locally, Jamaica has relied on imports over the years. In 2007, Jamaica met only 42% of its consumption and 32% in 2008. Government of Jamaica (GOJ) initiatives led to the contribution of local production moving from 51% in 2009 to 76% in 2011 with self-sufficiency moving up to 79% in 2012. GOJ provided critical extension support to Irish potato farmers and funding support to RADA to participate in the purchasing and storage of the excess production at the peak of the crop. Ten million (\$10) was provided to the Guy's Hill area farmers to acquire inputs. A further \$50 million was given to the farmers in the Christiana area.
- **Dasheen:** Dasheen is traditionally grown in Jamaica by small-scale poor farmers in a rain-fed farming system and typically on isolated plots of wet land on small farmer holdings. The size of farms is typically less than one acre (0.4 hectare). The crop is grown in fewer areas than most of the crops in the traditional farming system of small-scale farmers in Jamaica. The leading producing areas are Portland, Westmoreland and northern St. Elizabeth.
- **Cassava:** Traditionally produced by farmers in mixed-cropping systems in all parishes. Efforts have been made over the years to organise farmers into the supply chain of local agro-processors as part of GOJ policy to increase use of local raw materials (e.g. as flour ingredient to reduce imports of wheat). Commercialisation of bammy production has provided a market in recent years; however the main market is the household consumer through parish markets or supermarkets. Current interest by manufacturers in producing cassava will increase the large-scale producer component in the industry.
- **Hot peppers:** Currently produced by farmers in Clarendon, Hanover, St. Catherine, Trelawny, St. Thomas, Manchester and St. James.
- **Escallion:** Currently grown by small farmers in the parishes of Manchester and St. Elizabeth.
- **Onions:** Grown by small farmers in St. Ann, St. Elizabeth and Trelawny. There is also medium-scale (23 ha) farming being developed with GOJ support in St. Thomas.

- **Ginger:** Currently grown by small farmers in St. Ann, Manchester, Portland and St. James.
- **Turmeric:** Turmeric is traditionally grown mainly in the western parishes of Westmoreland and Hanover by small farmers. Main harvesting season is September to April, but it would seem that with the increasing demand from the fresh markets, the product is becoming available out of season. Some farmers boil and dry for local sale to the manufacturers of seasonings as it is a main ingredient in curry seasoning. In recent times, the MOA Produce Division has been encouraging farmers to grow the crop for export as dried turmeric by the Export Division.
- **Herbs and Spices:** Herbal teas (lemon grass, cerasee, peppermint, pimento). Herbal teas cover a range of products which are the dried form of certain herbs reputed to have medicinal qualities. Pimento (allspice) is a tree crop flourishing mainly in traditional livestock-farming parishes (e.g. St. Ann, Westmoreland and Trelawny). The harvested and dried berries are used in spices and the leaves are used in the production of essential oils. Both herbal teas and pimento have traditionally been wild harvested, but organised cultivation of herbs has become more organized in recent years in response to growing demand in the natural product / nutraceuticals market. At the same time, the rate of harvesting of pimento, driven by demand for pimento wood, has outstripped the planting of orchards, so that a severe shortage of pimento products has emerged. The GOJ seeks to support the expanded production by provision of services to farmers, such as the maintenance of nurseries and the sale of seedlings.

### 5.1.2 Volumes being grown currently and nature of product

#### Volume of production

- **Cantaloupe:** Based on MOA Estimates of Domestic Crop Production (2013), current volume of production is estimated at 15,840 tonnes. Cantaloupe is a short term crop (2.5 months), requiring relatively flat land, preferably with access to mechanical land preparation and semi-irrigated water supplies.
- **Bananas:** For many decades the local banana industry produced for both the domestic and export markets. The export market was considered the more important market to farmers and records were kept regarding the export volumes. The records show that export volumes declined from just over 43,000 tonnes in 2001 to a mere 40 tonnes in 2008, the last year before exports ceased. During these years, there was no estimate of the production for the domestic market. The decline in production over the period 2001 to 2008 was steady as most of the small farmers unable to meet the stringent quality requirements either ceased production or drastically cut production. Over the period 2008 to 2012 the domestic market became the all important market and a more business-like approach was taken by the producers - mainly the large estate farmers and the few medium size and elite farmers. Available records show the volume of local production in 2009 stood at approximately 70,000 tonnes and this increased to just over 72,000 tonnes by 2011.

- **Callaloo:** Based on MOA Estimates of Domestic Crop Production (2013), current volume of production is estimated at 3,469 tonnes.
- **Papaya:** The volume of papaya produced in the island was estimated to be 6,455 and 8,382 tonnes in 2012 and 2013 respectively.
- **Yams:** The volume of yellow yam produced in the island was estimated to be 100,325 and 95,334 tonnes in 2012 and 2013 respectively.
- **Sweet potato:** According to the MOA production statistics, the volume of sweet potato produced in Jamaica was estimated at 42,165 and 44, 224 tonnes in 2012 and 2013 respectively.
- **Irish potato:** The volume of Irish potato produced in the island was estimated to be 15,396 and 17,421 in 2012 and 2013 respectively.
- **Dasheen:** The volume of dasheen produced in the island was estimated to be 17,988 and 15,140 tonnes in 2012 and 2013 respectively.
- **Cassava:** Based on MOA Estimates of Domestic Crop Production (2013), current volume of production is estimated at 11,621 tonnes.
- **Hot peppers:** Based on MOA Estimates of Domestic Crop Production (2013), current volume of production is estimated at 15,204 tonnes.
- **Escallion:** Based on MOA Estimates of Domestic Crop Production (2013), current volume of production is estimated at 10,841 tonnes.
- **Onions:** Based on MOA Estimates of Domestic Crop Production (2013), current volume of production is estimated at 680 tonnes.
- **Ginger:** Based on MOA Estimates of Domestic Crop Production (2013) Current volume of production is estimated at 1198 tonnes.
- **Turmeric:** The current volume of production is estimated at 900 tonnes, based on purchases by agro-processors and MOA data. Exports in 2012 amounted to 117 tonnes.
- **Herbs and Spices:** Based on MOA data, the current volume of Pimento berries produced is estimated at 724 tonnes. For Herbal teas, the estimated annual volume of dried product is as follows: Lemon grass 70 tonnes; Cerasee 30 tonnes; and Peppermint 66 tonnes. Table 13 below gives production characteristics of selected products while Table 14 provides the potential volume of production for these items.

### **Nature of product**

Table 13 over, provides a summary of product characteristics as they relate to parishes of concentration, type of product (short-term, i.e. crop maturity less than 12 months, or long-term i.e. over 12 months) farming systems and technology (e.g. land preparation and source of water supplies).

**Table 13: Characteristics of Selected Products**

<b>Crops</b>	<b>Parish of Main Production</b>	<b>Description (type of crop)</b>	<b>Terrain</b>	<b>Technology(land preparation/irrigation)</b>
<i>Cantaloupe</i>	<i>St. Elizabeth</i>	<i>Short term</i>	<i>flat land</i>	<i>mechanical/semi-irrigated</i>
<i>Bananas</i>	<i>St. Thomas, Portland, St. Mary, St. James, Clarendon, St. Catherine</i>	<i>Short term</i>	<i>Flat land</i>	<i>Manual/mechanical; Rain fed (small)/irrigated (large)</i>
<i>Callaloo</i>	<i>St. Catherine, St. Thomas, Portland, St. James</i>	<i>Short term</i>	<i>flat land</i>	<i>manual, rain-fed/mechanical/irrigated</i>
<i>Papaya</i>	<i>St. Elizabeth, St. Mary, St. James</i>	<i>Medium Term</i>	<i>Flat land</i>	<i>Mechanical; Rain-fed/irrigated</i>
<i>Yams</i>	<i>Trelawny, St. Ann, Manchester, Clarendon</i>	<i>Short term</i>	<i>Hillside</i>	<i>Manual/Rain-fed (small)</i>
<i>Sweet Potatoes</i>	<i>Manchester, St. Ann</i>	<i>Short term</i>	<i>Hillside</i>	<i>Manual/ rain-fed (small)</i>
<i>Irish potato</i>	<i>Manchester, St. Catherine</i>	<i>Short term</i>	<i>Hillside</i>	<i>Manual/ rain-fed (small)</i>
<i>Dasheen</i>	<i>Portland, Westmoreland, St. Elizabeth (Northern)</i>	<i>Short term</i>	<i>Hillside</i>	<i>Manual/ rain-fed (small)</i>
<i>Cassava</i>	<i>St. Elizabeth, Manchester, Westmoreland, St. Catherine, other</i>	<i>Short term</i>	<i>Hillside</i>	<i>Manual/rain-fed</i>
<i>Hot Peppers (WI Red)</i>	<i>Hanover, Clarendon, St. Ann, Westmoreland, St. Catherine, St. Elizabeth, St. Mary, St. Thomas, Portland,</i>	<i>short term</i>	<i>flat land</i>	<i>manual, rain-fed/mechanical, irrigated</i>
<i>Hot Peppers (Scotch Bonnet)</i>	<i>Clarendon, Hanover, St. Catherine, Trelawny, St. Thomas, Manchester, St. James</i>	<i>Short term</i>	<i>flat land</i>	<i>manual, rain-fed/mechanical/irrigated</i>
<i>Escallion</i>	<i>Manchester</i>	<i>short term</i>	<i>flat land</i>	<i>manual/irrigated</i>
<i>Onions</i>	<i>St. Ann, St. Elizabeth, Trelawny, St. Thomas</i>	<i>short-term</i>	<i>flat land</i>	<i>manual/mechanical, rain-fed/semi-irrigated/fertigation</i>
<i>Ginger</i>	<i>St. Ann, Manchester, Portland, St. James</i>	<i>short-term</i>	<i>hillside</i>	<i>manual/mechanical, rain-fed</i>
<i>Turmeric</i>	<i>St. Catherine, Westmoreland</i>	<i>Short term</i>	<i>Hillside</i>	<i>Manual/rain-fed</i>
<i>Pimento</i>	<i>St. Ann, Trelawny</i>	<i>Long-term</i>	<i>Hillside/flat land</i>	<i>Manual/rain-fed</i>
<i>Lemon grass (dried)</i>		<i>Short-term</i>	<i>Hillside/flat</i>	<i>Manual/rain-fed</i>

<b>Crops</b>	<b>Parish of Main Production</b>	<b>Description (type of crop)</b>	<b>Terrain</b>	<b>Technology(land preparation/irrigation)</b>
<i>cerasee(dried)</i>		<i>Short term</i>	<i>Hillside/flat</i>	<i>Manual/rain-fed</i>
<i>peppermint(dried)</i>	<i>Manchester</i>	<i>Short term</i>	<i>Hillside/flat</i>	<i>Manual/rain-fed</i>

Table 14 provides a summary of volumes currently produced along with potential volumes, given agronomic conditions and production costs.

**Table 14: Potential Volume of Production of Selected Products**

<b>Items</b>	<b>Production (tonnes)</b>	<b>Farm gate price/ kilo</b>	<b>Current acreage (ha)</b>	<b>Maximum yield (kg/ha)</b>	<b>Potential volumes kg</b>	<b>Cost of Production \$/kg</b>
<i>Cantaloupe</i>	<i>3,469</i>	<i>108.94</i>	<i>286</i>	<i>17,045</i>	<i>4,874,870</i>	<i>55.00</i>
<i>Bananas</i>	<i>37,200</i>	<i>55.1</i>		<i>19,700</i>	<i>42,000</i>	<i>54.27</i>
<i>Oranges</i>	<i>79,178</i>	<i>209</i>			<i>-</i>	
<i>Callaloo</i>	<i>15,840</i>	<i>68.4</i>	<i>962</i>	<i>45,455</i>	<i>43,727,710</i>	<i>37.00</i>
<i>Papaya</i>	<i>8,382</i>	<i>110.32</i>	<i>413</i>	<i>18,100</i>	<i>7,475,000</i>	
<i>Yams</i>	<i>95,334</i>	<i>136.7</i>	<i>8,390</i>			
<i>Sweet Potatoes</i>	<i>44,224</i>	<i>92.5</i>	<i>2,561</i>			
<i>Irish potato</i>	<i>17,421</i>	<i>135.96</i>	<i>1,050</i>			
<i>Dasheen</i>	<i>15,140</i>	<i>115.15</i>	<i>838</i>			
<i>Cassava</i>	<i>11,621</i>	<i>44.1</i>	<i>617</i>	<i>16,800</i>	<i>20,000,000</i>	
<i>Hot Peppers (W/ Red)</i>			<i>1,161</i>	<i>25,000</i>	<i>9,025,000</i>	<i>78.80</i>
<i>Hot Peppers (Scotch Bonnet)</i>	<i>15,204</i>	<i>208.75</i>				
<i>Escallion</i>	<i>10,841</i>	<i>110.33</i>	<i>1,139</i>	<i>22,500</i>	<i>25,627,500</i>	<i>109.00</i>
<i>Onions</i>	<i>680</i>	<i>146.67</i>	<i>59</i>	<i>22,500</i>	<i>1,327,500</i>	<i>104.00</i>
<i>Ginger</i>	<i>1,198</i>	<i>170.65</i>	<i>248</i>	<i>26,250</i>	<i>6,510,000</i>	<i>51.25</i>
<i>Turmeric</i>	<i>900</i>	<i>88</i>	<i>111</i>	<i>8,108</i>	<i>1,524,141</i>	
<i>Pimento</i>	<i>724</i>	<i>264</i>			<i>724,000</i>	
<i>Lemon grass (dried)</i>	<i>13</i>	<i>1,116.07</i>			<i>26,000</i>	
<i>cerasee(dried)</i>	<i>30</i>	<i>440</i>			<i>40,000</i>	
<i>peppermint(dried)</i>	<i>27</i>	<i>792</i>			<i>50,000</i>	

Table 15 below provides the estimated volume of production and ex-factory prices for these products.

**Table 15: Production Volume of Selected Herbs and Spices-2013**

<b>Product</b>	<b>Part marketed</b>	<b>Production tonnes</b>	<b>Price J\$/lb</b>
<i>Pimento/Allspice</i> <i>Pimento dioica</i>	<i>Berries</i>	724	\$528-\$770/kg
	<i>Leaves</i>	-	\$440/kg
<i>Cerassee</i> <i>Momordica charantia</i>	<i>Plants</i>	30	\$440/kg
<i>Black mint</i> <i>Mentha viridis</i>	<i>Leaves</i>	-	\$330.00
<i>Jamaican peppermint</i> <i>Satureja viminea</i>	<i>Leaves</i>	66	\$360.00
<i>Lemon grass Cymbopogon</i> <i>citrates</i>	<i>Leaves Fresh</i>	70	\$770.00

### 5.1.3 Potential given agronomic conditions for expansion to meet market demand

- **Cantaloupe:** Potential volumes: based on current acreage planted and current yield of 17,045 kg. per hectare, on semi-irrigated land, and with mechanical land preparation technology, a potential volume of 4,874,870 kg is projected.
- **Bananas:** The agronomic conditions in the major banana growing parishes, for the most part, remain suitable for the cultivation of bananas. There has been a small reduction in precipitation in some areas brought about by the effects of climate change and although banana is very sensitive to reductions in rainfall, the overall impact of climate change is not considered to be significant at this time. From an agronomic point of view therefore, the potential to increase production to former levels, for example to 42,000 tonnes for export plus a domestic production of over 80,000 tonnes remains a realistic target.
- **Callaloo:** Yields range from 15,750 kg per hectare to 45,000 kg per hectare. Access to irrigation is a major factor in higher yields, in a suitable location (relatively flat land).
- **Papaya:** Current yields stand at 18,182 kg per hectare, and this is achieved under rain-fed conditions. It is expected that this can be substantially increased if grown under irrigated conditions. The crop is also susceptible to various devastating diseases - for example leaf-pot and ring-spot fungi which have constrained production over the years.

- **Yams:** Analysis of yield data from nine producing areas island- island-wide revealed that yield ranges from a low of 12,500 kg per hectare to a high of 22,500 kg per hectare. The difference in yields is linked to the level of production technology and the application GAP as well soil type and rainfall patterns.
- **Sweet potato:** Analysis of yield data from 13 producing areas island- wide revealed that yield ranges from a low of 11,362 kg per hectare to a high of 37,125 kg per hectare. The difference in yields is linked to the level of production technology being applied as well as to the prevailing agronomic conditions in the different areas. For example, it was observed that in all cases where higher yields were obtained, mechanical methods of land preparation were applied and the crop was irrigated. There are several other areas of technology that will impact yields including the use of improved planting materials as well as improved methods of pest and disease control.
- **Irish potato:** Analysis of yield data from 11 producing areas island- island-wide revealed that yield ranges from a low of 8,295 kg per hectare to a high of 11,364 kg per acre. The difference in yields is linked to the level of production technology being applied. For example, it was observed that in all cases where higher yields were obtained, mechanical methods of land preparation are used. There are several other areas of technology that will impact yields, including the use of improved planting materials as well as improved methods of pest and disease control.
- **Dasheen:** Analysis of yield data from seven producing areas island-wide revealed that yield ranged from a low of 4,091 kg per acre to a high of 28,410 kg per hectare. The difference in yields is linked to the level of production technology and the application GAP as well as to soil type and rainfall patterns.
- **Cassava:** With average yields of 12,000 – 16,800 kg per hectare, and a long tradition of cultivation among farmers, there is potential for increased volumes, provided price incentives are adequate.
- **Hot peppers:** Yields range from 15,000 kg per hectare to 34,090 for West India Red and between 11,250 and 27,500 kg per hectare for the Scotch Bonnet variety. This depends on location, water source and land preparation technology. Production can be increased with access to water, increased acreage in suitable locations and technology (e.g. mechanical land preparation).
- **Escallion:** Current yields of up to 22,500 kg per hectare are reported. The crop requires relatively flat land. There is potential for increased production with irrigation and improved technology (e.g. mechanical land preparation).
- **Onions:** Yields range between 9,000 kg per hectare and 22,500 kg per hectare depending on technology and source of water. Potential for increased production based on improved technology, access to water and additional acreage. GOJ is currently promoting increased production through 'agro-parks'. Production of 1,327 tonnes is projected for 2013 under this scheme.

- **Ginger:** Yields currently range between 4,000 and 10,500 kg per hectare, with manual rain-fed system producing the lower yields while mechanical land preparation produces higher yields, depending on the location. Increased technology and access to water, and increased acreages in suitable lands could increase production. GOJ is currently promoting ginger production with assisted loans and marketing support.
- **Turmeric:** Based on current reported yields of 8,000-25,000 kg per hectare, and current GOJ expansion plans, there is the potential to increase production to at least 1,500 tonnes.
- **Herbs and Spices:** Pimento, herbal teas (lemon grass, cerasee, peppermint). Pimento is a long-term crop and with the current rates of harvesting, production will not increase significantly in the short to medium-term. In the longer-term (10 or more years), sustainable increase in production could be attained with intensive and consistent replanting. Herbal teas have the potential of rapid increase in acreage and volume, especially if grown on a commercial scale.

#### 5.1.4 Cost of production and pricing for products in local markets during 2013

- **Cantaloupe:** Current cost of production is averaging J\$ 55.00 per kg.
- **Bananas:** An average cost of production is provided and is based on the following assumptions that growers produce primarily for the ripening market. A productivity of 10 tonnes per acre is projected and costs include maintenance and delivery to market. Under these assumptions, the cost to establish one acre is calculated at J\$117,800 and the annual operating cost is J\$434,300 per acre. These costs translate to J\$ 21.70/lb or J\$ 868/40lb box.
- **Callaloo:** Production costs range from J\$ 27- J\$ 43 per kg.
- **Papaya:** The current cost of production obtained from three parishes is between J\$ 28 and J\$ 30 per kg.
- **Yams:** Analysis of cost of production data from 9 communities reveals that the cost of production ranged from a low J\$ 24 per kg to a high of J\$ 74 per kg.
- **Sweet potato:** Analysis of cost of production data from 13 communities reveals that the cost of production ranged from a low J\$ 13 per Kg to a high of J\$ 49 per Kg.
- **Irish potato:** Analysis of cost of production data from 11 communities reveals that the cost of production ranged from a low J\$ 31 per kg to a high of J\$ 83 per kg.
- **Dasheen:** Analysis of cost of production data from seven communities reveals that the cost of production ranged from a low J\$ 18 per kg to a high of J\$ 57 per kg.
- **Hot peppers:** Production costs are in the J\$ 44- J\$ 100 per kg range for WI Red and J\$ 64- J\$ 118 for Scotch Bonnet variety.
- **Escallion:** Production costs of J\$ 109 per kg are reported for Manchester farms.
- **Onions:** Production costs range from J\$ 71 per kg and J\$ 104 per kg.
- **Ginger:** Production costs range between J \$ 21 per kg and J\$ 77 per kg.

- **Turmeric:** 2013 Cost of Production data from the MOA Exports Division projects yields of 25,000 kg per hectare, and returns of 59% from a sale of J\$ 30 per kg. There seem to be a general thinking that the price is low, as exporters of fresh turmeric are paying approximately J\$ 60.00 per kg.

#### 5.1.5 Interest by current and potential producers in growing products or increasing supply including conditions for market entry.

- **Cantaloupe:** In response to consumer demand, and attractive prices, farmers in melon-growing regions have adopted the product and increased production over the years. It is not a traditional item produced in Jamaica. At present most of the sales (% of available supplies) are to hotels and supermarkets. Hence the signals point positively to an ongoing strong consumer demand.
- **Bananas:** Jamaica small scale producers respond to prices that provide them a reasonable return for their investment and their effort. The cost and return data show that, ignoring depreciation, the farmer will receive approximately J\$ 191,000 net income per year per acre. This level of net income coupled with the fact that this income is spread relatively evenly throughout the year, allows the farmer to meet day to day household needs (e.g. children's school fees, lunch money, doctor bills). This provides strong incentives for farmers to enter the industry or for existing farmers to increase their supply.
- **Callaloo:** Production and acreage has increased steadily over the years in response to demand from processors, supermarkets, exporters, and restaurants.
- **Papaya:** Papaya is a high value crop with a rapidly growing domestic and export market. Farmers are presently enjoying good prices in an unsatisfied market. These conditions are strong incentives for farmers to expand and/or enter into new production.
- **Yams:** There is a growing export market for the crop and farmers are generally satisfied with the prices paid by exporters. Past experience with the Jamaican small-scale producers has shown that a satisfactory price and an assured market are powerful incentives for the growers to expand or enter into new production.
- **Sweet potato:** There is a growing export market for the crop and farmers are generally satisfied with the prices paid by exporters. Past experience with the Jamaican small-scale producers has shown that a satisfactory price and an assured market are powerful incentives for the growers to expand or enter into new production.
- **Irish potato:** Irish potato is a high value crop in the small-scale farmer farming system. The maturation period is short (3 months). High-yield results make the crop very profitable. Farmers realising reasonable profits over a three to four month period provides strong incentives for farmers to expand or to enter the industry.

- **Dasheen:** There is a growing export market for the crop and farmers are generally satisfied with the prices paid by exporters. Past experience with the Jamaican small-scale producers has shown that a satisfactory price and an assured market are powerful incentives for the growers to expand or enter into new production.
- **Cassava:** The bulk of small farmers' production goes into the parish/municipal markets to meet household consumer demand. Farmers have shown willingness in the past to increase production to meet the demand of agro-processors, but the supply chain has not been effectively organised and farmers have experienced problems with disposing of their produce to agro-processors in one GOJ scheme. Given proper incentives, farmers are willing to increase production of the crop to meet market opportunities.
- **Hot peppers:** Farmers have responded vigorously to the market opportunities over the past ten years, during which production has more than tripled and acreages have more than doubled. This has made hot peppers one of the most important non-traditional agricultural export items.
- **Escallion:** Production has increased by 87% and acreage under cultivation by 69% between 2004 and 2013, indicating ongoing interest of producers in responding to increased market opportunities.
- **Onion:** Traditionally an imported product, acreages have been below 60 hectares though increasing to over 100 hectares in 2012. Farmers are being encouraged to produce this item as part of an import-substitution thrust by the GOJ. To support this trend, GOJ is establishing "agro-parks" across the island, the first of which in the parish of St. Thomas, involves 23 hectares in onion production.
- **Ginger:** This is another crop targeted by GOJ for increased production, with an eye on recapturing Jamaica's traditional niche as a high quality producer in the export market. Acreage increased from 105 to 248 hectares between 2009 and 2013, while production increased from 298 tonnes to 1,198 tonnes.
- **Turmeric:** Turmeric is traditionally grown mainly in the western parishes of Westmoreland and Hanover by small farmers, but is now also the target of GOJ intervention. Production is being administered by the MOA Export Division. Seeking more favourable prices, some farmers direct their sales to the manufacturers of seasonings, where it is a main ingredient in curry.
- **Herbs and Spices:** The GOJ is supporting increased pimento production through maintenance of nurseries and provision of seedlings. As this is a long-term tree crop the degree of interest from producers is not as high as is the case with shorter-term crops. Producers are actively engaged in the market harvesting trees for wood and leaves, as demand exists in the jerk business and in the manufacture of briquettes. The growth of the pharmaceutical and nutraceutical industries and increased demand for herbal teas has prompted some producers to invest in these crops, but levels of output continue to be inadequate to meet the apparent demand for lemon grass, cerasee and peppermint. Processors continue to source most of their requirements from regional or international suppliers.

### 5.1.6 Constraints at the producer level to enter or expand production

- **Cantaloupe:** The product requires relatively flat land, and given limited availability and competing activities, the availability and/or cost of land may become a constraint. Farmers' accessing government lands as in the agro-park scheme may be a part of the solution.
- **Bananas:** Farmers are reporting that the major constraints they face in expanding or entering the industry are related to financing and marketing. As can be seen from Section 4.1.4 above, the cost of establishment and annual maintenance are quite high and unaffordable for this group of farmers. The high cost of maintenance is linked to the high costs of material inputs which are largely imported. The costs of these inputs have increased sharply with the depreciation of the local currency recently. On the marketing constraints, small-scale farmers have never been able to properly market their produce. They do not have the skills and/or the resources to properly carry out this commercial business activity. They are therefore unable to maximise the benefits from the production and overcome the constraints to accessing the resources to increase production.
- **Callaloo:** The crop provides best yields on relatively flat irrigated lands. The limited availability of flat irrigated lands not already pre-empted by traditional crops (e.g. sugar cane), could be a constraint.
- **Papaya:** The rain-fed conditions under which the crop is grown, restricts year round production, thus creating scarcity/shortage during certain months of the year. Also the control and management of the diseases to which the crop is susceptible pose a major challenge to the small-scale producers in particular. Lack of professional skills for the marketing of the product, especially with regards to the small-scale producers, remains a significant challenge for this crop.
- **Yams:** Low levels of production technology linked to land preparation and GAP, as well as the high cost of inputs, impact the cost of production which is the major constraints that farmers are reporting. The rain-fed conditions under which the crop is grown, restricts year round production, thus creating scarcity/shortage during certain months of the year. Also the export market is very demanding on quality and farmers are challenged to meet the required specifications. Lack of professional and skilled marketing of the product is also a constraint facing yam producers generally.
- **Sweet potato:** Sweet potato farmers are plagued with devastating pests and to a lesser extent fungal diseases that are responsible for the reported low yields. In addition, most of the sweet potato is grown under rain-fed conditions. Of the 13 producing areas surveyed, production is carried out under rain-fed conditions. Only in three of these areas was irrigation used. Over the last 10 years, the frequency and duration of droughts have been more than usual. Droughts, pests and diseases are the most important constraints sweet potato growers are reporting at this time.

- **Irish potato:** Low levels of production technology linked to land preparation, and GAP, as well as the high cost of input that impacts cost of production are the major constraints at the producer level. Lack of professional and skilled marketing of the product is also a constraint facing the small-scale Irish potato growers generally.
- **Dasheen:** Low levels of production technology and GAP, as well as the high cost of input that impacts cost of production are the major constraints that farmers are reporting. The rain-fed conditions under which the crop is grown, restricts year round production, creating scarcity/shortage during certain months of the year. Also, the export market is very demanding on quality and farmers are challenged to meet the required specifications. Lack of professional and skilled for marketing of the product is also a constraint facing dasheen producers generally.
- **Hot peppers:** Availability of Land, access to reliable water supplies and capital to invest in technology are the possible constraints for smaller farmers. The high cost of financing is a general constraint on investment.
- **Escallion:** Availability of irrigated lands.
- **Onions:** Availability of irrigated lands to facilitate extensive production to take advantage of economies of scale. Government is attempting to address this through agro-parks, but it is likely that the significant percentage of the demand will continue to be served by imports from more efficient producers abroad.
- **Ginger.** The competitive conditions in the export market have become increasingly competitive with more stringent conditions for market entry. Organization is required at the producer level to revitalize the industry and recapture position as a strong export item. Government is supporting a thrust to increase acreage and production.
- **Turmeric:** As mentioned above, the traditional farmers find the price being offered in the GOJ programme unattractive, and they may prove a disincentive to expand production for the export market.
- **Herbs and Spices:** As noted above, the fact that pimento is a long-term crop that offers little attractiveness of investment for the average farmer and the investment, this product is best coupled with other revenue-generating products (traditionally the case with livestock). Government support for expansion of acreages tends to reduce the level of risk to farmers. In the case of lemon grass, cerasee and peppermint, the absence of an organized supply chain results in insecure markets for farmers. Most processors rely on close relationships with producers to ensure supply of raw materials, and resort to imports.

#### 5.1.7 Conditions under which producers could expand or enter production

- **Cantaloupe:** Increased access to suitable lands, irrigation and application of effective technologies (e.g. mechanical land preparation), improved and more efficient market channels and marketing infrastructure (e.g. central wholesale market facilities).
- **Bananas:** Removal of the financial and marketing constraints will go a long way to creating the conditions for increased production, either by expansion of existing operations or by new acreages coming into production. A reduction in the cost of input

can be achieved by bulk purchase of inputs by the banana farmers' organisation, the All Island Banana Growers Association (AIBGA). Similarly the AIBGA can address the marketing issue by consolidating the farmers' production and by carrying out the various marketing functions on their behalf. While the AIBGA has some experience and some infrastructure to provide these services to the farmers, they presently need institutional strengthening to more effectively carryout these roles.

- **Callaloo:** Increased access to irrigated lands and production technologies.
- **Papaya:** Government and its partners to provide support to remove the constraints identified will create the conditions for expansion.
- **Yams** Government and its partners to provide support to remove the constraints identified will create the conditions for expansion.
- **Sweet potato:** In addition to the removal of the constraints identified above, producers need professional and skilled marketing support to validate the growing of sweet potato as a commercially viable and attractive business venture.
- **Irish potato:** Government and its partners support to remove the constraints identified will create the conditions for expansion.
- **Dasheen:** Government and its partners to provide support to remove the constraints identified will create the conditions for expansion.
- **Cassava:** Increased participation of agro processors in the supply chain will encourage small farmers to service this market under appropriate incentives, such as attractive prices.
- **Hot peppers:** Increased access to irrigated lands, production technologies and financing would encourage more private sector investments in production, as the market opportunities clearly exist.
- **Escallion:** Increased access to irrigated lands and production technologies and financing would encourage more private sector investments in the production, as the market opportunities clearly exist.
- **Onions, Ginger, Turmeric:** Increased acreages and production technology facilitated by GOJ action. As mentioned above, under the 'agro-parks 'programme, GOJ is allocating additional acreage and financing for the expansion of the sector, seeking to encourage private investment.
- **Herbs and Spices:** Pimento, herbal teas: Increased participation of processors in production, working with small farmers could improve the organization of the supply chain and strengthen the contracting system. Large-scale production on irrigated acreage could increase supplies and lead to a reduction of imports. Access to more affordable financing would facilitate this.

### 5.1.8 Character of competition including imports and what is required to be competitive

- **Cantaloupe:** Jamaican cantaloupes have excellent flavour and have been well-received in the market. Imported product provides some competition, but the evidence suggests that there is a consumer preference for the local product, once adequate supplies are available.
- **Bananas:** Locally produced bananas are preferred in the domestic fresh food market. However, periodic shortages and higher prices have meant that imported processed bananas (e.g. banana chips) have taken market shares. The challenge of local green bananas is mainly in the processed snack foods market. Additionally, the supply of ripe banana is dominated by one monopoly and retail prices are therefore artificially high. Increased competition will reduce prices and increase demand for this crop which is vital for small scale poor farmers.
- **Callaloo:** There is no significant competition within the domestic market, once the product is available.
- **Papaya:** Papaya producers face strong competition in the export markets. Increases in productivity and reduction in production costs as well as meeting export quality specifications are the main tools to deal with the competition in the foreign markets. Locally the small-scale producers have to compete with the medium and large scale producers. These larger producers enjoy economies of scale, plus they have the professional skills and resources to market their crop.
- **Yams:** Yellow yam producers face strong competition not only in the domestic market but also in the export markets. Increases in productivity and reduction in production costs as well as meeting export quality specifications are the main tools to deal with the competition, both in the domestic and foreign markets.
- **Sweet potato:** Competition in the domestic market is fierce as there are many farmers island-wide growing the crop. There is also competition with importers. With respect to the competition with imported sweet potato, farmers need to supply adequate quantities all year round to beat the competition. Removal of the constraints cited above will assist greatly in dealing with this competition.
- **Irish potato:** Imported Irish potato provides strong competition to local growers. Availability of supplies and suitable quality are the major competitive edge that importers have over local growers. Local producers need to increase supply throughout the year and to improve marketing efforts in order to be competitive.
- **Dasheen:** Dasheen producers face strong competition in the export markets. Increases in productivity and reduction in production costs, as well as meeting export quality specifications are the main tools to deal with the competition in the foreign markets.
- **Cassava:** Cassava is a traditional carbohydrate widely consumed by Jamaicans in fresh form or, in a processed form (e.g. bammies & cassava chips). Within the domestic market, competing products are other carbohydrates available to consumers which may be used as substitutes, especially when prices are lower. These include rice and flour which are imported or have high import content. As a raw material for agro-processors

(excluding producers of traditional bammy), it competes with imported grains such as wheat and barley. Cost competitiveness is a critical factor.

- **Hot peppers.** There is a marked preference in the domestic market for local West Indies Red and Scotch Bonnet, the two popular varieties. However, these items face competition in the international market from other varieties and producers.
- **Escallion:** Within the domestic market there is a strong preference for the local product. Inadequacy of supplies is the main factor causing processors to turn to imports.
- **Onions:** The local product faces strong competition from imports as imports make up the bulk of onions consumed in Jamaica. These are sourced from countries with more conducive agronomic conditions, better production and post-harvest technologies and larger-scale production. As mentioned above, GOJ is supporting increased local production of the crop. However, the reduction of, rather than the replacement of imports seems to be the more realistic goal.
- **Ginger:** Jamaican ginger is preferred for its flavour, although cheaper imported ginger is being used as a substitute. Once adequate supplies are available, the local varieties will dominate the domestic market. The picture is different for exports though, as Jamaica has lost its traditional dominance as a producer of a premium product as a result of limited supplies over a lengthy period.
- **Turmeric:** While the major turmeric producing countries are in Asia, exporters of fresh turmeric believe that Fiji is their main competition. Fiji exports 70-80% to USA.
- **Herbs and Spices:** Pimento faces little competition due to the specialised nature of the demand. The main problem has been adequacy of supplies. For herbal teas (lemon grass, cerasee and peppermint), inadequate supplies have caused processors to rely on imported materials, which are often competitive with the local product in price.

Table 16 over summarises the export market conditions for each product.

Table 16: Export Market Conditions for Selected Products

<b>PRODUCT</b>	<b>EXPORT MARKET STANDARD</b>	<b>INTERNATIONAL PRICING</b>	<b>INFRASTRUCTURE AND LOGISTICS</b>	<b>CHARACTER OF COMPETITION</b>	<b>TRENDS</b>	<b>WHAT TO DO TO COMPETE</b>	<b>INSTITUTIONS WITH A ROLE IN MARKETING</b>
<b>Bananas</b>	Bananas are currently exported from GLOBALGAP Certified farms in small quantities as green fruit for boiling.	<b>In 2012:</b> 156 tonnes was exported from Jamaica at US\$80-85/kg of this 86% to Cayman Islands. JP currently quotes US\$15/18.2Kg box for export.	Requires permit from Banana Board. Bananas must be from certified farm.  There is adequate sea and air cargo for transportation.	In the banana trade which is for ripe fruit: <b>Ecuador</b> has 24%, and averages US\$0.40/Kg FOB <b>Colombia</b> has 9.5% -US\$0.44/Kg. <b>Costa Rica</b> has 8.2% - US\$0.38/kg  Source :ITC using UN COMTRADE Statistics	- A developing niche of the Caribbean Diaspora is keen on having bananas for boiling.  -peeled chilled	Jamaica is not able to compete in ripe fruit market, but must continue to increase production to satisfy Diaspora and local needs.	Banana Board  Produce Inspection MOA

<b>PRODUCT</b>	<b>EXPORT MARKET STANDARD</b>	<b>INTERNATIONAL PRICING</b>	<b>INFRASTRUCTURE AND LOGISTICS</b>	<b>CHARACTER OF COMPETITION</b>	<b>TRENDS</b>	<b>WHAT TO DO TO COMPETE</b>	<b>INSTITUTIONS WITH A ROLE IN MARKETING</b>
<p><b>Callaloo</b> <i>Amaranthus sp.</i></p>	<p>Leaves and stems free of pest.</p> <p>Employ Good Agricultural Practices (GAPs). Use of approved pesticides in keeping with MRLs Must comply with packaging and labelling regulations. Only approved farms for USA market.</p>	<p>Jamaica 2012 data show export volume of 155,638Kg valued at US\$293,172 FOB Or, US\$1.88/kg.</p>	<p>Main export season October to April. Very heat sensitive and has a short shelf life. Shipped by air. Main available cargo space is to USA gateways, Canada and UK. Compliance with import country regulatory bodies: e.g. for USA: USDA/FDA. Canada: CFIA UK:DEFRA</p>	<p>Communication with importers indicates farmers in Florida are now growing callaloo as an all year crop.</p> <p>Callaloo is used in much the same way, and belongs to the same family as spinach which is a main stream vegetable, while the fresh callaloo market is a niche item. (Note that in Trinidad, dasheen leaf is used as a vegetable called callaloo.)</p>	<p>-Organic production -Fresh cut value add -Vegetable juice. -Canning Ago-processors US\$24.00 FOB/cs of 24 x19oz. Used in hotels and restaurants can substitute for spinach.</p>	<p>No need to aim to compete in the fresh market as the crop is highly perishable, but upgrades production to good food safety levels.</p>	<p>MOA guide to GAPs for crop production JAMPRO for registration. For USA market MOA Plant Quarantine Division must monitor farmer's fields. Produce Inspection. MOA provides overnight chill storage in Kingston for a fee. Importing country regulatory bodies.</p>

<b>PRODUCT</b>	<b>EXPORT MARKET STANDARD</b>	<b>INTERNATIONAL PRICING</b>	<b>INFRASTRUCTURE AND LOGISTICS</b>	<b>CHARACTER OF COMPETITION</b>	<b>TRENDS</b>	<b>WHAT TO DO TO COMPETE</b>	<b>INSTITUTIONS WITH A ROLE IN MARKETING</b>
<b>Yams</b>	<p>Yams must be free of soil, pest &amp; employ GAPs. Use of approved pesticides in keeping with MRLs. Must comply with customs, packaging and labelling regulations of importing country.eg FSMA of USA CFIA of Canada DEFRA of UK</p>	<p>Jamaica's 2012 data shows exports of 10,425 tonnes valued at US\$20.88m FOB or US\$2.00/KG</p> <p>Jamaica exports yellow yams and negro yams all year. Sweet yams and Renta (white yams), from October to May. Data is not broken out by variety as the same tariff code is used for all. Jamaica is a main exporter of yellow yams.</p>	<p>63% of the exports go to the USA. Fumigation treatment is required under the supervision of USDA officer. 21% to Canada 14% to Europe 2% to Cayman Islands</p> <p>Shipments are done by sea and air from Kingston and Montego Bay, MOA has a fumigation facility. Air cargo is easily accessible to UK, USA and Canada but must be pre-booked.</p>	<p>The main competition is white yams. Costa Rica is significant in the market all year. Brazilian and Columbian seem to compete September to December.</p> <p><b>Costa Rica:</b> 0.72/kg FOB 70% to USA, 15%-Europe 4% Canada.  <b>Honduras:</b> 0.40/Kg FOB 57%-Europe, 23%-USA  <b>Brazil:</b> 0.98/Kg FOB 44% -USA, 46%-Europe.  <b>Colombia:</b> 0.84/Kg 88%USA  Source: ITC using UN COMTRADE Statistics</p>	<p>-Packing as minimally processed slices of chilled yams.  -Packed as frozen roots and tubers similar to cassava.  - Dehydrated for rehydration in soups.  -Promotion of yams as high fibre.  -Cereal  -Cheaper white yams are used as substitutes to yellow yams.</p>	<p>Improve productivity, reduce post-harvest losses. Improve storage. GLOBALGAP /HACCP certified exporters can aim for better market penetration by a cross over into main stream export markets by marketing yams for their nutritional value (e.g. Loblaw's) for their Caribbean food category.</p>	<p>Ministry of Agriculture provides facility for fumigation and preclearance arrangement for USA for a fee.</p> <p>Produce Inspection MOA</p> <p>Scientific Research Council.</p>

<b>PRODUCT</b>	<b>EXPORT MARKET STANDARD</b>	<b>INTERNATIONAL PRICING</b>	<b>INFRASTRUCTURE AND LOGISTICS</b>	<b>CHARACTER OF COMPETITION</b>	<b>TRENDS</b>	<b>WHAT TO DO TO COMPETE</b>	<b>INSTITUTIONS WITH A ROLE IN MARKETING</b>
<b>Sweet potato</b>	Exporters indicate that the preferred sweet potato is the red skinned, white to cream flesh varieties. Tubers must be free from weevil damage, all soil removed, no scars or bruising & employ GAPs. Use of approved pesticides in keeping with MRLs. Must comply with customs, packaging and labelling regulations of importing country.	Jamaica's 2012 data shows exports of 1,400 tonnes valued at US\$2.8m or US\$1.98/Kg.  58% to United Kingdom (UK) 36% to Canada 6% to Cayman Islands. Since 2009 percentages to Canada and Cayman Islands have increased, while the UK has decreased. For SPS reasons Fresh Jamaican sweet potato is not allowed in the USA market.	Shipments are done by sea and air from Kingston and Montego Bay. Air cargo space is easily accessible to UK and Canada but must be pre-booked.	2012 Trade data for sweet potato shows: <b>Honduras:</b> US\$0.31/kg FOB with 22% (783 ton )to Canada; 77% (6563 tonnes) to Europe ) i.e. Netherlands, UK, France and Belgium. <b>Brazil:</b> US\$0.64/Kg FOB with 80% (1,500 tonnes) to the UK, and Netherlands and 3 % (52 tonnes) to Canada. There are some similar appearance between the Jamaican and these varieties. Source: ITC using UN COMTRADE Statistics The extent of export into Europe indicates GLOBALGAP certification.	Sweet potato has become a main stream vegetable. The Diaspora in European and North American market place has enabled the presence of a mix of the different types.  Sweet potato is being recognized for its nutritional value: <a href="http://www.unctad.info/en/Infocomm/AACP-Products/COMMODITY-PROFILE---Sweet-potato/">http://www.unctad.info/en/Infocomm/AACP-Products/COMMODITY-PROFILE---Sweet-potato/</a>	Improve productivity, reduce post-harvest losses. Improve storage by curing. With GLOBALGAP /HACCP certified exporters can aim to cross over into main stream export market by marketing sweet potato for their nutritional value (e.g. Loblaw's for their Caribbean food category).	Produce Inspection MOA  Importing country regulatory bodies.

### 5.1.9 Potential volumes and conditions for production

- **Cantaloupe:** Based on current acreages and a maximum yield of 17,045 kg per hectare a potential volume of 4,874,870 kg is projected in the short run.
- **Bananas:** Banana production in 2012 was 47,473 tonnes compared to 46,660 in 2011. The GOJ has secured a grant of €5 million from the European Union to bolster production for local consumption and regional exports. With this intervention and subject to good weather, banana production is expected to move to 100,000 tonnes over the next three years.
- **Callaloo:** A potential volume of 43,727, 710 kg is projected based on current acreage and maximum yields of 45, 455 kg per hectare.
- **Papaya:** Using the area reaped in 2013 of 413 hectares and the highest reported yield in that same year of 18.1 tonnes per hectare, the potential volume under current condition can be estimated at 7,475 tonnes. We note that this is slightly below the MOA estimate of production in that year. Removal of the identified constraints as discussed will result in further increase in this volume.
- **Yams:** Using the area reaped in 2013 of 5,798 hectares and the highest reported yield in that same year of nine tonnes per hectare, the potential volume under current conditions can be estimated at 52,182 tonnes. Removal of the identified constraints as discussed will undoubtedly result in further increase in this volume.
- **Sweet potato:** Using the area reaped in 2013 of 2,561 hectares and the highest reported yield in that same year of 14.8 tonnes per hectare, the potential volume under current condition can be estimated at 37,902 tonnes. Removal of the identified constraints as discussed will undoubtedly result in further increase in this volume.
- **Irish potato:** Using the area reaped in 2013 of 1,050 hectares and the highest reported yield in that same year of 11.3 tonnes per hectare, the potential volume under current condition can be estimated at 11,865 tonnes. Removal of the identified constraints as discussed will undoubtedly result in further increase in this volume.
- **Dasheen:** Using the area reaped in 2013 of 830 hectares and the highest reported yield in that same year of 11.3 tonnes per hectare, the potential volume under current condition can be estimated at 9,379 tonnes. Removal of the identified constraints as discussed will undoubtedly result in further increase in this volume.
- **Cassava:** Based on the GOJs thrust to expand acreage under cultivation, as exemplified by the leasing of 500 acres to a local beer manufacturer, to be brought into production over 18 months, the volume of cassava produced is projected to increase to 20,000 tonnes and acreage under cultivation to over 11,000 ha. The condition for this volume increase is the successful conclusion of the project, now in its pilot stage. This could be an example of a strategy for increasing acreage and volume of a domestic crop through the involvement of the agro-processor in the production of agricultural raw materials. This approach

provides an effective way to encourage suitably organised small farmers to enter the supply chain under appropriate contract arrangements.

- **Hot peppers:** Based on current acreage and maximum yields, the potential volume of production is estimated at 9 million kg.
- **Escallion:** Based on current acreage and maximum yields, the potential volume of production is estimated at 22 million kg.
- **Onions:** Based on current acreage and maximum yields, the potential volume of production is estimated at 1,300 tonnes.
- **Ginger:** Based on current acreage and maximum yields, the potential volume of production is estimated at 6 million kg.
- **Turmeric:** Based on current acreage and maximum yields, the potential volume of production is estimated at 1.5 million kg.
- **Herbs and Spices:** Pimento: based on current trends, pimento production is not projected to increase significantly over the next three years. Volume of production is therefore expected to hover around 700 tonnes. Herbal teas: Based on current production and the assumption of increased acreage, the volume of lemon grass is expected to increase to 26,000 kg, cerasee to 40,000 kg and peppermint to 50,000 kg. This will result in adequate supplies for the domestic agro-processor market.

## 6. DOMESTIC POLICY AND ENABLING ENVIRONMENT OPPORTUNITIES AND CONSTRAINTS

### 6.1 Domestic policies, regulations, and licensing impacting product production and product markets

Table 17 provides a summary of domestic policies, regulations affecting the selected products.

- (1) The table shows that **domestic policy/regulations** affect all products. These policies/regulations include:
  - i. Import permit;
  - ii. Exclusions List;
  - iii. Stamp duties; and
  - iv. Bound tariff (100%)
  
- (2) **Standards:** All items are subject to standards criteria of the International Plant Protection Convention (IPPC) and CARICOM Regional Organisation for Standards and Quality (CROSQ).

Table 17, provides a summary of the domestic policies and enabling environment as well as opportunities and constraints for each product.

**Table 17: Domestic Policy and Enabling Environment Opportunities and Constraints**

<b>PRODUCTS</b>	<b>DOMESTIC POLICY</b>			
	<b>Domestic Policy/Regulations</b>	<b>CET (%)</b>	<b>NTB</b>	<b>Standards</b>
<i>Cantaloupe</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>None, just need to satisfy import permit requirements.</i>	<i>IPPC; CROSQ</i>
<i>Bananas</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>Import prohibitions: Banana (fruits) cannot be imported due to SPS concerns.</i>	<i>IPPC; CROSQ</i>
<i>Oranges</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>Import prohibitions: Orange (fruits) cannot be imported due to SPS concerns.</i>	<i>IPPC; CROSQ</i>
<i>Callaloo</i>	<i>Import permit; Stamp duties;</i>	<i>40</i>	<i>None, just need to satisfy</i>	<i>IPPC;</i>

<b>PRODUCTS</b>	<b>DOMESTIC POLICY</b>			
	<b>Domestic Policy/Regulations</b>	<b>CET (%)</b>	<b>NTB</b>	<b>Standards</b>
	<i>Bound tariff (100%)</i>		<i>import permit requirements</i>	<i>CROSQ</i>
<i>Papaya</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>None, just need to satisfy import permit requirements</i>	<i>IPPC; CROSQ</i>
<i>Yams</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>None, just need to satisfy import permit requirements</i>	<i>IPPC; CROSQ</i>
<i>Sweet Potato</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>None, just need to satisfy import permit requirements</i>	<i>IPPC; CROSQ</i>
<i>Irish Potatoes</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>Free</i>	<i>None, just need to satisfy import permit requirements</i>	<i>IPPC; CROSQ</i>
<i>Dasheen</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>None, just need to satisfy import permit requirements</i>	<i>IPPC; CROSQ</i>
<i>Escallion</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>None, just need to satisfy import permit requirements</i>	<i>IPPC; CROSQ</i>
<i>Onions</i>	<i>Import permit; Exclusions List; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>None, just need to satisfy import permit requirements</i>	<i>IPPC; CROSQ</i>
<i>Turmeric</i>	<i>Import permit; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>Export inspection</i>	<i>IPPC; CROSQ</i>
<i>Mento</i>	<i>Import permit; Stamp duties; Bound tariff (100%)</i>	<i>40</i>	<i>Export restraint arrangement: Pimento exports are subjected to export licensing.</i>	<i>IPPC; CROSQ</i>
<i>Lemon Grass</i>	<i>Import permit; Stamp duties; Bound tariff (100%)</i>	<i>5</i>	<i>Export inspection</i>	<i>IPPC; CROSQ</i>
<i>Cerasee</i>	<i>Import permit; Stamp duties; Bound tariff (100%)</i>	<i>5</i>	<i>Export inspection</i>	<i>IPPC; CROSQ</i>
<i>Peppermint</i>	<i>Import permit; Stamp duties; Bound tariff (100%)</i>	<i>5</i>	<i>Export inspection</i>	<i>IPPC; CROSQ</i>

## 6.2. Institutions that play a role in marketing or production

The institutions that play a role in the marketing or production of the selected products include:

**Ministry of Agriculture:** The MOA has overall responsibility for national policies affecting the selected products, especially relating to regulation research and all and promotion of production. MOA is responsible for: produce inspection for products; guide to GAPs for crop production; for the US market, Plant Quarantine Division must monitor farmer's fields; MOA provides services for certain producers (e.g. for Callaloo overnight chill storage in Kingston for a fee); for yam it provides a facility for fumigation and pre-clearance arrangement for the US for a fee.

### **Divisions and agencies of the MOA have responsibilities relevant to the selected products as follows:**

- The Exports Division is responsible for Pimento, ginger and turmeric.
- Rural Agricultural Development Agency (RADA) provides extension services to farmers island-wide.
- Agricultural Investment Corporation (AIC) is currently promoting production of targeted crops through 'agro-parks', working in partnership with the private sector. Production expansion programmes are currently underway for onion working with a large importer; land has been leased to a manufacturer of beer for the production of cassava.

### **Other Government Institutions include:**

- Ministry of Industry, Investment and Commerce
- JAMPRO is responsible for the registration of exporters
- Jamaica Bureau of Standards
- Ministry of Foreign Affairs - administers foreign trade agreements
- Importing Country Regulatory Bodies

### **Producers' Organizations include:**

- Banana Board, all-Island banana Growers' Association (AIBGA)
- Jamaica Agricultural Society (JAS)
- Christiana Potato Growers' Association
- Yam Farmers' Association

### **Private Sector Organizations include:**

- Jamaica Exporters' Association (JEA)
- Jamaica Agro Processors Association (JHTA)
- Jamaica Hotel and Tourist Association

### 6.3. Common external tariffs, customs and duties impacting product

As shown in Table 18, Common External Tariff (CET) of 40% of (CIF) applies for imports of most items, except:

- Herbal teas (cerasee, lemon grass, and peppermint) attract 5%; and
- Irish potato is tariff and duty free.

#### 6.3.1 Other non-tariff barriers for product

- Non-tariff barriers (NTBs) do not apply, except for:
- Import prohibitions - banana and oranges (fruit) cannot be imported due to SPS concerns.
- Turmeric, and Herbal teas (i.e. cerasee, lemon grass and peppermint), are subject to Export inspection.
- Export restraint arrangement - pimento exports are subjected to export licensing.

#### 6.3.2 Other enabling environment factors

##### Government Agricultural Policies

Government policies target the agricultural sector as a priority area for economic growth. The GOJ, through the MOA has undertaken a number of initiatives aimed at promoting production of the selected products, including the 'agro-parks' programme. Under this programme some 3,237 hectares (8,000 acres) of land are to be engaged in the production of targeted crops in five parishes:

- Plantain Gardens and Yallahs, St Thomas
- Amity Hall and Hill Run, St. Catherine
- Ebony Park and Spring Plain in Clarendon
- New Forest/Duff House, St Elizabeth/Manchester
- Ettingdon, Trelawny and Meylersfield in Westmoreland

#### 6.3.3 Factors Influencing Products Access to Regional Markets

Table 18 over, provides a summary of the main factors influencing products access to regional markets.

**Table 18: Intra - Regional/International Policy and Enabling Environment Factors Influencing Products Access to Regional Markets**

<b>PRODUCTS</b>	<b>INTRA-REGIONAL/INTERNATIONAL POLICIES/MEASURES</b>				
	<b>Domestic Price (US\$/kg)</b>	<b>International Price (US\$/kg)</b>	<b>Regional / International Standard</b>	<b>NTB Regional Markets</b>	<b>NTB International Markets</b>
<i>Cantaloupe</i>		0.86	<i>CROSQ; IPPC</i>	<i>Import licenses; Technical measures</i>	<i>None, provided SPS requirements of export market is satisfied</i>
<i>Bananas</i>	0.95 (doz)	1.74	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>None, provided SPS requirements of export market is satisfied</i>
<i>Oranges</i>	2.77	1.61	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>None, provided SPS requirements of export market is satisfied</i>
<i>Callaloo</i>	0.77		<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>None, provided SPS requirements of export market is satisfied</i>
<i>Papaya</i>	2.14	3.35	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>None, provided SPS requirements of export market is satisfied</i>
<i>Yams</i>	1.78	2.16	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>None, provided SPS requirements of export market is satisfied</i>
<i>Sweet Potato</i>	1.56	2.38	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>Not on USDA APHIS pre- clearance list for Jamaica</i>
<i>Irish Potatoes</i>	2.26	0.94	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>Not on USDA APHIS pre- clearance list for Jamaica</i>
<i>Dasheen</i>	0.02	2.44	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>None, provided SPS requirements of export market is satisfied</i>
<i>Escallion</i>	2.58	2.74	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>None, provided SPS requirements of export market is satisfied</i>

<b>PRODUCTS</b>	<b>INTRA-REGIONAL/INTERNATIONAL POLICIES/MEASURES</b>				
	<b>Domestic Price (US\$/kg)</b>	<b>International Price (US\$/kg)</b>	<b>Regional / International Standard</b>	<b>NTB Regional Markets</b>	<b>NTB International Markets</b>
<i>Ginger</i>	3.94	7.17	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>Not on USDA APHIS pre-clearance list for Jamaica</i>
<i>Turmeric</i>		1.67	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>None, provided SPS requirements of export market is satisfied</i>
<i>Pimento</i>		4.39	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>Not on USDA APHIS pre-clearance list for Jamaica</i>
<i>Lemon Grass</i>		2.00	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>Not on USDA APHIS pre-clearance list for Jamaica</i>
<i>Cerasee</i>		1.00	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>None, provided SPS requirements of export market is satisfied</i>
<i>Peppermint</i>		2.50	<i>CROSQ; IPPC</i>	<i>Import licenses</i>	<i>Not on USDA APHIS pre-clearance list for Jamaica</i>

#### 6.3.4 Intra-Regional Policy and Enabling Environment Factors influencing producers to service intra-regional markets

##### **Regional Standards and harmonization prospects for the product**

All regionally-produced fresh agricultural produce are subject to CARICOM Regional Organization for Standards and Quality (CROSQ) certification, and International Plant Protection Convention (IPPC) phyto-sanitary criteria also apply. Common external tariffs, customs duties on importing products and intra-regional trade are not normally subject to customs duties.

##### **Other non-tariff barriers**

Possible NTBs that may affect regional products include import licenses and technical measures. These are administered by the MOA. For international markets, there are no NTBs for the products selected, but Sanitary/Phyto-Sanitary (SPS) requirements of export markets should be satisfied. Certain products (e.g. ginger, pimento, lemon grass and peppermint) are not on the USDA APHIS Pre-clearance list for Jamaica. Table 18 provides a summary of relevant intra-regional trade policies for each product.

##### **Infrastructure and logistics**

For bananas, there is adequate sea and air cargo for transportation. For yam, 63% of the exports go to the USA. Fumigation treatment is required under the supervision of USDA officer. Twenty one per cent (21%) of exports go to Canada; 14% to Europe; and 2% to Cayman Islands. Shipments are done by sea and air from Kingston and Montego Bay where the MOA has a fumigation facility. Air Cargo is easily accessible to UK, USA and Canada but must be pre-booked.

##### **Policy environment influence**

The policy environment supports regional sourcing of products by virtue of the CET and regional coordination of standards under IPPC and CROSQ. Fresh produce may therefore be imported into the island to meet the existing demand if supplies are available regionally. This is subject to the current domestic policy and regulation framework, such as the issue of import permits and other possible NTBs.

#### 6.3.5 Character of competition and what is required to be competitive

**Ginger:** The quality and flavor of this product is recognized as probably the best in the world. The cost of production however, must be reduced for it to be internationally competitive.

**Lemon Grass:** Need to significantly increase production in a controlled environment to ensure the best quality. The cost factors associated with this product are relatively low meaning that it can compete with imports.

**Cerasee:** Need to significantly increase production in a controlled environment to ensure the best quality. The cost factors associated with this product are relatively low meaning that it can compete with imports.

**Peppermint:** Need to significantly increase production in a controlled environment to ensure the best quality. The cost factors associated with this product are relatively low meaning that it can compete with imports.

### 6.3.6 For Products identified by Exporters, Extra-Regional factors that will influence the supply of products by producers

Table 18 before, shows intra-regional and international policies and measures that may impact the selected products. The data shows the products that are identified as having the best potential for export as well as highlighting the factors influencing their selection. These products are bananas, callaloo, yam, sweet potato, dasheen, ginger and pimento.

#### Export market standards

Table 18 also shows that all products are subject to IPPC standards for international export markets. CROSQ is also applicable for the intra-regional market.

#### International pricing

Table 18 shows a comparison of domestic and international prices for selected products. The table indicates that at prevailing prices for the following products, Jamaica is price-competitive: papaya; yams; sweet potato; dasheen; scallion; and ginger. It also demonstrates that for some products (oranges and Irish potatoes), Jamaica is not price competitive.

#### Infrastructure and logistics

For bananas, there is adequate sea and air cargo for transportation. For **yam**, 63% of the exports go to the USA. Fumigation treatment is required under the supervision of a USDA officer. Twenty one per cent (21%) of exports go to Canada, 14% to Europe and 2% to Cayman Island. Shipments are done by sea and air from Kingston and Montego Bay where the MOA has a fumigation facility. Air Cargo is easily accessible to UK, USA and Canada but must be pre-booked. For callaloo, the main export season is from October to April. Callaloo is very heat sensitive and has a short shelf life so is shipped by air. Main available cargo space is to USA gateways, Canada and UK. Compliance with import country regulatory bodies are required (e.g. USA - USDA/FDA; Canada - CFIA; UK - DEFRA).

### 6.3.7 Character of international competition and what is required to be competitive

**Bananas:** Jamaican bananas are not able to compete with those of lower-priced producers to the European market. Initiatives are currently being undertaken by the GOJ to increase banana exports to niche markets in the UK, Canada, Trinidad and Tobago and the wider Caribbean.

**Yams:** The targeted consumer in the external markets is the Diaspora, who is very loyal to the Jamaican product. However to cross over into other markets, farmers would need to adopt the 'minisett' technique as well as reduce the cost of production.

**Sweet Potato:** A new variety of sweet potato has been identified which is said to have tremendous potential in the UK market. This variety will complement the current one produced in Jamaica, which is already doing well in the markets of the UK and Canada.

**Dasheen:** The targeted consumers in the external markets are the Diaspora who is very loyal to this Jamaican product.

**Ginger:** The quality and flavor of this product is recognized as probably the best in the world; the cost of production however is high and must be reduced for it to be internationally competitive.

**Pimento:** The demand for this product is high internationally due to its high quality and rich flavor. However, production levels must be significantly increased for it to realize its true potential.

### ***Other factors***

There are no NTBs, provided SPS requirements of export market are satisfied.

**Table 19: Products Identified by Exporters, Extra-Regional Factors that will Influence the Supply of Products by Producers**

<b>PRODUCTS</b>	<b>PRODUCTS IDENTIFIED AND FACTORS THAT INFLUENCE THEIR CHOICE</b>			
	<b>Crops with best export Prospect</b>	<b>Character of competition</b>	<b>Quality/Standard</b>	<b>Other</b>
<i>Cantaloupe</i>		<i>Jamaica does not currently export this crop; trade data indicates significant imports particularly for the hotel sector.</i>		<i>Import substitution opportunity exists for local producers.</i>
<i>Bananas</i>	✓	<i>Niche, within the EU, Canada and markets now opening within the Caribbean.</i>	<i>Exporters reported no issue with quality/standards as the products is able to enter targeted markets without any problem.</i>	<i>Not able to compete in wider EU market with Latin-produced bananas.</i>
<i>Oranges</i>		<i>Niche, within the US, Canada and major export to Barbados.</i>	<i>No quality issues reported by exporters.</i>	
<i>Callaloo</i>	✓	<i>Main markets are the US and Canada</i>		
<i>Papaya</i>		<i>This product is exported to US, and a number of European countries.</i>	<i>No reported quality issues for the markets to which it is exported.</i>	<i>This is a crop that requires significant initial investment and maintenance cost. It is not a small farmer crop.</i>
<i>Yams</i>	✓	<i>Non- traditional agricultural export with the largest value; targets the Diaspora in the markets of the US, UK and Canada.</i>	<i>Exporters must ensure that they do not exceed the maximum residue limit (MRL) established particularly by the USDA authorities.</i>	
<i>Sweet Potato</i>	✓	<i>Targets Diaspora in the markets of the UK and Canada, a new variety is currently being considered for increased export to the UK.</i>	<i>As a result of the presence of <i>cylas formicarius</i> in Jamaica this crop is not allowed in the markets of the US, Barbados and Trinidad and Tobago. Efforts continue to address this problem with a view to get in into the markets of CARICOM.</i>	

<b>PRODUCTS</b>	<b>PRODUCTS IDENTIFIED AND FACTORS THAT INFLUENCE THEIR CHOICE</b>			
	<b>Crops with best export Prospect</b>	<b>Character of competition</b>	<b>Quality/Standard</b>	<b>Other</b>
<i>Dasheen</i>	✓	<i>Targets particularly the Diaspora markets in the US, UK and Canada.</i>	<i>No quality/standards issue reported.</i>	
<i>Escallion</i>		<i>Currently not a major export with minimal volume of export to the markets of the UK, Canada and some Caribbean countries.</i>		<i>This is not a product that is targeted for export; it is used mainly as a raw material for value addition which is then exported.</i>
<i>Onions</i>		<i>This crop is not currently being exported; the crop is however one which is target for increased local production with a view to reducing imports and provide opportunities to local farmers.</i>		<i>This crop provides opportunity for producers on the local market.</i>
<i>Ginger</i>	✓	<i>The export potential of this crop is not being realized.</i>	<i>Currently there is the issue of obtaining clean planting material.</i>	<i>Some exporters indicate that the product might not be price competitive notwithstanding its superior quality.</i>
<i>Turmeric</i>		<i>Currently not a major export item, but identified as one with tremendous potential for future growth.</i>		
<i>Pimento</i>	✓	<i>Pimento (allspice) is a major export item to countries such as the US, UK, Germany, Netherlands and many Caribbean countries. There is significant room for growth for the crop.</i>	<i>No quality issues identified.</i>	

## 7. RECOMMENDATIONS FOR PARTNERS AND PRODUCTS

### 7.1. Buyers and Products with the best potential

#### High Potential Buyers

**Agro Processors:** face growing demand, and chronic under-supply of domestic agricultural inputs, leading to reliance on imports.

**Exporters:** Unfilled export opportunities in product areas where Jamaica has competitive advantages.

**Hotels:** Growing demand because of steady growth of the industry and current reliance on imports for some fresh produce.

**Supermarkets:** Steady demand for fresh produce that meet standards of grade, appearance and packaging in keeping with consumer needs.

#### Products

Based on market opportunities and potential for sustainable increases in supplies, the following fresh produce are identified as having high potential: cantaloupe; callaloo; papaya; Irish potatoes; scallion; bananas; yams; sweet potato; dasheen; ginger; turmeric; lemon grass; cerasee; and peppermint.

#### 7.1.1 Conditions required to make the products competitive

- Improved quality of products.
- Lower production costs. Enterprise-level actions to increase productivity. An issue is the need to reduce the rising cost of inputs, which are mostly imported.
- Improved efficiency of supply chains and marketing of produce.
- Government actions: policies and programmes to strengthen agricultural producers through increased access to suitable lands, water supplies, and improved production and post-harvest technologies; increased capacity of farmers' organizations to market produce on behalf of small-scale farmers and to comply with food safety and other relevant standards. Increased access to affordable financing; increased and improved services provided to farmers (e.g. research & development and extension services).

#### 7.1.2. Conditions to build sustainable linkages between buyers and producers

- Improved market information, market intelligence and ongoing market research.
- Improved contacts and communication between buyers and sellers and other interested stakeholders (e.g. financial sector).
- Improved market infrastructure.
- Increased involvement of buyers (e.g. agro processors) in the supply chain (e.g. through backward integration and contract arrangements).
- Government facilitation of increased and improved linkages.

## 7.2 Recommendations for Partners and Products

### Partners

- Improve application of agricultural planning (e.g. crop zoning).
- Increase local production of imported produce (i.e. import substitution).
- Training of farmers (e.g.: in agronomic practices & water management to deal with drought conditions, carrying out GAP standards); Better transportation handling in field crates instead of bags from harvesting to delivery to avoid damage; Improve producers' capacity to meet required standard specifications.
- Strengthen farmers' organizations to reduce input costs and to support the marketing of farmers produce.
- Improved quality of agricultural produce including growing varieties most suitable for export.
- Measures to reduce the effects of seasonality and shortage of supply.
- Support to mitigate the vagrancies' of the weather in the rain-fed farming system.
- Support for research to develop and/or introduce improved varieties.
- Increased processing and storage of agricultural raw materials to facilitate year-round supplies.
- Measures to lower cost of raw materials to processors, through more efficient production of agricultural raw materials.
- Possible options to lower ex-factory prices will include: GAP with a view to improve yields and reduce post-harvest losses; Organize farmer groups to encourage the consolidation of high volume produce utilising economies of scale; Group marketing of raw materials to reduce handling and transportation costs;
- Marketing infrastructure (e.g. improve condition of parish markets to provide a cleaner environment; and
- Facilitate increased farmers' access to financing.

### Products

Products targeting Domestic HVM buyers

- **Cantaloupe:** Increase acreages and improve access to irrigation and technology e.g. mechanical preparation, as those factors lead to increased yields.
- **Oranges:** Increase acreages; rehabilitation of orchards; research and development; disease control
- **Callaloo:** Increased farmers' access to flat lands, irrigation and mechanical land preparation.
- **Papaya:** Increased acreage
- **Irish Potatoes:** Continue programmes to increase acreages and yields and lower costs and improve varieties; organizations of producers
- **Escallion:** Increased acreage, access to flat land, irrigation
- **Onions:** Increase acreages, access to irrigation, production technology

## Products Targeting Export markets

- **Bananas:** Initiatives currently been undertaken by GOJ to increase banana exports to markets in the UK, Canada, Trinidad and Tobago and the wider Caribbean.
- **Yams:** The targeted consumer in the external markets are the Diaspora, who are very loyal to the Jamaican product; however to cross over into other markets farmers would need to adopt the 'minisett' technique as well as reduce the cost of production.
- **Sweet Potato:** A new variety of sweet potato has been identified; this variety is said to have tremendous potential in the UK market; this new variety will complement the current one which is already doing well in the markets of the UK and Canada.
- **Dasheen:** The targeted consumers in the external markets are the Diaspora, who is very loyal to this Jamaican product.
- **Ginger:** The quality and flavor of this product is recognized as probably the best in the world; the cost of production must however be reduced for it to be internationally competitive.
- **Turmeric:** Government is promoting production through technical and financial support. Price incentives to farmers should be reviewed in the context of efficient operation, to increase producer support.
- **Pimento:** The demand for this product is high internationally due to its quality and flavor. However, production levels must be significantly increased for it to realize its true potential.
- **Lemon Grass:** Need to significantly increase production in a controlled environment to ensure the best quality. The cost factors associated with this product are relatively low; it can therefore competitive with imports.
- **Cerasee:** Need to significantly increase production in a controlled environment to ensure the best quality. The cost factors associated with this product are relatively low; it can therefore competitive with imports.
- **Peppermint:** Need to significantly increase production in a controlled environment to ensure the best quality. The cost factors associated with this product are relatively low; it can therefore competitive with imports.

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Sources supplied by Consultants:

Reference databases used for the study: (e.g. CFNI, USDA, PAHO.org, and Nutritiondata.self.com) and current (2013) tourism statistics supplied by the Jamaica Tourist Board.

Analysis of the Jamaican Fresh Agricultural Produce Industry (Jamaica Social Investment Fund); European Union All ACP Commodities Programme Caribbean Region Jamaican Agriculture Sub-Sector Strategy Fruits & Vegetables, Herbs & Spices, Roots & Tubers (international Trade Centre)