

# INVESTMENT PROFILE FOR MANGO

August 2021



# AGRO-INVEST

## AGRO-INVESTMENT CORPORATION

Promoting and Facilitating Agri-Business Investments



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## LIST OF ACRONYMS

FAO - Food and Agriculture Organization of the United Nations

FAOSTAT - Food and Agriculture Organization Corporate Statistical Database

GOJ - Government of Jamaica

ITC - International Trade Center

JMD - Jamaican Dollars

MICAF - Ministry of Industry, Commerce, Agriculture and Fisheries

STATIN - Statistical Institute of Jamaica

U.K. - United Kingdom

USA/U.S. - United States of America



USD - United States Dollars

USDA - United States Department of Agriculture

USDA APHIS - United States Department of Agriculture, Animal and Plant Health  
Inspection Service

## Product Profile

Table 1: Product Profile for Mango

<p>St. Julian 'Julie' Mango</p> 	<p><b>Botanical Name and Origin:</b> The mango (<i>Mangifera indica</i>) has its origins in South East Asia and was introduced to Jamaica in the 18th century.</p> <p><b>Species:</b> There are 41 species with 17 of them bearing fruit fit for human consumption. There are over 150 cultivars inclusive of 3 varieties namely:</p> <ol style="list-style-type: none"> <li>1. The St. Julian mango most commonly called 'Julie', is a medium-sized fruit and is somewhat flat on one side and the flesh is partially fibreless.</li> <li>2. The Tommy Atkins mango has an oblong-oval shape. Its size ranges from medium to large.</li> <li>3. The East Indian Mango is of medium size and has an oval shape. The skin of the mango is usually green in colour with a red or yellow colour.</li> </ol>																																																																								
<p>Tommy Atkins Mango</p> 	<p><b>Nutritional Value:</b></p> <table border="1"> <thead> <tr> <th>Principle</th> <th>Nutrient Value</th> <th>Percentage of RDA</th> </tr> </thead> <tbody> <tr> <td>Energy</td> <td>70 Kcal</td> <td>3.50%</td> </tr> <tr> <td>Carbohydrates</td> <td>17 g</td> <td>13%</td> </tr> <tr> <td>Protein</td> <td>0.5 g</td> <td>1%</td> </tr> <tr> <td>Total Fat</td> <td>0.27 g</td> <td>1%</td> </tr> <tr> <td>Cholesterol</td> <td>0 mg</td> <td>0%</td> </tr> <tr> <td>Dietary Fiber</td> <td>1.80 g</td> <td>4.50%</td> </tr> <tr> <td>Vitamins</td> <td></td> <td></td> </tr> <tr> <td>Folates</td> <td>14 µg</td> <td>3.50%</td> </tr> <tr> <td>Niacin</td> <td>0.584 mg</td> <td>3.50%</td> </tr> <tr> <td>Pantothenic acid</td> <td>0.160 mg</td> <td>1%</td> </tr> <tr> <td>Pyridoxine (vit B-6)</td> <td>0.134 mg</td> <td>10%</td> </tr> <tr> <td>Riboflavin</td> <td>0.057 mg</td> <td>4%</td> </tr> <tr> <td>Thiamin</td> <td>0.058 mg</td> <td>5%</td> </tr> <tr> <td>Vitamin C</td> <td>27.7 mg</td> <td>46%</td> </tr> <tr> <td>Vitamin A</td> <td>765 IU</td> <td>25.50%</td> </tr> <tr> <td>Vitamin E</td> <td>1.12 mg</td> <td>7.50%</td> </tr> <tr> <td>Vitamin K</td> <td>4.2 µg</td> <td>3.50%</td> </tr> <tr> <td>Electrolytes</td> <td></td> <td></td> </tr> <tr> <td>Sodium</td> <td>2 mg</td> <td>0%</td> </tr> <tr> <td>Potassium</td> <td>156 mg</td> <td>3%</td> </tr> <tr> <td>Minerals</td> <td></td> <td></td> </tr> <tr> <td>Calcium</td> <td>10 mg</td> <td>1%</td> </tr> <tr> <td>Copper</td> <td>0.110 mg</td> <td>12%</td> </tr> </tbody> </table>	Principle	Nutrient Value	Percentage of RDA	Energy	70 Kcal	3.50%	Carbohydrates	17 g	13%	Protein	0.5 g	1%	Total Fat	0.27 g	1%	Cholesterol	0 mg	0%	Dietary Fiber	1.80 g	4.50%	Vitamins			Folates	14 µg	3.50%	Niacin	0.584 mg	3.50%	Pantothenic acid	0.160 mg	1%	Pyridoxine (vit B-6)	0.134 mg	10%	Riboflavin	0.057 mg	4%	Thiamin	0.058 mg	5%	Vitamin C	27.7 mg	46%	Vitamin A	765 IU	25.50%	Vitamin E	1.12 mg	7.50%	Vitamin K	4.2 µg	3.50%	Electrolytes			Sodium	2 mg	0%	Potassium	156 mg	3%	Minerals			Calcium	10 mg	1%	Copper	0.110 mg	12%
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### East Indian Mango



Iron	0.13 mg	1.50%
Magnesium	9 mg	2%
Manganese	0.027 mg	1%
Zinc	0.04 mg	0%
Phyto-nutrients		
Carotene-β	445 µg	—
Carotene-a	17 µg	—
Crypto-xanthin-β	11 µg	—
Lutein-zeaxanthin	0 µg	—
Lycopene	0 µg	—

Source: USDA 2019

**Medicinal Uses:** The ripe fruit has diuretic and laxative properties.

**By-Products:** Purée, juice, pickles, chutney and flakes, squash, raw slices in syrup or brine, pickles, curries, candies, fruit bars, salsas, and sorbets in syrup or brine, concentrate and puree, jam, mango wafer, mango powder, dehydrated mango slices, and mango milk powder.

## Crop Production

**Cost of Production:** A 20.24 ha (50-acres)mango farm is a highly viable proposition. A summary is given in the table 12 (See Appendix).

**Table 2: Revenue Projections for a 20.24 Ha (50-acres) Mango Orchard**

		Revenue Projections									
		YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10
Estimated Output (kg / ha)	Yield (50 acres/20.4 Ha)	\$ -	\$ -	\$ 138,441.60	\$ 179,974.08	\$ 207,662.40	\$ 269,981.36	\$ 311,513.84	\$ 404,982.16	\$ 404,982.16	\$ 467,260.64
Estimated Farmgate Price (1\$/ kg)	Price per KG	\$ 125.00	\$ 125.00	\$ 125.00	\$ 125.00	\$ 125.00	\$ 125.00	\$ 125.00	\$ 125.00	\$ 125.00	\$ 125.00
<b>Estimated Gross Revenue/sales</b>	<b>Total Revenue</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$17,305,200.00</b>	<b>\$22,496,760.00</b>	<b>\$25,957,800.00</b>	<b>\$33,747,670.00</b>	<b>\$38,939,230.00</b>	<b>\$50,622,770.00</b>	<b>\$50,622,770.00</b>	<b>\$58,407,580.00</b>
Operating Cost		\$ 18,572,261.20	\$ 1,645,937.04	\$ 2,404,086.96	\$ 2,307,582.64	\$ 2,579,810.64	\$ 2,607,498.96	\$ 3,111,980.96	\$ 3,125,015.52	\$ 3,159,868.80	\$ 3,163,127.44
<b>Net Income</b>		<b>\$ (18,572,261.20)</b>	<b>\$ (1,645,937.04)</b>	<b>\$14,901,113.04</b>	<b>\$20,189,177.36</b>	<b>\$23,377,989.36</b>	<b>\$31,140,171.04</b>	<b>\$35,827,249.04</b>	<b>\$47,497,754.48</b>	<b>\$47,462,901.20</b>	<b>\$55,244,452.56</b>
operating margin				14%	10%	10%	8%	8%	6%	6%	5%

Source: RADA (2021)

### Project Viability:

**Net Margin:** Under favorable conditions, investors can expect average a margin of 92% over the 10 years.

**Internal Rate of Return (IRR):** The viability of the project is assessed in Table 2 above over a period of 10 years. The IRR works out to 59%.

**Net Present Value (NPV):** The NPV of the project is positive (\$121 million JMD) which suggests that the investment is worthwhile using a 10% discount rate.

**Suitable Locations:** Suitable locations for commercial mango production are in the parishes of St. Catherine, St. Elizabeth, Clarendon, and St. Thomas.

**Drainage:** Good drainage is required and sufficient nutrient supply is necessary for good crop production for Mangoes.

**Reap:** Mangoes are considered to be alternate bearing. This means that the tree will produce more fruit every other year (Agricultural Marketing Resource Center 2018).

**Harvesting Methods:** Using a picking rod with a netted pouch can reduce the damage of Mangoes when harvesting. This method of harvesting will mitigate the physical damages that is usually associated with defective harvesting methods of mangoes.

**Post-harvest handling:** Mangoes are commonly arranged in corrugated fibre board boxes. The mangoes are packed in single layer 8 to 20 fruits per box. The boxes ought to have an adequate number of air gaps to permit good ventilation.

#### **Disease Control:**

- Fruit fly traps
- Field sanitation / removal of damaged mangoes
- Insecticidal Sprays
- Treatment with either hot water treatment T102a or irradiation T105 150gy for fruit flies

**Intercropping:** Investors can practice intercropping with other fruits and vegetable to provide income during the first two years of the Mango Orchard. Suitable vegetable crops such as cabbage, cauliflower, tomato, potato, cucumber, pumpkin can be grown as intercrops.

### **Market Opportunities and Challenges**

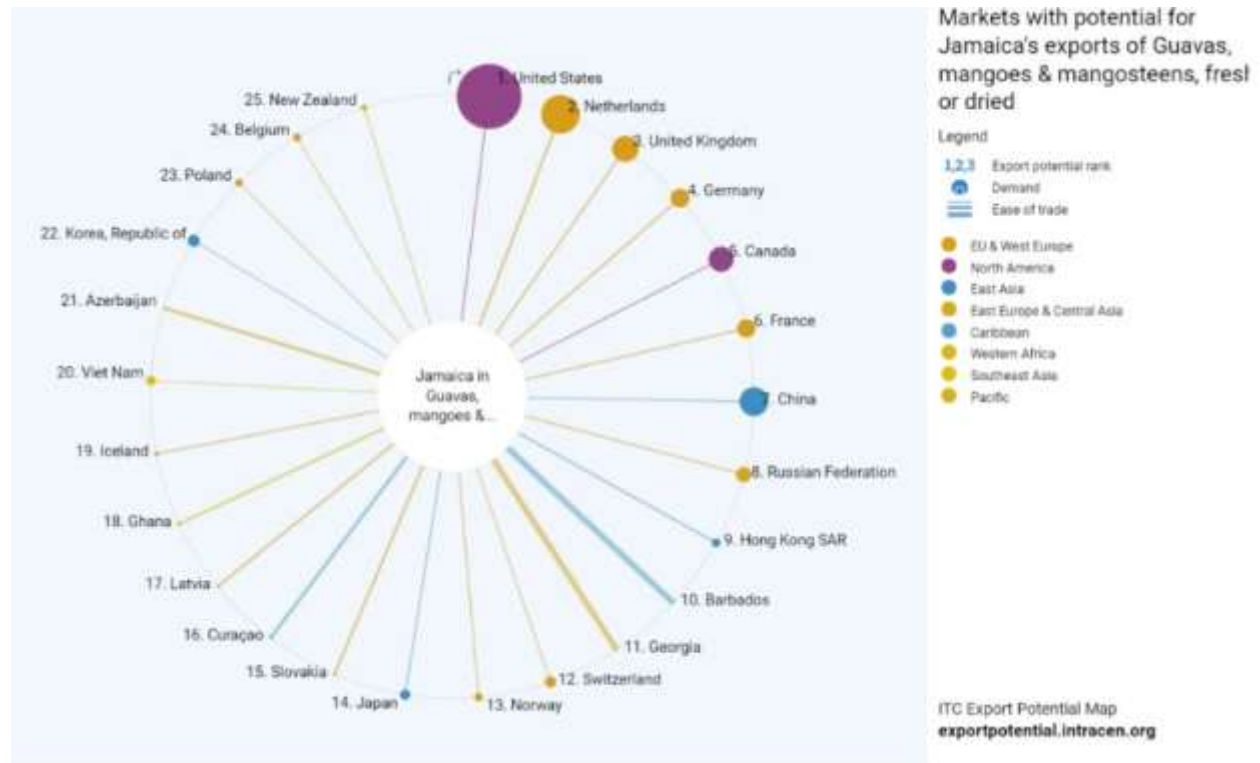
**Export Potential:** Mangoes fall under the International Harmonised System code 08045040, comprising of “Guavas, mangoes and mangosteens, fresh or dried”. The markets with greatest potential for Jamaica’s exports of mangoes are the Netherlands, U.S. and U.K (See Figures 1 and 2).

Based on data from the ITC (2021), the U.S. market has the highest demand potential for mangoes. The total untapped export potential of Guavas, mangoes & mangosteens, fresh or dried stands at \$ US 3 billion.



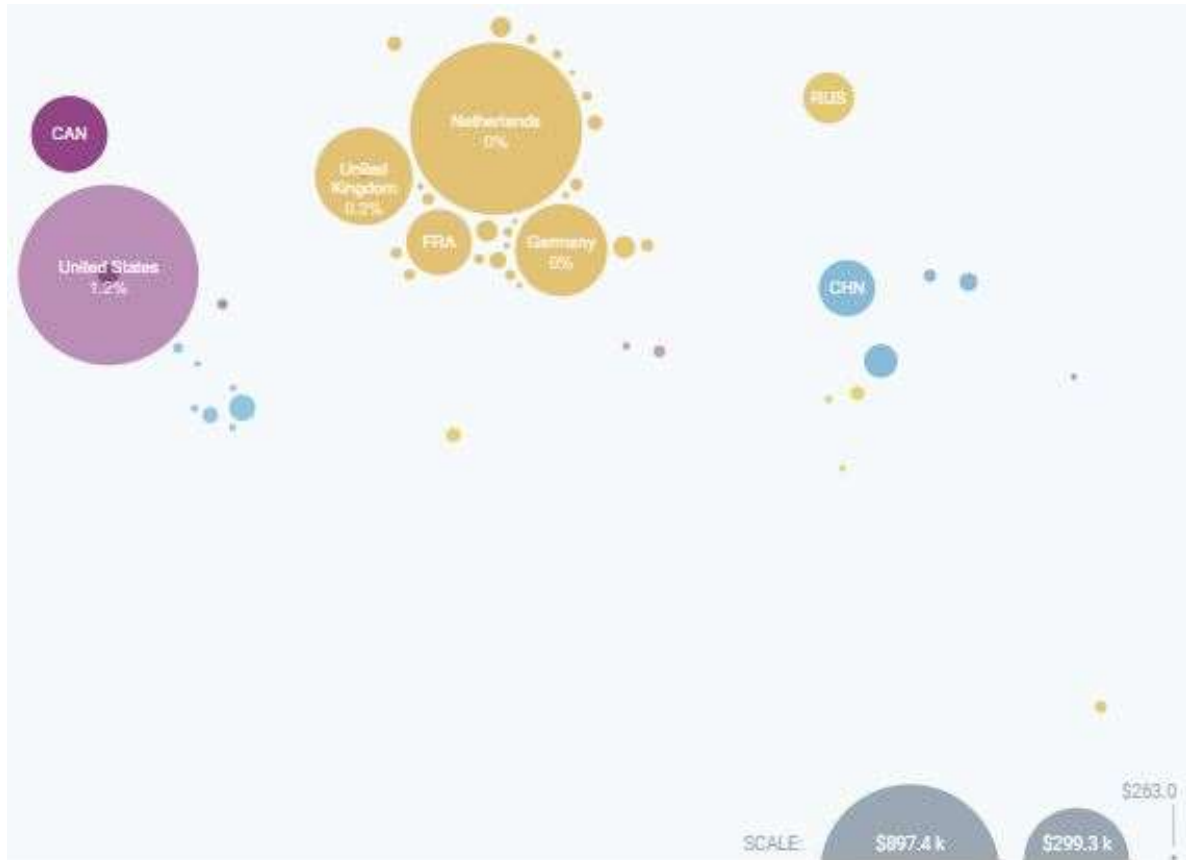
For investors to successfully take advantage of this market it requires several key components: pricing to remain competitive and profitable, good sales and marketing strategy, using attractive packaging similar other exporting countries and having a nearly all year-round presence in the market.

Figure 1: Markets with the Greatest Potential for Jamaica’s Exports of Mangoes



Source: ITC (2021)

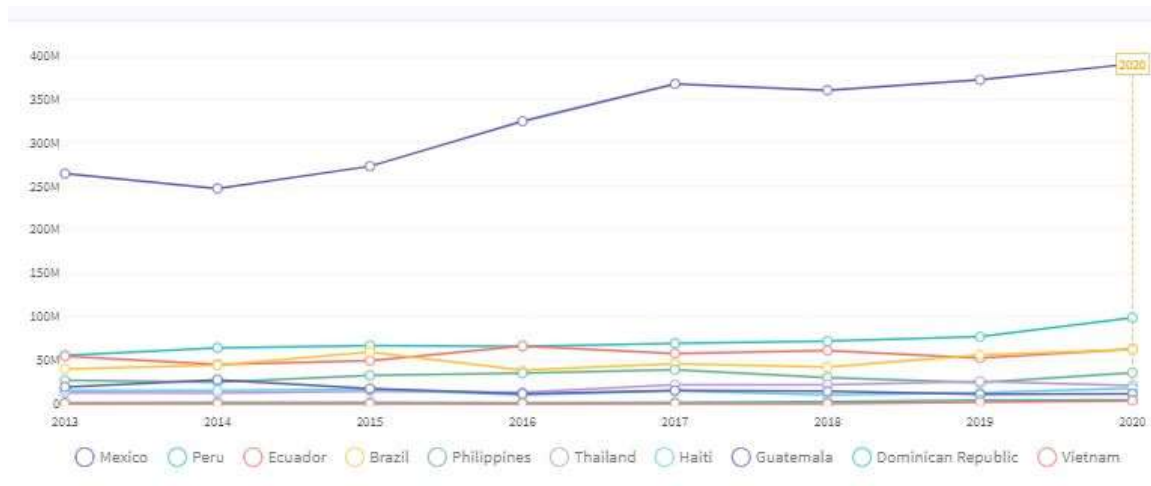
Figure 2: Market with the Greatest Potential for Jamaica’s Exports of Mangoes



Source: ITC (2021)

United States, Netherlands and United Kingdom. United States shows the largest absolute difference between potential and actual exports in value terms, leaving room to realize additional exports worth \$897.4 k..

Figure 3: Mangoes: US Import Sources



Source: Tridge (2021)

According to data by Tridge (2021) Mexico is the largest importer of Mangoes to the United States of America accounting for 54.39% of the import market. Other top importers are Peru and Ecuador with 13.75% and 8.73% respectively.

**Standards:** Mangoes must be produced and handled under the necessary sanitary and hygienic processes. These sanitary and phytosanitary measures therefore requires pest and disease free mangoes. Investors must ensure that mangoes produced are of the highest quality.

USDA-APHIS requires treatment of the mangoes by irradiation or hot water immersion. Fruits must be submersed in hot water at 45-48 °C for 90 minutes (See Table 3). Other precautionary measures include:

1. Mangoes must be produced in orchards in accordance with a systems approach employing a combination of mitigation measures for certain fruit flies, soft scale insects, and diseases.
2. Mango shipments will be inspected prior to exportation from Jamaica.
3. Mangoes have to be exported in commercial consignments only.
4. Mangoes must be accompanied by a phytosanitary certificate.

Table 3: Hot Water Treatment Time for Various Size Mangoes

Count (Mangoes/Box)	Weight (Grams)	Treatment Time (minutes)
6-8	571 - 700	90
9-12	376 - 570	75
14 - 18	Up to 375	65

Source: FAO “Mango Value Chain Analysis And Market Access Strategy” (2015)

According to a study entitled ‘Mango Value Chain Analysis and Market Access Strategy for Jamaica’ (2015), the estimated cost of HWT Plant = US\$ 300,000 which gives an amortized cost of US\$ 4,434 per month with full year-round utilization.

**Tariffs applied by United States of America:**

**Table 4: Tariffs applied by the U.S to Jamaica**

Product description	Tariff regime	Applied tariff (as reported)	Applied tariff (converted)	Total ad valorem equivalent tariff
Guavas, mangoes, and mangosteens, fresh, if entered during the period September 1 through May 31, inclusive	MFN duties (Applied)	6.6 cents/kg	66.00 \$/Ton	0.02454
Guavas, mangoes, and mangosteens, fresh, if entered during the period September 1 through May 31, inclusive	Preferential tariff for GSP countries	0	0	0
Guavas, mangoes, and mangosteens, fresh, if entered during the period September 1 through May 31, inclusive	Preferential tariff for CBI countries	0	0	0

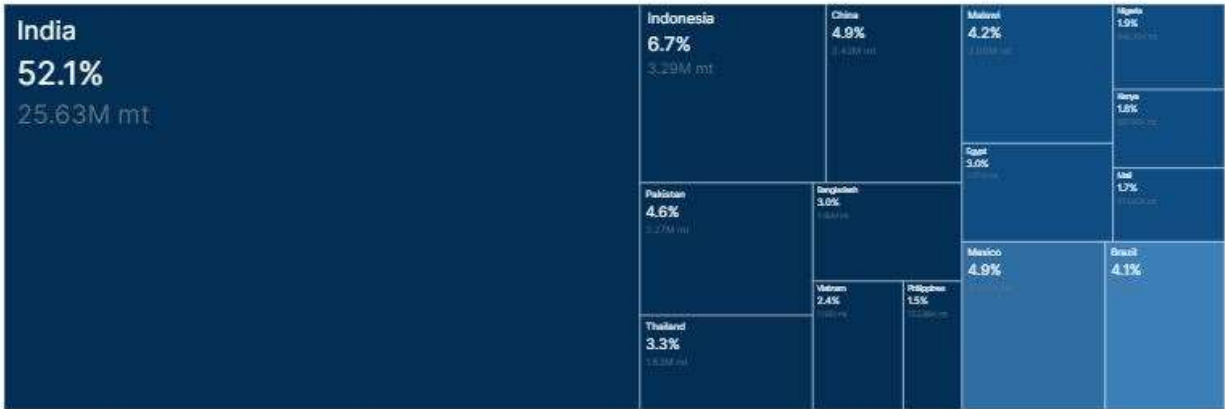
Source: ITC (MAcMap) 2021

## Market Analysis

### World Production

Mango is produced in most regions of the world. According to Tridge (2021), India is the largest producer, accounting 45.89% of the world production (25.63 million MT) followed by Indonesia (3.29 million MT) and China (2.42 million MT) in 2019.

Figure 4: Top 10 Producers of Mangoes Globally

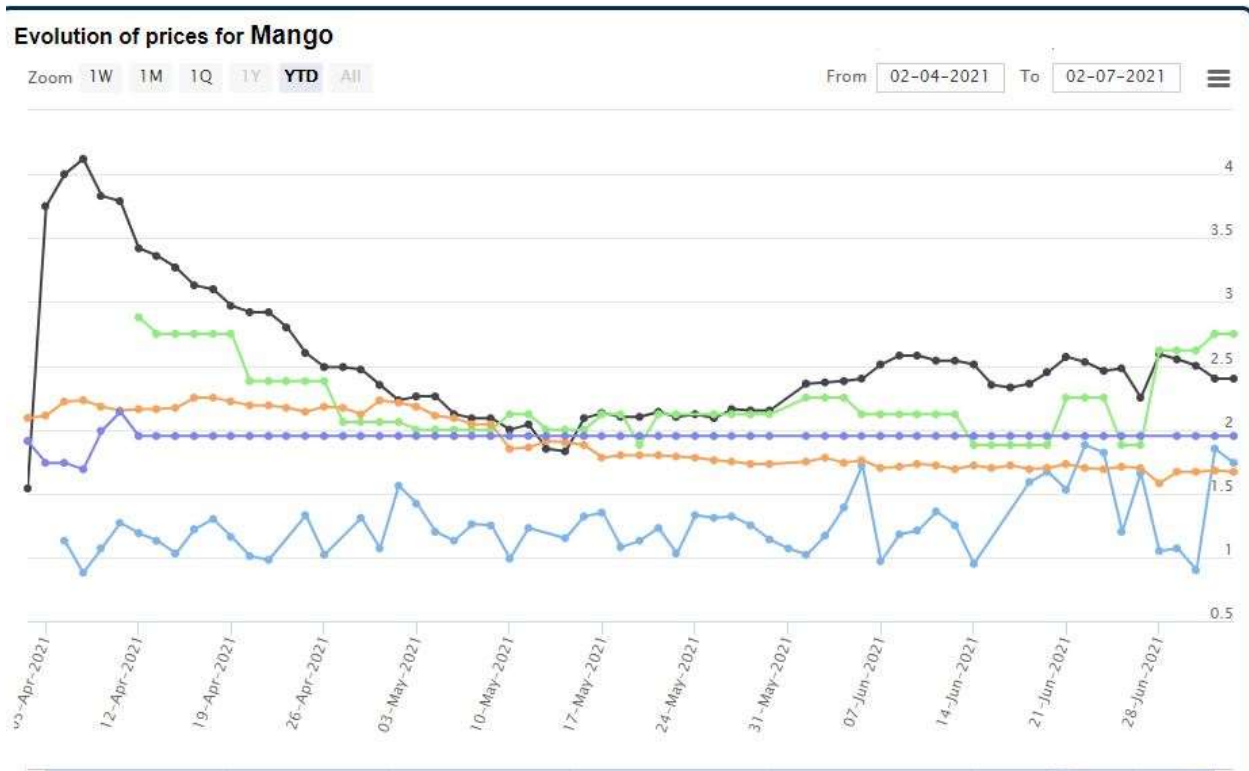


Source: Tridge (2020)

### Market Prices

According to ITC (2021), the average retail price for mangoes in the U.S. are 2.41 USD/kg with the lowest price being 1.67 USD/kg and highest at 3.93 USD/kg.

Figure 5: Evolution of Prices for Mangoes



Source: ITC (2021)

According to 2021 data from the ITC, the average retail price for Mango was US \$2.41.

### World Export Characteristics

Jamaica's export value of 080450 - Fruit, edible; guavas, mangoes and mangosteens, fresh or dried amounted to US\$ 16,678 in 2019.

**Table 5: Exports from Jamaica to USA of 080450 - Fruit, edible; guavas, mangoes and mangosteens, fresh or dried**

Year	Quantity	Units	Value (\$ USD)	Unit Value (\$ USD)	Annual Growth In Value (%)
2016	5,131	Weight in kilograms	10,407	2.03	
2017	5,160	Weight in kilograms	11,511	2.23	10.61
2018	272	Weight in kilograms	576	2.12	-95.00
2019	8,561	Weight in kilograms	16,578	1.94	2,778.13

Source: Caribbean Export Intelligence Portal (2019)

### Jamaica Exports to the World

The total exports of Mangoes for 2020 was 291,312kg and was valued at US\$623,190 with Canada being the largest importer of mangoes from Jamaica. (See Table 6 and Figure 6). Canada imported US\$512,395 worth of mangoes.

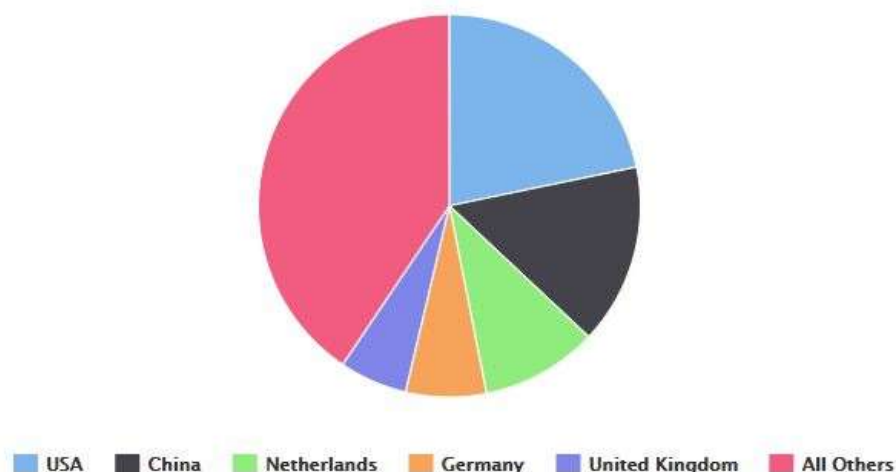
**Table 6: Jamaica's Export of Mangoes in 2020 (Preliminary)**

Description	kg	J\$	US\$	Country	Year
Mangoes fresh or naturally dried	286	71,433	497	Cambodia (Democratic Kampuchea)	2020
Mangoes fresh or naturally dried	245,100	72,453,741	512,395	Canada	2020
Mangoes fresh or naturally dried	250	91,000	653	St. Maarten (Dutch part)	2020
Mangoes fresh or naturally dried	42,445	12,729,898	90,907	United States of America	2020
Mangoes artificially dried	1,663	508,449	3,533	Canada	2020
Mangoes otherwise prepared or preserved whether or not containing added sugar or other sweetening matter or spirit not elsewhere specified or included.	1,039	731,895	4,993	Barbados	2020
Mangoes otherwise prepared or preserved whether or not containing added sugar or other sweetening matter or spirit not elsewhere specified or included.	516	1,381,032	9,536	Canada	2020
Mangoes otherwise prepared or preserved whether or not containing added sugar or other sweetening matter or spirit not elsewhere specified or included.	100	34,600	253	St. Maarten (Dutch part)	2020
Mangoes otherwise prepared or preserved whether or not containing added sugar or other sweetening matter or spirit not elsewhere specified or included.	14	63,495	423	United States of America	2020
<b>Total</b>	<b>291,412</b>	<b>88,065,543</b>	<b>623,190</b>		

Source: STATIN (2020)

Figure 6: Top 5 Importers of Jamaican Mangoes in 2020

Top 5 importers of 080450 – Fruit, edible; guavas, mangoes and mangosteens, fresh or dried across the World



Source: Caribbean Export Intelligence Portal (2021)

Table 7: Mango Variety of Jamaica's Export in 2020

Mango Type	Quantity (Boxes)	Weight (KG)
East Indian	2,449.00	10,933.00
St. Julian	6,147.00	27,622.00

Source: Plant Quarantine/Produce Inspection Division (2021)

### World Import Characteristics

Table 8 below shows the total mango imports for the period of 2020. The total imports for this period were 6,056.50kg.

Table 8: Jamaica's Total Mango Imports in 2020

Description	kg	J\$	US\$	Country	Year
Mangoes artificially dried	109.07	27,705.09	197.303195	United States of America	2020
Mangoes otherwise prepared or preserved	96.00	64,157.54	452.86303	Belgium	2020
Mangoes otherwise prepared or preserved	5,851.43	3,737,872.59	26736.6125	United States of America	2020
	<b>6,056.50</b>	<b>3,829,735.21</b>			

Source: STATIN (2020)

The Total value of imports in the World for Mangoes in 2020 amounted \$ US 3,400,232,368.

**Table 9: Global Mango Imports for the period of 2016-2020**

Year	Quantity	Units	Value (\$ USD)	Unit Value (\$ USD)	Trade Balance (\$ USD)
2016	1,659,070,747	Weight in kilograms	2,538,647,167	1.53	-174,266,772
2017	1,760,213,783	Weight in kilograms	2,875,756,500	1.63	20,474,013
2018	1,950,382,384	Weight in kilograms	3,186,370,930	1.63	-212,625,765
2019	2,177,910,626	Weight in kilograms	3,682,428,079	1.69	-228,720,483
2020	2,039,662,915	Weight in kilograms	3,400,232,368	1.67	-375,343,710

Source: Caribbean Export Intelligence Portal (2021)

### USA Imports from World

In 2019, USA imported 518,228,020 Kg of mangoes from across the world which amounted to \$ US 658,241,335.

**Table 10: U.S. Mango Imports for the period of 2016-2019**

Year	Quantity	Units	Value (\$ USD)	Unit Value (\$ USD)	Annual Growth In Value (%)
2016	464,793,034	Weight in kilograms	583,375,614	1.26	-545,846,943
2017	508,634,555	Weight in kilograms	655,949,819	1.29	-614,724,471
2018	500,466,560	Weight in kilograms	637,294,335	1.27	-597,060,532
2019	518,228,020	Weight in kilograms	658,241,335	1.27	-606,569,762

Source: Caribbean Export Intelligence Portal (2021)

## Financial Opportunities for Investment

**Table 11: Financial Opportunities for Investment in Agriculture in Jamaica**

Provider	Finance Type	Amount Lower Limit	Amount Upper Limit	Currency
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Development Bank Of Ja Ltd	Grant	Not Specified	\$300,000.00	USD
Development Bank Of Ja Ltd	Loan Commercial	Not Specified	Not Specified	USD
Development Bank Of Ja Ltd	Loan Commercial	Not Specified	Not Specified	USD
First Global Bank Ltd	Loan Commercial	Not Specified	Not Specified	USD
U W I Credit Union Co-operative Society	Loan Commercial	Not Specified	Not Specified	USD
Inter-American Dev Bank	Equity	Not Specified	\$5,000,000.00	USD
Inter-American Dev Bank	Loan Commercial	Not Specified	\$5,000,000.00	USD
EXIM Bank	Loan Commercial	\$8,455.22	\$500,000.00	USD
St Catherine Co-Op Credit Union Ltd	Loan Commercial	Not Specified	\$200,000.00	USD
Access Financial Services Ltd	Loan Commercial	Not Specified	\$150,000.00	USD
Access Financial Services Ltd	Loan Commercial	\$30,000.00	Not Specified	USD
Access Financial Services Ltd	Loan Commercial	\$10,000.00	\$100,000.00	USD
Development Bank Of Ja Ltd	Loan Government	Not Specified	\$15,000,000.00	JMD
Development Bank Of Ja Ltd	Loan Government	Not Specified	\$15,000,000.00	JMD
Development Bank Of Ja Ltd	Loan Government	Not Specified	\$5,000,000.00	JMD
Development Bank Of Ja Ltd	Loan Government	Not Specified	\$500,000.00	JMD
Development Bank Of Ja Ltd	Loan Government	Not Specified	\$5,000,000.00	JMD
Development Bank Of Ja Ltd	Loan Government	Not Specified	\$2,500,000.00	JMD
Development Bank Of Ja Ltd	Loan Government	Not Specified	\$5,000,000.00	JMD
Development Bank Of Ja Ltd	Grant	Not Specified	\$300,000.00	JMD
Development Bank Of Ja Ltd	Loan Government	\$50,000,000.00	\$500,000,000.00	JMD
EXIM Bank	Loan Government	Not Specified	\$2,000,000.00	JMD
EXIM Bank	Loan Government	Not Specified	\$62,000.00	JMD
First Global Bank Ltd	Loan Commercial	Not Specified	\$30,000,000.00	JMD
National Commercial Bank Ja Ltd	Loan Commercial	Not Specified	\$30,000,000.00	JMD
National Commercial Bank Ja Ltd	Loan Commercial	Not Specified	\$7,500,000.00	JMD
National Commercial Bank Ja Ltd	Loan Commercial	Not Specified	\$5,000,000.00	JMD
JN Small Business Loans Ltd	Loan Commercial	Not Specified	\$5,000,000.00	JMD
JN Small Business Loans Ltd	Loan Commercial	\$30,000.00	\$1,000,000.00	JMD
JN Small Business Loans Ltd	Loan Commercial	Not Specified	\$150,000.00	JMD
JN Small Business Loans Ltd	Loan Commercial	\$30,000.00	\$1,000,000.00	JMD
JN Small Business Loans Ltd	Loan Commercial	\$1,000,000.00	\$5,000,000.00	JMD

Scotia Ja Microfinance Co Ltd	Loan Commercial	\$60,000.00	Not Specified	JMD
Access Financial Services Ltd	Loan Commercial	Not Specified	\$100,000.00	JMD
Access Financial Services Ltd	Loan Commercial	\$100,000.00	\$500,000.00	JMD
Access Financial Services Ltd	Loan Commercial	\$500,000.00	\$1,000,000.00	JMD
Access Financial Services Ltd	Loan Commercial	Not Specified	\$30,000.00	JMD
Bank Of Nova Scotia Ja Ltd The	Loan Commercial	Not Specified	\$500,000.00	JMD
Bank Of Nova Scotia Ja Ltd The	Loan Commercial	\$500,000.00	\$5,000,000.00	JMD

Source: Caribbean Export Intelligence Portal (2019)

## Appendix

Table 12: Detailed Cost of Production for a 20.24 ha (50 acres) one hectare Mango Orchard

			<b>Cost of Production Estimates for a 20.4 Hectare Mango Farm</b>									
<b>Item</b>	<b>UOM</b>	<b>Quantity (Each)</b>	<b>Total (\$)</b>	<b>Yr. 2</b>	<b>Yr. 3</b>	<b>Yr. 4</b>	<b>Yr. 5</b>	<b>Yr. 6</b>	<b>Yr. 7</b>	<b>Yr. 8</b>	<b>Yr. 9</b>	<b>Yr. 10</b>
<b>Labour Operations:-</b>												
Land Preparation			3,036,000.00									
Head trenches/maint.			212,520.00	56,672.00	56,672.00	56,672.00	56,672.00	56,672.00	56,672.00	56,672.00	56,672.00	56,672.00
Line & peg			70,840.00									
Dig holes			121,440.00									
Apply manure			291,456.00									
Head & drop plants			72,864.00									
Plant & stake			72,864.00									

Apply fertilizer			30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00
Apply herbicide			30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00	30,360.00
Apply slugbait			30,360.00	30,360.00	30,360.00	-	-	-	-	-	-	-
Apply pesticide			-	-	28,336.00	28,336.00	28,336.00	28,336.00	28,336.00	28,336.00	28,336.00	28,336.00
Prune plants			113,344.00	113,344.00	113,344.00	113,344.00	113,344.00	113,344.00	113,344.00	113,344.00	113,344.00	113,344.00
Harvest produce			-	-	113,344.00	113,344.00	113,344.00	113,344.00	113,344.00	113,344.00	113,344.00	113,344.00
Transport to farmgate & market			-	-	404,800.00	404,800.00	607,200.00	607,200.00	1,012,000.00	1,012,000.00	1,012,000.00	1,012,000.00
Irrigation labour			607,200.00	607,200.00	607,200.00	607,200.00	607,200.00	607,200.00	607,200.00	607,200.00	607,200.00	607,200.00
<b>Sub - total</b>			<b>4,689,608.00</b>	<b>868,296.00</b>	<b>1,414,776.00</b>	<b>1,384,416.00</b>	<b>1,586,816.00</b>	<b>1,586,816.00</b>	<b>1,991,616.00</b>	<b>1,991,616.00</b>	<b>1,991,616.00</b>	<b>1,991,616.00</b>
<b>Material Inputs:-</b>												
Pegs	40.00	2,448.00	97,920.00									
Seedlings	70.00	2,448.00	291,456.00									
N.P.K fertilizer	8,000.00	4.54	31,169.60	61,489.12	109,093.60	136,012.80	162,932.00	187,017.60	215,353.60	226,688.00	252,190.40	255,024.00
Manure	6,500.00	4.54	34,003.20	34,003.20	34,003.20							
Slugbait	1,500.00	4.54	42,504.00	42,504.00	42,504.00							
Fungicide			-	-	34,003.20	34,003.20	34,003.20	34,003.20	34,003.20	34,003.20	34,003.20	34,003.20

Insecticide			-	-	31,169.60	31,169.60	31,169.60	31,169.60	31,169.60	31,169.60	31,169.60	31,169.60
Herbicide			60,720.00	60,720.00	60,720.00	60,720.00	60,720.00	60,720.00	60,720.00	60,720.00	60,720.00	60,720.00
<b>Sub - total</b>			<b>557,772.80</b>	<b>198,716.32</b>	<b>311,493.60</b>	<b>261,905.60</b>	<b>288,824.80</b>	<b>312,910.40</b>	<b>341,246.40</b>	<b>352,580.80</b>	<b>378,083.20</b>	<b>380,916.80</b>
<b>Equipment:-</b>												
Knapsack Sprayer & Mist Blower			238,000.00									
Irrigation Equipment (on farm drip)			11,498,344.00									
<b>Sub - total</b>			<b>11,736,344.00</b>					-				
<b>Other Costs:</b>												
Land Charges			499,928.00	499,928.00	499,928.00	499,928.00	499,928.00	499,928.00	499,928.00	499,928.00	499,928.00	499,928.00
Supervision			1,088,608.40	78,996.72	177,889.36	161,333.04	204,241.84	207,844.56	279,190.56	280,890.72	290,241.60	290,666.64
<b>Sub - total</b>			<b>1,588,536.40</b>	<b>578,924.72</b>	<b>677,817.36</b>	<b>661,261.04</b>	<b>704,169.84</b>	<b>707,772.56</b>	<b>779,118.56</b>	<b>780,818.72</b>	<b>790,169.60</b>	<b>790,594.64</b>
<b>TOTAL</b>			<b>18,572,261.20</b>	<b>1,645,937.04</b>	<b>2,404,086.96</b>	<b>2,307,582.64</b>	<b>2,579,810.64</b>	<b>2,607,498.96</b>	<b>3,111,980.96</b>	<b>3,125,015.52</b>	<b>3,159,868.80</b>	<b>3,163,127.44</b>

Source: MICAF (2021)