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EXPORT MARKET ACCESSMENT

Global Quality & Standard Programme - Vietnam

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Acronyms

ACIAR	Australian Centre for International Agricultural Research
Agro-Trade	Agro Processing and Market Development Authority, Vietnam
AMIA	Australian Mango Industry Association
APHIS	Animal and Plant Health Inspection Service
AQSIQ	Administration of Quality Supervision, Inspection and Quarantine of the PRC
CNF	Cost & Freight
CBI	The Centre for the Promotion of Imports from developing countries
CIF	Cost, Insurance & Freight
CRCNA	The Cooperative Research Centre for Developing Northern Australia
EU	European Union
FAO	Food and Agriculture Organisation
FOB	Free on Board
GAIN	Global Agricultural Information Network
GQSP	Global Quality and Standards Programme
HWT	Hot Water Treatment
MARD	Ministry of Agriculture and Rural Development
MRD	Mekong River Delta
MRLs	Maximum Residue Levels
NMB	National Mango Board, Florida, USA
SECO	State Secretary for Economic Affairs, Switzerland
SENASA	National Service of Agrarian Health, Peru
SIAEP	Sub-Institute of Agricultural Engineering and Post-Harvest Technology
SMEs	Small & Medium Enterprises
SPS	Sanitary and Phytosanitary
UNComtrade	United Nations International Trade Statistics
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
USA	United States of America
USDA	United States Department of Agriculture
VHT	Vapour Heat Treatment
WTO	World Trade Organization

Introduction

The assessment of the potential for export in different markets was conducted with an extensive review of the existing literature relevant to the mango market and of numerous online news articles published by sector media like FreshPlaza, AsiaFruit, CHOICE, Taste Australia, Asia Pacific Mango Network, etc.

A survey on the field was organized and conducted by SIAEP through person-to-person interviews with 20 exporters and 5 mango processors. The outcomes were incorporated in the analysis of the export markets and recommendations. A brief summary of the responses of 20 exporters is attached at the end the report.

Contacts were established with Vietnamese Embassies in the main export countries, with Vietnamese institutions delegated to promote the export and with Agro-Trade, through the UNIDO country office in Vietnam, to collect available information and data on the mango exportmarkets.

The mango industry associations Australia Mango Industry Association-AMIA and National Mango Board-NMB in the USA were also contacted. Interviews by telephone with tropical fruit consultants and importers were organized. Due to the present international travel limitations, it was not possible to conduct on the field surveys.

The mango sector in Vietnam is characterised by small scale farmers, large volume, low-value production; by a supply-chain with limited links to processing and export. Small-scale farmers that belong to a cooperative are able to access more resources, have better market connections and outcomes measurement, thereby achieving a higher level of inclusion. However, trust and commitment amongst members is still weak. (SIAEP direct communication)

As regards the mango export, Vietnam recorded almost 160,000 tons in 2019 (UN Comtrade) which is equal to 20% of the total production, if we assume that the production in 2019 was the same as in 2018 (crops data from FAO for 2019 are not available yet). This percentage is well beyond the global average export rate which was 4.2% in 2018, indicating the dynamism of the Vietnamese export industry. Presently 95% of the mangoes exported goes to China, through informal cross-border trade. The remaining 5% is scattered in small quantities amongst different markets (mainly regional).

This study analysed the reasons behind the success story of the export to China, identified the pros and cons of this important business and stressed the potential risks represented by the progressive introduction of more stringent requirements, as declared by the Chinese competent authorities recently¹. The study assessed the potential business opportunity in other markets, both with strict or mild requirements, to foster the export to countries other than China and thus

¹ China tightens veggie and fruit import requirements for Vietnam, VOV -Monday, 08/19/2019, Agriculture exporters suffer as China rules tighten, By Thi Ha VN Express International July 1, 2019, China tightens veggie and fruit import requirements for Vietnam, CustomsNews, 19/08/2019

diversify the present unbalanced export pattern.

This study will complement the analysis of the mango value chain in the Mekong River Delta and of food safety requirements adopted by different export markets.

As in many other countries producing mango, also in Vietnam the production is ensured by thousands of small-sized farmers. Half of them are located in the Mekong River Delta. Improving mango competitiveness, both for the domestic and export markets, would result in improved incomes for these farmers, thus creating concrete poverty alleviation opportunities.

COVID-19

Possible impact on consumers' behaviour towards tropical fruits

At the time of writing this report the COVID-19 pandemic has only slowed down in Asia and Europe, with some worrying new cases of contagion in several European countries and it is still rampant in the American continent, India and in Africa.

COVID-19 has turned the world upside down. Every aspect of our lives has been affected. How we live and interact with one another, how we work and communicate, how we move around, and travel are still big question marks. The pandemic has caused a global health emergency and a global economic slowdown. Trade, investment, growth, and employment are all affected. Countries have lost business and jobs. Europe has approved an unprecedented, massive financial support to the economies of its state members.

The Aviation industry is facing its greatest crisis ever in history. A dramatic shock impacted the labour markets with the biggest employment decline since WWII. The global manufacturing growth, which was already decelerating in 2019 due to the trade tensions among dominant economies, is expected to further decline due to economic disruptions triggered by COVID-19. Tourism is facing an unprecedented challenge. Some scenarios point to declines of 60% to 80% in international tourist arrivals for the year, depending on the speed of the containment, the duration of travel restrictions and shutdown of borders²² (UN World Tourism Organization). Crops and tropical fruit production and their export structure and dynamics were not exempted. All actors along the value chain in the supplying countries had to deal with extra costs: recruit more people, reorganize shifts, ensure labour safety in particular at farms and packing levels. In addition, extra cost for specific sanitation of the facilities between shifts.

Furthermore, the logistics: inland transportation and the frequency of the commercial flights will be less than last year, and the cost will be higher, which is having an impact on the regularity of the supplies (essential for the high-end market distribution) and on the final cost at destination. Lower incomes and supply chain disruptions suggests that total merchandise trade will likely fall between 13 to 32 percent in 2020 (FAO Biannual Report June 2020). The World Trade Organization

²² See UNWTO <https://www.unwto.org/news/covid-19-international-tourist-numbers-could-fall-60-80-in-2020>

(WTO) expects a recovery in trade in 2021, although the extent is likely to be limited. At the retail level the lockdown and the subsequent measure to prevent a restart of the infection (like limitations in access to shops and supermarkets) in Europe and North America has hit consumption in general. The heavy loss of jobs across all countries has impacted the purchasing power of consumers and their consuming choice. There are concerns that occasional consumers may think twice before buying luxury, exotic fruit like mango. Furthermore, the food service industry has been hit by the closure of restaurants, the cancellation of events, and annihilation of tourism and this has further impacted the fresh and exotic fruit consumption. For several months ahead the lifestyle of consumers in developed countries will be different from that pre-coronavirus. Likely some of the projections mentioned in this report will not be confirmed in the next 12-18 months.

Mango global market – Overview

Global mango, mangosteen and guava production

Pineapple, mango, avocado and papaya are somewhat newcomers in the global commodity trade, as they appeared in the international market in significant volumes in the 1970's. Their popularity outside their country of origin has been maintained by the development of transportation, new trade agreements and a growing interest in exotic produce by consumers. These major tropical fruits are furthermore among the most valuable agricultural food commodities when measured on a value basis, with preliminary estimates for 2019 pointing to a total combined global export value of more than 12 billion USD from a volume of more than 9 million tonnes (FAO Stat., ITC Trade Map and author's estimate).

Mango has been cultivated for centuries, with the earliest evidence of crops dating back 2,000 years. Today, over one hundred tropical and subtropical nations grow different varieties. These are largely cultivated by smallholder farmers on typically less than 5 ha of land. (FAO, Global Prospects for Major Tropical Fruits special features).

Global mango production has steadily grown in past years. In 2018 it exceeded 55 million tons, from 48 million tons recorded in 2015³. Almost 73% of the total production is in Asia, then Africa with 15.4%, North & South America with 11.5 and Oceania with 0,11%. In Europe Spain started a mango production a few years ago, whose volumes are still limited.

Table 1: Mango, mangosteen & guava production per region 2014-2018

Unit: Tons

Region/ Year	2014	2015	2016	2017	2018	%	CAGR 2014-18
Asia	34,804,753	34,488,128	35,510,962	37,593,344	40,399,823	72.95	3.80%
Africa	7,210,133	7,811,691	7,939,564	8,179,824	8,535,320	15.41	4.31%
Americas	5,556,048	5,723,518	6,024,010	6,174,518	6,385,776	11.53	3.54%
Europe	-	-	-	-	-	-	
Oceania	46,801	44,110	48,655	49,948	62,865	0.11	7.66%
World	47,617,735	48,067,447	49,523,191	51,997,634	55,383,784	100.00	3.85%

Source: FAO Stat

Even though the preliminary crop data for 2019 are not available at FAO, it's expected that global production of fresh mangoes, mangosteens, and guavas will continue the growing trajectory.

³ It is worth stressing that the trade data relevant to mangoes are aggregated to the mangosteen and guava statistics, which creates some uncertainty in assessing the real flows of mangoes. FAO estimates that, on average, mango accounts for approximately 75 percent of total production volume, guava for 15 percent and mangosteen for the remaining 10 percent. In addition, there are macroscopic inconsistencies between import-export volumes recorded by the reporters and the partners. Therefore, some data need to be further elaborate once FAO and UN Comtrade have consolidated the 2019 data.

Table 2: Mango, mangosteen & guava production per country 2014-2018**Unit: Tons**

Country/Year	2014	2015	2016	2017	2018	%	CAGR 2014-18
India	18,413,330	18,527,000	18,643,000	19,506,000	21,822,000	39.40	4.34%
China	4,625,632	4,784,312	4,795,244	4,917,519	4,992,114	9.01	1.92%
Thailand	3,597,589	3,331,113	3,404,745	3,803,164	3,791,208	6.85	1.32%
Indonesia	2,733,508	2,176,448	2,184,399	2,566,046	3,083,643	5.57	3.06%
Pakistan	1,716,822	1,636,473	2,159,046	2,331,736	2,320,050	4.19	7.82%
Mexico	1,754,609	2,069,959	2,197,313	2,283,192	2,178,927	3.93	5.56%
Brazil	1,491,812	1,400,342	1,515,167	1,547,928	1,897,904	3.43	6.20%
Bangladesh	992,296	1,220,616	1,375,993	1,517,619	1,407,308	2.54	9.13%
Egypt	927,352	1,214,242	1,305,134	1,404,232	1,307,869	2.36	8.98%
Vietnam (12th)	823,954	895,467	725,306	744,425	779,347	1.41	- 1.38%
Others	10,540,831	10,811,475	11,217,844	11,375,773	11,803,415	21.31	2.87%
World	47,617,735	48,067,447	49,523,191	51,997,634	55,383,785	100.00	3.85%

Source: FAO Stat

India is by far the main producer with almost 22 million tons in 2018. India cultivates at least 30 different varieties of mango which fruit ripen at various times between February and August. Second largest producer is China with almost 5 million tons, then Thailand, Mexico, Indonesia, Pakistan, Brazil, Bangladesh, Egypt. Vietnam produced 779,347 tons in 2018 placing it at the 12th position amongst the main 20 producers.

Global mango, mangosteen and guava trade

Export pattern

Only 4.2% of the total production was traded internationally in 2018. Most fresh mangoes are consumed in the country of production. In addition, the perishable nature of the mango requires extra care in trade and distribution and limits the expansion of its export.

Asian mango producers are mostly trading with neighbouring Asian markets and domestically, where there are large populations well acquainted, consuming mango daily, for example India, China, Thailand, Indonesia and Pakistan.

Table 3: Global mango, mangosteen and guava export by country 2015-2019

Unit: Tons

Country/Year	2015	2016	2017	2018	2019	%	CAGR 2015-19
Thailand (Mainly mangosteen in 2019)	218,816	183,290	244,481	260,003	479,616	18.63	21.7%
Mexico	331,148	369,314	435,815	395,539	412,011	16.01	5.6%
Brazil	156,557	154,383	179,744	170,631	222,126	8.63	9.1%
The Netherlands (re-export)	117,199	166,132	184,896	218,747	220,503	8.57	17.1%
Peru	132,105	157,070	162,838	199,350	191,417	7.44	9.7%
Vietnam	43,348	83,812	176,605	142,715	158,697	6.17	38.3%
India	173,806	193,383	172,441	153,284	147,242	5.72	-4.1%
Pakistan	43,714	82,658	35,578	70,786	96,610	3.75	21.9%
Ecuador	49,287	63,177	59,006	59,825	53,117	2.06	1.9%
Egypt	33,515	50,991	61,726	66,896	51,547	2.00	11.4%
Spain (re- export)	82,325	34,097	41,393	6,150	47,207	1.83	-13.0%
Ivory Coast	27,996	37,360	41,139	40,301	40,234	1.56	9.5%
China	17,051	29,289	36,657	26,329	35,086	1.36	19.8%
HK	14,255	14,853	16,634	9,073	33,727	1.31	24.0%
Indonesia	39,389	35,660	10,062	39,817	28,960	1.13	-7.4%
USA (re- export)	30,992	29,180	28,132	22,210	28,415	1.10	-2.1%
Laos (re- export)	2,522	5,307	5,588	6,450	28,078	1.09	82.7%
Dominican Republic	11,074	15,786	15,691	14,792	26,378	1.02	24.2%
Belgium (re- export)	17,029	17,681	18,045	22,280	23,720	0.92	8.6%
Mali	-	20,571	19,729	12,387	19,945	0.77	-1.0%
Philippines	23,195	20,618	19,278	17,796	18,827	0.73	-5.1%
France (re- export)	8,481	19,312	18,047	16,417	18,442	0.72	21.4%
Guatemala	20,391	16,189	22,481	21,764	18,213	0.71	-2.8%
Senegal	14,685	14,568	16,367	18,511	16,187	0.63	2.5%
Yemen	24,972	9,406	33,884	36,496	14,485	0.56	-12.7%

Subtotal (First 25 export countries)	1,633,852	1,824,087	2,056,257	2,048,549	2,430,790	94.44	10.4%
Others	127,316	157,879	188,496	253,912	143,195	5.56	3.0%
World	1,761,168	1,981,966	2,244,753	2,302,461	2,573,985	100.00	10.0%

Source: ITC, author's elaboration

In terms of mango trade volume, between 2015 and 2019 global exports grew by an average of 10% (CAGR). Global exports of fresh mangoes, mangosteens, and guavas exceeded 2.5 million tonnes in 2019, an increase of 12% from the previous year.

Mexico is confirmed to be the largest exporter (16% of the total) followed by Brazil (8.63%) and Peru (7.44%). The extraordinary performance of Thailand is due to the fast growth in import demand for mangosteen from China, with shipments increasing by a reported 265% year-on-year between January and October 2019, to a total of 289,000 tonnes⁴. Vietnam occupies the 6th position, amongst the first 9 main exporters.

The Netherlands have confirmed their role as a hub for the import and re-export of mango to different European markets, mainly Germany and Russia despite the export ban (source: CBI). Spain is offset by importing 60,000 tonnes of mangoes mostly from Brazil and Peru, thus re-exporting in addition to supplying locally grown mangoes from the Malaga area (myfruit, 8/03/2018)⁵

Export growth

The leading exporters, Mexico and Brazil have substantial growth driven by the demand for mangoes in Europe and the USA. Mexico exported 350Ktons to the USA and approximately 70% of Brazilian mango exports are destined for EU markets and 20% for the USA (FAO).

The largest exporters, Mexico, Brazil and Peru all export more than 10% of their production (up to 84% for Ecuador), mostly to the US and Europe. Although India is the world's largest producer, and seventh-largest exporter, the share of exports relative to production is negligible. China is also a very small exporter relative to production.

Import pattern

The USA, with more than 500K tons, is the largest importer of mangoes. The USA and Canada imported 25% of all mangoes supplied in 2019 and sourced almost all of them from Mexico, Brazil, Peru and Ecuador.

Europe collectively imported more than 414K tons, 17,5% of all mangoes supplied, mostly from

⁴ FAO, Major Tropical Fruits Market Review, February 2020 snapshot

⁵ European mango is growing: Spain will triple production in 4 years, myfruit, 8 March 2018

Brazil, Peru, Mexico and increasingly from west Africa. The Netherlands is the main European importer and re-exporter. Germany and the United Kingdom (UK) are the largest markets in Europe. Asian suppliers are under-represented in the USA and European markets of supply, despite producing almost 73% of the world's mangoes. The import data of China refers mainly to mangosteen (364K tons) imported from Thailand⁶, as the total volume of imported mangoes through formal trade is 14,485 tons. The same for Vietnam the import data (166,438tons) refers mainly to mangosteen imported from Thailand⁷.

Table 4: Global mango, mangosteen and guava import by country 2015-2019

Unit: Tons

Country/Year	2015	2016	2017	2018	2019	% of total	CAGR 2015-19
USA	-	464,793	508,636	500,467	518,228	21.92	3.7%
China	112,923	72,762	76,937	170,668	379,792	16.07	35.4%
The Netherlands	170,849	202,828	21,916	250,036	250,671	10.60	10.1%
Vietnam	28,850	39,877	95,855	73,268	166,438	7.04	55.0%
Germany	72,852	75,050	87,238	102,579	90,509	3.83	5.6%
United Kingdom	71,524	82,937	84,969	86,161	79,579	3.37	2.7%
Canada	56,316	57,110	65,571	67,298	71,202	3.01	6.0%
France	41,541	58,212	62,174	67,073	70,227	2.97	14.0%
Spain	36,091	38,168	43,428	53,510	60,590	2.56	13.8%
United Arab Emirates	88,163	103,417	87,504	78,723	60,323	2.55	-9.1%
Saudi Arabia	65,774	54,098	69,572	53,572	54,723	2.31	-4.5%
Hong Kong (China)	42,624	32,462	35,461	27,920	50,623	2.14	4.4%
Malaysia	55,140	51,158	61,389	62,411	44,684	1.89	-5.1%
Portugal	25,558	28,253	31,050	38,906	34,607	1.46	7.9%
Belgium	25,048	29,222	30,836	34,389	33,398	1.41	7.5%
Russian Federation	5,294	6,119	11,907	25,683	31,119	1.32	55.7%
Thailand	18,380	26,597	29,945	71,680	28,369	1.20	11.5%
Singapore	22,083	20,336	23,651	26,824	25,547	1.08	3.7%
Oman	15,724	17,444	23,596	35,467	20,670	0.87	7.1%
South Korea	13,917	11,747	13,972	17,383	18,840	0.80	6.1%
Italy	8,298	9,535	11,515	13,509	16,057	0.68	17.9%

⁶ Author's elaboration

⁷ Source: ITC, Trade map

Kuwait	18,960	17,232	14,808	9,035	14,800	0.63	-6.0%
Switzerland	13,470	14,741	14,984	15,211	14,723	0.62	2.2%
Yemen	-	17,182	18,104	15,689	13,658	0.58	-7.3%
Nepal	15,845	14,362	11,457	7,407	12,491	0.53	-5.8%
Subtotal (first 25 import countries)	1,025,224	1,545,642	1,536,475	1,904,869	2,161,868	91.45	20.5%
Others	-	182,307	405,167	226,659	202,001	8.55	2.6%
World	-	1,727,949	1,941,642	2,131,528	2,363,869	100.00	10.9%

Source: ITC, author's elaboration

Import growth

Global mango imports increased from 1.7 million tonnes in 2015 to around 2.36 million tonnes in 2019 (+660,000tons)⁸. The USA was the number one importer (518,000 tonnes), with Europe collectively importing 320,000 tonnes after allowing for internal re-exports (CBI). Europe and the USA accounted for 35% of the global imports. From 2016–2019, global imports volume grew by an average of almost 11% per annum. Although in theory, global exports should align with global imports, unaccounted re-export trade and other discrepancies affect the results. The average measured import prices (CIF) were USD1.58/kg across all markets, although there were some significant and possibly unexplained variations. Generally, European prices were higher (more than USD2.00/kg), reflecting the increased logistics to supplying the market. The USA (supplied mostly from Mexico) recorded USD1.27/kg as the average import price. (ITC, Trade Map)

The main importers are almost fully reliant on imported mangoes for their market consumption. Since the USA and Europe do not produce mangoes, except for 1,000 tons in Florida and 22,000 tons in Spain in 2017 (myfruit), all mangoes must be imported from tropical countries: mostly Latin America, and increasingly from western Africa for Europe. Europe and the USA are highly sophisticated markets with stringent quality standards that suppliers must meet. China production (about 5 million tons according to FAO) is not sufficient to meet the domestic demand. China is importing mangoes mainly from its neighbouring producers Vietnam (with 5- 10% of Cambodian origin), Myanmar, and from Thailand and Taiwan.

⁸ The USA 2015 import unit quantity is mixed (tons and boxes) in the ITC statistics. Estimates in 2015 were elaborated by using export mirror data from the supplying countries.

Production & Trade - Projections 2020-2029

The projections 2020-2029 elaborated by FAO are in line with the positive trend: global production of mangoes, mangosteens and guavas is projected to reach 72.8 million tonnes by 2029, increasing at 2.9% p.a. over the next decade⁹. Income growth and associated shifts in dietary preferences in the two globally leading consuming countries, India and China, will be the main factor behind this rise. The two countries are expected to experience increases in per capita consumption of between 2 to 3% p.a. over the outlook period, reaching 17.6kg and 4.3kg in 2029, per annum respectively.

Mango production in India is destined largely for local informal markets and is projected to account for 26.7 million tonnes in 2029, or 36.6% of global production.

China, whose domestic mango production is comparatively low at a projected 5.8 million tonnes in 2029, is expected to see import growth of 5.1% p.a. on account of strongly increasing demand for mangosteen, reaching an overall global import volume share of 21% in 2029.

⁹ Source: FAO "Major Tropical Fruits Market Review February 2020 snapshot".

Export market assessment

China

The analysis of the Chinese market was elaborated by reviewing several reports prepared by the Australian Centre for International Agricultural Research (ACIAR) and Griffith University in 2019; by ACIAR, Griffith University and Adelaide University in 2016; furthermore Mr. Peter Johnson¹⁰ provided the author with numerous, valuable contributions based on his direct experience in Vietnam and China.

The export market assessment of this study starts with the Chinese market because of its strategic importance for the Vietnamese export of fresh mangoes and for the entire value chains involved in this flow of transactions, from the exporters, to the pack-houses, to the collectors, to the smallholding farmers, to the suppliers of inputs.

Table 5: China mango, mangosteen and guava import (formal trade) 2015-2019

Unit: Tons

Country/Year	2015	2016	2017	2018	2019	CAGR 2015-19
Thailand*	98,376	59,341	71,708	153,745	349,000	37.24%
Indonesia**	-	15	-	7,474	1,949	
Taiwan	6,294	1,599	25	284	5,614	-2.82%
Malaysia***	7,295	9,179	271	2,786	4,011	
Peru	30	959	1,138	1,337	624	113.56%
Australia	541	1,355	970	227	163	-25.91%
Philippines	371	284	106	167	158	-19.22%
Vietnam	-	-	226	2,069	141	
Pakistan	15	5	8	9	20	
Cambodia	-	-	-	-	10	
India	-	-	3	2	3	
World	112,923	72,762	76,937	170,668	379,792	35.42%

Source: ITC, author's elaboration

Note:

* Thailand volume refers to mangosteen (97%)¹¹

** Indonesia doesn't have a protocol with China to export mango. The volume refers to mangosteen

*** Malaysia doesn't have a protocol with China to export mango. The volume refers to mangosteen

If we separate the impressive import volume from Thailand between mangosteen (97%), mangoes and guava, as FAO estimates 289K tons were exported from Thailand to China between Jan. and Oct.

¹⁰ Mr. Peter Johnson is an Australian mango expert, associated with Griffith University, in Queensland and an industry officer with the Western Australian Department of Agriculture and Food.

¹¹ Source: FAO "Major Tropical Fruits Market Review February 2020 snapshot".

2019 (+265% Y/Y), Thai mango imported is about 8,500 tons and the total import through official trade is only about 15,000 tons, while the import of mangoes through informal cross-border trade and grey channel (from HK) is more than 200,000 tons (however, not recorded by Chinese statistics).

Import requirements

Australia, Ecuador, India, Myanmar, Pakistan, Peru, Philippines, Taiwan, Thailand and Vietnam can export fresh mangoes to China (ACIAR).¹²

The import is regulated by bilateral phytosanitary agreements. However, the agreement with Taiwan does not contain mandatory quarantine provisions and for the import from Vietnam and Myanmar the legislation gives the quarantine inspectors the authority to treat the mangoes imported through cross-border differently from the formal trade regulations. In fact, there are no mandatory pest and disease management provisions in the AQSIQ announcement on inspection and quarantine requirements for Myanmar mangoes (August 2007) or in the plant protection and phytosanitary cooperation agreement between China and Vietnam (June 2008). As regards the other seven suppliers the SPS regulations provide mandatory Hot Water Treatment (HWT) for mangoes coming from Ecuador, India, Pakistan and Peru and Vapour Heat Treatment (VHT) for mangoes coming from Australia, Philippines and Thailand.

The norms also set systems to ensure that mangoes are free from pests of concern to China. Taking Peru as an example (SENASA, 2005), only mangoes from designated orchards, packing houses and treatment plants can be exported to China, with farms and facilities subject to an annual approval process by SENASA (Peru) and AQSIQ (China) quarantine agencies (ACIAR). The compliance with these stringent regulations results in additional costs and risks, in comparison with the other supplies through informal channels. The treatment service, in particular VHT is expensive, can damage the produce and may slow transportation from the orchard to the final destination. Exporters have to pay for annual farm and pack-house audits by national and Chinese inspectors, hire a certified orchard monitor, undertake control programs when target pests are found in the orchard, keep detailed farm and pack-house records, implement traceability systems, and recruit additional labour to manage fruit treatment processes. Finally, quarantine inspections at the port of arrival in China may delay the release of consignments by some days, reducing the freshness of the mangoes.

These factors may explain the limited quantities of mangoes imported through official channels, despite the consumers' growing demand for imported mangoes, which are perceived as safer and of better quality than the domestic produce. Also, these factors could be the reason for the development of a significant re-export trade of mangoes and other fruits from Hong Kong to China. In fact, unlike mainland China, Hong Kong does not have in place any mandatory quarantine requirements for imported fruit. Through the grey channel Hong Kong re-export a significant quantity of imported mango fruit, actually skipping phytosanitary controls. (ACIAR). Also, this trade is not reflected in China trade statistics.¹³

¹² The cross-border mango trade between China and Vietnam: Findings from a rapid market appraisal, 30 October 2019.

¹³ In 2019, Hong Kong imported a total 50,623 tons of mango, mangosteen and guava; exported to mainland China 33,551 tons. China

Mango production and import

According to FAO statistics China is the second largest producer of mangoes with 667,264ha harvested and 4,992,114tons of production in 2018. While according to the Ministry of Agriculture & Rural Areas of China the Country is the third producer (after India and Thailand) with the cultivated area of 294,326ha, the harvested area of 170,080 ha and the production calculated as 2,414,800tons (2018). This inconsistency is still under bilateral evaluation betweenFAO and the competent Chinese authorities.

The cultivation of mango fruit started in the 80s' and has steadily grown since, becoming the main source of income for mango farmers in eight provinces and regions such as Guangxi, Yunnan, Hainan, Sichuan. The totality of the production is consumed domestically (the export is irrelevant). In 2019 China imported through the informal cross-border trade about 150,000tons from Vietnam (out of which 5-10% is of Cambodian origin) and 25,000 from Myanmar¹⁴. Through formal channels about 15,000 tons only, divided between Thailand 8,566tons, Taiwan 4,797tons, Peru 623, Australia 163, Philippines 158, Vietnam 141, Pakistan 20, Cambodia 10 (ITC). However,these data are only indicative as very often the mirror data are inconsistent. India for example recorded an export to China of 3,341 tons, while China does not record any import from India. More than 20 varieties are cultivated in the production areas: Guangxi, Yunnan, Hainan, Sichuan, Taiwan, Guangdong, Guizhou and Fujian with a balanced seasonality which is the result of moving the harvest forward or postponing harvest and other comprehensive technical measures and combination of varieties¹⁵.

Table 6: Mango production of China

Maturity	Production area	Harvesting time											
		1	2	3	4	5	6	7	8	9	10	11	12
Early	Hainan, <u>Taiwan</u> and Guangdong												
Middle	Guangxi												
Late	Sichuan, Fujian and Guizhou												
All year	Yunnan												

Source: Kosmos Publisher, 2018

Other studies indicate that the main mango season goes from April to July. The main areas of production are Guangxi (30.42%), Hainan (28.28%) and Yunnan (19,62%) which assure more than 78% of the total production.

Chinese sources highlighted that thanks to the adoption of a series of technical measures, such as top working, bagging, integrated pest management and so on, the quality of mangoes has significantly improved over time and its market competitiveness has increased accordingly¹⁶.

recorded 0 tons imported from HK

¹⁴ Source: ACIAR

¹⁵ KosmosPublisher, Development Status of Chinese Mango Industry in 2018

¹⁶ Source: KosmosPublisher: Development Status of Chinese Mango Industry in 2018 <https://kosmospublishers.com/development->

Farmers mainly sell fresh fruits, because the price of fresh mango is generally better, and a few enterprises or farmers sell fresh fruits to processing enterprises. Therefore, the processing enterprises mainly use fresh mango or fruit juice from Vietnam and other South-east and South Asian countries. Mango juice and mango flesh are the main processing products of mango.

The case of cross-border trade

The cross-border trade deserves to be described further for the impressive volume of the transactions of various goods that are processed daily, and for the special formalities related to the operations.

In 1992 the Chinese government took a political decision by promoting cross-border trade as a vehicle for economic and diplomatic engagement with its neighbouring countries (UNDP 2007). A certain number of reforms were subsequently approved, providing the establishment of 13 open border cities and the abolishment of export duties and licencing. Most commodities became eligible for cross-border exchange. Tariffs and value added tax on imported goods were significantly reduced. Private companies were allowed to engage in border trade, along with state owned and collective enterprises. (ACIAR). This strategic decision created a unique opportunity to improve the economic condition of the business operators from both sides of the border. Over time, the success of this political decision fostered other favorable policy measures and stimulated key public investment in roads and bridges, loading and unloading facilities, storage, physical markets, and other support infrastructure, leading to significant and sustained growth in border trade flows.

Despite the growing volumes of transactions, the Chinese customs don't record the cross-border movements which therefore are not reflected in the official Chinese statistics (grey trade category), even though transactions are documented and declared in some way, with goods having to pass through Customs and official checkpoints. Importers must have a business license, a food distribution or trading license, and a tax certificate. Border agents responsible for handling the paperwork on behalf of importers must have a customs registration certificate (ACIAR). The Small-scale border trade is conducted by enterprises located in border counties or cities that are licensed to engage in commercial transactions with companies or trade agencies in border areas of adjacent countries. In order to be classified as small-scale border trade, the value of individual import transactions cannot exceed RMB 8,000 (equivalent to about US\$ 1,165 at the current exchange rate). Of course, the transactions are organized to be within this threshold.

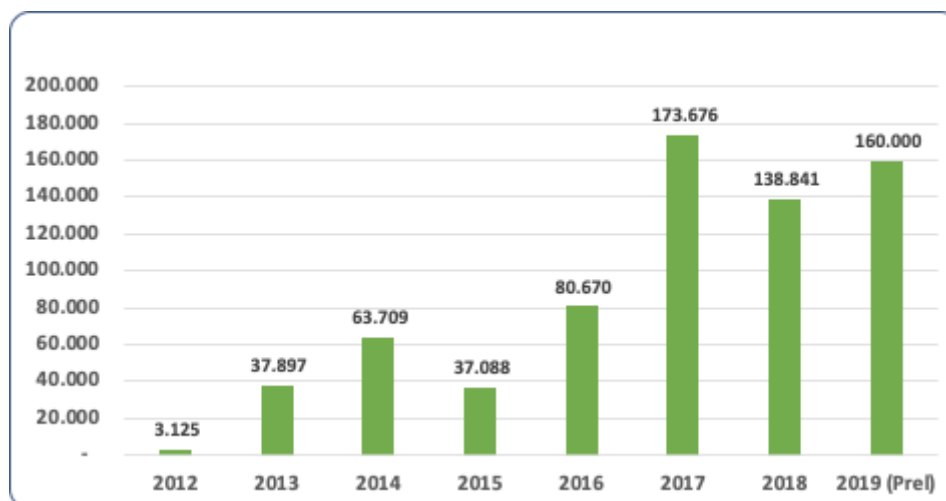
The cross-border mango trade between Vietnam-China

The export from Vietnam to China through cross-border trade has grown dramatically in the past 8 years, not only for the mango, which is the specific object of this study, but also for other fruits like watermelon, dragon fruit, longan and lychee, somehow creating an unbalanced pattern of Vietnamese export flows. For example, in 2019 the total export of watermelon was 161,472tons, out of which 160,302tons (99.2%) went to China. (ITC, 2019).

Most of the transactions take place through the Pingxiang land border, in Guangxi Province. Thanks to the land proximity and the agility of the border procedures the produce can reach the final destination in south-east, east and north-east provinces within 7-10 days from the orchard/pack-house. There are other four entry ports for fresh fruits: Quinzhou (a seaport) Dongxing Longbang and Shuikou located along the Vietnamese land border. From Pinhxian the mango goes to Puzhai, where important infrastructures have been developed during the past years.

Table 7: Vietnam Mango export to China – Cross Border Trade

Unit: Tons



Source: ITC and UN Comtrade

China doesn't record the informal cross-border trade. Vietnam does. Volumes have constantly grown from 2015, as well as the number of Chinese agents and importers. Some importers interviewed by ACIAR declared that the volumes of mangoes exported to China are even larger than the official Vietnamese statistics.

Also, Myanmar mango export to China is facilitated by the informal cross-border trade at Muse Town, in Shan State at the border with Yunnan Province. However, the volumes of the transactions are not clear because the Chinese authorities don't record them and Myanmar export data are not credible. Again, estimates indicated 25,000 tons as the informal import of Burmese mangoes into China.

Finally, Hong Kong is importing 20,000-25,000 tons of mangoes per year (ICT) Some are re-exported to the mainland, but these transactions are not reflected in the statistics.

The Vietnamese mango is a great commodity for the Chinese businessmen: it comes from different parts of Vietnam which makes the produce available from September-October to June. The pick season is in April-May-June, in direct competition with Hainan crop.

The Vietnamese mango is a lucrative commodity for the Chinese buyers and distributors, as the quality is good, it has a good appearance, competitive price in comparison with other origins which are subjected to quarantine treatment and also prompt readiness due to the short logistics

and thanks to the varietal options it is available for 9-10 months of the year.

However, it is worth stressing also some disadvantages for the Vietnamese suppliers from the cross-border trade business: Vietnamese exporters and Chinese importers don't have direct business relationships. There are no written contracts. All these aspects are looked after by the Chinese border agents, who speak Mandarin and Vietnamese fluently. The agents collect orders from Chinese buyers and place the orders to the Vietnamese suppliers. Quality, quantity, price, packaging, delivery time are discussed between the agents and the Vietnamese suppliers. It seems that also the payments are settled through the agents. In case of dispute the Vietnamese exporters are likely to bear the loss.

More importantly, the Vietnamese exporters have a limited knowledge of the final market's reaction, retail price, consumers' choice opinion. They are not supporting the diffusion of the Vietnamese brand with any promotional activities. This lack of feed-back prevents the exporters from informing the backwards value chain (pack-houses, collectors, farmers, chemical suppliers) on the market's reactions and needs. After the recent warnings from the Chinese authorities for an imminent tightening of the SPS and quality regulations for the informal cross border trade we can conclude that the cross-border trade is highly at risk.

Market

In Chinese culture fresh fruit is very important. Fresh fruit is given as a nice gesture or as a gift. Imported fruit, in particular tropical fruit, is also perceived by the medium-high income class as an indicator of their wealth, not only in Tier I, but also in Tier II and III cities. There is a growing segment of consumers who are more concerned about the safety standards of the locally produced fresh fruit. They believe that the imported fresh fruit is safe, of high quality, has variety and year-round availability. In particular the purchase of imported fresh fruit is higher during the Chinese fresh fruit counter-seasons. There is a clear, broad business opportunity for foreign exporters of fresh fruit, in particular tropical fruit.

The largest percentage of the Vietnamese mangoes is sold to the traditional outlets and wet market. The second main destination is the processing industry. Only a small portion reaches the medium level supermarkets. From some interviews, conducted by ACIAR teams with Chinese fruit industry representatives, it emerged that they were not able to recall any consignment of Vietnamese mangoes¹⁷. Worse, the origin of Vietnamese mangoes on sale on the shelves in a low-medium supermarket, which were identified by the same international team of researchers, was not indicated. Which brings to the conclusion that despite the large volumes of produce constantly supplied to Chinese buyers the brand/image of the Vietnamese produce has a long way to go. However, the survey ascertained that most of the importers were of the opinion that the imported mangoes have a great potential for expansion.

One of most popular imported varieties is R2E2 from Australia, The Australian mangoes due to

¹⁷ Source: AGB/2016/007 in-depth interviews with 26 stakeholders in the supply chain of imported mangoes in Shanghai

their good quality, visual appeal and high price, grasp the Chinese Spring Festival windows. Displayed in high-end supermarkets and tropical fruit stores, they are purchased as gifts. The other popular varieties are Kent from Peru, Narcissus from Thailand and of course green skin mangoes from Vietnam. (ACIAR)

The e-commerce

China is the world's largest and fastest-growing e-commerce market. Fresh fruit is one of the drivers of this exponential growth. Online purchase of fresh produce is quickly becoming a preferred purchase channel for Chinese consumers, especially among young professionals in Tier I cities. In fact, giants like Alibaba Group and JD.com, the two largest e-commerce platforms (also for imported fruit) in China, are investing in smaller, more specialized fresh produce e-commerce companies to expand their own presence in online fresh produce e-commerce¹⁸.

However, getting the Business to Consumers-B2C (e-commerce) for Vietnamese exporters could be complicated due to the different culture, the language barrier and very strict e-commerce policies. As said before Chinese consumers prefer imported fresh fruit (and in particular tropical) because of its availability, safety and quality. Therefore, the mango exporters will need to "sell" these factors extensively to build an e-reputation and gain popularity amongst the Chinese e-consumers. It would be advisable to establish a partnership with a Chinese digital agency, who can assist the Vietnamese exporter in understanding the Chinese cultural environment and in identifying the right match between the Vietnamese mango brand value and the preference of the Chinese consumers.

The Vietnamese community in China is rather small, only 30,000 people.

South Korea

Import requirements

South Korea requires vapour heat treatment for imported fruit, which are subject to residue testing for agricultural chemicals, aflatoxin, and other contaminants, plants. This includes checks on fruits regarding pesticide residues. Samples are taken and compliance confirmed by the National Institute of Food & Drug Safety Evaluation of the MFDS.

Concerning plant health requirements, Animal and Plant Quarantine Agency (AQPA) undertakes pre-clearance quarantine inspections in exporting countries to ensure that the exporting establishments and the controls on the supply chain are able to deliver products which meet the phytosanitary requirements. Vietnam is listed as having established the conditions for the export of mango to Korea.

Local production is quite recent. It started about 30 years ago with Irvin cultivar imported from

¹⁸ Source: Imported fruits in China sell well on Chinese E-commerce <https://ecommercechinaagency.com/imported-fruits-sell-well-chinese-e-commerce/>

Taiwan. The cultivation area and the number of farmers have grown particularly from 2011. The main area of cultivation is Jeju Province (Korean Rural Economic Institute, CRCNA). The whole production takes place in greenhouses, harvesting season goes from April to October. Due to the specific production costs and the high content of sugar the selling price of domestic mango is more than 12\$/piece (Koreaherald, 2010). The South Korean markets were heavily protected until recently – with the market opening to dragon fruit (in 2011) and mango (in 2012).

Market

Similarly, to the Japanese, the Korean consumers' preference is driven by appearance (including packaging), skin colour, absence of defects (otherwise considered of low quality), flavour and sweet juicy flesh.

Table 8: South Korea mango, mangosteen and guava import 2015-2019

Unit: Tons

	2015	2016	2017	2018	2019	CAGR 2015-19	Price \$/Kg 2019
Thailand	6,141	6,347	8,841	10,295	11,061	15.85%	3.6
Peru	0	525	645	2,592	4,237	99.19%	4.6
Philippines	5,716	3,968	3,315	2,633	1,831	-24.77%	2.4
Vietnam	211	394	475	658	805	39.76%	3.4
Taiwan	1,760	386	347	692	464	-28.34%	5.9
Brazil	0	0	190	293	243	13.09%	5.4
Australia	85	112	68	135	127	10.56%	5.9
India	0	0.5	62	42	45	-14.81%	3.2
World/Year	13,917	11,747	13,972	17,383	18,840	7.87%	3.8

Thailand has a dominant position with more than 11K tons, followed by Peru with more than 4K tons (CAGR 99%), Philippines with 1.8K tons, Vietnam with 805 tons (CAGR 39.7%) and Taiwan with 464 tons. The successful Thai and Peruvian export models are based on proper and constant/consistent delivery time, class I and extra quality and impeccable presentation.

Despite the long distance, Peru has performed exceptionally in this market. The main variety exported is Kent. The season starts at the end of November and goes through to mid-March. There are seven packhouses certified annually by Korean inspectors. The inspectors check each shipment before being shipped. The first shipments go by air till the arrival of the sea shipments (average 30 days). The Peruvian mangoes are appreciated by Korean consumers because they have a good red blush, good sizes, good packaging presentations and are sent in perfect time so that the fruit doesn't arrive soft. Actually, if the mangoes are ready to eat when they arrive, they are too ripe, (Fresh Plaza, Vivaldi Fruit MD interview, 20.03.2020).

Cambodia may become a future competitor, as the JV between Hyundai Corp (which invested in VHT plant) and Cambodian Mao Legacy (400ha) established in 2019, may have some competitive advantages (e.g. competitive ex-orchard prices, strict technical and quality control, south Korean deep market knowledge) versus the conventional exporter-importer relationships. Notwithstanding the strict import requirements and the strong Korean consumer preference for good red blush, good size mangoes properly presented with adequate packaging, Vietnamese exporters managed to increase their market share. The high average market price, the growing domestic consumption, should encourage the Vietnamese exporters to increase their market penetration with more convincing marketing initiatives.

The Vietnamese community in S. Korea has about 170,000 people and represents a stable market reference for Vietnamese mangoes.

Japan

Import requirements

Japan permits the import from countries that have signed protocol agreements. The supplying countries approved for shipping mangoes into Japan are Mexico and Thailand (1987), Taiwan, Philippine, Brazil (2004), Pakistan, India (2006), Peru (2010), Australia, USA and Vietnam (2015). As per the protocol, all mangoes for exports to Japan must undergo VHT as a phytosanitary measure for fruit flies (DAWR, 2017b). MRL controls are strict.

Market

Despite the large population (126 million people) the mango market in Japan is relatively small. There is a niche local production, estimated by FAO to be around 3,000 tons in 2018, which was more or less the same in 2017 and 2016, and it is expected to continue this trend in 2019. Mainly cultivated in Okinawa they are available from mid-June to mid-August. Mangoes produced in Japan are valued as a premium mango due to a unique production? and strict quality control. The main variety is Irwin, whose characteristics are red skin and an average weight of 400g. There is also a niche market variety called “Sun in the snow” produced in greenhouses located in Tokachi and used as Christmas gifts. Mangoes cultivated in Miyazaki prefecture are widely known for their high quality with a rich sweetness and delicious aroma. As a result, the wholesale price for Miyazaki mango is normally from \$50 to \$90/Kg.(CRCNA).

In the past the mango market was traditionally dominated by local production. However, Japan has increased import volume of fresh fruit (including mangoes) to secure sufficient supply to meet the consumers’ demand. imports passed from about 6,000 tons in 2015 to 7,500 tons in 2019. By adding the local production, the total market is just below 11,000 tons.

Table 9: Japan mango, mangosteen and guava import 2015-2019**Unit: Tons**

Country/Year	2015	2016	2017	2018	2019	CAGR 2015-19	Price /Kg 2019
Mexico	2,749	2,865	3,112	3,464	3,361	5.15%	3.6 \$/kg
Thailand	1,200	1,400	1,588	2,036	2,096	14.96%	5.4 \$/Kg
Peru	253	144	319	713	715	29.66%	4.5 \$/Kg
Taiwan	805	432	588	624	657	-4.95%	8.4 \$/Kg
Philippines	473	669	535	352	262	-13.73%	5.6 \$/Kg
Brazil	235	262	283	256	206	-7.63%	4.9 \$/Kg
Pakistan	80	70	101	89	117	9.97%	4.2 \$/Kg
India	24	52	72	52	47	18.30%	4.1 \$/Kg
China	8	25	21	33	20	25.74%	3.65 \$/Kg
Vietnam	22	10	18	6	17	-6.24%	6.8 \$/Kg
World	5,965	6,012	6,690	7,692	7,535	6.02%	4.7 \$/Kg

Mangoes are typically air freighted to Japan due to their limited shelf life. The Key airports for receiving mangoes are Narita and Haneda airport near Tokyo. However, sea freight is used by some other countries for shipping mangoes into Japan. Mexico is the largest mango supplier in the Japanese market (45%). Thailand is the second largest (28%), with a slight increase in volume because premium supermarkets are promoting varieties imported from Thailand (Ohta, 2014).

While volumes still remain very low, a small quantity of GAP certified fruit from Dong Thap mangoes (My Xuong Co-operative) have started to enter this market. A number of Japanese (and South Korean) trading companies have come to Dong Thap to source supplies of mangoes but have found it difficult to find suppliers who can commit to producing sufficient consistent quantity and quality throughout the year. However, this confirms that there is an interest in Vietnamese mangoes in these markets.

The appearance is extremely important for Japanese consumers. Fruit has to be carefully packed. No scratches, blemishes or black marks on the skin. Otherwise it is considered low quality level-price. Japanese consumers favour sweetness more than bitterness (acidity). Preference goes for high brix mango. Mangoes should weigh about 300g-400g per fruit (Musa, 2010, CRCNA).

The Vietnamese community in Japan has about 372,000 people and like in South Korea represents a stable market reference for Vietnamese mangoes.

United Arab Emirates

Import requirements

Imported fresh produce, like mangoes, must follow standard import regulations. They also have to go through a set of procedures to determine compliance with health and import standards before they are approved for further distribution and sale. The regulatory framework for imports and standards is mostly based on GCC (Gulf Cooperation Council) and GSO (GCC Standardization Organization) requirements.

Because of its extreme weather conditions UAE is completely dependent on import (80%) for its fruit and vegetable consumption.

Table 10: UAE mango, mangosteen and guava import 2015-2019

Unit: Tons

Country/Year	2015	2016	2017	2018	2019*	CAGR	Price FOB \$ /Kg
Pakistan	38,888	50,039	25,482	33,537	26,977	-8.74%	0.88 \$/Kg
India	26,740	31,065	34,816	19,611	20,731	-6.17%	1.20 \$/Kg
Vietnam	84	1,231	3,414	5,531	6,000	190.72%	0.68 \$/Kg
Kenya	8,868	6,875	6,870	5,670	5,135	-12.77%	1.54 \$/Kg
Egypt	5,111	6,679	7,762	4,571	4,633	-2.42%	0.83 \$/Kg
Yemen	1,544	700	1,838	2,390	2,400	6.90%	N.A.
South Africa	867	912	1,839	1,508	2,115	24.97%	1.13 \$/Kg
Australia	1,299	974	1,074	1,221	932	-7.97%	3.10 \$/Kg
Sri Lanka	461	719	1,158	926	900	18.20%	1.12 \$/Kg
Indonesia	1,446	1,002	597	1,209	770	-14.58%	1.12 \$/Kg
Brazil	543	746	456	595	623	3.50%	N.A.
Thailand	1,614	1,812	1,742	1,326	577	-22.68%	2.92 \$/Kg
Peru	57	165	135	183	216	39.52%	1.94 \$/Kg
Philippines	65	85	35	65	35	-14.34%	1.97 \$/Kg
Others				382	400		
World	88,163	103,417	87,504	78,723	72,444	-4.79%	1.04 \$/Kg

Note:

**2019 import data are not available. Author's elaboration on the mirror data. Data in red were not available, author's estimation*

The data in yellow are preliminary

Tropical fruit (including mangoes) represent an important part of UAE import. For mango the main suppliers are Pakistan and India (more than 60% of the total), who are catering to their large communities living and working in UAE. The mango market recorded a decreasing trend between

2015 and 2019 (the import data for 2019 are not available yet and were constructed assembling the mirror data).

Market

The market is characterized by one of the most multicultural societies in the world (the expatriates were 88% of the population in 2018), which results in diverse eating habits and a large foodservice sector offering a variety of cuisines. There are some interesting trends: the overall consumer spending on food and beverages is on the rise, the per capita consumption of fresh fruit and vegetables is above global averages and women are the main driver for the growing culture of healthy eating at home.

Exporters usually rely on a local partner who operates as importer and often distributor to wholesalers including markets such as Al Aweer, hypermarkets, supermarkets, hotels, restaurants and institutions. However, large retail chains, such as Carrefour, Spinney's, Lulu Hypermarket and JM Foods usually work directly with suppliers, which helps reduce the price of fresh food for end consumers. Interestingly, the price difference between supermarket chains is mainly due to quality level difference.

The well-developed modern retail infrastructure caters to high-earning consumers, who are increasingly interested in healthy eating (organic produce and superfoods) regardless of price. Low-income expatriates are price driven, with shopping preference in the fresh market and discounted supermarkets. The food service segment is the second most important channel for fresh produce (39% of fruit and 24% of vegetable sales in 2017). The fresh fruit sales are divided by retail 50%, Food service 40% and Institutional (educational institutions, healthcare providers, etc) 10%.

Vietnam has performed well in the past 5 years, passing from 84 tons in 2015 to 6,000 tons in 2019 (preliminary estimate), **CAGR 190%**. Asian and African suppliers dominate the competitive lower price produce segment. By combining the diversity in demand with a structured supply chain the market still presents opportunities for suppliers of high-quality produce. Vietnam exporters should rethink their strategic approach to this market, by increasing their focus on the high market and differentiate Vietnamese origin from Pakistani and Indian varieties.

The Vietnamese community in the Emirates is rather small, 20,000 people.

Australia

Import requirements

Imported foods are inspected by Australian Department of Agriculture and Water Resources. Food Standards Australia New Zealand (FSANZ) classifies food as either risk food or surveillance food. Risk food is food that has been assessed by FSANZ as posing a medium to high risk to public health, thereby requiring stricter border controls. Surveillance food is considered to pose a low risk to human health and safety. Most horticultural products (including mango) are considered

surveillance food. Food imports must meet Australian food safety standards and be imported in accordance with the procedures set out in the Imported Food Control Act 1992 which requires implementation of a risk-based border inspection program (the Imported Food Inspection Scheme - IFIS). Levels of pesticides in imports are checked by the border controls departments of the Department of Agriculture and Water Resources. Mangoes have to receive an irradiation treatment before shipping.

Market

The production was stable at around 40-44,000 tons/year between 2010 and 2017. In 2018 there was a significant increase of the harvested area (+34%) and of production (+30%). More than likely this trend continued in 2019 (FAO will publish these data only in September). During the same period (2015-2019) both export and import have remained stable: Export -2.1% CAGR and Import -2.3% CAGR. The domestic demand showed a potential increase during the period 2014- 2017, which has fostered the expansion of the cultivated area and the increase of domestic production to meet the growing demand.

Table 11: Australia - Mango import 2015-2019 (main suppliers) – Quantity in Tons

Country/year	2015	2016	2017	2018	2019	CAGR 2015-19	Price \$/Kg
Thailand	287	300	366	273	289	0.17%	5.21
Mexico	448	466	323	192	175	-20.94%	2.2
India	4	24	127	134	174	156.82%	2.1
Pakistan	11	32	43	39	79	63.70%	2.6
Viet Nam	32	56	86	83	66	19.84%	3.2
Brazil				0	62		0.6
Iran					23		0.43
Peru					20		12.6
Philippines	181	114	18	1	5	-59.23%	13.4
China	6	4	8	3	3		17.6
Taiwan				0	3		6.4
World	995	1,020	1,035	753	906	-2.32%	3.50

Table 12: Australia - Mango, mangosteen and guava export 2015-2019 (main markets)

Country/year	2015	2016	2017	2018	2019	CAGR 2015-19	Price\$/Kg
Singapore	1,068	1,143	1,673	2,154	1,533	9.46%	2.69
HK, China	3,207	3,304	3,329	2,274	1,508	-17.19%	2.62
New Zealand	1,094	906	1,247	1,337	1,225	2.87%	2.30

UAE	1,159	803	967	954	932	-5.30%	3.10
Saudi Arabia	79	218	258	344	409	50.84%	2.79
Lebanon	458	417	213	396	394	-3.69%	1.62
Kuwait	90	130	118	241	279	32.69%	4.06
Qatar	115	100	177	220	238	19.94%	2.84
Canada	133	158	124	214	228	14.42%	3.18
China	135	65	132	236	188	8.63%	5.09
Korea	77	114	68	147	127	13.33%	5.31
Oman	3	2	41	73	65	115.75%	3.16
Malaysia	86	99	7	15	62	-7.85%	2.91
USA	18	100	64	76	55	32.21%	4.70
Maldives	5	7	4	21	35	62.66%	2.94
Thailand		9	12	4	22	34.31%	7.50
Bangladesh	21	27	23	38	19	-2.47%	2.42
Bahrain	18	14	7	27	16	-2.90%	3.25
Japan	72	64	35	36	14	-33.60%	9.64
Brunei	12	10	9	7	6	-15.91%	3.50
Nauru	2	2	1	1	4	18.92%	2.00
Belarus			18	36	4		4.00
Switzerland	34	29	20	11	1	-58.59%	5.00
World	8,015	7,728	8,554	8,885	7,362	-2.10%	2.84

The static import volume needs to be better evaluated in the scenario. Even considering the strict requirements for food safety, the MRLs and phytosanitary controls as barriers, some dynamic and generally complying suppliers like Thailand (0.17%), Mexico (-20.9%) and Peru haven't grasped this business opportunity yet. On the contrary countries like India, Pakistan and Vietnam have entered the market, but still with limited volumes and seem to mainly cater to their respective communities in Australia. One could conclude that the Australian consumers have a kind of mistrust towards imported fruit like mangoes.

However, with a complying and impeccable quality mango, Vietnam should be able to use the March-September off-season window to enter the Australian market and meet the modern distribution retailers demand for high quality mangoes to be offered between April-September.

European Union

The analysis of the main European markets was elaborated by reviewing some technical papers prepared in the recent years by CBI – The Centre for the import from developing countries - The Netherlands, online articles published by specialized media and telephone interviews with

European consultants specialized in tropical fruits and importers.

Import requirements

Fresh mangoes must comply with the general requirements for fresh fruit and vegetables. Pesticide residues are one of the crucial issues for fruit and vegetable suppliers. The EU sets the amounts of residues found in food to ensure that they are safe for consumers and as low as possible. If pesticide residues are ever found at a level of concern for consumers, the Rapid Alert System for Food and Feed (RASFF) circulates the information and measures are taken to protect the consumer. All consignments are subject to documentary and integrity checks. Competent Authorities generally follow a (confidential) risk-based protocol in which certain products from certain origins (country, region or individual business operator) are selected for physical checks, which can include laboratory analysis. Products exceeding the MRLs are withdrawn from the market. It's worth stressing that some buyers in EU Member States, such as the United Kingdom (when it was still an EU member), Germany, the Netherlands and Austria, use even lower maximum residue levels than those established by the European legislation.

Regulations concerning protective measures against pests of plants came into full effect at the end of 2019. It requires that all plants, plant products and other listed objects (such as viable seeds and wood packaging) entering the EU must be accompanied by a phytosanitary certificate issued by the National Plant Protection Organisation guaranteeing that they are inspected by the exporting country's national plant protection authority, and that they are free from quarantine pests, within the requirements for regulated non-quarantine pests and practically free from other pests.

GAP (Good agricultural practice) certification is increasingly common, though not compulsory for import to the EU. Global GAP certification is an expensive requirement to meet. Thailand has been able to secure wider access to EU markets through the development of its Thai GAP certification which, while cheaper to administer, has achieved trust and acceptance in European markets. (CBI) Mangoes should, at the very least, be:

- Intact;
- Sound, not affected by rotting or deterioration;
- Clean, practically free of any visible foreign matter;
- Fresh in appearance;
- Practically free from pests and damage caused by pests;
- Free from black stains or trails which extend under the skin;
- Free from marked bruising;
- Free from damage caused by low temperature;
- Free from abnormal external moisture;
- Free from any foreign smell or taste;
- Able to withstand transport and handling.

As regards packing, it is essential to pay attention to the packaging requirements, which vary

among customers and market segments. It goes without saying that the packaging must be new, clean and of a quality packaging to prevent damage and protect the product properly. The European consumers are used to “touching” the produce to check the level of ripeness. The mango may become bruised at the end of the day, thus unsaleable. It would be advisable that the exporters targeting the high market segment pack the mangoes in a light cardboard tray wrapped with plastic mesh, able to contain from 1 to three fruits. The base of the tray should contain indication of the origin, quality information and suggestions about the best way to eat that mango.

Market

For a more effective market understanding it would be advisable to consider Europe as an organized aggregation of markets, with a different history, language, culture, and food preferences. Consumers in some countries have more familiarity with tropical fruit. In some others the consumers prefer local production, which goes in direct competition with the imported tropical fruit. Furthermore, some European countries have long hosted large communities coming from different mango producing countries, including Vietnam. These communities have a deep familiarity with mangoes and thus prefer to consume the specific varieties coming from their country of origin, even though they are more expensive than other origins.

Table 13: Europe (28) Mango, mangosteen and guava import 2015-2019 (by members)

Unit: Tons

Europe (28)	2015	2016	2017	2018	2019	CAGR 2015-19
The Netherlands	170,849	202,828	212,916	250,036	250,671	10.06%
Germany	72,852	75,050	87,238	102,579	90,506	5.57%
UK	71,524	82,937	84,869	86,161	79,579	2.70%
France	41,541	58,212	62,174	67,073	70,227	14.03%
Spain	36,091	38,168	43,428	53,510	60,590	13.83%
Portugal	25,588	28,253	31,050	38,906	34,607	7.84%
Belgium	25,048	29,222	30,836	34,389	33,398	7.46%
Italy	8,298	9,535	11,515	13,508	16,057	17.94%
Poland	5,993	7,109	10,127	11,908	11,964	18.87%
Austria	6,741	7,172	7,874	8,828	9,084	7.74%
Norway (No EU)	5,176	6,155	7,051	7,552	7,438	9.49%
Sweden	4,215	5,265	5,852	6,576	5,722	7.94%
Denmark	3,524	3,595	4,553	370	4,768	7.85%
Czech Republic	3,755	4,819	5,257	5,355	4,219	2.96%
Romania	1,435	2,343	3,726	5,993	3,728	26.96%
Lithuania	1,622	991	2,004	2,867	2,457	10.94%
Hungary	535	1,066	1,332	2,142	2,340	44.62%
Finland	1,066	1,724	2,031	1,911	1,807	14.10%
Ireland	2,172	2,085	2,050	2,004	1,356	-11.11%

The most popular commercial varieties are Kent (fibreless) and Keitt (fibreless and productive), Palmer (minimal fiber), Osteen (typical from Spain) Tommy Atkins (long shelf life, but with some fibre, which is losing popularity with consumers), Amelie (from Burkina Faso) Shelly (from Israel). There are also minor commercial varieties like Ataulfo (Mexico) Nam Dok Mai (Thailand) Alphonso and Kesar (mainly consumed by the Indian communities, Chaunsa and Sindhri (popular amongst Pakistani communities). The latter are shipped by air.

Mangoes are a popular tropical fruit, and their consumption is increasing thanks to more attractive prices, available fibreless varieties and improved ripening techniques. Mangoes are commonly imported from developing countries, in a position to ensure a complying and reliable supply.

Notwithstanding the stable increase of the consumption, predicting the potential of the mango market in Europe is difficult. The market is still driven by supply and mainly influenced by external factors such as the distance from the countries of production, the available volumes (only 4.5% of the global production is exported, while the majority of the crops is consumed locally) quality, price, and last but not least the competition from the local fruits produced in different European countries.

Supermarket buyers' main concern is to assure the presence of good quality fruit on the shelves and to sell them within the shelf life; therefore, they are keen to establish business relationships only with suppliers with a long-term strategy, able to keep their promise (even when prices are less favourable) in terms of continuity in volumes, delivery time and consistent quality.

The Netherlands has become the main hub for the import of mangoes in Europe. They imported 250,000tons in 2019 and re-exported 220,500tons. To ensure the continuity in supplying their customers in Europe during the whole year the Dutch traders are dealing with several exporting countries. Mainly Brazil (96,318tons) and Peru (81,601), but also several thousand tons from west-Africa suppliers like Ivory Coast (11,152tons) Senegal (6,879tons), Mali and Burkina Faso and central America such as the Dominican Republic (9,548tons). Some volumes are imported also from the USA and Israel. (CBI)

The mangoes for domestic consumption are sold mainly by supermarkets, both whole fresh fruit and increasingly as freshly cut product.

The re-export goes mainly to Germany (40%) and France (13%). The rest of the mangoes are divided mainly among Belgium, United Kingdom, Scandinavia and Russia (despite the Russian import ban). Because of the challenges in sourcing mangoes, the Netherlands will maintain its leading role in the import and re-export of mangoes for several years to come.

The Vietnamese community in the Netherlands is estimated around 25,000 citizens.

Germany is the largest consumption market for mangoes in Europe. In 2019 Germany had an

estimated mango domestic consumption of 80,000 tonnes (imports minus exports). The country imported 12,000 tons less than 2018. However, the German market has experienced an above average growth, growing from 57,836 tons recorded in 2011. German consumers are still considering mangoes as an exotic fruit, with increasing popularity. As more and more consumers are becoming familiar with mangoes, demand can continue its growth over the next years.

Future developments on the mango market in Germany depends on how supply and compliance will be managed. Food safety and pesticide residues are a deal breaker for supermarkets, while consumers buy mangoes based on price and appearance. Taste is not always the most direct concern, but disappointed consumers will not repeat their purchase for a while. Supplying a product that lives up to the high German standards and expectations can be a challenge for exporters. Most mangoes in Germany are supplied through the Netherlands, either by German importers using Dutch logistics or by Dutch traders. The strong and long-lasting relationships are the result of a full understanding of the German way of doing business.

The Vietnamese community in Germany is estimated around 170,000 citizens.

The United Kingdom is an important market for mangoes, but also very selective. Export opportunities can be found in mango diversification and ethnic markets. Right after Germany, the United Kingdom is the second-largest importer of mangoes in Europe. About 80,000 tons were imported in 2019, recording a drop of 6,000 tons in comparison with 2018, across all supplying countries. However, the import volumes have been stabilising over the past four years: 82,937 tons in 2016, 84,869 tons in 2017 and 96,161 tons in 2018.

The stabilisation is a result of a maturing market and the devaluation of the British pound. Besides the traditional fresh whole fruit, new products such as freshly cut mangoes, frozen mango lollies and ice cream, have entered the market, increasingly attracting the interest of consumers.

Another important characteristic of the UK market is the ethnic mango segment: The United Kingdom is an important market for specific air freighted mango varieties from Pakistan (Chaunsa and Sindhri), and from India (Alphonso and Kesar). Throughout the year 2019, Pakistan and India (8,500 and 4,400 tons respectively) were the third and fourth non-European mango suppliers after Peru and Brazil (14,615 and 11,713 tons). It's unlikely to find Pakistani or Indian mangoes in the modern supermarkets. Brexit and the low value of the British pound may put further pressure on the mango market.

The Vietnamese community in the UK is estimated to be about 70,000 citizens. Very small in comparison with the Indian (1,5 million) and the Pakistani (1,2 million) communities.

France is an interesting market for West African suppliers. Mango is a popular fruit in France. With 77,200 tons of imported mangoes in 2019, France has positioned itself as the third-largest consumer market in Europe, even though it exported 18,442 tons in 2019. Because of its historic connection, West Africa has quite a high export volume of mangoes to France. For example, Ivory

Coast exported 14,760 tons to France, just below Peru (15,685tons) and surpassing Brazil. The preferred varieties are Kent and Keitt, the same as in the rest of Europe. But French consumers are also familiar with Amelie mango variety from Burkina Faso. There is an important segment of tree-ripened mangoes shipped by air to supermarket chains like Carrefour or supplied to the high-end catering segment. Ivory Coast, Senegal, Mali and Burkina Faso are expected to continue having an important share in the French market. However, Peru (15,685 tons in 2019) has been the leading supplier steadily growing its export volumes, in particular during the winter season. French consumers (like Italian, Spanish and Portuguese) have a strong preference for locally produced fruits. This means the mango supply from neighbouring Spain is relatively high (10,719 tons).

The Vietnamese community in France is estimated to be more than 350,000 citizens.

Spain is an interesting and complex market. It's one of the fastest-growing importers of mangoes. At the same time, it is one of the fastest-growing markets in Europe. With both local production (that Freshplaza overview of the global mango market estimated as 34,000tons in 2018, 30% more than the year before) and aggressive exports, Spain aspires to become a second potential trade hub for mangoes. Osteen, which is the main mango variety, has driven the Spanish consumption upward. The annual consumption has gone up from 210 to 580 grams per capita in the last five years. Worth mentioning even more are the increased imports and exports. The trade with non-European suppliers and the exports to European markets both increased by 72% over the past five years, with the export volume being higher than the import. Spain has become a net exporter of mangoes. The majority of Spain's export goes to Portugal (16,588 tons), France (13,554 tons) and Germany (6,236tons). Spain could be an entry gate for the southern Europe market.

There is no record of a Vietnamese community in Spain.

Portugal's population is only 10 million inhabitants. Nevertheless, it has the highest mango consumption per capita. It is an interesting market for those that are competitive with or in addition to the Spanish and Brazilian suppliers. An estimated net import volume of 21,791 tons (import minus export) in 2019 indicates that the average person consumes at least 2.2 kilos per year. Spain is by far the largest supplier to Portugal with 15,151tons, followed by Brazil (11,504tons), which exports both sea- and air-freighted mangoes. The rest of the demand and supply gaps are mainly covered by mangoes that are traded through the Netherlands (6,824 tons). Most of the Portuguese traders are comfortable with the business relationship with Spain, Brazil and the Netherlands. But Portugal is a mature market with a strong preference for mango consumption therefore there could be a window of trade opportunities between the Spanish and Brazilian seasons.

There is no record of a Vietnamese community in Portugal.

United States

Import requirements

The USA authorities have put in place a stringent system of controls to ensure that the imported fresh fruits and vegetables (including fresh mangoes) comply with the same requirements as the domestic products.

As regards chemicals the Environmental Protection Agency-EPA has set an MRL on imported foods. The mango exporters have to comply with the limits indicated for 43 compounds. FDA controls through sampling and testing the conformity of the imported foods.

As regards SPS certification the Animal and Plant Health Inspection Service (APHIS) issues an import permit (filled in by the US based importer with food description and origin) that has to accompany the imported goods along with an SPS issued by a recognized NPPO of the exporting country. Foods are inspected at the entry port or at final destination. APHIS has offices in 29 exporting countries, including Vietnam where 5 officers ensure the compliance with APHIS conditions and provide pre-clearance.

All pre-export shipments must be treated with irradiation, quarantined, and granted phytosanitary certificates by APHIS. At the arrival port, APHIS checks each shipment. Irradiation treatment can also be done in the USA. To comply with Public Health Security and Bioterrorism Preparedness and Response regulations, the establishments in the country of origin have to be registered with FDA and the US based importers have to provide Prior Notice for each consignment.

Market

Over the past two decades, the United States Department of Agriculture has issued roughly 100 new rules allowing specific crops to be imported from certain countries. Crops that previously would not have been approved because they might have introduced invasive pests and diseases, were allowed in through new “systems approach” that manage those risks by combining methods like orchard inspections, sprays and bagging of fruits.

As a result, the proportion of the imported fresh fruit eaten in the United States rose to 53.1% in 2016, from 23% in 1975, according to the Agriculture Department’s Economic Research Service. Fresh vegetable imports rose to 31.1% from 5.8%. (Still, the United States remains a net agricultural exporter, with grains, soybeans, meat and nuts accounting for most of the trade surplus.). Greater availability has led to a huge increase in per-capita consumption of many crops, including mangoes (up 1,850% from 1975 to 2016), limes, avocados, grapes, asparagus, artichokes and squash. More than half of the fresh fruit and almost a third of the fresh vegetables consumed in the USA are imported. Notably Vietnam, with US\$ 1 billion is in fourth position amongst the first 10 exporters of fruit.

The USA is the largest mango import market. In the past 5 years the import has grown steadily (CAGR 7.8%) The local production is in Florida where the farmers harvest about 1,000 tons per year (FAOSTAT).

Table 14: USA mango, mangosteen and guava import 2015-2019 (main suppliers)**Unit: Tons**

Country/Year	2015	2016	2017	2018	2019	CAGR 2015-19
Mexico	290,812	304,059	332,504	327,947	341,923	4.13%
Peru	38,243	44,953	51,546	49,944	54,353	9.19%
Ecuador	41,958	56,319	49,517	52,540	44,367	1.41%
Brazil	31,934	27,858	32,934	31,782	39,967	5.77%
Guatemala	16,785	12,447	16,818	17,026	13,424	-5.43%
Haiti	0	7,079	9,347	6,617	8,366	5.14%
Thailand	652	2,030	3,827	3,685	4,690	63.77%
Dominican Rep.	901	1,038	1,154	1,924	3,431	39.69%
Philippines	3,103	3,065	2,932	2,563	2,162	-8.64%
Costa Rica	2,798	1,420	1,291	794	1,795	-10.50%
India	5,193	915	1,444	1,766	1,741	-23.91%
Nicaragua	4,289	2,775	4,496	3,300	1,015	-30.25%
Burkina Faso	7	105	136	128	383	171.97%
Viet Nam	0	0		3	294	
Pakistan	170	116	106	100	102	-11.99%
Australia	18	124	60	75	52	30.37%
South Africa	78	373	373	158	43	-13.83%
Sri Lanka	0	1	4		35	
China	12	14	53	30	29	24.68%
Cambodia	0	24		11	11	
Ghana	0		14	18	11	
Myanmar	0				10	
Colombia	0	0	2	1	8	
Jamaica	5	18			6	4.66%
World	448,782	464,793	508,635	500,467	518,228	3.66%

The market is dominated by four supplying countries: Mexico, Peru, Ecuador and Brazil. After them come Guatemala, Haiti, Nicaragua, and Costa Rica with minor volumes. As regards the Asian origins, India declared exports of 5,215 tons, but the USA recorded only 1,741 tons and only 102 tons from Pakistan, who instead declared 270 tons. Vietnam performed better than Pakistan by exporting 294 tons in 2019 (author's elaboration). Mexico has a leading export position (70%) thanks to its logistic advantages, (some of the main entry points by road are Laredo TX, Nogales, Pharr TX, Otay Mesa, Progreso TX, Rio Grande City, Laredo), the vast land dedicated to mango production, the

favourable climate and the abundance of inexpensive labour. There are 10 states in Mexico that produce mango over 7 months, starting in February in Chiapas and ending in August in the state of Sinaloa (Francisco Villegas, president of Emex AC).

The Latin American mangoes are distributed throughout supermarkets and fresh local markets. While Indian and Pakistan mangoes are mainly supplied to their large communities through specialized ethnic shops or through e-commerce. Despite some initial indirect high-profile testimonials like President Bush who while visiting India in 2006 said to PM M. Singh <<a hell of a fruit!>>. Or Ron Somers, then the president of the US-India Business Council, who appreciated in public the Indian mangoes, the Alphonso mango has not achieved its share in the modern distribution as yet. The produce was never adequately supported by a medium-long term promotional strategy. In addition, the retail price of the Indian mangoes was too high for the larger market and has remained confined to an ethnic niche. The main reason for its expensive quotation is due to the cost of air transportation which is three times the cost of the mango itself. Therefore the “king of the mangoes” main market remains the ethnic community, who is keen to pay a much higher price to have its national produce. (Interview with the mango importer Dr. Bhaskar Savan, with Vice Magazine, February 7, 2018, Vice Media Group LLC). Much of the final consumer price of fruit of Asian origin comes from transportation costs. A study conducted in 2012 confirmed that the high selling price of the imported Indian mangoes was due more to the transportation cost (and wholesalers margin) than the irradiation cost¹⁹.

Interestingly, to differentiate the offer and attract the consumers preference some giant supermarkets like Costco have stressed their interest in organic mangos? More and more Mexican growers are adding an organic area to their orchard. <<The yield is lower, but they are getting 1.5-2.0 \$ more per box, so the increased value back to the farm makes it worth it. Being able to offer organic produce strengthens their position as suppliers. The sales of organic mango are growing 15-20% every year²⁰.

Both demand for mangos and availability have increased over the years. In the past five years, the volume shipped by Mexico, Ecuador, Peru, Brazil, Guatemala, Haiti and Nicaragua to the US has increased by about 13%. Total import volume has increased more than 87% during the 15 years and import value (FOB) increased more than 120%. During that same time frame, availability per capita has increased more than 68%.

In regard to varieties, contrary to volume and value imported, mango varieties haven't shown much change in recent years. It takes years for mango plantations to get established and any shift in market demands related to a specific variety would take quite a while to be translated into practice from an agronomic standpoint. As a result, Ataulfo (honey mango), Madame Francis, Keitt, Kent and Tommy Atkins continue to be the main varieties. (Vlad Mitton, member of the National Mango Board, to FreshPlaza, 12 Sep 2019).

¹⁹ Source: Specialty Crop Access to U.S. Markets: A Case Study of Indian Mangoes / ERR-142 Economic Research Service/USDA

²⁰ Source: Organic Produce Network-OPN CONNECT NEWSLETTER 52 · FEBRUARY 22, 2018

Personal telephone interviews with American citizens, with long working experience in Asia and thus deep familiarity with Asian mango varieties, who are living in different American states confirmed that the Asian origin is a rarity. They called several Asian shops in different cities to discover that they were selling only Kent or Ataulfo varieties. Asian varieties were not available.

The USA hosts the largest Vietnamese community in the world which is estimated to be more than 2,200,000 citizens.

Conclusions

The mango global market

The global production in 2018 and trade in 2019 are in line with the trends of recent years where both have grown steadily. The projections 2020-2029 elaborated by FAO confirm this positive scenario. The export-import profiles did not change in 2019. Mexico, Brazil and Peru were the most active exporters. The remarkable export performance of Thailand refers to the large supplies of mangosteen to the Chinese market. The USA and the EU remained the largest import markets, both dominated by Mexico and Latin American producers. Some countries from West Africa are expanding their export to the EU market.

China

As regards the import requirements China has adopted a strict level in terms of SPS regulations (HWT and VHT treatments) and accepts supplies only from inspected and certified orchards, pack-houses and treatment plants. The controls of the import through cross border or grey channels are limited. This disparity is reflected in the imported quantities of mangoes, about 15,000 tons through the formal channel and more than 200,000 through the informal channel. The large domestic production, which accounted for almost 5 million tons (or 2.5million tons according to Chinese statistics) in 2018, doesn't meet the growing market demand. Vietnamese mangoes haven't reached modern distribution yet and are generally sold through small grocery shops, wet markets, low-medium supermarkets and to the local food service and processing industry.

Business operators from both sides have greatly benefited from this favourable situation. The key competitive factors for the Vietnamese exporters are the low farm production costs, the lack of VH or HW treatment, the geographical proximity in comparison to air freighted mangoes from more distant countries, the diverse varieties which enable them to meet the different requests from Chinese importers and average good quality of produce.

There are serious disadvantages for the Vietnamese value chain. Like the farmers who are not aware of what happens to their fruit beyond the orchard border, the exporters are not aware of (or have no influence on) what happens beyond the Chinese border. Therefore, there is no feed-back along the value chain and consequently no pressure to improve the quality and the compliance of the mangoes. In addition, Vietnamese mangoes have no identity, and they are in direct price competition with local producers.

More in general the "easy going" market has channelled 95% of the export flows towards a single market, making the entire export sector extremely vulnerable and it has discouraged the necessary marketing efforts to penetrate other markets with a more solid and wider share. Any diversification process will require a tremendous effort from all the value chain actors to regain the lost time in comparison with other competitors.

The cross-border business will be sustainable as long as the Chinese authorities tolerate the import of non-complying fruit. Changes in importing policies will have a massive impact.

Improving the ability along the entire supply chain to comply with strict regulations is of crucial importance.

In addition, China has already issued several notices, warning that they are going to introduce more stringent controls at the borders. The possible implementation of stricter controls will force the Vietnamese exporters to elaborate a contingency plan for a possible escalation of the regulatory requirements, i.e. deal only with those farmers/packhouses in a position to comply with the stricter import regulations.

As the necessary corrections to ensure large quantities of performing produce will require some time to be introduced and implemented (2 or 3 seasons minimum), any decision of the Chinese authorities to align the informal import controls to the formal import regulations may seriously jeopardize the existing impressive business. Thus, the sooner the mango industry introduces corrective actions the better it secures the level of this business.

There is an untapped market for the Vietnamese mangoes, which is represented by the modern distribution in Tier I, II and III cities governed by formal contracts, SPS and MRLs compliance, strict quality standards, stable relationship and by the e-commerce segment which is steadily growing amongst the young urban generation with a medium-high income.

Market/Info	Strengths	Weaknesses	Opportunities	Threats
▪ Import market size: 200K tons (informal), 30K Tons (formal) ▪ CAGR: 35.4% ▪ Local production: 5 Million tons. ▪ Food safety controls: strict for formal, mild for informal trade, SPS ▪ Vietnamese community: 30,000	▪ Stable relationship ▪ Consolidated product sourcing experience ▪ Export experience ▪ Large export volumes management ▪ Proximity	▪ No relationship with modern retailers ▪ No market knowledge ▪ No origin identity ▪ Undervaluation of Vietnamese varieties quality.	▪ Untapped modern distribution in Tier I, II and III cities ▪ E-commerce segment ▪ Consumers' high consideration for imported mangoes	▪ More stringent regulations ▪ Drastic reduction of present export volumes ▪ Chinese producers' associations initiatives ▪ Competitors: Hainan, South-west provinces, Thailand, Taiwan, Peru, Australia, Philippines. ▪ Small Vietnamese community

South Korea

Mango import is regulated with strict norms. It is essential to have a strong relationship with Korean importers. Mangoes have to be VH treated. Some orchards, and packhouses in Vietnam (Mekong River Delta) have been certified as they meet Korean requirements.

The Market has maintained a positive trend during recent years. Competitors are Thailand (leading position), Peru (very dynamic), Philippines and Taiwan. It is likely that tough competition will result from the new Korean-Cambodian JV.

Despite the strict requirements and the strong Korean consumer preference for good red blush, good size mangoes, properly presented with adequate packaging Vietnam has performed well. Korea is a fastidious import market with sophisticated consumers. The high average market price and the growing domestic consumption should encourage the Vietnamese exporters to increase their market penetration with more convincing marketing initiatives. To expand its share Vietnam needs to ensure proper and constant delivery time, class I and extra quality mangoes and impeccable presentation.

The Vietnamese community in S. Korea consists of 170,000 people and represents a stable market reference for Vietnamese mangoes.

Market/Info	Strengths	Weaknesses	Opportunities	Threats
▪ Import market size 18,840 Tons ▪ CAGR 7.87% ▪ Local production: a few hundred tons, Irvin variety (greenhouses); ▪ Food safety controls: strict, VHT ▪ Vietnamese community: 170,000	▪ Competitive Cand F price ▪ Vietnam growing export ▪ Origin identity	▪ Limited export history ▪ Small volumes (850 Tons in 2019) ▪ Limited suitable product	▪ Proximity ▪ Growing market, ▪ High selling price market, ▪ Consumers driven by dietary diversity(fresh fruit) ▪ Quite a large Vietnamese community	▪ Strict food safety policy ▪ Long buying chain: trading agents, importers, distributors. ▪ Competitors: Thailand Peru, Philippines, new Korean-Cambodian JV, new Korean-Philippine JV, local producers.

Japan

Mango import is regulated with strict norms. It requires VHT treatment of imported fruit from countries that have signed protocol agreements.

Despite the large population (126 million people) the mango market in Japan is relatively small, about 11,000 tons (local production plus import).

The competitors are Mexico, Thailand, Peru, Taiwan, Philippines and Brazil. Vietnam's presence in this market is unremarkable so far.

Like Korean consumers, Japanese consumer preference is driven by appearance (including packaging), skin colour, absence of defects (otherwise considered of low quality), flavour and sweet juicy flesh. The average market price is quite high.

The Vietnamese community in Japan is quite large with about 372,000 people and should represent a potential market opportunity for Vietnamese mangoes.

Market/Info	Strengths	Weaknesses	Opportunities	Threats
▪ Import market size 7,535 Tons ▪ CAGR 6.02% ▪ Local production: 3-4,000 tons (greenhouses) ▪ Food safety controls: strict, VHT ▪ Vietnamese community: 372,000	▪ S. Korea export experience can be extended to Japan	▪ Small and not dynamic market ▪ Limited export history ▪ unremarkable export volumes	▪ Proximity ▪ Similar consumers' preference as in S. Korea ▪ Familiarity with yellowish mango varieties, ▪ Large Vietnamese community	▪ Strict food safety policy ▪ Long buying chain: importers, wholesale market, retailers.

UAE

Medium level of import norms. Market almost completely dependent on imports for its fruit and vegetable consumption. Tropical fruits (and mangoes) are an important part of UAE import. Market is dominated by expatriates (88% of population). Growing attention to a healthy style of eating. Decreasing mango market between 2015 and 2019. Competitors are Pakistan and India (more than 60% of the total market, thanks also to their large communities). The well-developed modern retail infrastructure caters to high earners, who are increasingly interested in healthy eating (organic produce and superfoods) regardless of price. Low-income expatriates are price driven with shopping preference in the fresh market and discounted supermarkets.

Vietnam has performed well in the past 5 years. As the Asian and African suppliers dominate the competitive lower price produce segment, Vietnamese exporters should rethink their strategic approach to this market, focusing on the high market and differentiate Vietnamese origin from the other Asian and African varieties.

Market/Info	Strengths	Weaknesses	Opportunities	Threats
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▪ Import market size 72,445 Tons ▪ CAGR -4.79% ▪ Food safety controls: mild ▪ Vietnamese community: 20,000	▪ Steadily growing export history (CAGR 190.7%) ▪ Comparatively large volume exported (6,000 tons)	▪ Long distance ▪ Decreasing market ▪ Undervaluation of the Vietnamese varieties (lowest price/KG)	▪ Mild food safety policy, ▪ Large high-income expat community	▪ Small Vietnamese community ▪ Competitors: Pakistan, India, Kenya, Egypt
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Australia

Food imports are governed by highly strict norms. Australian production saw a significant increase in 2018 having remained unchanged since 2010. However, import volume is still limited. Vietnamese exports are still minimal. Competitors are Thailand, Mexico and India. Direct communication with importers-distributors indicated a business opportunity for Vietnamese exporters to enter the modern distribution market with more important volumes in the April- September window, on condition that they are able to offer a complying and impeccable quality mango.

Market/Info	Strengths	Weaknesses	Opportunities	Threats
▪ Import market size: 1,000 Tons ▪ Local production: 70,000 tons (preliminary forecast in 2019) ▪ Food safety controls: strict, irradiation or VHT ▪ Vietnamese community: 300,000	▪ Recent successful export experience	▪ No origin identity ▪ No relationship with importers	▪ Relatively close market ▪ Untapped market window coinciding with Vietnamese peak season, ▪ Large Vietnamese community	▪ Strict food safety policy ▪ Retailers' commitment with local producers ▪ Australian consumer's preference for local production ▪ Competitors: Thailand, Mexico, India

European Union

Mango import is governed by strict norms. High level of attention to MRLs, infestation and diseases. SPS certificate. The European market is an organized aggregation of markets, with different history, language, culture and food preferences. The market has grown steadily during the last 5 years driven by year-round availability of products, fiberless varieties, improved

ripening practices and more attractive prices. The projections, outlined before the Covid-19 emergency, were encouraging.

The market is largely dominated by the Latin American suppliers, along with some dynamic West African countries, which resulted in European consumers developing a preference for the common varieties exported by these suppliers, such as Kent, Keitt, Tommy Atkins, Palmer, Osteen (from Spain), Amelie (from W. Africa) and Shelly (from Israel). Exotic varieties like Ataulfo (Mexico) Nam Dok Mai (Thailand) occupy a small market segment. Alphonso and Kesar (India), Sindhri and Chaunsa (Pakistan) are imported regularly but are confined to the ethnic communities. Most mangoes are sold through supermarkets. Modern distribution prefers to deal through importers-traders. Business is regulated by long term contracts, which involve continuity of supply, price flexibility, high requirements and minimum negotiation room. But the exporters become part of a stable supply retail programme. The wholesalers represent another option. They cover the spot market, moving according to trade fluctuations. Their end customers are specialised shops, street merchants, restaurants and hotel chains.

Market/Info	Strengths	Weaknesses	Opportunities	Threats
▪ Import market size 414,000 Tons ▪ CAGR 10.06% ▪ Food safety controls: strict, SPS ▪ Vietnamese community: 800,000	▪ Successful export of other fresh fruit	▪ Very long distance ▪ Only air freight option ▪ No export history ▪ No country variety identity	▪ Steadily growing market ▪ Planned sales through importers. ▪ Spot sales through wholesalers ▪ Large Vietnamese community (France, Germany, Czech Rep); ▪ Implementation of EVFTA	▪ Very strict food safety policy ▪ High level quality standards dictated by buyers. ▪ Consumers' preference for varieties from Latin- American suppliers

USA

The USA is the largest mango import market. The market is dominated by Latin American supplying countries. Ataulfo (honey mango), Madame Francis, Keitt, Kent and Tommy Atkins continue to be the main varieties. The organic mango segment is rapidly growing (15-20% per year). Mexican mangoes hold the leading position (70%). The Asian origin market share is very limited. The Latin-American mangoes are mainly distributed through supermarkets and fresh local markets while Indian and Pakistan mangoes are distributed throughout specialized ethnic shops or through e-commerce. In this scenario the entry market of a newcomer like Vietnam will be complicated. To overcome the general perception that the only good mango varieties are those

which have been offered by supermarkets over the past 20 years, an extensive and continuous marketing campaign will be required²¹. Transportation costs will constitute a burden for the competitiveness of the Vietnamese mangoes. In the first phase it will be possible to cater, through a series of committed importers, to the ethnic market, where members will be glad to welcome and pay more to enjoy the flavour and taste of the familiar Vietnamese variety. However as in the case of the Indian and Pakistani mangoes, there is a risk of confinement to that market segment, which would jeopardise sales to the modern distribution. It's not feasible that a single exporter or a group of exporters can approach the USA market without the concrete support of Vietnamese institutions delegated to promoting export.

Market/Info	Strengths	Weaknesses	Opportunities	Threats
▪ Import market size: 518,000 Tons ▪ CAGR 3.7% ▪ Local production: 1,000 tons ▪ Food safety controls: strict, irradiation ▪ Vietnamese community: 2,2 million	▪ Newcomer, ▪ No history of previous consumers' disappointment	▪ Very long distance, ▪ Only air freight option ▪ Only very recent, export history ▪ Very limited export volumes ▪ No country variety identity	▪ Steadily growing market ▪ Very large Vietnamese community	▪ Very strict food safety policy ▪ Consumers' preference for Latin- American varieties ▪ Competitors: Mexico, Peru, Ecuador, Brazil, Latin American suppliers, Thailand, Philippines, India, Pakistan

²¹ Even the website of the National Mango Board does not promote any Asian variety <https://www.mango.org/mango-varieties-availability/>

For discussion

At first glance the mango export performance of Vietnam would appear impressive. In fact, its ratio production-export places Vietnam amongst the top 10 best supplying countries. However, the analysis of the Vietnam export pattern reveals more strategic weaknesses and threats/problems than strengths and opportunities.

Due to the intrinsic nature of the majority of Asian varieties, mango is not suitable for long transportation. In fact, the majority is consumed locally in the developing countries where it's produced and where the large population have an established familiarity with this beautiful produce and only 4-5 % of the global production is traded internationally.

Mango requires adequate management before, during and after harvesting. It needs to be protected from pest infestation and plant disease with a judicious usage of biological and chemical products, to avoid becoming harmful for human health and for the environment. Mango needs to be carefully handled during transportation: proper packaging, controlled temperature, short travel time from farm to table all within its brief shelf life. It's therefore natural that the export is focused on the neighbouring countries.

During the last few years, Vietnam has exported ever growing quantities to China year by year (95-97% of the total), taking advantage of its proximity and of the lack of strict technical requirements and quality standards controls. Even though the export business is mainly carried out by SME/family companies, it is not clear if it has also benefited in the same measure as the thousands of small householding farmers.

During this period the favourable export opportunity to China has slowed down the necessary, complex process to produce and export complying (and therefore more competitive) produce. By concentrating its efforts only towards the Chinese border, Vietnam has unwittingly exposed its export industry to a risky market situation (sooner or later the Chinese authorities will introduce more stringent controls in the cross-border transactions, and it will be difficult for Vietnam to be in a position to keep its impressive supply position). It has lost precious time to diversify its export basket by entering and consolidating its share of other remunerative regional markets, leaving the space to other regional competitors.

The modus operandi of the business through the border has prevented exporters so far from having an adequate knowledge of the Chinese modern distribution and the preferences of Chinese consumers which are the basis for building any commercial strategy. The badly needed and advisable export diversification will be more difficult and expensive, as the small volumes presently exported to other regional markets don't offer those economies of scale to implement/launch marketing campaigns to induce the local consumers to discover and appreciate the good qualities of the Vietnamese produce. The much farther and larger markets like the USA and EU, as of today, are extremely difficult, not only for the Vietnamese mangoes. In fact, other Asian export champions like India, Pakistan and Indonesia have a marginal or even

zero presence in these markets. These markets have been dominated by Latin American suppliers, who have greatly influenced the consumers preferences. To conquer market shares will involve a tremendous marketing effort.

Therefore, in the first phase Vietnam should concentrate on **regional markets**:

- First, in China, where it needs to secure/maintain the existing impressive business by gradually exporting mangoes complying with Chinese legal requirements and with the quality standards of the Chinese modern distribution through formal channels and thus prepare the ground for ensuring/continuing the export.

- Secondly, it must concentrate its efforts to expand its presence in South Korea, where the current purchasing price justifies the investment to produce and send by air freight impeccable mangoes complying with strict requirements and with consumers' preferences. The target is the erosion of the present Thai and Peruvian market shares. More than likely, catering successfully to the South Korean market, should facilitate the expansion of the Vietnamese mangoes also in Japan, where despite the limited market size, local consumers' preference and modern distribution requirements are similar to those in South Korea.

- The untapped opportunity offered by Australia's off-season window represents the next priority to supply air freighted and then sea shipped mangoes of better quality than the present of Mexican origin.

- Then the UAE market. Even though, unlike India and Pakistan, the Vietnamese community is not very large, the modern and competitive distribution infrastructure requires good quality and competitive mangoes.

As regards the more distant markets, Europe and the USA:

- Europe

This market will require a more defined marketing strategy, the choice is between:

(i) the spot market represented by importers-wholesalers dealing with specialized and ethnic segments, where consumers prefer exotic and qualitative varieties, despite the fact that the prices are higher than the common varieties.

(ii) The importers-traders dealing with the modern distribution infrastructure, where the requirements are (besides the legal requirements compliance) constant quality, year-round availability of quantities, price flexibility, respect of time delivery and impeccable packaging. As of today, the only feasible way to transport Vietnamese mango varieties is by air, which will increase the challenges.

- The USA

The USA market is not an immediate, feasible option. Mexico is benefitting from its close proximity to cater to modern distribution and to traditional grocery shops in California, Texas, Arizona and the other states with very competitive prices. The shares not occupied by Mexico are controlled by Peru, Brazil, Ecuador and other central American suppliers. India and Pakistan, despite having started their export much earlier than Vietnam, haven't conquered the modern distribution or the e-commerce segments yet, and their limited airfreighted volumes are still confined to their large local communities, who are happy to buy the familiar varieties they are accustomed to, regardless

of the price.

The authors of this study did not find objective factors/characteristics to classify the Vietnamese mango as higher in terms of taste, flavour and smell than others of Asian origins. Actually, some popular green skin varieties in Vietnam are called Taiwan or Thailand. Therefore, he could not answer yet the first marketing question:<< *what the unique selling proposition of the Vietnamese mango is*>>.

However foreign markets require quality mango: fresh, good taste, perfectly formed skin with good colour, without residues and storable. To gradually introduce a series of corrections to production towards international standards and thus create a more diversified export capacity, it will be necessary to have a two-fold approach.

- On the industry side:

- (i) first, foster forms of aggregation/coalition like cooperatives to disseminate amongst identified, progressive farmers the essential best agricultural practices; facilitate the introduction of modern techniques, reduce inputs costs, increase quality control, facilitate crop certification and ensure larger, homogenous quantities of complying mangoes.

- (ii) Second, involve all the concerned value chain actors in this process: such as PPD, the suppliers of chemicals, the providers of logistic services, the pack-houses, the treatment service suppliers and the exporters. Ideally encourage the creation of a very short value chain to further reduce costs and increase controls and ensure traceability to facilitate buyers' investigation. Foster commitment along the value chain through written contracts. Ensure the proper and timely feed-back from foreign markets to the growers.

- On the foreign markets side:

- (i) the majority of the common consumers in the largest markets like the USA and EU, in general are not in a position to make a choice based on the origin of the mango exposed on the shelves. Therefore, to convince a foreign buyer to import Vietnamese mangoes instead of Thai, or Indian or Pakistani (just to mention a few of the most popular Asian varieties) will first depend on the exporter's capabilities to sell successfully his mangoes.

Secondly, it will be essential the capacity of the country to inform the buyers about the rigorous controls in place, from the inputs suppliers to the exporters and about the progress made in dissemination of the quality culture along the value chain. Without having the above systems in place, the Vietnamese exporters will continue to lack great support and face difficult challenges.

Last consideration: as clearly summarized in an ACIAR report, combining the mango varieties which are suitable to the local growing conditions, meet the transporters' needs and satisfy the foreign consumers' preferences is very complicated. Farmers are guided by varieties which are resistant to pests and diseases and are productive. While traders prefer endurance fruit, able to tolerate SPS treatments and transportation and final consumers are attracted by colours, aroma, flavour and texture.

Annex

Annex 1: List of importers

South Korea

❑ Sakata Korea Co., Ltd. 273 Gangnam-daero, Seocho-gu Seoul, 137862 Rep. of Korea
+82-234746670

Japan

❑ Mizuasa Fruit and Vegetables Co. Ltd 2 Yamanouchi-cho, Kanagawa-ku Yokohama-shi, Kanagawa
+81.045-441-2981

Australia

❑ Fresh Express

Ph +61.401196760

Mr. Barry Doran (barrydoran@hotmail.com)

❑ Australia Fruits Imports Pty Ltd

315, Cooper St, Melbourne Market, 9/11 Badalya Rd, Epping VIC 3076

+61.0393388245

❑ AB Trading Corp Pty Ltd 1124/45 Macquarie Street Parramatta NSW 2150 Australia

+61.449104256

info@abtrading.com.au

❑ AS Barr Group

2 Sherwood Rd Rocklea, Brisbane Markets, Brisbane 4106, Queensland, Australia Contact person:
Joe Saina

+61.0732783744

❑ Antico International Pty. Ltd

Sydney Markets Warehouse G,

Sydney Markets 2129, NSW, Australia

Contact person: Hugh Molloy

+61.0297643833

❑ bgp International

3/217 Ferrars Street, Melbourne 3001, Vic, Australia

Contact person: Prudence Barker

+61. 03 96863300

❑ Favco – Fruit & vegetable Co.

385 Sherwood Road, Rocklea 4106, Qld, Australia

Contact person: Matthew Kellythorn

+61.0737171500

❑ FruitMaster

74-80 Stubbs St,

Kensington 3031, Vic, Australia

Contact person: Brett Pickering

+61.0393766767

❑ J.E. Tipper

14 Murdoch Circuit, Acacia Ridge 4110, Queensland, Australia

Contact person: Daniel Lutman

+61.02 97631323

❑ Valleyfresh Global

1-11 Bliss Court, Derrimut 3020, Vic, Australia

Contact person: Simon Powell

+61.3 83682808

United Kingdom

❑ Wealmoor

Jetha House

Unit 5, Auriol Drive, Greenford Park, Greenford Middlesex UB6 0TP

www.wealmoor.co.uk

Mr. Jayesh Dodhia (<mailto:jayesh.dodhia@wealmoor.co.uk>)

❑ Ripe Now Ltd

Bittern Way, Wyberton, Boston PE21, UK,

United Kingdom

Mr. Levy Hook (<mailto:lewey@ripenow.co.uk>)

❑ Pacific Produce UK The Threshing Barn North Weston Thame

Oxfordshire OX9 2HA

United Kingdom

Mr. Robert Kullum (rob@pacificproduce.co.uk)

The Netherlands

❑ BUD Holland

Transportweg 67

2676 LM Maasdijk The Netherlands

Mr. Richard van den Akker (<mailto:r.vandenakker@bud.nl>)

❑ Frutos Tropicales Europe BV Klappolder 191

2665 MP Bleiswijk The Netherlands

*Mr. Edwin Janssen - (edwin@bud.nl)
Mr. Matthijs Ahsman (<mailto:matthijs@fteurope.eu>)

☐ Nature's Pride

Honderdland 611

2676 LV MaasdijkHolland

Mr. Karel van der Linden (<mailto:Karel.vanderLinden@naturespride.nl>) Mr. Arjen de Haan (<mailto:Arjen.deHaan@naturespride.nl>)

Mr. Peter Ypma (<mailto:peter@naturespride.nl>)

☐ YEX BV

ABC Westland 120

2685 DB PoeldijkThe Netherlands

Mr. Martijn de Graaf (<mailto:info@yex.nl>)

Italy

☐ SPREAFICO FRANCESCO & FRATELLI S.P.A. Italy

Mr. Matteo Malvestiti <https://www.spreadico.net/it/>

Fresh fruit consultants

☐ Fresh Dynamics Asia, Netherlands

Mr. Marcel Stallen, FAO agri-business, value chain and market consultant.

marcels@freshdynamics.biz

m.stallen1@kpnplanet.nl

☐ Eurasia Connection, Germany, Mr. Willem Kokkeel kokkeel@eurasia-connection.com

<http://www.eurasia-connection.com/>

☐ Fruit Consultancy Europe, Netherlands, Mr. Piet Schotel piet@fruitconsultancy.nl

<https://www.fruitconsultancyeurope.nl/>

Annex 2: Summary of 20 Export Companies Survey Responses

Summary of the responses provided by 20 export companies during the structured interviews conducted by SIAEP in August-September 2020

Q1 – Company's details

Please see the list of the companies at the end of this document

Q2 - Type of business?

▪ Private sector -	15
▪ Smallholders/Household -	3
▪ Joint-Stock enterprise -	1
▪ Cooperative -	1
▪ State-owned -	0
▪ Foreign investment enterprise -	0

Q3 - Years of activity?

▪ 2-5 years -	11
▪ over 10 years -	5
▪ over 5 years -	4
▪ 1-2 years -	0

Q4 - Number of employees?

▪ 25-50 -	15
▪ 50-100 -	3
▪ 100-200 -	1
▪ 200-500 -	1
▪ more than 500 -	0

Q5 - Its own packing facility?

▪ Yes -	14
▪ No -	6

Q6 - Facility related to the export activity?

▪ Yes -	3
▪ No -	17

Q7 – If yes, which facility?

▪ VHT Plant -	1
▪ HWT Plant -	1
▪ Washing machine & Cold storage system -	1
▪ Cold storage system -	1
▪ Irradiation Plant -	0

Q10 - Company's export markets, in order of volume?
(5 Skipped)

▪ China -	8
▪ Russia -	3
▪ S. Korea -	3
▪ Australia -	3
▪ HK -	3
▪ UAE -	3
▪ Singapore -	3
▪ USA -	2
▪ Japan -	1
▪ Oman -	1
▪ France -	1
▪ Thailand -	1
▪ Canada -	1

Q11 - Basket of fruit exported?

▪ Mango -	20
▪ Dragon fruit -	8
▪ Longan -	4
▪ Rambutan -	3
▪ Bananas -	2
▪ Coconut -	2
▪ Durian -	2
▪ Grapefruit -	2
▪ Jackfruit -	2
▪ Lychee -	2
▪ Passion fruit -	2
▪ Star apple -	2
▪ Guava -	1
▪ Lemon -	1
▪ Mangosteen -	1
▪ Watermelon -	1

Q12 - Percentage of mango exported in the last 3 years?
(weighted average)

▪ 2019 – 20 companies -	52%
▪ 2018 – 15 companies -	44%
▪ 2017 – 15 companies -	43%

Q13 & Q14 - Import fruits from another country?

- | | |
|------------------|------------------|
| ▪ 7 companies - | YES - Only mango |
| ▪ 13 companies - | NO |

Q15 - From which country?

- | | |
|-----------------|-------------------|
| ▪ 6 companies - | Cambodia |
| ▪ 1 company - | Cambodia and Laos |

Q16 – Name of the main export market?

- | | |
|---------------|----|
| ▪ China - | 11 |
| ▪ Japan - | 2 |
| ▪ S. Korea - | 2 |
| ▪ Russia - | 2 |
| ▪ USA - | 2 |
| ▪ HK - | 1 |
| ▪ Australia - | 1 |
| ▪ UAE - | 1 |

Q17 – Profile of the customer abroad?

- | | |
|------------------------|-----|
| ▪ Importer - | 61% |
| ▪ Distributor - | 33% |
| ▪ Supermarket' buyer - | 5% |
| ▪ Other | 1% |

Q18 - Terms of payment agreed?

- | | |
|-------------------|-----|
| ▪ Bank transfer - | 90% |
| ▪ Cash - | 10% |

Q19 – Products exported to the main market?

- | | |
|----------------------|-----|
| ▪ Mango - | 65% |
| ▪ Basket of fruits - | 35% |

Q20 – Mango varieties exported?

- | | |
|-------------------|-----|
| ▪ Tuong Da Xien - | 69% |
| ▪ Cat Chu - | 62% |
| ▪ Keo - | 54% |
| ▪ Cat Hoa Loc - | 15% |
| ▪ R2E2 - | 8% |
| ▪ Xiem Nùm - | 8% |

Q21 (A) – Means of transportation?

- By road - 60%
- By sea - 25%
- By air - 15%

Q21 (B) – Duration of the transportation?

- By road - 1-4 days (China)
- By sea - 3 days (HK), 5 (China), 7-8 (Japan & S. Korea), 16-26 (Dubai), 20 (USA) 16-23 (Australia), 16-40 (Russia)
- By air - ½ day (Dubai), 1 (Australia), 2 (USA)

Q22 - Export during the year?



Q23 – Frequency of the shipment in these months?

- Frequency and quantities vary significantly in the responses. It goes from 30 tons per month to more than 2,000 tons per month. It depends on the company size of the exporter, its business relationships and the dimension of the markets

Q24 – Certificates or quality testing required by local authorities?

- Japan & S. Korea: Pesticide residue, plant protection, Brix: >180, VietGap: List of members selling mangoes to a Japanese company, Certificate of origin. APC.
- China: not required, HACCP, Certificate of origin
- USA: HACCP, GLOBAL GAP, ISO 9001:2015, Planting Area Code, Irradiation
- Russia: FFTA, APC, VietGAP, HACCP, Certificate of Plant Quarantine of Vietnam (phyto)
- UAE: MRLs
- Australia: VietGap, certification of origin
- HK: SPS

Q25 – Difficulties in finding these certificates?

- No
- If the company exports to the United States, it must wait for irradiation and then have to apply for an export license from the plant quarantine department, so the cost increases.
- The farmer has not followed the mango production standards
- Product quality, growing regions,
Lack of some certificates to enter the EU market.

Q26 - Issues related to the technical requirements

	Never %	Rarely%	Sometimes%	Often%
Pesticide problems	60	15	25	0
Unauthorized substance	85	5	10	0
Exceed MRL	80	5	15	0
Pest infestation	60	10	30	0
Plant disease	70	15	15	0

Q27 – How did you solve the problem?

- The handling of damaged shipments depends on the failure rate of the shipment. If the shipment is damaged less than 60%, the importers can sort and sell the mangoes with a discount to recover the cost. If the shipment is damaged more than 60%, it must be destroyed, and the costs are borne by the exporter. However, there are companies that pre-treat the fruit properly, so no spoilage occurs.

**Q28 – How long was the consignment delayed?
(only 12 answers)**

- No delay - 8
 - 3 days or a week. 2
 - 3- 10 days 1
 - 10 days 1
- (Additional cost to run the refrigerated truck. In addition, a delay in customs clearance)

Q29 – Was the consignment rejected?

- No – 89%
- Yes – 11%

Q30 - How often do you experience delays in releasing consignment?

- Sometimes - 60%
- Never - 25%
- Rarely - 15%
- Often - 0%

Q31 – Issues you faced with supplier related to quality standards?

▪ Skin colour -	75%
▪ Size, aroma, taste -	50%
▪ Ripeness -	50%
▪ Presence of blemish -	20%
▪ Cleanness -	20%
▪ Traceability -	10%
▪ Packing -	10%
▪ Labelling -	5%

Q32 – Who decides the quality specifications in the company?

▪ Business owner -	13
▪ QC staff and technical/purchasing dept. -	5
▪ HR -	1
▪ Responsible for the cooperative	1

Q33 – Difficulties in finding quality standard complying mangoes?

▪ No -	12
▪ Yes -	7
▪ Skipped -	1

Q34 – Your main competitors in your main export market?

▪ Chinese producers -	8
▪ Thai -	7
▪ Vietnamese exporters -	4
▪ Mexico -	2
▪ Philippines -	2
▪ India -	1
▪ Bangladesh -	1
▪ Don't know -	1
▪ Skipped -	1

Q35 – Varieties and prices of the main competitors?

- In the Chinese market the main competitors are those countries selling mangoes with the price from 10% to 40% lower than the Vietnamese mangoes, but the quality is not as good as Vietnamese mangoes. Chinese mango prices range from \$0.22 to \$0.784/Kg. While Vietnamese mango prices range from \$0.65 to \$1.73 / kg.
- In the USA market the major competitors are Mexican and Thai mangoes. The selling price of Vietnamese mangoes in this market is often higher than that of competitors due to high transportation costs, so customers often buy Vietnamese mangoes when mangoes from other countries are out of season.

Q36 – Complaints from your buyers?

▪ Skin colour -	74%
▪ Presence of blemishes	11%
▪ Cleanness -	37%
▪ Ripeness -	58%
▪ Disease (lack of shelf life) -	42%
▪ Latex on skin/sap burn -	11%
▪ Internal breakdown -	5%
▪ Size -	26%
▪ Length of stem -	0.0%
▪ Smell -	0.0%
▪ Taste -	11%
▪ Labelling -	5%
▪ Packing -	5%
▪ Traceability -	5%
▪ Other (Please specify) -	11%

Q37 – Other issues not related to quality?

▪ Seasonality -	60%
▪ Volume/Quantity, availability -	50%
▪ Time of delivery -	25%
▪ Others -	10%

Q38 – Could you indicate the total mango business in your main market?

- Can't answer -
- I don't have details –
- Skipped 10 interviewees

Q39 – Segmentation of your main market?

13 answered – 7 skipped

▪ Supermarkets –	13
▪ Specialized exotic fruit shops -	8
▪ Traditional shops –	7
▪ Ethnic shops –	1

Q40 – Most profitable segment in main market?

4 answered – 16 skipped

▪ Supermarkets (in particular HK and Dubai) –	3
▪ E-commerce -	1

51

Q41 – Has your main market got potential growth?

- The demand for tropical fruits in the USA market is very high, but mangoes have not yet been able to enter major USA supermarkets such as Walmart and Costco.
- Korean consumers rate Vietnamese mangoes as sweet and delicious as mangoes from Thailand, the Philippines or Australia.
- Countries with high demand for tropical fruits, especially mangoes are Australia, UAE, Russia, China. In China local traders often buy Vietnamese mangoes for processing and then export processed mango products to Russia or other neighbouring countries. But currently, due to the epidemic effect, it is decreasing as the market demand is not high as compared to that of some years ago.
- The USA market is large, but they require strict product quality. The price of Vietnamese mango is not really competitive because the transportation cost is too high.
- The Chinese market is very large and has not been fully exploited.
- The Japanese market is in great demand. Vietnamese mango flavor is appreciated. The price of Vietnamese mango fine with Japanese families.

Q42 – How can it be improved?

- 20 skipped

Q43 – Who are your suppliers?

- | | |
|----------------------|-----|
| ▪ Collectors - | 79% |
| ▪ Farmers - | 58% |
| ▪ Cooperatives - | 37% |
| ▪ Your own orchard - | 16% |
| ▪ Pack Houses - | 11% |

Q44 – How many days to move mangoes through the value chain?

- Farm-Packhouse: from a few hours to max 3 days [18 responses]
- Farm-Middle/intermediate man: from a few hours to max 3 days [14 responses]
- From middleman to pack house: from a few hours to max 2 days [12 responses]
- From pack house to exporter: from a few hours to max 3 days [11 responses]
- From middleman to exporter: from 1/2day to max 3 days [10 responses]
- Consolidation of export consignment: from a few hours to max 2-3 days [11 responses]
- SPS treatment (VHT, irradiation): max 1 day [5 responses]
- Inspection: in general, 1-day max 2-3 days [11 responses]
- Cut off time at port/airport: in general, 1-2 days. Sometimes more [17 responses]
- From airport to markets/supermarkets/consumers: from 2 to 5-7 days [11 responses]

Q45 – Payment terms to Vietnamese suppliers?

- | | |
|-------------------|----|
| ▪ Cash - | 18 |
| ▪ Bank transfer - | 2 |

Q46 – Which documents you require from your suppliers?

- APC Area production code - 47%
- VietGap - 40% [6 responses]
- PUC (Pack house unit code)- 27%
- Others: not required/no need - 27% [8 responses]
- GlobalGap - 20% [3 responses]
- BRC - 7%

Q47 – Do you provide feed-back to your suppliers?

- Yes - 56%
- No - 44%

Q48 – Who conducts these operations?

Activity	The supplier	The exporter	Third party	Responses
Grading	26%	74%	0%	19
Ripening	25%	75%	0%	16
Cold storing	11%	84%	5%	19
Cleaning	16%	84%	0%	19
Labelling	11%	89%	0%	19
Fungicides	27%	67%	7%	15
Wrapping	22%	78%	0%	18
Packing	24%	82%	0%	17
Irradiation	11%	33%	67%	9
VHT	0%	0%	100%	5
HWT	17%	33%	50	6
Transport	6%	41%	71%	17

Q49 – Do you or your suppliers apply for any post-harvest disease control?

- Yes - 63%
- No - 37%

Q50 – Is there unbroken cool chain?

- From farm to exporter: Yes - 79% No – 21%
- From Exporter to departure: No – 89% Yes – 11%
- At the departure point: No – 89% Yes – 11%

Q51 – What do you do with the fruit that doesn't meet any export requirements?

- Local traditional markets – 80%
- Processing companies – 53%
- Supermarkets - 16%
- Shops - 11%
- Other (return to the suppliers) - 5%

Q52 – At what discount do you sell these products?

- From 20% to 70% on the export price
- Return to the suppliers [1 response]

Q53 – What % of losses usually occur in your export consignments and what are the main reasons for these losses?

- 5-10%
- 5% Due to burning pus on mango skin
- 5-10% (cold damage and mechanical damage
- 40% loss if the export fails
- 10-20%
- 20-30%
- 5%
- 50%
- 3-5%
- 10-30%
- 5-10%
- 10% due to shipping process
- 10-20% due to inadequate transportation and selection of the quality inputs
- 10-40% loss due to overheating, long transit time, mechanical damage
- 5% loss due to shipping
- The losses cannot be calculated
- 5-7% for a single shipment to Japan

Q54 – What process happens if the export consignment doesn't meet the importer's standards?

- The importing country will choose the shipment again, and the substandard goods will be decided by the importer
- If the exported goods do not meet the importer's standard, the company will be deducted money or the company will negotiate to reduce the price for the lots with great losses.
- If the shipment is 70% damaged, the entire shipment must be cancelled and additional storage costs and costs of shipment cancellation in the importing country. If the shipment is less than 60% damaged, the importers can classify and sell them cheaply to recover capital 20-30%
- Chinese traders buy back at low prices

From Q55 to Q71 - Where do you think we should provide technical assistance along the supply chain?

- **Q55 - Suppliers of chemicals?** Yes 32% No 68%
Q56 - Because not good quality, wrong material
- **Q57 - Farmers?** Yes 37% No 63%
Q58 - Because used at the wrong time, too much chemicals, the average quality.
- **Q59 - Cooperatives?** Yes 5% No 95%
Q60 - Continuous control process
- **Q61 - Collectors?** Yes 79% No 21%
Q62 - The way they handle the product. Not adequate mean of transportation
- **Q63 - Pack houses?** Yes 17% No 83%
Q64 - Losses. Physical/Chemical treatment
- **Q65 - Are the extensions providing enough services in terms of advice and control?**
Neutral 84% Good 11% Very good 5%
- **Q66 - Service (treatment) providers?** Yes 11% No 89%
Q67 - Cost [100%]
- **Q68 - Customs?** Yes 11% No 89%
Q69 - Too long export procedure [100%]
- **Q70 - Transportation?** Yes 16% No 84%
Q71 - Too costly air freight [100%]

Q72 - What support do you receive in the sphere of your export activity?

	Yes	Sometimes	Often	No
From the Gov.t?	18%	0%	=	82%
From export associations?	11%			89%
Vietnamese Consulates/Trade Offices?	17%	0%	0%	83%
Financial contribution for the participation in exhibitions?	37%	0%	5%	58%
Participation in trade missions?	39%	0%	0%	61%
Export insurance for commercial risks?	28%	0%	6%	66%

Q73 - Do you see opportunities in developing new export markets?

Yes 100%

63

Q74 – What are they?
(16 answered 4 skipped)

- South Korea 9
 - Japan 6
 - South-East Asia 2
 - USA 2
 - Russia 2
 - Middle East 2
 - Hong Kong 1
 - Singapore 1
 - Brunei 1
 - Malaysia 1
 - Canada 1
 - Australia 1
- Opportunities are great because these markets (Dubai, Oman, HK) have not been exploited to their full potential.
 - The quality of Vietnamese mango is too delicious.
 - The trade conflict between the USA and China facilitates exports. The company's sales increased by 30%.
 - The Hoa Loc sandy mango meets only the Korea, Singapore e HK markets because of a very short preservation time.
 - Having quarantine, food safety and safety certification is exportable to Canada and Middle East.
 - Find out about the needs and meet new markets, change the mechanism to compete with Thai mangoes.

Q75 – Would you be willing to invest in capital equipment that would enable you to better access these markets?

Yes 84% No 5% Other 11%

Q76 – Would you be willing to invest in accreditation programs that would enable you to better access these new export markets?

Yes 95% No 5%

Q77– Would you be willing to invest in your supply base to enable you to receive mangoes that will meet export market's requirements.

Yes 63% No 37%

Q78– If yes, please specify

- The establishment must ensure the best quality of goods.
- Investing in Cambodia: a farm about 15 hectares of acacia green.
In Vietnam do not dare to invest because the market depends too much on China.
- Planting area planning meets the requirements of new markets: ensured production process, completed construction of VietGap, GlobalGap for farmer, applied measures to lengthen the season for exporting mangoes all year round.

Q79– How and where do you expect that the COVID-19 will impact your business?

- For air transport: the increase in the cost of air transport due to the influence of Covid-19 epidemic makes the orders limited. Goods going to countries like the US or Australia are greatly affected. The total output of exported goods decreased by 50% compared to the previous years.
- For sea and road transport: Customs clearance of goods is too slow along with high transportation costs, so exporting shipments has many difficulties.
- In addition, raw materials are in shortage by 50% compared to the previous year. Traders from other countries cannot visit or buy mango, so the number of orders is also significantly reduced.

Q80– Do you have any suggestion to solve these issues?

- The company accepts to reduce profits to support customers with prices.
- Change shipping methods with lower costs.
- The government supports to reduce taxes and interest rates to reduce production costs in order to increase competitive advantage.
- Wishing the Government to support market expansion, reduce export, promote domestic sale.
- Introducing post-harvest technology for processing - preserving - exporting to new markets.
- The solution is to sell those goods to the Chinese market.
- Reduce shipping costs, reduce the cost of irradiation and heat treatment.
- The company has a policy to regulate export volumes to suit the current situation.
- Domestic sale at low prices, retail at markets, 40% discount.

Annex 3: List of the companies interviewed by SIAEP

Hoa Loc Cooperative

Khu Pho hamlet, Hoa Hung Commune, Cai Be District, Tien Giang Province

Viet Tuyen Fruit Processing Facility

Dong My Hamlet, My Hoi Commune, Cao Lanh District

VINA T&T Import Export Service Trading Co. Ltd

79 Tran Huy Lieu, Ward 12, Phu Nhuan District, City. HCM City

Dong Thap Kim Nhung Company Limited

No. 1061, Group 1, Hamlet 1, Ward 11, City. Cao Lanh, Dong Thap Province

My Tam Fruit Company Limited

11E / 1, Area 8, An Binh Ward, Ninh Kieu District, Can Tho City

Company Limited Le Huy

Binh Trung Hamlet, Binh Phuoc Xuan Commune, Cho Moi District, An Giang Province

Ba Xoai Import-Export Company Limited

Hamlet 2, My Hiep Commune, Cao Lanh City, Dong Thap Province

Transport Service Trading Company Ltd Phuc Khang Thinh

55/5000 No. 40, Hamlet 2, My Hiep Commune, Cao Lanh District, Dong Thap Province

Hoang Phat Fruit Company Ltd

Phu Thanh hamlet, Tam Vu town, Chau Thanh district, Long An province

Chanh Thu Fruit Import-Export Company Ltd

Nhon Phu hamlet, Hoai Nghia commune, Cho Lach district, Ben Tre province

Nam Nhan Fruit

Hamlet 4, Tan Thanh Commune, Cai Be District, Tien Giang Province

Hung Lap company

Hamlet 5, An Huu Commune, Cai Be District, Tien Giang Province

Cao Lanh Agricultural Products Co Ltd

130, My Thoi Hamlet, My Xuong Commune, Cao Lanh District, Dong Thap Province

Hoa Loc RR Import Export Co. Ltd

Hamlet 3, Tan Hung Commune, Cai Be District, Tien Giang Province

Elite Foods Company

No. 15, street 3, Center land residential area, ward 10, Go Vap district

EMMA Import Export Trading Co. Ltd

D33 Agricultural Products Wholesale Market,

Sao Khue SG Co. Ltd

34 A, Road 609, Group 3, Trung Viet Hamlet, Phuoc Hiep Commune, Cu Chi District, HCMC

Khanh Hoa Phat Import Export Co. Ltd

R25 Street No. 4, Van Phuc Urban Area, Quarter 5, Hiep Binh Phuoc Ward, City. HCM City

Vinh Long Clean Agriculture Facility

29/B Tra Phu street, Ward 4, Vinh Long city

Viet Investment – Production & Trading Co. Ltd

210 Ly Thai To street, ward 1, district 3, Ho Chi Minh city

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