Appendix 8.12

This case study forms part of the overarching *2017–19 ACIAR Mango Agribusiness Research Program*

Project:	**Opportunities and strategies to improve biosecurity, market access and trade for selected mango markets**
Study:	**The Philippines**
Project number:	**AGB/2016/008**
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Contents

1 Acknowledgements

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2 Case summary

As a tropical country, the Philippines is endowed with a favourable climate for producing tropical fruits, such as bananas, pineapples and mangoes. Mangoes are considered the country's third most important fruit in terms of export volume and value. One of the opportunities in the fresh mango industry is accessing the Chinese market through direct and formal trade channels. This study aimed to identify the factors that hinder mango exporters from pursuing the Chinese market, as well as other issues that constrain fresh mango exports.

In the past decade, the Philippines has experienced a decline in its ability to export sufficient volumes of mangoes to the international market. Mango exporters find it difficult to seize the opportunity to expand their market base due to various constraints. Suppliers are confronted with inadequacy, as well as the seasonal supply of mangoes. Steady, low production levels are worsened by weather disturbances and pest infestation. This inevitably causes an even more inadequate supply of export-grade mangoes. This problem has a serious impact on the competitiveness of fresh mango exports in terms of price and the ability of export firms to deliver the required volume. Contributing to the low competitiveness of fresh Philippine mangoes is the high cost of freight as well as treatment and inspection. Substantially increasing the volume of mangoes for export would make shipping more economical.

Fresh mango exporters prefer to send their fruit to Hong Kong rather than to China using a direct route. Without the additional cost of vapour heat treatment (VHT), inspection and refrigeration during transit, mango exporters are able to maintain a competitive price in the receiving market. There is still room for improvement in terms of public sector support. This study makes the following recommendations:

- **Development of export-quality mangoes**: an analysis study to develop opportunities for a more direct transaction between producers and exporters to encourage mango growers to produce export-quality mangoes.
- **Investment of foreign accreditation**: evaluation to develop a model for local quarantine officers to liaise with importing countries, for example as undertaken by China and South Korea.
- **Optimising VHT facilities**: analyse and evaluate the opportunity for mango exporters and the government to collaborate with researchers to ensure VHT facilities are more cost-efficient.

3 Introduction

3.1 Project background

As a tropical country, the Philippines is endowed with a favourable climate for producing tropical fruits such as bananas, pineapples and mangoes. Mangoes are considered the country's third most important fruit in terms of export volume and value. Major export destinations include Japan, Hong Kong and South Korea. This paper looks at how the Philippines could seize China's growing potential in relation to becoming its main export market. The current direction of Philippine mango exports is focused on Hong Kong, with 30–40% being re-exported to China via an informal trade route.

There is great opportunity to maximise the potential of the direct and official access that the Philippines has achieved in terms of Chinese markets. This, however, entails a considerable effort from suppliers and exporters in complying with the various requirements imposed by China (which is a phytosanitary market).

3.2 Study objectives

This case study aims to identify technical, scientific and commercial constraints that may prevent the Philippines from meeting the requirements of the mango export market to China.

A study to review published research and reports was conducted to:

- detail which markets the Philippines were exporting into (particularly phytosanitary markets) and the current export arrangements that are in place
- document the maximum residual limits that have occurred in the past
- document the maximum residual limits that management currently processes in the Philippines.

Interviews with key stakeholders were conducted to:

- gain an understanding of other potential quarantine issues (such as mango seed weevil and mango pulp weevil) and their potential impact on market access
- detail where the Philippines have lost access to phytosanitary markets in the past, for what reason and how the situation was resolved, if at all
- identify potential commercial companies that may exist in the Philippines that have the technical capacity to meet export requirements
- identify – through consultation with previous project personnel – the ability of local industries to meet the rigours of export protocols, particularly regarding continuity of supply and fruit quality.

3.3 Study methodology

This study covers the whole value chain of fresh mangoes. Technical, scientific and commercial issues at every stage of the chain were documented. Both the Philippine mango exporters and quarantine officers were interviewed to provide a more balanced view of the constraints faced by the exporters. To be able to achieve the objectives of the study, key informant interviews were conducted with stakeholders from the industry and public sector.

Private sector

A total of three fresh mango exporters were interviewed: two of whom were located in Davao while the other one was in Cebu.

1. **Exporter A:**
   - Located in Mindanao
   - Had its own VHT facility
   - Exported to China
2. **Exporter B:**
   - Located in Visayas
   - Had a partner in Manila that conducted VHT treatments
   - Exported to Japan
3. **Exporter C:**
   - Located in Davao City
   - Had its own VHT facility
   - Exported to South Korea

Public sector

Some officers and staff from the Bureau of Plant Industry (BPI) were interviewed. These officers were from research and development, production support and administration divisions in the National Mango Research and Development Center in Guimaras and the Plant Quarantine Service.

4 The Philippine fresh mango export industry

4.1 Mango production

As a tropical country, the Philippines is endowed with a favourable climate for producing tropical fruits, such as bananas, pineapples, and mangoes. Mangoes are considered the country's third most important fruit in terms of export volume and value. Mango production in the Philippines is often small-scale, with an average farm size of just 1.34 hectares (ha) in 2015.

There are two main varieties of mangoes grown in the Philippines: Carabao and Pico. The former is an export variety, while the latter is mainly for local consumption. More than 80% of mangoes produced in the Philippines are the Carabao variety. The Philippines is divided into three islands: Luzon, Visayas, and Mindanao, with Luzon responsible for producing the majority of the mango crop. Luzon produced approximately 70% of the total quantity of mangoes from 1991 to 2010 (see Figure 1). However, Mindanao seems to have been catching up in the last six years with Luzon producing a little more than 50%, while Mindanao has produced closer to 30%.

The top-producing province in the whole country is Pangasinan, which produces a quarter of the total quantity of mango crops. In Visayas, the Cebu province produces the highest volume while Zamboanga del Norte and Davao del Sur are leading producers in Mindanao. In 2016, 85% of mangoes produced were Carabao mangoes. Although only around 1% of Philippine Carabao mangoes came from Guimaras, mangoes from this province are famous worldwide for their sweet taste and blemish-free skin. Almost all (about 99%) of mangoes produced in Guimaras are Carabao mangoes (i.e. for exports).

Figure 2 shows areas in the Philippines with the highest production of mangoes. Yellow areas are those that have high mango production levels while red areas have medium production levels and light blue areas have little to no production. In the same figure, black map markers indicate the location of VHT facilities across the country.

Figure 1. Political map of the Philippines

Sources: Villar, 2003a & 2003b

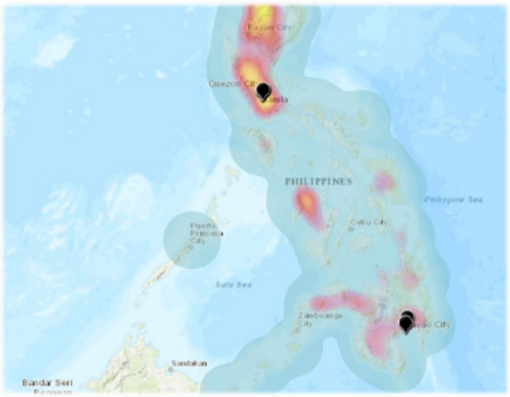

Figure 2. Mango production and VHT facilities in the Philippines, 2016

Sources: Map created using ArcGIS software by Esri
Note: Yellow and red colours indicate high mango concentration. Black markers show the location of VHT facilities.

The harvested area increased steadily from 1990 until 2006 (see Figure 4) and has plateaued ever since. However, based on official data, total production volume has decreased for the past decade. In 2016, the total volume of production was 814,055 tonnes, while in 2006 it was 919,030 tonnes (see Figure 3). Accordingly, the yield trend, which is total production per area harvested, has also decreased since the early 2000s (see Figure 5). Bad weather and pest infestation are among the main culprits. It is also interesting to note that the profitability of mango production has quickly fallen. Figure 6 shows that the ratio of net profit to cost dropped from 2.9 in 1996 to 0.89 in 2016.

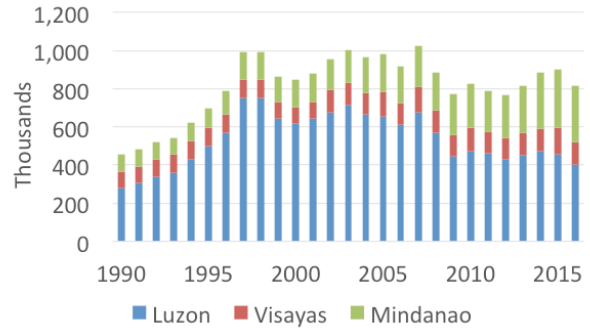

Figure 3. Domestic production by weight (tonnes), 1990–2015

Source: Authors' analysis

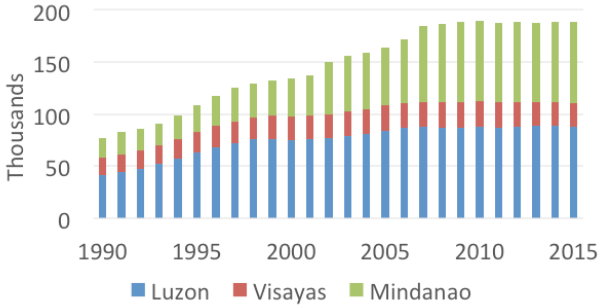

Figure 4. Area harvested (hectares), 1990–2015

Source: Authors' analysis

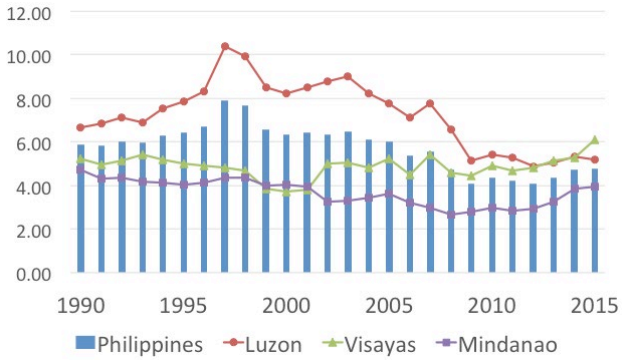

Figure 5. Yield (tonnes per hectare), 1990–2015

Source: Authors' analysis

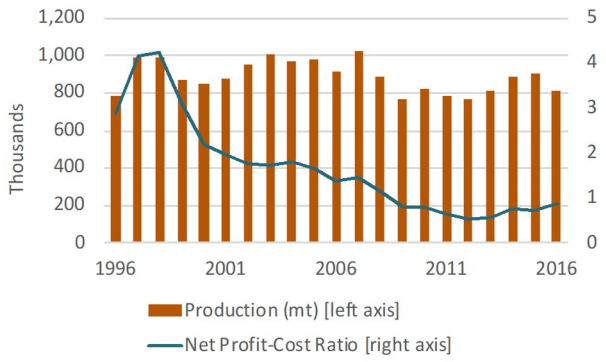

Figure 6. Net profit–cost ratio, 1996–2015

Sources: PSA, 2018a, 2018b, 2018c

The consequence of low yield in recent years is the high farmgate price of Carabao mangoes. Farmgate price per kilogram in 2016 was PHP38.92[1] (USD0.74), while back in 2006 it was just PHP24.75 (USD0.47).

Mango supply is seasonal as shown in Figures 7 and 8. The peak months in Luzon are from March to May. On the other hand, Mindanao provides a more stable supply all year round, which is also reflected in their farmgate prices.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Luzon Production	Lean		Peak			Lean					Lean	Lean
Mindanao Production	Stable supply for the entire year											

Figure 7. Mango production in Luzon and Mindanao

Source: Authors' analysis

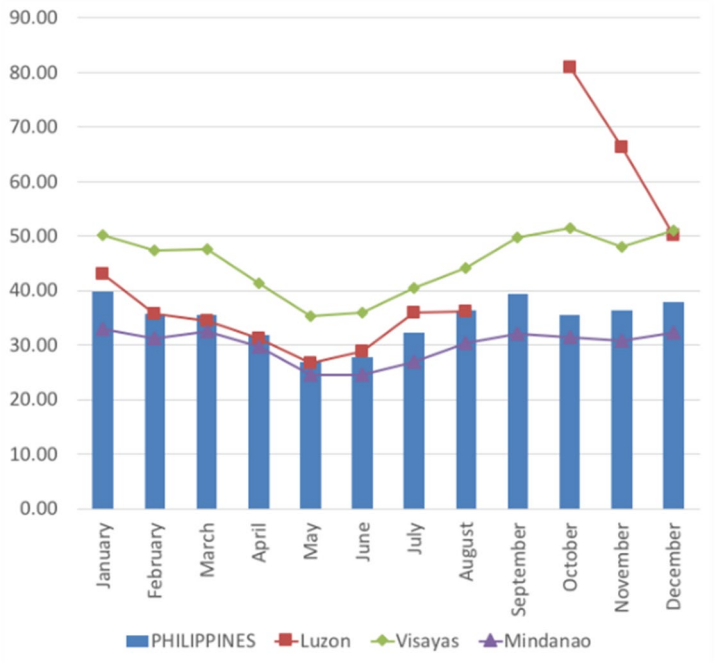

Figure 8. Average monthly farmgate price of Carabao mangoes in the Philippines, 2010–2018

Source: PSA, 2018d

4.2 Value chain

According to official statistics, the average share of domestic consumption to total mango production was 92% from 2010 to the present. Alternatively, the decreasing trend in total production of mangoes has adversely affected the volume of exports. Exported mangoes as a share in gross production has declined. During the 1990s, the average share of exports was at 4.8% and it then fell to 3.3% in the 2000s. This has further reduced to an average of 2% since 2010 (PSA, 2018e).

The Philippines' main participation in the global value chain of mangoes is in the production and processing stages (see Figure 9). In fact, around 70% of export sales come from processed or dried mangoes. Fresh mango exporters compete with processed

[1] *Exchange rate as of December 2018: PHP52.7691 = USD1*

mango firms in terms of procuring mangoes. However, from a processing firm's point of view, fresh mango exporters are viewed as partners (rather than as competitors) to ensure that farmers obtain the highest possible price for their mango produce. Mangoes for processing are usually those that do not meet export-grade requirements.

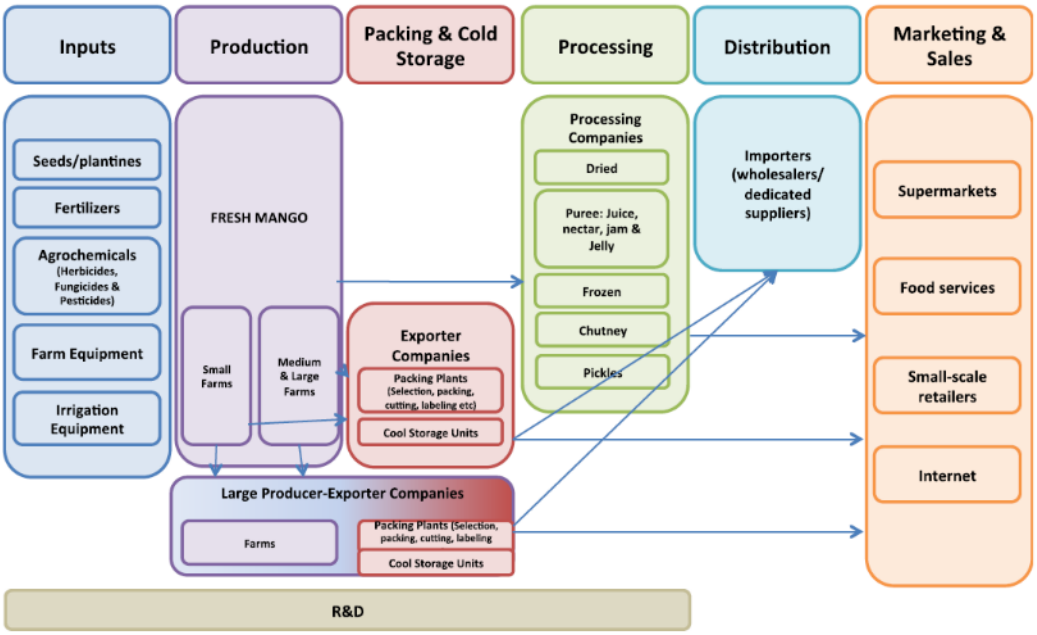

Figure 9. The Philippines' participation in the global mango value chain

Source: Fernandez-Stark et al. 2017

Fresh mango exporters have different modes for procuring mangoes. Some firms have their own mango farms while others obtain their mangoes from BPI-accredited farms. When buying from accredited farms, exporters usually liaise with farmers/growers directly. Classified pricing occurs when mangoes are priced differently depending on whether they are export- or local-grade and is a service that exporters offer to traders and growers. An alternative pricing scheme is 'straight pricing' whereby no sorting takes place. Export-grade means superior physical quality of the fruit (e.g. colour/maturity; and absence of scratches, mould, burns and other imperfections on the skin) (Briones et al, 2013). Superior-quality fruit fetch a much higher price – usually around PHP75.00 (USD1.42) to PHP80.00 (USD1.52) per kilogram. When farmers sell their produce to traders, the buying price is generally only PHP25.00 (USD0.47) per kilogram. The difference in prices encourage farmers to liaise with exporters directly. Some farmers build networks with different packing houses. In this way, rather than waiting for the traders or exporters to approach them during harvest season, they actively offer their produce to mango exporters.

4.3 Transportation from source to treatment plant / packing facility

Traders sort mangoes at the farm to select export-grade and sizes as demanded by importing countries. As a quality control measure, one export company was only willing to accept mangoes within 24 hours of harvest. Another company would query suppliers to find out if the maturity of the mangoes was between 105 to 110 days. For mangoes between 115 and 120 days, problems such as cracking occurred. Mangoes that were acceptable for exports were wrapped in newspaper and then placed inside banana boxes. Each box contained 18 kilograms of mangoes. After that, the mangoes were transported

via open-top trucks. Tarpaulins were used as improvised covers to protect the fruit from too much sunlight and rain. The traders, or the farmers/growers (for direct sourcing), take on the responsibility of shouldering costs associated with transporting the fruit to the packing houses or plants.

4.4 Treatment facilities for fresh mango exports

In the Philippines, there are two kinds of treatment facilities for fresh mango exports: VHT and irradiation.

4.4.1 VHT facilities

Of the eight VHT facilities owned by seven mango exporting companies listed on the BPI's official website, five are located in Metro Manila while the other three are in Davao (BPI, 2018a).

Due to long transit times of three to five hours, mangoes can suffer physical damages such as bruises and bumps that result in some mangoes being rejected upon arrival at the packing house. Rejected mangoes are either returned to the growers or sold to the local market. The rate of rejection from the farm to the packing facility is around 10% due to physical damage and 2% for misclassification of size. Listed below are the main stages of the VHT. BPI inspectors are present to monitor the whole process from Step 2 until the end.

Receiving and grading

- The mangoes are weighed and sorted during this stage.

HWT

- After sorting, the mangoes are washed with chlorine as the use of fungicide has been banned by the BPI.
- The mangoes are then dipped in hot water at 50 ºC for 10 minutes.
- Conditioning takes place for 24 hours at room temperature. The purpose of this process is to identify if there are any issues with the fruit before treatment commences.

Loading and VHT

- The capacity of the VHT facility depends on the model of the machine (e.g. 7–8 tonnes or 12 tonnes per batch)
- The whole treatment process lasts four hours due to the 'ramp-up' time to reach 46 ºC (for Carabao mangoes).
- Once 46 ºC is reached, the mangoes are subjected to VHT for 10 minutes.

Cooling down and drying

- The mangoes are then placed in a cold shower for 10–15 minutes.

Final grading and packing of the treated mangoes

- Treated mangoes are checked for any damage (e.g. bruising due to handling).
- Some of the rejects are kept for taste testing while others are used as a control product for further observations.
- The treated mangoes are packed into boxes with mesh/nets.
- The boxes are then sealed.
- The standard weight per box is five kilograms.

Staging

- At the staging area the boxes are stored at 19 ºC.

Loading into reefer van or container truck

- The boxes are loaded into a reefer van or refrigerated truck.
- The temperature inside the reefer should be maintained at 9 ºC.

4.4.2 Irradiation treatment facility

In the Philippines there are currently two irradiation facilities owned and operated by the Philippine Nuclear Research Institute (PNRI). The PNRI is mandated to 'develop and regulate safe and peaceful uses of nuclear science and technology in the Philippines' (PNRI, 2017). The facilities offer gamma and electron beam irradiation services to over 90 clients including research centres and industry (PNRI, 2017) (see Table 1).

Table 1. Irradiation services performed by PNRI in 2017

Technical service	Number of technical services	Clients served
Gamma irradiation services (MID)	668	91
Gamma irradiation services (Gammacell 220) for a small volume of samples	34	28
Electron beam irradiation services	19	1

Source: PNRI Annual Report, 2017

The facility in PNRI caters to the needs of the food industry such as the spice and herbal products sector. They rely on the gamma irradiator facility of the PNRI for microbiological decontamination. However, the demand has increased overtime and PNRI can no longer cope with it. There are plans to upgrade the facility and to establish a commercial facility in the future (Gaspar, 2018).

4.5 Transportation from the treatment facility to the export destination country

4.5.1 Containerisation

A 20-ft container usually carries seven tonnes of treated mangoes, while a 40-ft container carries 11 to 12 tonnes. Exporters frequently load around 1,100 to 1,200 boxes into a 20-ft container, and 2,200 boxes into a 40-ft container. To fill a container, an exporter may require one week to procure a sufficiently large load of mangoes.

Demand in terms of fruit size and weight of fruit per box may differ by importing country. South Korean markets prefer larger mangoes (i.e. medium, large, and extra-large). Table 2 provides information on the standard size classification and weight of mangoes, as well as the total count of mangoes per box.

Table 2. Mango count and size per carton

Size classification	Weight (grams/fruit)	Pieces per carton			
		2.5 kg	5 kg	10 kg	12 kg
Extra-large (XL)	>350	6–7	12–14	24–28	30–32
Large (L)	300–349	8	16	32	41–43
Medium (M)	250–299	10	20	40	44–50
Small (S)	200–249	12	24	48	51–63
Super small (SS)	160–199	14–16	28–32	56–64	64–75

Source: PNS/BAFPS, 2004

For markets that require phytosanitary accreditation, containers need to be refrigerated to keep treated mangoes from ripening too fast. In the case of other markets that do not require VHT (e.g. Hong Kong), dry and half-open-door containers are utilised instead of refrigerated containers. For transport at arrival ports, non-refrigerated trucks are usually less costly than refrigerated ones.

4.5.2 Mode of transportation

Based on interviews with fresh mango exporters, the usual modes of transportation from the treatment facility to the importing country are air and sea freight. Sea freight is cheaper and, therefore, a more common mode of transportation. One exporter made a comparison in terms of the cost of sending treated mangoes by air and sea. If the shipment is to be transported by air from Davao, the cost would be USD6.00; however, sea freight would be USD3.00. Whenever exporters are pressed for time, they choose to ship by air.

4.5.3 Transit time by sea

Table 3 shows the transit time from the Philippines to the destination markets. For Japan, an average of five days is required to ship mangoes from the Philippines. The shortest transit time is for those shipments destined for Hong Kong, which would take three days.

Table 3. Philippine mango export transit times

Port of origin	Port of destination	Duration (days)
Manila	Hong Kong	2–3 (8–12 if there is port congestion)
Davao	Hong Kong	3
Manila	Japan	4–5
Davao	Japan	5
Davao	China	7
Davao	South Korea	7–8

Source: Authors' analysis

4.5.4 Import country customs inspection

Currently, fresh mango exports wait at the port in China for only three days. This is a vast reduction in the original waiting time of 20 days which occurred if there was a phytosanitary issue attributed to a Philippine mango exporter.

4.6 Export destinations

In terms of export volumes, the Philippines has decreased by almost half compared to export data in 2001 (see Figure 10). This result can largely be explained by the decreasing trend in production levels. However, in terms of export value it seems that the trend is increasing (see Figure 11).

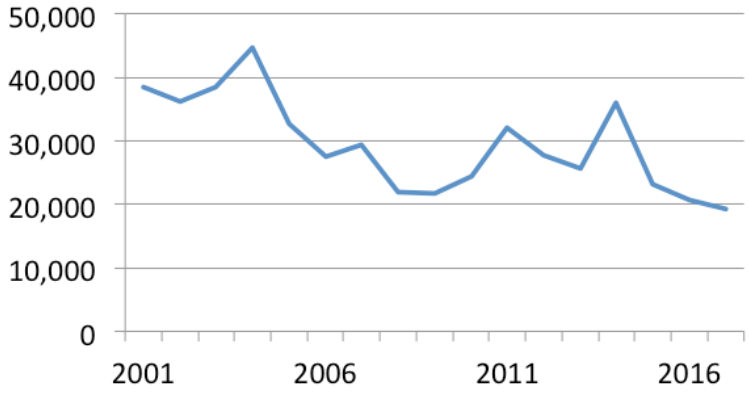

Figure 10. Philippine mango exports by volume, 2001–2016

Source: ITC, 2018
Note: Commodity classification 080450 – fresh or dried guavas, mangoes and mangosteens (volume of guava and mangosteens exports is negligible).

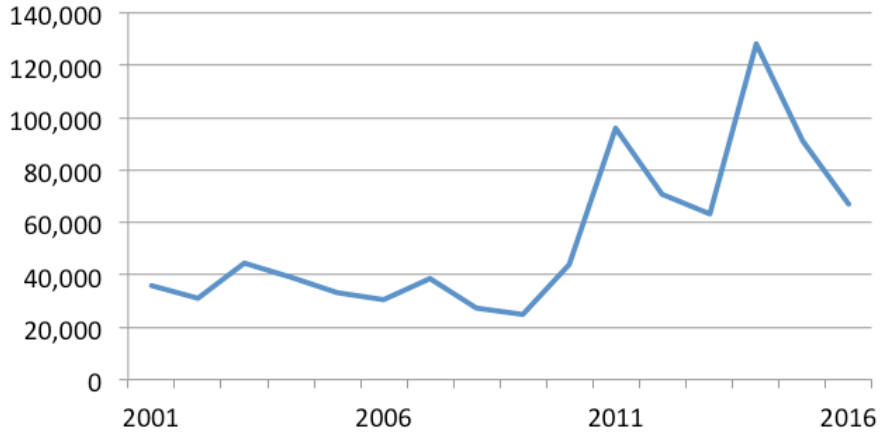

Figure 11. Philippine mango exports by value, 2001–2016

Source: ITC, 2018
Notes: Commodity classification 080450 – fresh or dried guavas, mangoes and mangosteens (volume of guava and mangosteens exports is negligible).
Figures presented in USD.

The Philippines' share in global mango exports has decreased over the past couple of decades. In 2001, around 5% of all exported mangoes came from the Philippines; however, this share dropped to 1% in 2016. The Philippines used to supply a sizeable share of mangoes to Asia. In 2001, around 30% of all mangoes imported into Asia were from the Philippines. During that time, Thailand only supplied 20% of the market share; however, this has been dramatically reversed. In 2016, Thailand supplied more than 70% of the mangoes, while the Philippines only had around 8% share. The same trend can be observed in the Philippines' mango exports to China and Hong Kong (see Table 4).

Table 4. Philippine mango exports by share, 2001–2016

	2001 share (%)	2010 share (%)	2016 share (%)
World mango exports	5.31	1.70	1.11
Total mango imports			
Asia	27.86	6.69	7.64
China	10.24	0.63	1.23
Hong Kong	60.82	21.71	38.71

Source: ITC, 2018
Note: Commodity classification 080450 – fresh or dried guavas, mangoes and mangosteens (value of guava and mangosteens exports is negligible).

In the early 2000s, Hong Kong and Japan were the top export destinations of both fresh and processed Philippine mangoes (see Figure 12). The share of exports to the United States of America (USA) has also grown sharply since 2011. At the same time, direct exports to China have also increased.

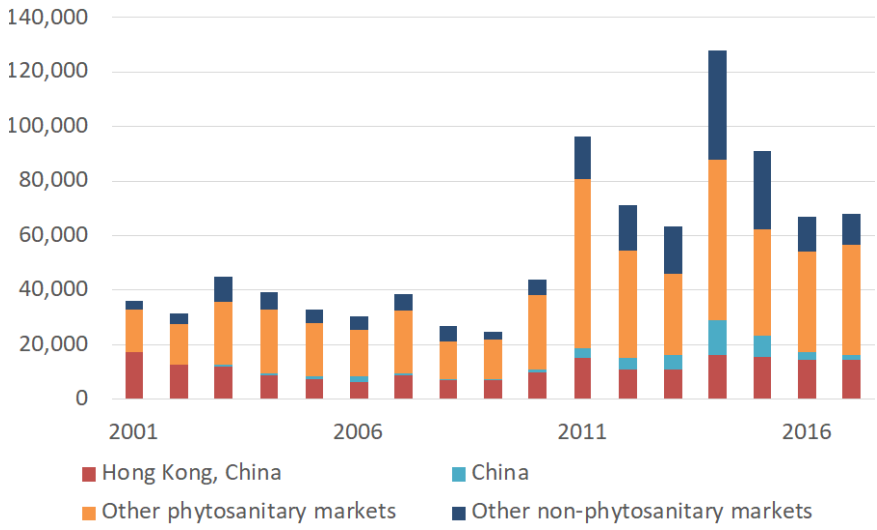

Figure 12. Philippine mango export destinations by value, 2001–2016

Source: ITC, 2018
Note: Figure presented in USD.

5 Phytosanitary controls and measures of mango freshness

5.1 Pest and diseases affecting Philippine mangoes

In 2002, a list of diseases and pests in the mango industry was published by AFMIS. Some major diseases that mangoes commonly suffer from include anthracnose, scab, stem rot, sooty mould, and storage rot. Common pests that affect mangoes are mango hoppers, mango tip borers, mango twig borers, fruit flies, and scale insects. To control the pests, especially fruit flies, some farmers wrap and bag mangoes on the tree (DA AFMIS, 2002).

As early as 1987, the BPI released Special Quarantine Administrative Order No. 20 that declared mango pulp weevil (MPW), *Sternochetus frigidus* (Fabricius), as a dangerous

and injurious pest. As a result, the Palawan province was quarantined to prevent its spread. Among the pests that the BPI is currently focused on eliminating are fruit flies, pulp weevils, and seed weevils. Due to the risk of spreading pests and diseases, importing countries may impose phytosanitary controls.

5.2 Phytosanitary market requirements

In some cases, import requirements are easy and simple, such as in Hong Kong. However, other importing countries require certain types of treatments and other protocols before accepting mango shipments. These countries may be referred to as 'phytosanitary markets'. For example, Japan, South Korea, and China also require some form of treatment (e.g. VHT) while the USA government requires hydrothermal treatment and irradiation of mangoes before import.

Japan

All mango exports to Japan are subject to monitoring of pesticide residues which is conducted by the BPI – National Pesticide Analytical Laboratory (NPAL). Japan requires a maximum residue limit (MRL) of 0.05 ppm for chlorpyrifos, cypermethrin, and profenofos (DA-AFMIS, 2009). Japan adopts the specific MRL export standards and mangoes need to be fully matured (i.e. 110–125 days from flower induction). Also, the mango's surface needs to be clean, free from defects and properly trimmed properly. Latex burn (if any) must not exceed 5% of the surface area. Other physical and mechanical defects are not acceptable. Finally, mangoes should be free from pest or disease.

To ensure that mangoes are free from pests, the Japanese government imposed a protocol that requires Philippine mangoes to undergo VHT. Aside from VHT, the mangoes need to be packed into cartons (with mesh) inside an enclosed packaging area. The whole process of treatment up to loading requires monitoring by personnel from the Japanese Ministry of Agriculture, Fisheries, and Forestry. All auxiliary costs of engaging a foreign quarantine inspector (e.g. salary, transportation, and accommodation) are to be shouldered by the exporters (DA-AFMIS, 2009).

South Korea

Like Japan, South Korea imposes the use of VHT, as well as the usual export standards in terms of size and weight of the packaged mangoes.

Australia

Australia grows its own mango varieties, such as Kensington Pride, Tommy Atkins, Keitt, Kent, and Irwin. Although Philippine mangoes are acceptable to the Australian market in terms of taste, local mangoes (i.e. Kensington Pride) are still preferred. Mangoes originating from Guimaras, one part of the Philippines are only allowed to enter Australia after they have undergone VHT (DA-AFMIS, 2009). A Philippine quarantine inspector is required to certify the treatment; the presence of a foreign inspector is not required. The Australian government has funded a project that sought to identify additional areas for sourcing mango exports to Australia. In 2010, Biosecurity Australia certified Davao del Sur as a new source of mangoes. Sarangani and General Santos had also requested to be included in the 'pest free areas' (DA-AFMIS, 2009).

In October 2016, the Department of Agriculture and Australian Embassy officials signed 'the amended Specific Commodity Understanding for the importation to Australia of fresh

mango fruits from the Philippines'. This recognises the Philippines as free from seed weevil and pulp weevil, except for the island of Palawan (Lesaca, 2016).

China

The Chinese market may be categorised into Southern China and Northern China. Philippine exporters usually access China through Hong Kong (DA-AFMIS, 2009). In 2009, China and the Philippines signed a protocol of phytosanitary requirements for mango exports arriving from the Philippines. Included in this protocol was the use of extended hot water treatment (EHWT) (DA-AFMIS, 2009).

USA

In 2001, the United States Department of Agriculture – Animal and Plant Health Inspection Service (USDA-APHIS) conducted a pest risk analysis that was used as a basis for approving a federal rule that allowed mangoes to enter the USA provided that they were sourced from Guimaras and they had undergone VHT (DA-AFMIS, 2009). A year later, the USA government approved the use of irradiation technology as an alternative quarantine treatment for imported fruits and vegetables (DA-AFMIS, 2009). Since then, the PNRI and BPI have undertaken research to determine the effect of irradiation on pests while seeking to maintain mango quality.

In 2003, the Philippines requested that the USA allow mangoes from anywhere in the Philippines (except from Palawan) to enter Hawaii and Guam (DA-AFMIS, 2009). The Philippines argued that Guam and Hawaii also have mangoes that are hosts to mango seed weevil. A ruling was released in 2006 stating that mangoes arriving from approved areas other than Guimaras should be labelled properly (i.e. 'For distribution in Guam and Hawaii only'), and must be accompanied by a phytosanitary certificate issued by the Department of Agriculture declaring that the mangoes have undergone treatment for fruit flies of the genus *Bactrocera* (DA-AFMIS, 2009).

The same protocols as in Japan are applied to the USA. Upon subjecting the fruit to VHT, it needs to be carefully packed into cartons within an enclosed area. Before shipment, the mangoes must be inspected by a designated quarantine officer from the USDA-APHIS. All costs related to inspection (e.g. salary and accommodation) are the responsibility of the exporting firm (DA-AFMIS, 2009).

In 2014, the USDA recognised that all areas in the Philippines are free from mango seed weevil (*Sternochetus mangiferae*) and mango pulp weevil (*Sternochetus frigidus*). Nonetheless, the fruit still needed to undergo treatment against fruit flies (*Bactrocera spp.*). The treatment could be either VHT or irradiation (using 150 Gray); however, during that time there were no approved VHT or irradiation facilities in the Philippines, therefore fresh mangoes were not allowed entry into any port within the USA. (USDA-APHIS, 2014). As of 2018, the USDA had not authorised any irradiation facility in the Philippines (BPIb, 2018).

5.3 Maximum residue limits (MRL)

Apart from treatment requirements, importing countries also closely check compliance with the MRLs. Being a member of ASEAN, the Phillipines has made significant steps towards the harmonisation of standards in food safety, as well as setting the maximum residue limits of pesticides (PNS/BAFS, 2015).

As early as 2013, a recommendation was made by the Philippine Council for Agriculture and Fisheries – Committee on Fruits and Vegetables to the Department of Agriculture's Office of the Secretary about the establishment of a national standard on pesticide residue. This was followed by the creation of a Technical Working Group (TWG) who were

responsible for developing an initial list of MRLs for specific crops (e.g. banana, mango, pineapple). Experts from various research institutions, and the public and private sectors were involved in this endeavour. The draft standards were then presented to stakeholders to inform them of the set limits. In 2015 this list was finalised and then adopted as the Philippine National Standards (PNS/BAFS, 2015).

MRLs for mangoes were based on various sources such as the Fertilizer and Pesticide Authority (FPA), Codex Alimentarius, ASEAN, and the Japan Agricultural Standard (JAS). The FPA and BAFS' TWG regularly review and update the MRL list (PNS/BAFS, 2015). Figure 13 lists the pesticide residues in mangoes and their corresponding MRL.

	MRL (ppm)
azoxystrobin	1.00
benomyl	2.00
captan	5.00
carbaryl	3.00
carbendazim	2.00
cartap hydrochloride	3.00
chlorothalonil	0.50
chlorpyrifos	0.05
clothianidin	1.00
cyfluthrin (includes β-cyfluthrin)	0.02
cypermethrin	0.03
deltamethrin	0.50
dimethoate	1.00
dinotefuran	1.00
dithiocarbamates (includes mancozeb, propineb)	2.00
etofenprox	2.00
fenthion	5.00
fenvalerate	1.00
glyphosate	0.20
imidacloprid	0.20
profenofos	0.05
pymetrozine	1.00
tebuconazole	0.10
thiophanate-methyl	2.00
trifloxystrobin	0.70

Figure 13. Pesticide residue MRLs in mangoes

Source: PNS/BAFS, 2015

5.4 Compliance issues in the past

Compliance issues with regard to importation requirements are presented in the following section.

China

In 2006, China's import regulations were changed to reject mangoes treated using VHT. The following year, the Philippines requested China approve the EHWT as a cheaper alternative to VHT. EHWT was anticipated to decrease export costs to China by approximately PHP20.00 per kilogram. In 2009, the official protocol was approved and signed by the Philippine and Chinese governments for the EHWT protocol.

Japan

In 2005, Japan intercepted a mango shipment from the Philippines that was found to contain chlorpyrifos that exceeded the MRL permitted by Japan. This led to an inspection of mangoes from that specific company. A few months later the Japanese Government's Ministry of Health, Labor and Welfare announced the resumption of exports from the company.

6 Public sector

6.1 Bureau of Plant Industry

The BPI is part of the Department of Agriculture and is tasked with promoting the development of plant industries through crop and plant research and development.

The BPI has various functions including quarantine and phytosanitary control measures. Below are some of the laws that mandate the BPI in this function.

- Executive Order 116
    - 'Recommend plant quarantine policies and prescribe rules and regulations for the prevention, control and eradication of pests, diseases and injuries to plants and plant products.'
- Presidential Decree 1433 'The Plant Quarantine Law'
    - 'to prevent the introduction of exotic pests in the country and prevent further spread of plant pests already existing from infested to pest-free areas and to enforce phytosanitary measures for the export of plants, plant products and regulated articles.'
- Law of Instruction 986 on Pesticide Residue Analysis and Monitoring
    - 'Establish pesticide laboratories all over the country.'
    - 'Monitor the levels of pesticide residue in crops to protect the local and international consumers from possible health hazards.'
    - 'Check on possible indiscriminate use and application of pesticides on food crops and other agricultural products.'
    - 'Determine and evaluate practices on the use of pesticides for possible modification resulting in acceptable low residues in agricultural products.'
- Presidential Decree 1144 on Analyses of Formulated Pesticide Products
    - 'The decree which created the Fertilizer and Pesticide Authority recognising BPI mandate on pesticide residue analysis and having the expertise and facilities specifically mandates BPI to perform technical analyses on formulated pesticide products.'
- Republic Act 7394 'Consumer Act of 1992'
    - 'To improve the quality of local fresh agricultural crops and promote its export.'
- Republic Act 7607 'Magna Carta for Small Farmers'
    - 'Monitor the level of chemical residues of agricultural crops and by-products and recommend policies for safety of consumers.'

The six divisions in the BPI are listed below:

1. Agricultural Engineering Division
2. Plant Product Safety and Services Division (BPI, 2018b)
    - 'tasked with the characterisation of agricultural crops and its by-products as well as monitoring of pesticide formulated products, pesticide residues and other contaminants in the foods.'
    - Constituent Sections and Laboratories
        - Accreditation and Inspection Section

                - ‘Spearhead the accreditation of packing houses and establishments involved in the distribution of fresh and minimally processed fruits and vegetables.’
                - ‘Inspection of packing houses of fresh agricultural produce intended for export and domestic markets for compliance to food safety protocols.’
            - Contaminants Laboratory Section
            - Pesticide Analytical Laboratory Section
            - Satellite Pesticide Analytical Laboratories (SPAL)
3. National Plant Quarantine Services Division (NPQSD) (BPI, 2018c)
    - ‘regulatory arm of the Philippine Department of Agriculture when it comes to matters of import, export, domestic movement as well as market access of plants and plant products. It aims to prevent the entry of foreign pests into the country, prevent spread of pests already existing in the country and comply with the phytosanitary requirements of the trading partners.’
    - NPQSD has 23 centre stations and twelve (12) sub-stations nationwide.
    - The NPQDS-Central Office has 10 sections:
        - Accreditation and licensing
        - Quarantine policy and coordination
        - Pest risk analysis
        - Market access
        - Laboratory operations and diagnostic
        - Sanitary and phytosanitary
        - Database management system
        - Information/communication
        - Capacity building and cooperation
        - Special programs
4. Crop Pest Management Division (BPI, 2018d)
    - ‘Develops and formulates guidelines and standards on management of plant pests.’
    - ‘Provides technical assistance, coordination, and where necessary supervision over regional facilities.’
    - ‘Provides facilities for plant pests and disease diagnosis; mass production and rearing of biological control agents for field distribution; training for crop protection staff and extension agents; and proper evaluation of national programs and projects on crop protection.’
    - ‘Supervises and evaluates researches and other development projects on exotic pests of special national considerations.’
    - ‘Acts as the central monitoring arm and repository of regional pest data.’
    - Constituent sections:
        - Pest forecasting section
        - Bio-control and integrated pest management (IPM) section
        - Plant health and pest status section
            - ‘Develops and maintains a repository of pest data, specimen-based pest list and other crop protection information.’
            - ‘Determines and reports the pest incidence and resistance (i.e. invasive, outbreak, epidemic).’
5. Crop Research and Production Support Division
6. National Seed Quality Control Services Division

Exporters need to comply with the export certification procedures and phytosanitary certification systems, which are based on the International Plant Protection Convention’s standard for export certification systems, enforced by NPQSD.

6.1.1 Export certification procedure

The following are the export certification procedures (BPI, 2018a):

1. The NPQSD requires exporters to file their 'Application for Exportation for commercial and non-commercial volume' at least 48 hours before the date of departure.
2. An import permit from the destination country may need to be submitted by the exporters to NPQSD. This should include details on the terms and conditions of compliance.
3. A clearance for restricted and/or prohibited exports or the movement of plants, planting materials and plant products issued by designated agencies in the Philippines (e.g. Department of Environment and Natural Resources).
4. Exporters need to accomplish an application for phytosanitary certification.
    a. BPI-NPQSD is the only government agency in the Philippines authorised to issue such certification.
    b. It may be denied for 'exports to countries in which the commodity is prohibited by the plant quarantine regulations'.
5. Inspection/examination/verification of commodities needs to be completed at least 48 hours before actual loading. Location of the inspection may happen either at the office of the National Plant Quarantine Services or at the premises of the export company.
6. Treatment may be waived depending on the requirements of the importing country.

6.2 Programs for the mango industry[2]

Based on a commodity profile document regarding mangoes (BPI, 2016), below are the strategies and support programs for the whole mango value chain identified by various stakeholders in the industry:

Inputs: improve availability of quality planting materials

1. Invest in nurseries.
2. Strengthen the accreditation of nurseries and also the plant material certification program.
3. Conduct training on the proper handling of planting materials.
4. Reproduce and distribute information, education, and communication (IEC) materials to farmers.

Farm production: enhance farm efficiency and investments

1. IEC campaign on GAP / best farm practices
2. Benchmarking and best practices dissemination
3. Conduct training on modern farm/processing practices
4. Develop sanitising protocols and codes of practice for compliance of GAP

Processing: increase export value

1. Coordinate with PhilMech the fabrication of prototype equipment
2. Develop marketable value-added products through capacity building and institutional development

Market: improve market price and quality standards

1. Exporters to work with suppliers, growers and contractors to ensure GAP is in place
2. Find alternative markets

[2] *http://bpi.da.gov.ph/bpi/index.php/commodity-profile/186-mango-elements-paper-2016*

3. Conduct of trade missions
4. Tap agricultural attaché

Financing: access to long term funds

1. Review of the mango financing program
2. Endorsement of proposals to financing institutions
3. Review official data in consultation with the private sector

7 Industry feedback

7.1 Mango procurement

One of the main problems faced by exporters is achieving an adequate volume of fresh mangoes. Due to the low production volume of mangoes, the export industry finds it difficult to source export-grade mangoes from such a small base. More than a decade ago, during peak season the mango export industry could easily fill around four to six containers within one week. At present, even one 40-ft container is difficult to fill. During peak season, a packing house needs to source mangoes to fill three to four containers.

Due to the limited and seasonal supply in some parts of the country and changes to climate, it has recently become more difficult to procure mangoes. Not all areas can deliver export-grade fruit. Mindanao is known to have a stable supply of mangoes all year; however, especially during lean season in Luzon, exporters have to compete with those from Luzon as they flock to Mindanao farms in search for export-grade mangoes.

7.2 Inspection costs

All of the respondents raised the cost of Japanese inspectors as one of the problems within the industry. According to one respondent, the cost of one Japanese inspector is PHP1 million per year. However, another respondent provided an estimate of around PHP2 million per quarter per inspector.

The cost of inspections is not an issue for other phytosanitary markets (e.g. China and South Korea) as they have already deputised or authorised Philippine inspectors to complete actual and physical inspections for every shipment.

7.3 MRL restrictions in the Philippines

One exporter stated that they began reducing the volume of their exports to Japan due to the MRL restrictions. Some of the chemicals used by suppliers are illegally sourced and contain chemicals banned by the BPI. Since these are usually cheap, some mango producers utilise these products; however, due to weak monitoring of chemical usage at farms, exporters are at risk of obtaining mangoes that would eventually be rejected for exceeding MRLs set by the BPI.

The main difficulty is that there seems to be some discrepancy between the MRLs set by the BPI and those set by the receiving country (i.e. Japan), with the BPI being stricter. Some exporters are puzzled with the rationale of applying a stricter MRL when the mangoes rejected by BPI quarantine officers for export are actually sold to the domestic market. If health safety was an issue, clearly these mangoes should be banned, even in the domestic market.

7.4 Production practices

MRL issues are an ongoing challenge. Exporters argue that mango quality could still be improved; however, current problems regarding mango quality are only present when the fruit starts to ripen. The business risk associated with poor-quality mangoes is borne by exporters. An exporter demonstrated the uncoordinated planting schedule for mangoes – any mango grower can plant at any time, therefore there is no stable supply of mangoes. Another exporter noted that during off-peak in Luzon, Luzon-based exporters compete with Mindanao-based exporters for the export-quality mangoes, this inevitably increases the price.

7.5 Small volumes to China

The current market in China is small. Exporters want this to increase drastically so that it would be more cost-effective to ship fresh mangoes into this market. The small volume of mangoes exported to China is due to several reasons. The first is that some exporters are not able to meet the demands of the Chinese market (i.e. flawless skin). They often target buyers that focus on quality and taste of the fruit rather than the outside appearance. Second, exporters feel that the public sector could contribute further to assist the export of Philippine mangoes into China.

7.6 Problems related to VHT

The main setback with VHT is the cost of the treatment and the ancillary cost of refrigeration during transit. VHT mangoes are not competitive compared to the untreated fruit. The treatment is estimated to cost 60 to 70 cents per kilogram of mangoes. According to one exporter, their maximum load for VHT was 6.4 tonnes. Losses due to VHT are estimated to be 3–10%. Latex burn usually becomes more apparent after VHT. Rejected mangoes are generally sold in the local market. An exporter suggested that the eating quality of fresh mangoes changes after subjecting them to VHT and subsequent refrigeration in transit to importing countries.

8 Results and discussion

8.1 Challenges and potential solutions along the chain

Fresh mango exporters in the Philippines currently face various challenges along the value chain. Suppliers are confronted with inadequacy as well as seasonality of supply of mangoes. The downward trend in the production volume of mangoes is alarming. Production levels are adversely affected by weather disturbances and pest infestation. Low production worsens the inadequate supply of export-grade mangoes. Although not a problem for exporters directly, the high cost of inputs is one of the major problems faced by mango growers (Briones et al, 2013). If inputs were cheaper, mango growers could invest more on these essential inputs and hopefully increase their production.

Luzon exporters need to source mangoes from Mindanao during Luzon's off-peak season. Based on interviews, Mindanao exporters complained about higher prices of export-quality mangoes as they compete with their Luzon counterparts when procuring mangoes during that time. Mango growers are offered a very good price by exporters, rather than by traders. By procuring mangoes directly from mango growers, exporters help them benefit more from their produce. This provides an incentive for mango growers to maintain export-grade quality because they are aware that these are priced much higher than lower-grade fruit. This is a win-win situation as exporters would also enjoy a much greater volume of export-grade mangoes in their future transactions.

The problem of low-volume production affects the competitiveness of fresh mango exports in terms of price and also their ability to deliver the required volume. Moreover, other factors contributing to low competitiveness of fresh Philippine mangoes are high freight cost and the added cost of treatment (e.g. VHT). Substantially increasing the volume of mangoes for export would make shipping more economical (Briones et al, 2013).

8.2 Hong Kong as a preferred route

Fresh mango exporters still prefer to send their fruit to Hong Kong than to China using the direct route due to:

1. the absence of taxes and tariffs
2. VHT not being required which, in turn, allows exporters to save on the cost of VHT and refrigeration during transit.

However, it is important to note that the consignment trading arrangements with the Hong Kong market places the risk of loss for unsold produce in the destination market on the exporters (Briones et al, 2013). Payment is not made upon arrival of the shipment; sometimes it would take at least a week before payment is made (DA-AFMIS, 2009).

8.3 Public sector role

Currently, whenever there are violations of quarantine rules and regulations in the import country, the Department of Foreign Affairs notifies the BPI who then informs the exporter. The BPI undertakes an investigation and instructs the exporter regarding corrective actions to take.

Apart from the times when shipments are intercepted at the port of destination, the role of the government is to facilitate discussions and agreements when setting new MRL standards in an import country. In 2006, when Japan set a higher standard of MRL acceptance for chlorpyrifos and cypermethrine (from 0.5 ppm to 0.05 ppm), the government engaged in discussions with the Philippine Mango Exporters Foundation during this process.

9 Conclusion and recommendations

9.1 Conclusion

As a tropical country, the Philippines is endowed with a favourable climate for producing tropical fruits, such as bananas, pineapples and mangoes. Mangoes are considered the country's third most important fruit in terms of export volume and value. One of the opportunities in the fresh mango industry is to tap into the Chinese market through the direct and formal trade channels. However, in the past decade, the Philippines has experienced a decrease in its ability to export adequate volumes to the international market. Mango exporters find it difficult to seize opportunities to expand their market base which is primarily due to various constraints. Suppliers are confronted with inadequacy as well as seasonality of mango supplies. The downward trend in the production volume of mangoes is alarming. Production levels are adversely affected by weather disturbances and pest infestation. Low production worsens the inadequate supply of export-grade mangoes.

The problem of low-volume production affects the competitiveness of fresh mango exports in terms of price and the ability to deliver the required volume. Moreover, other factors contributing to low competitiveness of fresh Philippine mangoes are high freight cost and

the added cost of treatment (e.g. VHT). Substantially increasing the volume of mangoes for exports would make shipping more economical.

For this reason, fresh mango exporters still prefer to send their fruit to Hong Kong rather than to China using the direct route. Without the additional cost of VHT treatment, inspection, and refrigeration during transit, mango exporters are able to maintain a competitive price in the receiving market.

The government plays an important role in addressing some challenges faced by the fresh mango export industry. For instance, serious efforts have been made to ensure that proper quarantine and phytosanitary protocols are observed by all stakeholders. There is still room for improvement by the public sector in terms of how it demonstrates support to the mango export industry. This could be achieved by negotiating a more realistic set of MRLs or by providing more expeditious assistance and investigation during shipment interceptions.

9.2 Recommendations

Below are key recommendations on the issues raised by some mango exporters:

- **Development of export-quality mangoes**: an analysis study to develop opportunities for a more direct transaction between producers and exporters to encourage mango growers to produce export-quality mangoes.
- **Investment of foreign accreditation**: Evaluation to develop a model for local quarantine officers to liaise with importing countries, for example as undertaken by China and South Korea.
- **Optimising VHT facilities**: Analyse and evaluate the opportunity for mango exporters and the government to collaborate with researchers to ensure VHT facilities are more cost-efficient.

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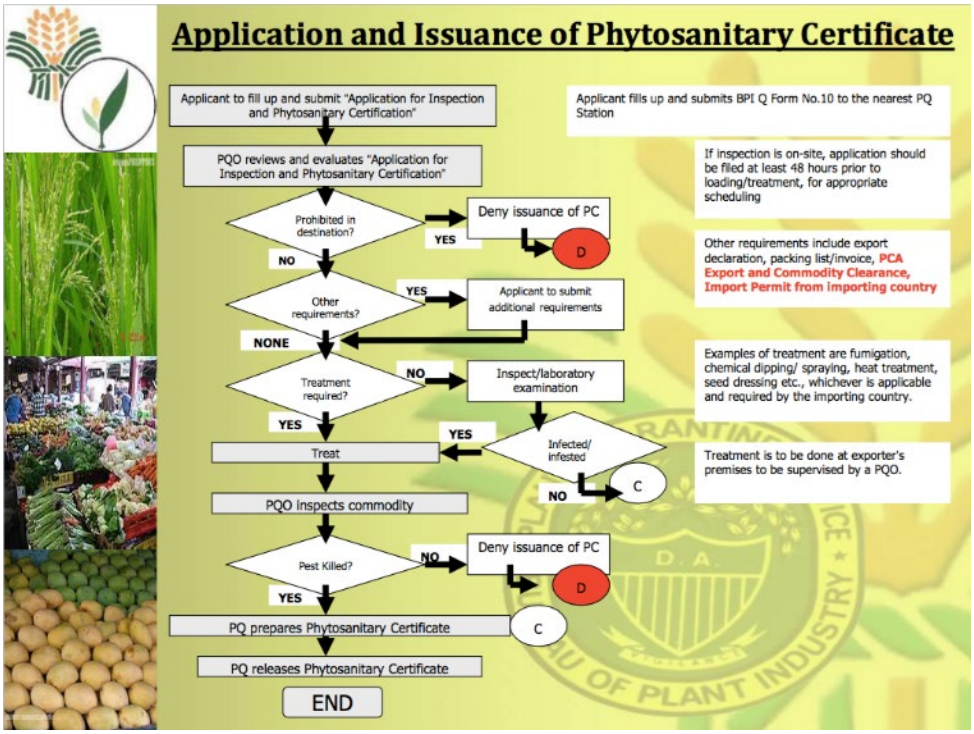
11 Supporting documents

11.1 Application and issuance of phytosanitary certificate



Source: BPI (2018a)

11.2 Application for inspection and phytosanitary certificate

BPI 'Q' FORM No. 10

Republic of the Philippines
Department of Agriculture
BUREAU OF PLANT INDUSTRY

PLANT QUARANTINE SERVICE
Manila

Application for inspection and Phytosanitary inspection

Date:_____

The Director
Bureau of Plant Industry
Manila

I/WE _____
(Name, Address and Telephone No. of Exporter)
_____ hereby request for inspection and certification of the following plant materials intended for export.

Common Name : _____

Scientific Name : _____

Quantity (Specify Unit)* : _____

Description & No. of Packages : _____

Source of Plants/Plant Products : _____

Name & Address of Consignee : _____

_____

Date and Place of Inspection Desired: _____

Port Of Entry : _____

Means of Conveyance : _____

Flight No./Voyage No. : _____

Departure Date : _____

Import Permit No./Additional : _____

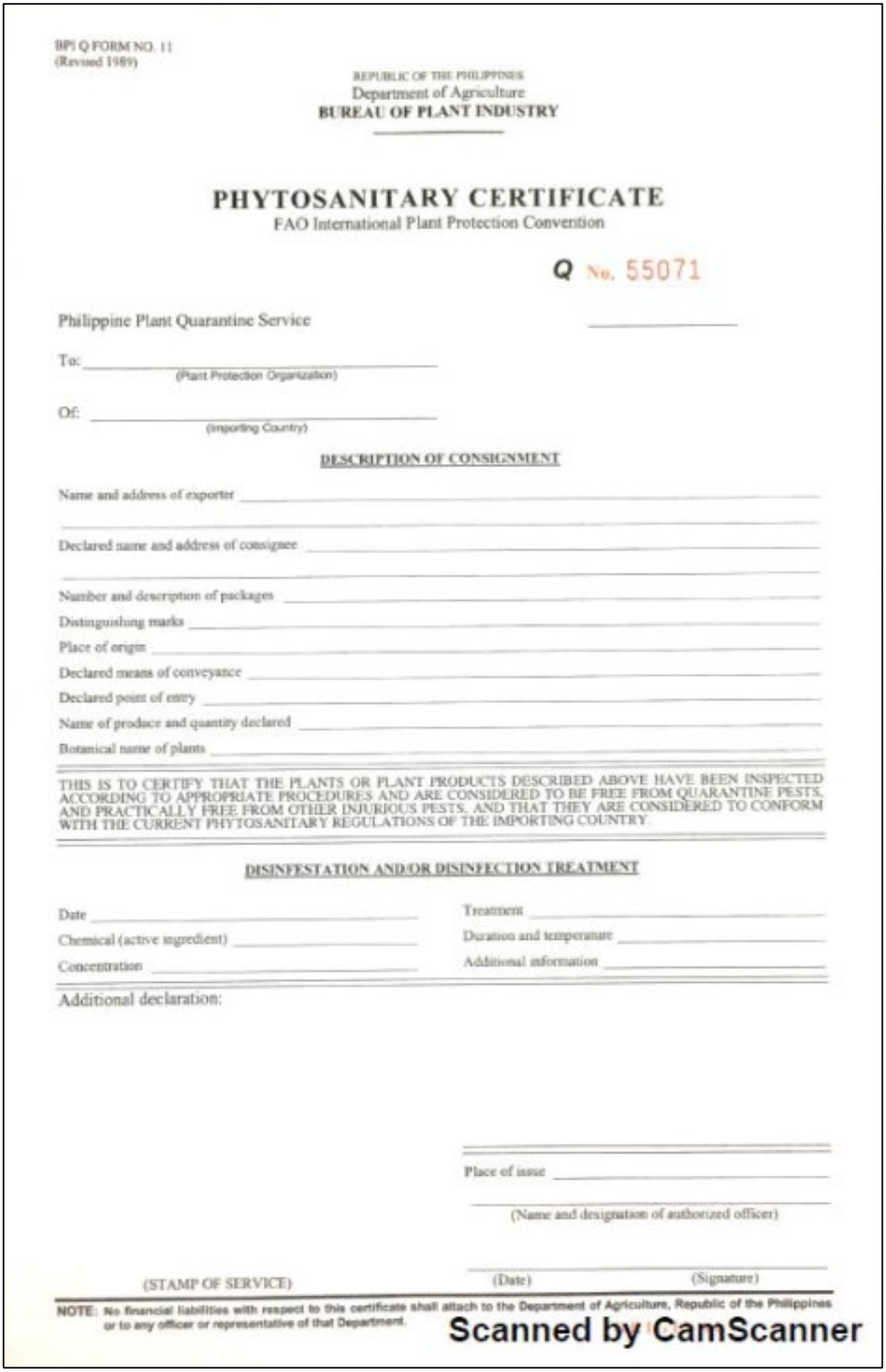
Declaration/Treatment (if any) : _____

_____
(Signature of Applicant/Authorized Representative)

STAMP OF THE SERVICE

_____
(Name & Designation of Applicant/
Authorized Representative)

* For Plants - No. of Pieces
* For Planting Materials - No. of kgs.



BPI Q FORM NO. 11
(Revised 1989)

REPUBLIC OF THE PHILIPPINES
Department of Agriculture
BUREAU OF PLANT INDUSTRY

PHYTOSANITARY CERTIFICATE

FAO International Plant Protection Convention

Q No. 55071

Philippine Plant Quarantine Service

To: _____
(Plant Protection Organization)

Of: _____
(Importing Country)

DESCRIPTION OF CONSIGNMENT

Name and address of exporter _____

Declared name and address of consignee _____

Number and description of packages _____

Distinguishing marks _____

Place of origin _____

Declared means of conveyance _____

Declared point of entry _____

Name of produce and quantity declared _____

Botanical name of plants _____

THIS IS TO CERTIFY THAT THE PLANTS OR PLANT PRODUCTS DESCRIBED ABOVE HAVE BEEN INSPECTED ACCORDING TO APPROPRIATE PROCEDURES AND ARE CONSIDERED TO BE FREE FROM QUARANTINE PESTS, AND PRACTICALLY FREE FROM OTHER INJURIOUS PESTS, AND THAT THEY ARE CONSIDERED TO CONFORM WITH THE CURRENT PHYTOSANITARY REGULATIONS OF THE IMPORTING COUNTRY.

DISINFESTATION AND/OR DISINFECTION TREATMENT

Date _____ Treatment _____

Chemical (active ingredient) _____ Duration and temperature _____

Concentration _____ Additional information _____

Additional declaration:

Place of issue _____

(Name and designation of authorized officer)

(STAMP OF SERVICE) (Date) (Signature)

NOTE: No financial liabilities with respect to this certificate shall attach to the Department of Agriculture, Republic of the Philippines or to any officer or representative of that Department.

Scanned by CamScanner

Source: BPI (2018a)

11.3 Export accreditation process flow

FLOW	DETAILS	RESPONSIBLE PERSON
STEP 1	Exporter must file an application for accreditation to the nearest BPI-NPQSD, all necessary documents must also be submitted	Exporter
Submission of Notarised Application Form together with other required documents	Application form must be duly accomplished and signed by authorised signatory; the required documents must also be current or updated	
	Must be complete and valid.	National Plant Quarantine Services Division (NPQSD) Accreditation Committee
	Requirements are written in Memorandum Order No. 40, Guidelines for Accreditation of Exporters, Traders, Growers and Packing Facilities for Export of Fruits and Vegetables	
STEP 2	Schedule must be done after the completion of the documentary Requirements. Presidential Decree 1433 will be discussed including the rules and regulations on the specific export commodity applied for.	Accreditation Screening Committee (ASC) or Regional NPQSD Office
Scheduling of Orientation for Exporter and scheduling of Facility and Farm Inspection		
STEP 3	NPQSD Officers will make an actual facility and field visit of the exporter facility and farm. The Accreditation of Exporter is guided by the following Memoranda and AO's:	NPQSD Officers and Inspectors
Inspection of Facility and Farms	**Pineapple** – Memorandum Circular No. 01, Series of 2005 " Protocol for the Export of Fresh Pineapple	
	Asparagus – Memorandum Order No. 179 Series of 2007 " Protocol for the Export Of Fresh Asparagus	
	Banana – Memorandum Order No. 41 Series of 2012 " Revised Protocol for the Export of Fresh Cavendish Banana	
	Okra – Memorandum order No. 103 " Revised Okra Export Protocol	
	Mango – Bilateral Agreements between Japan, South Korea, New Zealand, Australia, USA and China	
	Papaya – Bilateral Agreements Between Japan, South Korea and New Zealand	
STEP 4	NPQSD officer/inspector will submit **report on the on-site evaluation of facilities and farm management and cultural practices** of the exporter.	NPQSD

Report and Recommendation by the PQO	ASC shall meet to discuss the result of evaluation and recommends action to the BPI Director	
	(For regional offices, all documents and reports will be noted by the Regional-In-Charge and to be forwarded to the NPQSD Central Office, Manila)	
STEP 5 Approval/Disapproval of the BPI Director	Certificate of Accreditation will be signed by the **BPI Director** upon the recommendation of the **Chief of NPQSD**	BPI Director
STEP 6	Each Exporter will have its own code which will be used in all their boxes.	BPI-NPQSD
Issuance of Certificate of Accreditation with Corresponding Identification Code	Note: All inspection for Export Certification will be subjected to the supervision of the NPQSD Officers.	

Source: BPI (2018a)

11.4 Guidelines for the accreditation of exporters, traders, growers, and packing facilities for export of fruits and vegetables (summarised)

BPI Memorandum Order No. 40 S. 2012:

Guidelines for the accreditation of exporters, traders, growers and packing facilities for export of fruits and vegetables

PD1433 'Plant Quarantine Law of 1978'

International Plant Phytosanitary Convention (IPPC)

World Trade Organization – Sanitary and Phytosanitary Agreement

I. Policy for Accreditation
- No export of fruits and vegetables shall be allowed unless the exporter is accredited pursuant to this Circular
- Moreover, the exporter shall not be allowed to source fruits and vegetables from non-accredited growers and traders.
- Fruits and vegetables for export shall only be processed in accredited packing facilities.

II. Procedure for Accreditation

1. … must file an application for accreditation with the nearest BPI-Plant Quarantine Service (BPI-PQS) station. BPI-PQS may impose a minimal administrative fee.
2. BPI PQS shall evaluate …
3. In the case there of an existing Accreditation Screening Committee (ASC), the application shall be forwarded by BPI PQS to the ASC for evaluation and recommendation.
4. … shall conduct interview of and orientation to applicants on Plant Quarantine Law, relevant rules and regulations, the specific protocol for export and other relevant matters.

5. BPI PQS, or the ASC in proper cases, shall validate and evaluate … cultural management practices, standards and operations … disposal and sanitation programs.
6. … Certificate of Accreditation …
7. Certificates of Accreditation must be posted prominently in the office…
8. … violates the Plant Quarantine Law … shall be delisted … Accreditation shall be revoked. Re-accreditation shall only be possible upon compliance of all corrective measures based on thorough BPI-PQS accreditation.
9. … shall allow the inspection, regular or otherwise,… by BPI PQS, or any personnel of the DA as may be authorized by the Secretary.
10. … shall comply with all the stated requirements for accreditation …
11. Accreditation shall be renewed on a yearly basis.

III. Requirements for Accreditation

- Accreditation of exporters
  - PS Mark and/or ISO and /or SQF and/or DTI-ISO aligned accreditation required by the importing country and the appropriate Philippine Government Agency, whenever necessary.
  - List of accredited traders
  - Valid supply contracts between exporter and accredited growers
  - BPI PQS Inspection Report
  - Brand Name
- Accreditation of traders
- Accreditation of growers
  - Certificate of Attendance of owner, farm manager or a quality assurance in a training on Good Agricultural Practices (GAP)
  - BPI PQS Inspection Report
- Accreditation of packing facility
  - Packing facility process flow
  - Disposal system for rejected fruits
  - Disinfestation Program
  - Written standard operating procedure, including pest management and other safeguards
  - Certificate of attendance of the owner, facility manager or a quality assurance in a training on Good Manufacturing Practices
  - List of exporters using the facility and the export destination
  - BPI PQS Inspection Report

IV. Transitory Provision

V. Effectivity: Jun 7, 2012