National Export Strategy
Melon Sector Strategy

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Koji Kubo
Consultant, Winrock International

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Abbreviations

ASEAN	Association of Southeast Asian Nations
AQSIQ	General Administration of Quality Supervision, Inspection and Quarantine
B2C	Business to Consumer
CBM	Central Bank of Myanmar
CMP	Cutting, Making, and Packing
CNY	Chinese Yuan
Codex	Codex Alimentarius Commission
DALMS	Department of Agriculture Land Management and Statistics
DICA	Directorate of Investment and Company Administration
DOA	Department of Agriculture
GACC	General Administration of Customs of the People's Republic of China
GAP	Good Agricultural Practice
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
EM	Effective Microorganisms
EurepGAP	Euro-Retailer Produce Working Group Good Agricultural Practice
FAO	Food and Agriculture Organization of the United Nations
IMF	International Monetary Fund
IPPC	International Plant Protection Convention
IRD	Internal Revenue Department
MADB	Myanma Agricultural Development Bank
MFVP	Myanmar Fruit, Flower, Vegetable Producer and Exporter Association
MIC	Myanmar Investment Commission
MMK	Myanmar Kyat
MMPEA	Myanmar Melon Producer and Exporter Association
MOALI	Ministry of Agriculture, Livestock and Irrigation
MOC	Ministry of Commerce
MOPF	Ministry of Planning and Finance
MRLs	Maximum Residue Limits
NEGPC	North East Gate Public Company
NES	National Export Strategy
O2O	Online-to-Offline
OSSC	One Stop Service Center
PoA	Plan of Action
SPS	Sanitary and Phytosanitary measures

ToT	Training of Trainers
USAID	United States Agency for International Development
VAT	Value added tax
WTO	World Trade Organization

Introduction

Diversification of agriculture to horticulture has been a global trend, and fruits and vegetables as a product group have gained almost twice as large a share as that of grains such as rice and maize in the global trade of agricultural products. Diversification to horticulture is particularly dynamic in developing countries (Weinberger and Lumpkin 2007). Myanmar is embarking on agricultural diversification through the emerging export of watermelon and muskmelon (melons hereafter) to China.

The melon exports to China encapsulate two fundamental issues that the Myanmar economy confronts under the process of integration to the global economy. First, the value chain of perishable melons would face friction with the country's economic institutions which are only compatible with production and trading of traditional storable crops. Second, the country's trade and investment relationship with neighboring countries is "grey," which may have both positive and negative ramifications on trade. While unofficial Chinese investors occupy substantial proportions of production and trading of melons, there is no consensus around their presence in the country.

The exploration of the National Economic Strategy (NES) for the melon exports to China will provide a guideline for other fresh food products as well as for melons, and shape a framework on how to get along with "grey" economic activities.

Where We Are Now

Current Context

With the rapid growth of exports via the border trade with China in the past decade, melons have emerged as major export crops in Myanmar. The country's traditional agricultural exports have been limited to storable gain and legume such as rice, maize, and pulses and beans. Melons are an important addition to the country's list of exportable crops. They mark the country's first major horticultural exports, initiating a transition of Myanmar agriculture from extensive cultivation of low-value crops to intensive horticulture. Chinese varieties are grown using the seeds imported from China. Almost all fruits that meet the standards in terms of size and appearance are exported to China. As such, melon are export-oriented cash crops.

Melons are grown in plains across the county, with prosperous cultivation in the basins of Ayeyawady and Chindwin Rivers. Melon production thrives in the Central Dry Zone which spreads across Mandalay and Sagaing Regions. The dry climate with scarce rainfall during the winter season

is suitable for melons which are susceptible to fungal diseases under a wet climate. According to the melon cultivation census by Myanmar Fruit, Flower and Vegetable Producer and Exporter Association (MFVP) in 2017, the melon cultivation acreage in Mandalay and Sagaing Regions was estimated to be 47,830 acres of which 34,697 acres were of watermelons, and 13,133 acres were of muskmelons.

Melons are grown in two distinctive types of ecosystems: flood plains and dry uplands. Flood plains include *kyun* (sandbars that appear on the surface of rivers during the dry season) and *kaing* (alluvial banks that appear on the surface of rivers during the dry season). Some flood plains were developed from fallow land into melon fields. Melon planting in flood plains usually starts in late November or December as it has to wait for the water to recede. In dry uplands, melon cultivation has expanded replacing traditional legume and oilseed crops such as chickpeas and sunflowers. These traditional crops require few amounts of water so that they can be grown in rain-fed fields. By contrast, melons require irrigation. When melons are grown in rain-fed fields, they are often irrigated with tube well pumping groundwater.

Melons have two biophysical characteristics that stimulate leasehold farming. First, the melon's vegetation period is four months, in contrast to perennial tree crops that require several years before the first harvest and continue to bear fruits for decades. Second, melons are vulnerable to replant failure; continuous cropping in a field changes the balance of microbes in the soil, which leads to soil-borne diseases of melon plants. Shifting cultivation from one field to another annually is an arduous but effective measure to prevent soil-borne diseases. These two biophysical characteristics of melons encourage leasehold farming. While the country's conventional agriculture is land-owner farming, high profitability of melon cultivation allows growers to offer high land rental fees that underpin leasehold farming and accelerate the growth of melon cultivation.

A unique feature of the value chain of melon exports is brokers located in the Myanmar-China borderland. They intermediate buyers in mainland China with Burmese melon growers, taking 3 to 5% of sales commission charge from the latter. Brokers operate in the sophisticated wholesale system in the border town of Muse located in the north of Shan State adjacent to Ruili in Yunnan Province of China. Built in 1996, the Mandalay-Muse highway connects the distance of 450 kilometers between Mandalay city—the center of the Central Dry Zone—and the border town, Muse. In August 2005, the Myanmar Government opened the 105 mile border trade zone in the outskirt of Muse. The border trade zone houses one-stop service center (OSSC) comprising the

branch offices of the Customs, Internal Revenue Department, Plant Quarantine Office, Immigration Office and Border Trade Department.[1]

In December 2007, under the auspices of the then military regime, Myanmar fruit brokers established a company called the North East Gate Public Company, Ltd. (NEGPC), a wholesale market, adjacent to the 105 mile trade zone. During the melon harvest season between October and April, Muse brokers host daily auctions in the NEGPC wholesale market where melon growers consign fruits to them to sell to buyers in mainland China. In the peak period in February to March, 500 trucks carrying 16 tons of melons each arrive in NEGPC that attracts a thousand of buyers' agents from mainland China. The daily export volume can amount to 8,000 metric tons (MT), which makes the NEGPC one of the biggest melon markets around the globe.

Muse brokers play several crucial roles in the melon export value chain. First, they make exports as easy as domestic sales. All growers have to do for the export procedure is to bring melons to auctions. Brokers ensure sales to buyers from mainland China, although the selling prices are subject to fluctuations. Brokers match fruits with buyers from China, negotiate the prices with them, and collect payments from them on behalf of growers. Second, brokers offer supporting services, such as the provision of seeds and other agricultural supplies often on credit, transportation services and loans. In the context of the underdeveloped rural credit market, brokers alleviate growers' financial constraints.

Production

Melons are grown most commonly as post-monsoon crops, and their plant life is four months. The harvest period spans from December to April, which correspond to China's counter-season. While planting in alluvial land has to wait for the flood water to recede until November or December, the harvest is still before China's on-season.

Three popular watermelon varieties are *855*, *Seedless*, and *Htan Wan*. The *855* variety is a large fruit with thick skin, which is the most tolerant of rough transportation. The *Seedless* and *Htan Wan* are high-quality varieties with higher sugar content. Three popular muskmelon varieties are *Shwe* (honeydew melon) and *Paye Takwa* and *U-khon* (meshmelon). According to the survey of melon farmers by Su Thanda Zaw (n.d.) which covers 903 farmers from 68 villages in nine townships of Mandalay and Sagaing Regions, farmers' choice of crop varieties for the 2016-2017 crop season can

[1] Kudo (2013)

be summarized as in Table 1. Among 627 farmers who grow watermelons, the *855* variety is the most popular, while the *Shwe* variety is the most common among the 304 farmers who grow muskmelon. The yield includes substandard fruits that can be as high as 20% of production. For all these varieties, the bulk of the harvest is exported to China as fresh fruits, while substandard fruits such as small fruits and those with blemish are sold in the local market.[2]

Table 1 Farmers' adopted melon varieties

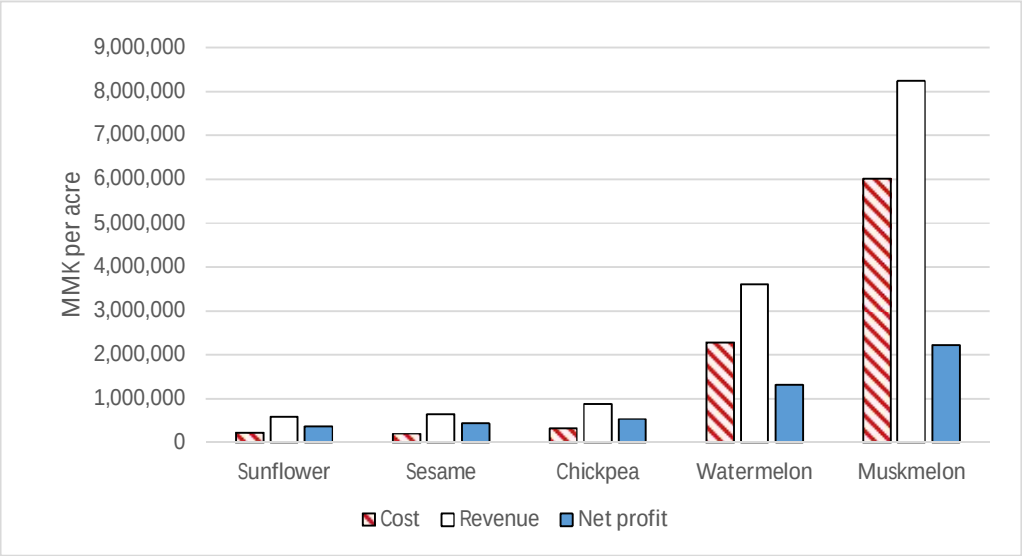
Variety	No. of farmers	Mean yield (MT per acre)
Watermelon		
855	209	8.5
Seedless	35	9.6
Htan Wan	10	8.9
Muskmelon		
Shwe	243	12.9
U- Khon	53	11.8
Phaye Takwa	120	12.4

Source: Su Thanda Zaw (n.d.)

Compared with traditional dry season crops in the Central Dry Zone, melon cultivation is costly but generates higher profits on average. Figure 1 summarizes the production costs, revenues, and profits of melons and alternative crops. As melons are grown mostly in the post-monsoon season, alternative crops are those grown in the same season. On average, watermelon generates six times as high as the revenues of sunflower, and muskmelon does 13.7 times. However, the production costs of melons are also significantly higher than those of the alternative crops; the total costs of cultivation and marketing of watermelon are 10.1 times higher than that of sunflower, and those of muskmelon 26.7 times. As a result, the gaps in profits between melons and the traditional crops are much smaller than their gaps in revenues, but watermelon is, on average, still 3.5 times as profitable as sunflower, and muskmelon 5.9 times.

[2] The high-end domestic markets are emerging in the country's urban areas such as Yangon, and a few growers sell fruits to the supermarket chains which offer prices comparable to the exports to China.

Figure 1 Comparison of costs and profits of dry season crops per one acre of cultivation



Source: Department of Agriculture Budalin Township Office

The high production costs of melons partly result from intensive uses of inputs and labor as compared to the traditional crops. Tedious labor for melon cultivation includes grafting melon seeding onto disease-resistant host plant stems, entangling vines on poles (muskmelons), thinning out all fruits except one on a stem in order to grow it into a bigger fruit, and spraying of pesticides. Table 2 compares the cost of production of *Shwe* melons per acre with that of sunflower. The total labor cost is MMK 972,000, which amounts to 243 worker-days, while the same size of the sunflower field employs 34 worker-days of labor. The material cost of melons is above 31 times as high as that of sunflower. For *Shwe* melon cultivation, the proportions of labor, services, and material in the total costs are 16.2%, 40.5%, and 43.3%, respectively.

Table 2 Cost structure comparison, melon and traditional crop

Melon: *Shwe* variety	Labor	Service	Material	Total
Cultivation	777,000	823,750	2,415,400	4,016,150
Harvest	195,000		190,000	385,000
Marketing		1,612,000		1,612,000
Total	972,000	2,435,750	2,605,400	6,013,150

Sunflower	Labor	Service	Material	Total
Cultivation	40,000	30,000	83,000	153,000
Harvest	30,000	10,000		40,000
Marketing		12,500		12,500
Total	70,000	52,500	83,000	205,500

Source: Department of Agriculture Budalin Township Office

Transportation of fruits from farms to Muse consists of 20% of the total costs of melon production and marketing. Twelve-wheel open freight trucks with a capacity of 16 to 17 tons of fruits with their full load cost between MMK 800,000 to 1,200,000 depending on seasons and distance. It is a common practice between melon growers and Muse brokers that the latter arranges the transportation on credit. The transportation operators bill the fees to Muse brokers who deduct it from the payment of Chinese buyers before making remittances to the growers. Other service costs for marketing include the duties, broker fees, and handling charges in the border areas, which are all arranged by brokers and whose costs are deducted from the melon sales revenues. Thus, while the marketing costs are high for melons, Muse brokers help melon growers operate with smaller working capital.

Another significant service cost of melon cultivation is the land rental fee,[3] which amounts to MMK 600,000 per acre, equivalent to 10% of total costs. The actual land rental fee varies between MMK 300,000 and MMK 700,000, depending on various factors including the soil quality, access to water resources, and the demand and supply in the local market. The land rental fee often exceeds the net profits from traditional crop cultivation. As tenants usually make a down payment of the rental fees, the farmland lease is an attractive option especially for farmers under financial distress.

Despite its high expected profitability, the high costs of production and marketing deter financially

[3] The cultivation cost of sunflowers does not include the land rental fee since the land-owner farming is the norm for traditional crops.

constrained farmers from entering melon cultivation. Burmese melon farmers often started melon cultivation on a small scale such as one to two acres and have gradually expanded production by financing cultivation costs using the accumulated profits in preceding years.

Large rooms remain for melon production to increase by means of replacing traditional crops. According to the Agricultural Statistics (2015), the total areas planted to chickpeas and sunflower—the dry season crops alternative to melons—in the whole country are 920,000 acres and 1,152,000 acres, which sum up to 43 times of melon cultivation in Mandalay and Sagaing Regions. The underdeveloped rural credit market is one of the constraints for the growth of melon cultivation.

Profile of Burmese Producers

The average production scale of melon farming is relatively small. According to the survey of Su Thanda Zaw (n.d.) which covers above 900 melon farmers, the mean cultivation size is 5.2 acres for watermelon and 6.7 acres for muskmelon, as shown in Table 3. However, some large farmers cultivate more than 100 acres of melons.

Table 3 Burmese farmers' scale of melon farming in 2016/2017 crop season

Cultivation acreage	No. of farmers	Mean (acres)	Median (acres)	Minimum (acres)	Maximum (acres)
Watermelon	627	5.2	3	0.5	80
Muskmelon	304	6.7	4	1	130

Source: Su Thanda Zaw (n.d.)

Furthermore, drawing on another survey of Burmese producers, this section illustrates the patterns of land use by melon farmers. The sample of the survey is 59 farmers who attended the General Annual Meeting of the Myanmar Melon Producer and Exporter Association (MMPEA)[4] held in Mandalay on August 19, 2019. The sample contains 24 farmers from Sagaing Region and 19 from Mandalay Region, while the rest are from Ayeyawaddy (3), Bago (3), Magway (8), and Yangon (2) Regions. These farmers grow melons in 25 townships of 6 Regions. The sample does not necessarily represent the population of Burmese melon producers. In fact, the sample is overrepresented by 14 farmers from Chaung-U Township in Monywa District of Sagaing Region. Nonetheless, MFVP's melon producer census in 2017 indicates that Chaung-U is the most prominent township of

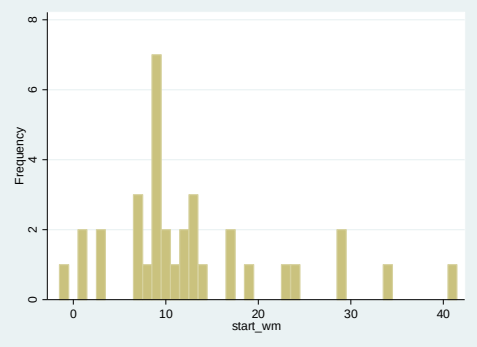
[4] MMPEA is a subordinate organization of MFVP.

muskmelon production. This township accounted for 45.5% of the total muskmelon farming households in the MFVP census.

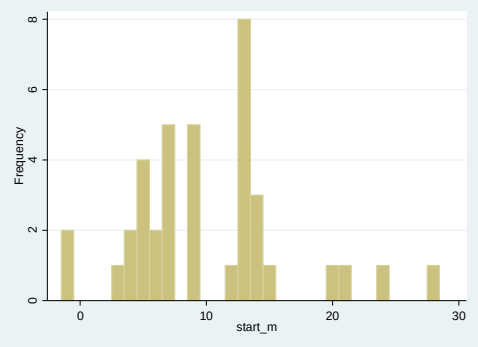
Among 59 farmers, 20 produce watermelon (33.9%), 26 produce muskmelon (44.1%), and 13 both (22.0%). The median cultivation acreage of watermelon growers is 10 acres, and that for melon growers is 14.35 acres. These are much higher than the average cultivation size of the survey by Su Thanda Zaw (n.d.), implying that the convention was attended by leading melon farmers. Figure 2 shows the duration of cultivation. The median duration is ten years for both watermelon and muskmelon. The data is consistent with our perception that melon production is still in the nascent stage, and melons have been gradually replacing extensive cultivation of traditional crops.

Figure 2 Duration of melon cultivation

Watermelon



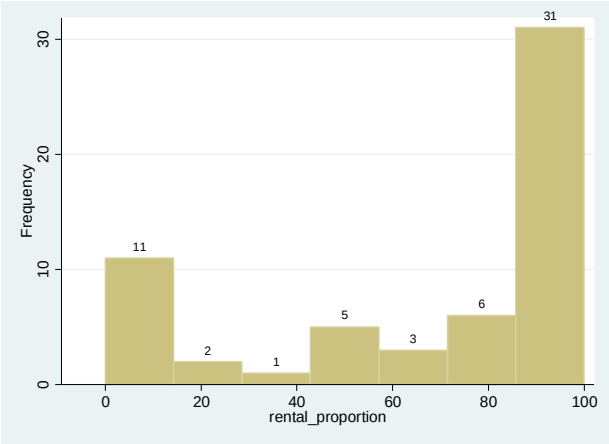
Muskmelon



Source: Own survey

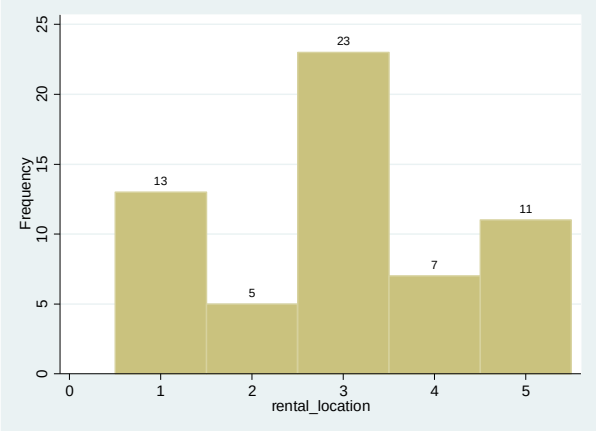
The prevalence of leasehold farming among the sample farmers is striking. As shown in Figure 3, among 59 sample farmers, 48 farmers rented farmland while 11 farmers (18.6%) grew melons only on their own farm. Thirty-one farmers (52.5%) grew fruits only in rented farmland. Furthermore, farmers take troubles of searching land for lease far from their home villages. Figure 4 summarizes the locations of leased farmland. Eighteen farmers grew melons outside the Township their family resided, of which 11 farmers rented farmland more than 50 miles away from their village. This requires us to renew our perception of Burmese farmers as static land-owner farmers of traditional crops to dynamic agricultural entrepreneurs.

Figure 3 Use of land lease in melon cultivation



Source: Own survey

Figure 4 Location of leased farmland



Source: Own survey

Note: 1: no land rental, 2: land rental within the village, 3: land rental within the township, 4: land rental in a nearby township, 5: land rental in the location more than 50 miles from the village.

Value Chain Operations

By sharp contrast to the storable crops such as rice, maize, and pulse and beans, melons are produced and exported in a value chain with fewer intermediaries which mobilizes fruits from farm to markets in a shorter time. The melon export value chain primarily comprises melon growers, brokers in Muse, and agents of buyers in mainland China. Burmese growers produce melons independently from brokers and sell fruits in arm's length transactions to the agents of buyers in

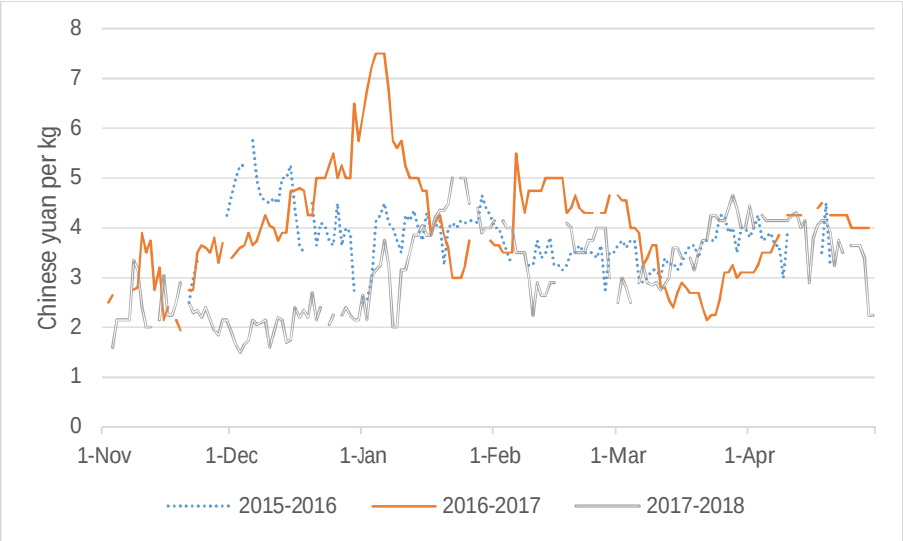
mainland China, matched by Muse brokers in auctions.

At the harvest time, growers contact Muse brokers to send fruits to the NEGPC wholesale market. In some cases, growers arrange transportation from the production areas to the wholesale market in the borderland themselves. There are numerous small and medium freight service companies as well as their syndicates called "*gates*"[5] and freight service brokers who facilitate growers find freight trucks. In other cases, Muse brokers arrange freight service providers and dispatch them on growers' request. Whichever arrangement is, freight service providers accept deferred payments; Muse brokers pay the freight charge to them after transportation of fruits from farm to Muse, and they deduct that charge when they receive payments from the buyers in mainland China before remittances to melon growers.

Notably, growers are uncertain of how much they get from melon sales at the time of shipment from the farm because prices will be determined in the auctions in Muse. Figure 5 depicts the daily auction prices of *Shwe* melon variety for the period from November 2015 through April 2018. The auction prices exhibit high volatility which is partially attributable to the nature of spot transactions as well as the nature of melons as perishable fruits. Due to arm's length transactions between growers and buyers, relative demand and supply vary from day to day. In addition, as fruits are perishable, the price elasticity of demand is low, so that a concentrated arrival of fruits against a given level of demand could result in a sharp drop in prices. Furthermore, as the demand for melons in the domestic market is much smaller and inelastic, it is not a viable option for melon growers to redirect sales to the local market even if they anticipate a temporary drop in melon prices.

[5] Ksoll and Quarmby (2014) and ADB (2016)

Figure 5 Wholesale price of *Shwe* melon



Source: Data compiled by Wuiti Yi Lwin

Exposure to price fluctuations are asymmetric between Muse brokers and melon growers; brokers are less exposed to the price risk than growers. At an auction, the revenue of a melon grower is determined by the winning price that a buyer bids to the broker. The broker charges the grower 3 to 5% of the successful bid price as a sales commission. While Muse brokers hold auctions and match melons with the buyers in China, they do not actually buy fruits. This trading practice allows brokers to mitigate the price risk and shift it to growers. Such consignment sales are not peculiar to the fruit trading in the NEGPC wholesale market. The same pattern is observed in Myanmar's domestic fruit market.[6] As such, melon growers are more exposed to high uncertainty of melon prices.

Another uncertainty the growers face is the damages to fruits during transportation in two legs, one between farm and Muse, and the other from Muse to Wanding in Ruili city, the Chinese side of the borderland. First, growers are solely responsible for any damages on fruits before auctions. Due to the simple packing and transportation through the rough road connecting Mandalay to Muse, a certain portion of fruits are damaged before auctions. Second, although prices are set at the auctions in Muse, growers are still responsible for any damages on fruits until the hand-over of fruits in the Chinese territory to the buyers. The buyers in China often renegotiate the prices with Muse brokers as they carefully inspect fruits and reject a certain portion when they receive them in Wanding.

[6] The fresh fruit market in Mandalay operates with consignment sales. For example, Manaw Thuka broker house, a popular wholesaler in Mandalay, lets its space to growers and middlemen to sell fruits, taking 10% commission.

The NEGPC is a private company that provides the venue for brokers to host daily fruit auctions. It deals melons from October to May and mangoes from April to July. The NEGPC wholesale market was established in December 2007 on the top of a hill adjoining the 105 mile trade zone. The NEGPC consolidated fruit trading that used to take place in the premises of individual brokers in Muse town, which enhanced the convenience for buyers in mainland China and stimulated their demand for Myanmar fruits. The NEGPC accepts non-founding brokers to host auctions as long as they contribute fees to NEGPC. As of December 2018, 84 brokers host melon auctions including the 15 founding members of NEGPC.

In the NEGPC wholesale market, melons are auctioned concurrently at twelve trading posts from 7:00 AM to 10:00 AM. At each trading post, brokers take turns holding auctions. Each slot of an auction is restricted to five minutes, during which buyers submit sealed bids repeatedly until the auctioneer/broker declares the successful bid. Some growers put their limit price to the brokers/auctioneer below which they do not agree on sales. However, most growers delegate the power to a broker/auctioneer who decides whether to accept a bid based on their judgment about the market conditions. For growers, once they send fruits to Muse, it is almost an irreversible process that they have to accept no matter what prices determined in the auction as alternative buyers cannot be found before the fruits perish.

Melons are priced by product attributes such as variety, size, appearance, and blemish. In general, large fruits are favored by the market. Sorting and grading of fruits are done by growers at the time of loading harvested fruits on a freight truck in the melon farm, and fruits are auctioned on the same freight truck without any sorting/grading by brokers. The unit of deals is the whole load of the freight truck, which is 16 MT for a 12-wheel truck and 10 MT for a 6-wheel truck. There are two types of pricing; one is the quotation of a unit price per kilogram, and the other is the quotation of the price for the whole load of the freight truck. Inconsistent grading of fruits in terms of size and appearance often invokes the buyers to demand a massive discount at the auction or at the time of the inspection of delivered fruits in Wanding.

Muse brokers rely on the social network of growers to get orders from growers who commission sales to their auctions. The long distance between Muse and the production areas inhibits brokers from frequent communicate with growers in person. Instead, brokers use leading growers as agents/representatives to secure the orders of consignment sales from growers. Such leading growers introduce fellow producers to brokers. While some growers visit the auctions, others never meet with the brokers in person, not to mention with the buyers in mainland China.

Muse brokers are better positioned to monitor individual growers' capacities of growing quality melons. The track record of deals with growers in the past years enables a broker to differentiate creditworthy growers and engage in interlinked transactions of credit and consigned sales. Brokers offer agricultural supplies on credit only to creditworthy growers in exchange for the latter's commitment to sales consignment to the former. Brokers are also major suppliers of seeds of Chinese melons.

Regarding the export procedure, officers of the Myanmar Customs station in the NEGPC wholesale market to process export declaration. This convenient export procedure ensures the delivery of auctioned fruits to Wanding within the same day of the auction. The fruits are delivered to the Wanding logistic center in the Chinese territory approximately 10 kilometers away from the NEGPC wholesale market via the Kyin San Kyawt Road and the border checkpoint dedicated to the trading of agricultural commodities. The Chinese authorities at the Wanding checkpoint accept melons without sanitary and phytosanitary certificates, which deviates from the global norm of the international trade of fresh fruits.

In the Wanding logistic center, fruits are transshipped from Burmese freight trucks to Chinese open freight trucks. Burmese freight trucks which have carried melons from farm to the NEGPC wholesale market are permitted to drive in the Chinese territory up to the Wanding logistic center. As a standard Chinese truck has a loading capacity of 34 MT, Chinese buyers usually procure two truckloads of melons.

The buyers in mainland China who procure fruits in the NEGPC wholesale market are considered to be distributors who send fruits to the wholesale markets in destinations all across China. The Wanding logistic center is a transit point in the fruit trade, full of freight trucks from various parts of China. For these distributors, the NEGPC wholesale market is popular for the procurement of out-of-season melons.

Chinese Investment in Melon Value Chain

A considerable portion of melon production in Myanmar owes to unofficial investment by Chinese entrepreneurs (Htet Khaung Lin 2019). Production by Chinese entrepreneurs started in the mid-1990s in Shan State and Mandalay Region. Their production skewed to watermelons, in particular, *Seedless* and *Htan Wan* varieties using grafting as a means of pest control. The production unit is 40 to 50 acres which is supervised by a Chinese agro technician, and the

cultivation size sometimes exceeds 100 acres managed by several technicians. Although such a large scale production requires substantial investment in land rental, labor and material inputs, the background of Chinese operators nor their relationship with buyers in mainland China is uncertain (Antonio 2015).

While the **Farmland Law (2012)** prohibits farmers from leasing their farmland to foreigners or foreign companies without permission from the Regional Government, the unofficial Chinese investment are prevalent. The Chinese investment hired Shan people fluent in the Chinese language as nominees for negotiation of land rental. A mass of 40 to 50 acres of farmland often belongs to many farmers who individually possess small plots of 3 to 5 acres. For acquiring a mass of leased land, nominees of Chinese investment approach influential villagers such as a village chief who coordinate an assembly of farmers where they offer a land rental contract at lucrative land rental fees.

In Mandalay, watermelon cultivation by unofficial Chinese investment initially spread as the off-season crop of rice. Major production areas included Kyauk Se and Myit Thar Townships. However, due to concern about soil degradation and adverse impacts on rice production—the prioritized crop for food security during the military regime, the Regional Commander of Mandalay Division banned watermelon cultivation in the farmland classified as paddy field (*le* in Burmese) in 2006. This stimulated the move of Chinese investment to the farmland of other classifications, dry fields (*ya*) and alluvial land (*kyun* and *kaing*) in Mandalay as well as in Sagaing.

Later on, some unofficial Chinese investment launched broker houses in Muse and participated auctions in NEGPC. Again, Chinese investors usually employ Burmese nominees and operate as Burmese companies in Muse. While Chinese broker houses handle their own produce, they use auctions at NEGPC for sales to China. However, it is not sure whether Chinese-controlled brokers have arm's length deals with the buyers in mainland China, or they utilize facilities of NEGPC for the convenience of the export procedure while negotiating sales terms with buyers outside the auctions.

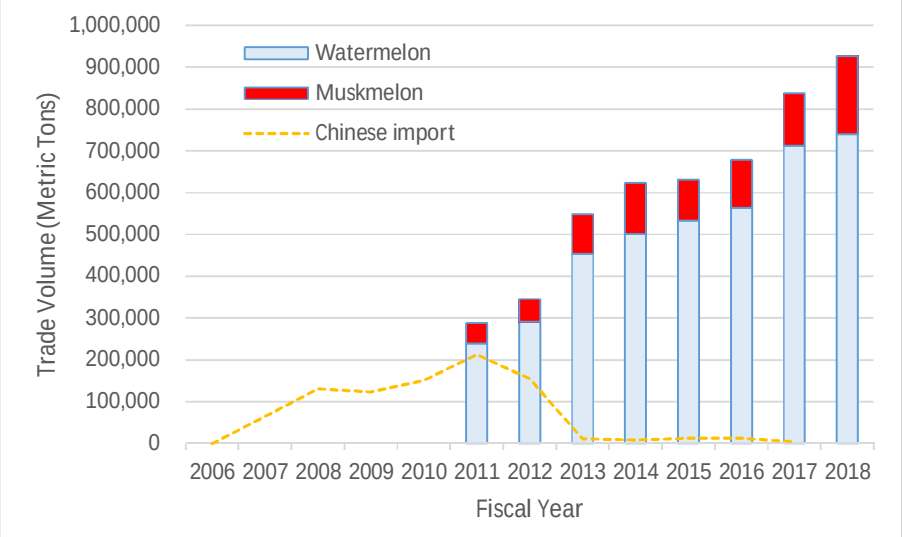
Chinese investment in melons has been consolidated gradually as Myanmar authorities tightened immigration controls. There are cases that the authorities deported Chinese agro-technicians staying in production areas without necessary travel documents. By contrast, Chinese investors who have incorporated as Myanmar companies using Myanmar nominees deploy Chinese staff after obtaining their visas to conform to immigration regulations.

By 2018, Chinese-controlled broker houses are estimated to have accounted for nearly half of the total turnover of melon auctions at NEGPC, implying a high share of Chinese-controlled production in Myanmar's melon exports to China. Apart from their own produce, these Chinese-controlled broker houses handle the produce of Burmese farmers consigned to them and those produce of sharecropping. Sharecropping is the arrangement that broker houses finance the production costs, and melon farmers undertake melon cultivation as production managers. Two parties share the profits at the fixed rate such as 50: 50. Those melon farmers, who have skills in melon cultivation but are under financial distress due to losses at the times of melon price collapse, turn into sharecroppers. With their own production as well as liquidity injection to melon production, Chinese investors houses have contributed to the growth in melon exports.

Export Performance

Myanmar's melon export to China has snowballed in the past decade. According to MFVP's record of the cross-border trade in Muse, the total volume of melon exports—the sum of watermelon and muskmelon export—more than tripled from 287 thousand MT in 2011 to 927 thousand MT in 2018. The MFVP data is available for the period from 2011. Figure 6 compares Myanmar's melon exports from Muse to Ruili with China's imports of melons from Myanmar. While these statistics should match with each other, considerable discrepancies exist between the two records. If China Customs do not capture the bulk of the imports of Myanmar melons, it implies that the melons are imported unofficially.

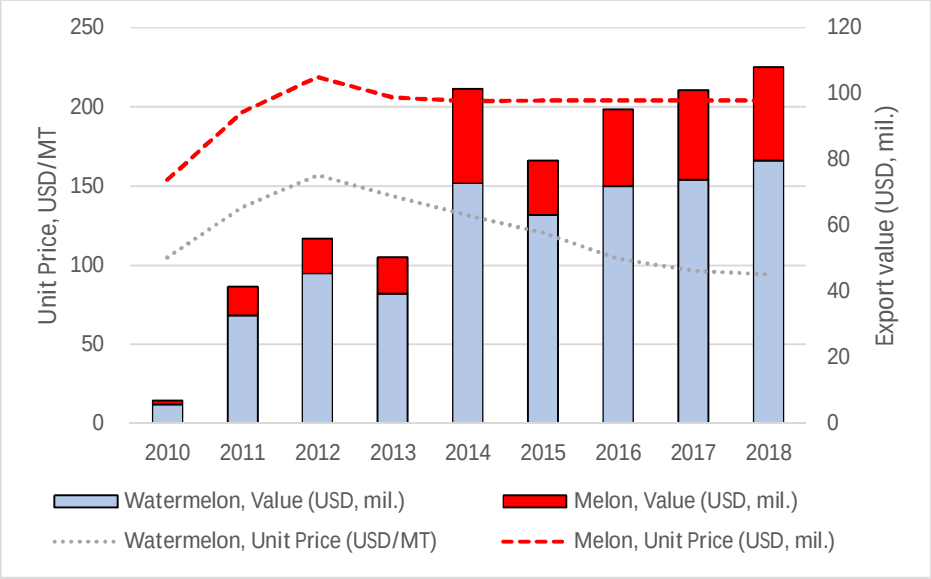
Figure 6 Myanmar's exports of melons to China and corresponding Chinese imports of melons from Myanmar, 2006-2018



Sources: MFVP; China Customs

MFVP's transaction data is complemented by the trade statistics of Myanmar's Ministry of Commerce to check the trade value and average unit prices of melon exports to China. Figure 7 summarizes the export values and unit prices of Myanmar's melon exports to China. The value of the melon exports amounted to USD 108 million in 2018. The average export prices of watermelon and muskmelon are USD 94 per MT and USD 204 per MT, respectively. Given that a conservative estimate of the ongoing unit prices in 2018 yields CNY 2/kg (USD 0.28/kg) for watermelon and CNY 3/kg (USD 0.42/kg) for melon, the Myanmar trade statistics may undervalue the melon exports to China.

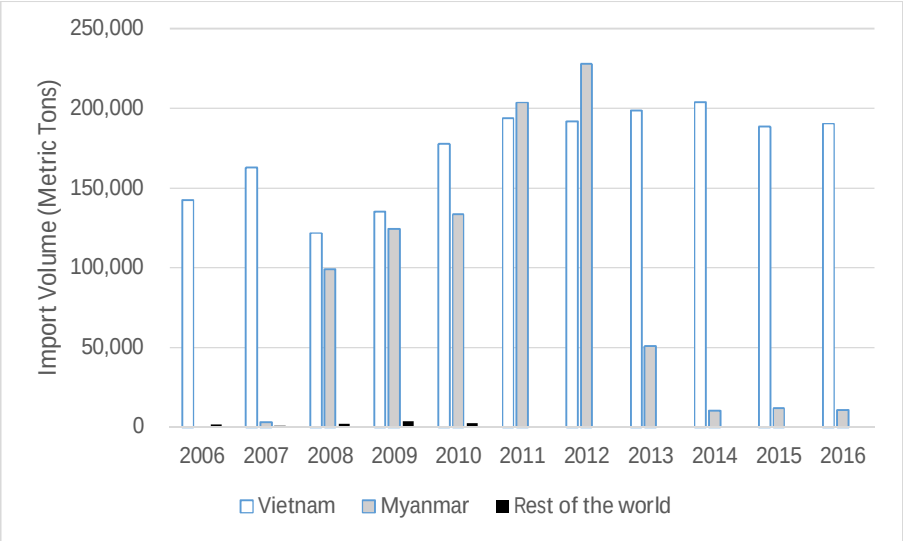
Figure 7 Export values and unit prices of melon exports to China, 2010-2018



Source: Ministry of Commerce, Myanmar.

Figure 8 below shows China's imports of watermelon around the world. Vietnam and Myanmar are two primary source countries of China's watermelon imports. In 2011 and 2012, Myanmar was the top exporter of watermelons to China. Since 2013, however, the melon imports from Myanmar have dropped sharply.

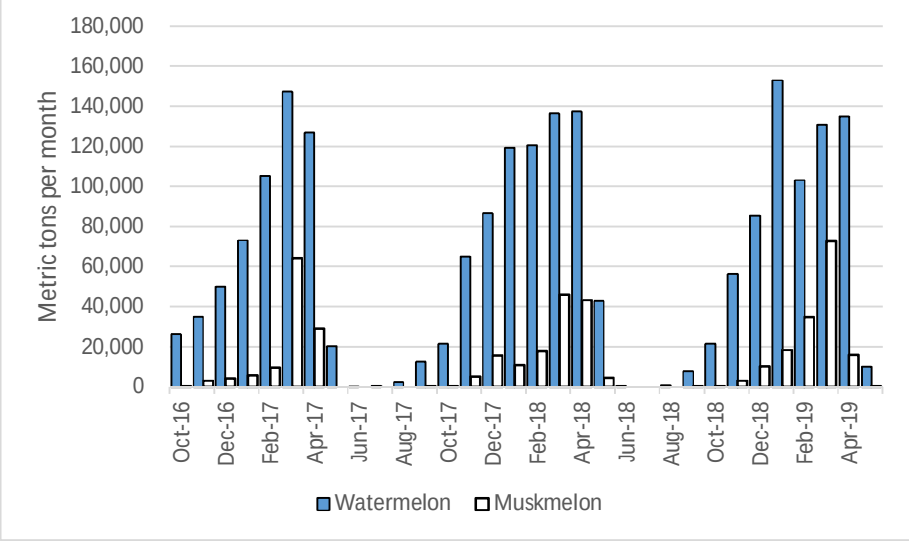
Figure 8 China's imports of watermelon from the world, 2006-2016



Source: China Customs

Myanmar's melon exports to China exhibit notable seasonality. MFVP's monthly record of melon export in Figure 9 below shows that the melon exports span from October to May, which fits in China's lean season of melon production. March and April correspond to the harvest time in *kyun* and *kaing* where melon cultivation starts late in November and December to wait for the flood water to recede. For the melon export season of 2018/2019, the melon exports in March and April 2019 summed up to 41.2% of the annual total.

Figure 9 Melon export from Muse by month



Source: MFVP

Global Perspectives

By looking at the international trade statistics of melon trade in the global market, this section reviews the patterns of international trade of melons around the world. Table 4 below lists global top 10 importing countries of watermelon and muskmelon. The statistics in this table are considered not to count China's imports from Myanmar. Proper counting of imports from Myanmar would bring China the world largest importer of watermelon and the sixth largest importer of muskmelon. These figures indicate that the melon trade between Myanmar and China, of which the trade of watermelon was 704,001 MT in 2018/2019, is significant in terms of scale.

Table 4 Top 10 melon importers, 2017

Watermelon		Muskmelon	
Country	Import volume (MT)	Country	Import volume (MT)
United States	723,623	United States	671,915
Iraq	524,402	Netherlands	225,524
Germany	412,459	France	180,342
China	224,322	United Kingdom	160,355
Canada	224,027	Canada	157,720
France	188,034	Germany	129,059
United Arab Emirates	169,891	Spain	81,165
Poland	150,665	Iraq	64,455
Netherlands	144,530	Portugal	54,395
United Kingdom	125,693	Belgium	43,513

Source: FAO stat

Trade patterns of fresh fruits are influenced by properties of fruits. For banana, because of afer-ripening, it is harvested in green and ripens gradually during transportation. As such, banana is one of the most widely traded fresh fruits around the globe. Cherries and strawberries are perishable, but their high commercial value per weight—above USD 2 per kilogram—pays for air transportation. By contrast, after-ripening does not occur with watermelon, and its commercial value per weight is relatively low at below USD 0.5 per kilogram. The perishability and relatively low commercial value limit the scope of trade to a region within a short distance. Compared with watermelon, muskmelon has more suitable characteristics of after-ripening and of relatively high commercial value. However, melon's trade price is often less than USD 1 per kilogram, which is not

so suitable for air transportation such as cherries or strawberries.

Decomposition of melon imports by source country confirms the trade patterns as mentioned above. For the watermelon imports of the United States, Table 5 summarizes the top trade partners. Neighboring Mexico occupies 83% of the country's imports in volume and 81% in value. Other major trade partners are also located close to the United States, including Guatemala, Honduras, and Costa Rica. These top four countries retained 99.6% of import market shares in terms of both volume and value. The average import price for 2017 was USD 0.42/kg. For the muskmelon imports of the United States, the import market shares of the four Latin American countries, namely Guatemala, Honduras, Mexico, and Costa Rica, sum up to 99.8% in terms of both volume and value. The average import price for 2017 was USD 0.53/kg, and there was no significant difference in average export prices between the four countries. The examples of the US imports indicate that melon trade is mostly regional and that melons do not travel a long distance. Between watermelon and muskmelon, however, source countries are more diverse for muskmelon in terms of distance between the source and market countries. The United States imported 303 MT of muskmelon from Thailand and 140 MT from Portugal in 2017.

Table 5 United States imports of watermelon and muskmelon by country, 2017

	Watermelon				Muskmelon		
	Volume (MT)	Value (USD, mil.)	Unit Price (USD/kg)		Volume (MT)	Value (USD, mil.)	Unit Price (USD/kg)
Mexico	600,252	248.34	0.41	Guatemala	354,867	177.18	0.50
Guatemala	70,320	35.06	0.50	Honduras	154,678	83.83	0.54
Honduras	40,448	17.56	0.43	Mexico	111,881	72.84	0.65
Costa Rica	9,641	3.37	0.35	Costa Rica	49,029	24.36	0.50
Canada	1,021	0.29	0.29	Brazil	666	0.40	0.61
Nicaragua	843	0.29	0.35	Thailand	303	0.08	0.25
Panama	827	0.51	0.62	Canada	287	0.13	0.47
Brazil	253	0.13	0.51	Portugal	140	0.06	0.44
Dominican Rep.	18	0.02	1.00	Dominican Rep.	39	0.07	1.81
World	723,623	305.56	0.42	World	671,915	358.96	0.53

Source: World Trade Atlas

Similar patterns are found for German imports of melons. Table 6 lists the source countries of muskmelon for German imports. As shown in the list, imports were mostly sourced from neighboring European countries, including Spain, Italy, and the Netherlands. Top four countries are all neighboring European countries which collectively accounted for 95% of the market shares for

both watermelon and muskmelon. Germany's import patterns are consistent with those of the United States, and both of them indicate that melons are mostly traded within a region. Nonetheless, Germany sourced a small amount of melons from distant countries such as Costa Rica, Turkey, Uzbekistan, Kazakhstan, and Iran. These countries collectively retained 2.3% of the total volume and 1.4% of the total value of Germany's muskmelon imports.

Table 6 Germany imports of watermelon and muskmelon by country, 2017

	Watermelon				Muskmelon		
	Volume (MT)	Value (USD, mil.)	Unit Price (USD, mil.)		Volume (MT)	Value (USD, mil.)	Unit Price (USD/kg)
Spain	268,404	146.12	0.54	Spain	58,280	56.03	0.96
Italy	77,066	39.13	0.51	Netherlands	50,458	64.58	1.28
Netherlands	32,762	30.90	0.94	Italy	11,299	11.74	1.04
Greece	12,556	5.02	0.40	France	3,255	4.64	1.43
Hungary	9,950	3.48	0.35	Costa Rica	1,097	1.02	0.93
France	4,483	3.05	0.68	Austria	611	0.64	1.05
Bulgaria	2,197	0.82	0.37	Turkey	601	0.53	0.88
Austria	1,212	0.71	0.58	Uzbekistan	473	0.13	0.28
Costa Rica	1,109	0.67	0.60	Kazakhstan	389	0.22	0.56
Morocco	635	0.25	0.39	Iran	374	0.13	0.34
World	412,461	231.25	0.56	World	129,058	142.30	1.10

Source: World Trade Atlas

For diversification of export destinations of Myanmar melons, the country's mango export has some implications. Mangoes have two features suitable for international trade; they do after-ripening and have relatively high commercial value per weight which is at least above USD 1 per kilogram in the international market. Despite these favorable features for international trade, Myanmar's mango export disproportionately relies on China. Table 7 summarizes an annual average export of mangoes by trade partner for the period from 2010 to 2019. While Myanmar has exported mangoes to 15 countries, most of them are on a trial basis, and China accounts for 99% of Myanmar's mango exports. Apart from China, Myanmar's export destinations are mostly regional, such as Bangladesh, India, and Singapore. Exports to Japan and Korea are considered to be processed mango pulp and puree given the sanitary and phytosanitary measures that these countries apply to fresh mangoes. Challenges for diversification of export destinations are formidable for Myanmar fresh mangoes, not to mention for melons.

Table 7 Myanmar's mango export

		2010 to 2019, annual average	
	Export Destination	Volume (MT)	Value (USD, mil.)
1	China	38,431.51	14.19
2	Bangladesh	130.10	0.03
3	India	70.31	0.02
4	Singapore	63.64	0.03
5	Thailand	4.04	0.01
6	Japan	3.96	0.00
7	Korea, Republic of	3.24	0.01
8	Russian Federation	3.24	0.00
9	Hong Kong, China	1.09	0.00
10	Ukraine	0.10	0.00
11	Malaysia	0.10	0.00
12	Germany	0.03	0.00
13	Kuwait	0.01	0.00
14	Netherlands	0.00	0.00
15	United Arab Emirates	0.00	0.00
	Total	38,711.4	14.3

Source: Ministry of Commerce, Myanmar

Development Initiatives

The melon export to China has not attracted the attention of the Government of Myanmar until recently when it was added to one of the target commodities of the National Export Strategy in 2017. Unlike growers of rice—the country's major export crop as well as staple, melon farmers have not been eligible for the preferential loan of Myanma Agricultural Development Bank (MADB) which granted MMK150,000 per acre to paddy growers at the concessional interest rate of 8% per year as of 2016. In comparison, commercial banks are regulated to set the lending late below 13% and the deposit rate above 8% per year.[7]

[7] The Central Bank of Myanmar (CBM) regulates commercial banks by capping the lending rate at 3% above the Central Bank reference rate and setting the deposit rate floor at 2% below the reference rate. Currently, the Central Bank reference rate is 10%. This cap on the lending rate has been considered to be low and have impeded banks from extending loans (GIZ 2018). In January

Compared with other horticultural crops, melons have allured less development aid from the international donor community. A notable exception is the USAID Value Chains for Rural Development project implemented by Winrock International, an international non-governmental organization, for five years from 2015 to 2019 in collaboration with MFVP.

However, the melon export to China represents the country's first major export-oriented horticulture which has the potential to ignite a transition of the Myanmar agriculture from the extensive cultivation of traditional crops to the intensive horticulture that generates more employment and higher income to producers. Since the melon sector is on the frontier of the agricultural intensification and rural transformation, the sector confronts various frictions including the deficient rural credit market and the weak regulatory framework of fresh fruit trade. As such, development initiatives would be highly beneficial for the melon sector that is leading the country's rural development.

Legal and Legislative Framework

China's sanitary and phytosanitary measures

Around the world, the trade of fresh fruits is subject to sanitary and phytosanitary (SPS) measures by importing countries for protection of plant or human health. Sanitary measures are for food safety, and they are usually implemented in terms of product or process standards such as maximum residue limits (MRLs) of pesticides or the prohibition of certain chemicals in production. Phytosanitary measures are for plant protection to control the risk of the spread of foreign plant diseases or pests. They often take the form of a "positive list" which bans imports of any fresh fruits from any countries except for those individual crops from specific countries published in the notifications of the competent authorities (Roberts and Krissoff 2004). Furthermore, phytosanitary measures often prescribe exporting countries to adopt specific risk control measures. An example of phytosanitary measures is Japan's control of fruit fries which requires exporting countries to apply the vapor heat treatment to fruits before export.

To reduce the uses of SPS measures as instruments for trade protection from foreign competition rather than hazards to plant or human health, countries adopted the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) under the World Trade Organization (WTO) in January 1995. While member countries are allowed to set their own standards and

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2019, CBM issued an instruction to loosen the collateral requirement of bank loans and approve banks to provide unsecured loans for which the permissible lending rate was raised to 16% per year.

measures to mitigate the risk of pests and diseases, the Agreement established a guideline for containing trade distortion caused by SPS measures (Roberts and Krissoff 2004).

Under the SPS Agreement, WTO member countries conform to the following obligations (Unnevehr 2000).

(1) Transparency: Member countries are required to publish regulations that affect trade.
(2) Equivalence: Member countries are required to admit that different health protection measures can achieve the equivalent safety level. They should not arbitrarily discriminate between domestic produce and imported produce.
(3) Science-based risk management: Regulations should be based on scientific evidence of risk reduction.
(4) Regionalization: Member countries are required to allow imports from the regions of an exporting country as long as those areas are free from pests and diseases.

In addition, the WTO encourages the use of international standards for harmonization of SPS measures among member countries. Two institutions are identified as the organizations that lead standardization of SPS measures: the Codex Alimentarius Commission (Codex) for food safety, and the International Plant Protection Convention (IPPC) for plant health.

In general, for the trade of fresh fruits, the competent authorities of exporting countries—Ministry of Agriculture or Health—take the responsibility to verify that the exported fruits adhere to the product and process standards and hazard management procedures that importing countries impose. They attach to every shipment of fresh fruit export the sanitary and phytosanitary certificates that prove the fruits undergo the procedures prescribed by the importing countries. On the contrary, it is an international protocol that the border control of an importing country demands sanitary and phytosanitary certificates for imported fresh fruits.

The SPS Agreement applies to the bilateral trade of fresh fruits between China and Myanmar since both countries are members of the WTO. China joined the WTO in December 2001, while Myanmar signed the General Agreement on Tariffs and Trade (GATT)—the predecessor of the WTO—in July 1948 as its founding member

For fresh fruit imports, China takes a restrictive approach to plant protection using a positive list in order to control the spread of foreign plant diseases and pests. The inclusion of a new fruit item in the positive list often requires a substantial trade negotiation for exporting countries, exemplified by the case of Malaysian durian. The negotiation included auditing by Chinese authorities of the hygiene standards of processing facilities and the hazard management measures. While frozen

whole durian was first approved for imports in China by the end of 2018, the regulation limits the export facilities only to those approved ones that comply with the standards.

Until recently, it was the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) that administered the SPS measures in China and published the positive list of permissible fruits for imports. Any fruit by a specific country not on the list was prohibited for imports in China. As of January 2018, AQSIQ's positive list included eight items for Myanmar, 22 items for Thailand, two items for Lao PDR, and eight items for Vietnam. In principle, China approved imports of watermelon from four countries, namely Myanmar, Vietnam, Malaysia, and Lao PDR, and melon from Myanmar and Taiwan.[8]

Myanmar's eight items on the AQSIQ list are longan, mangosteen, rambutan, lychee, mango, watermelon, melon, and Indian jujube. The imports of the last four items are restricted to the land ports in Ruili city, Yunnan Province. While Myanmar officially exported some fruit items not on the list such as banana and pineapple, they are considered to be unofficial imports according to China's regulations.

In practice, China has been accepting melons imported from Myanmar without sanitary and phytosanitary certificates, which is not compatible with China's SPS measures nor the international protocol of fresh fruit trade. Myanmar's Plant Protection Division under the Department of Agriculture (DOA) stationed in the Muse 105 mile trade zone does not issue sanitary or phytosanitary certificates for melon exports. Furthermore, while the melon trade is recorded properly in Myanmar's export statistics, China Customs record does not capture the bulk of the melon imports from Myanmar. These indicate the uncertain status of Myanmar melons imported in China. There is a risk that Chinese authorities change the practice and demand proper documents for melon trade.

As a part of China's reform of government organizations, it was announced in March 2018 that AQSIQ was dissolved into two governmental bodies. Regarding fresh fruit trade, two functions of AQSIQ were (1) assessment of market access of fruits from foreign countries, and (2) implementation of inspection and quarantine of imported fruits. The latter covered not only the inspection at the border checkpoints but also the assessment of the risk management measures of exporting countries before shipment.[9] The purview of the former function was announced to be

[8] Produce Report (2018)

[9] These are based on Food Safety Law and Law on the Entry and Exit Animal and Plant Quarantine of China and their implementing regulations.

transferred to the new State Administration for Market Regulation (SMAR) which also incorporated China Food and Drug Administration (CFDA) and the State Administration for Industry and Commerce (SAIC). This restructuring was aimed to create a regulatory body with consolidated powers in market regulation. On the other hand, the implementation of inspection and quarantine of imported fruits was transferred under the mandate of the General Administration of Customs of the People's Republic of China (GACC), also known as China Customs. Previously, importers had to apply for inspection separately to AQSIQ[10] and GACC. The reform has streamlined the procedures so that importers need to make only one application to China Customs for import inspection.[11]

China's reform is expected to strengthen its border controls concerning SPS measures. As a recent development, the Government of Myanmar represented by MOALI and MOC is under negotiation with the GACC to expand China's positive list of fruit imports to include avocado, banana, pineapple, and pomelo.

ASEAN China Free Trade Agreement and other preferential trade schemes

In November 2004, China and ASEAN signed the Agreement on Trade in Goods of the ASEAN-China Free Trade Agreement (FTA) which set the schedule of tariff reduction effective from July 2005. Since October 2003 prior to the signing of the FTA, China also agreed with ASEAN individual member countries to implement the reduction in import tariffs on agricultural goods of the categories HS01 to HS08 including fruits (HS08), which is so-called the "Early Harvest Program" of the FTA (Zhang 2011). As such, imported melons from Myanmar have been exempted for import tariffs of which China's MFN (most favored nation) rates are 25% for watermelon and 12% for muskmelon.

However, implementation of China's tariff exemption is uncertain. It is the rule of the FTA the document that proves the country of origin issued by competent authorities of the exporting country is attached to the goods. This document is called "Form E" for ASEAN-China Free Trade Area Preferential Tariff Certificate of Origin. According to the record by the Ministry of Commerce, Myanmar, Form E has never been issued for melon exports to China for the past five years (2015-2019). During this period, the total number of Form E for fruit exports is just four times, with the total export value of USD 93,576.[12] It remains unclear whether tariff exemption is applicable

[10] To be precise, before the reform in March 2018, China Inspection and Quarantine (CIQ) was under the mandate of AQSIQ to perform inspection and quarantine of imported fruits. In the reform, CIQ was merged with GACC.

[11] USDA Foreign Agricultural Service (2018)

[12] For agricultural and fishery exports of categories HS01 to HS10, issuance of Form E is most active for exports of fish and crustaceans.

for the melons imported in China via cross-border trade.

In addition, China has various preferential tax policies (PwC 2019). Once China imposed 13% of value added tax (VAT) on imported agricultural products as well as local products, VAT rebates appeared to have been applied in some provinces. As a result, the effective tax rates might differ depending on the entry ports of imported fruits. A further marketing study would be due for exploration of marketing channels to make the best of China's preferential tax policies to enhance competitiveness of Myanmar fruits in the Chinese market.

Export Competitiveness Issues

This section lists the main export competitiveness constraints for the melon sector in three aspects, namely, supply-side issues, business environment issues, and market entry issues;

- **Supply-side issues** affect production capacity and quality which include farmland, agricultural inputs and credit, and production technology. The analysis refers to the adoption of the Myanmar GAP (Good Agricultural Practice) Protocol as well.
- **The quality of the business environment issues** is concerned with institutional factors that affect transaction costs, such as the regulatory environment.
- **Market entry issues** include market intelligence services of which it is difficult for individual farmers and intermediaries to internalize the costs regardless of the positive externalities for the sector.

Supply-Side Issues

Box 1 Overview of supply-side issues related to Myanmar's melon sector

- Land rental market and environmental impact of melon cultivation
- Poor quality agricultural inputs and limited access to credit
- Seed supply and shortage of preferred seeds
- Lack of incentives for growers to adopt Myanmar GAP

<u>Land rental market and environmental impact of melon cultivation</u>

Melon production relies on land lease. As discussed earlier, two biophysical features of melons—a short vegetation period and vulnerability to replant failure—contribute to widespread uses of land leases in melon cultivation. Chinese-controlled producers, as well as Myanmar farmers, make use of leased land as a means to pest management. Many producers limit repeated cultivation in the same

field to at most two years and instead continue shifting cultivation on the rented land, preferring the soil which has never been planted to melons.

There are at least three kinds of environmental risks arising from melon cultivation. First, irrigation by groundwater using tube well can cause salinization depending on salinity/electric conductivity of water and soil texture. Underground salinity that has dissolved in the water accumulates on the surface of the field as it evaporates, which prevents plants from absorbing moisture and nutrients from the soil. The risk is particularly high in the dry zone as little rain does not flow salinity. Second, heavy uses of pesticides lead to persistent soil contamination which damages microorganisms in the soil. Third, melon cultivation often leaves plastic sheets in the ground. Growers plant melons on the raised beds covered by plastic mulch to manage the moisture conditions of the soil. The plastic sheets also inhibit weed growth and protect fruits from pathogens in the ground. However, if plastic sheets are not removed completely before plowing for the next crop, they remain in the soil persistently.

The environmental impacts of melon cultivation may differ substantially by the ecosystem of fields as well as types of crops to be planted afterward. In *kyun* and *kaing*, annual inundation washes off the chemical residues in the soil and repairs the soil condition. In fact, continuous cropping is often observed in these ecosystems. By contrast, dry upland is more vulnerable to environmental risks. Furthermore, even in dry upland, the impacts of melon cultivation on the soil conditions may vary. On the one hand, some witnessed that no crops can be grown for several years after melon cultivation (Htet Khaung Lin 2019). On the other hand, the impacts of melon cultivation on the crop yield may not be significant as far as the field is planted to legume and oilseed crops. Scientific evidence concerning the effects of melon cultivation on the soil conditions is yet to be established.

While the land lease is common among melon growers, some growers practice continuous cropping with skillful farming. A combination of soil conditioning with effective microorganisms (EM) and greenhouse as a means of pest management enables reduced use of pesticides, which is compatible with both continuous cropping in a field and reduced-chemical fruits that fetch higher prices in the market. However, it is indispensable for such reduced-chemical farming to find the market that pays a premium for reduced-chemical fruits; otherwise, reduced-chemical agriculture does not pay off.

On the contrary, the bulk of melon growers have neither skills of reduced-chemical farming, financial resources for it, or access to the market of reduced-chemical fruits. They inevitably choose farming with intensive use of pesticides, which put them in a vicious cycle of shifting cultivation

using leased land and the modest fruit prices that the segment of Chinese market tolerant for uncertain food safety pays for it.

For farmers' land lease, it is not sure how far their right as lessors are protected. It is the Village Tract Land Management Committee that administers the contract of land lease between villagers. The committee consists of a surveyor of the Department of Agriculture Land Management and Statistics (DALMS), a village tract administration clerk, a village chief, a farmer representative, and a villager representative. Although the first two members represent governmental organizations, the committee is the village's self-governing body based on mutual understanding of concerned villagers. It is not in a position to monitor the soil condition before and after the lease to melon growers. Furthermore, as the Farmland Law (2012) prohibits land lease to foreign related parties without permission from State Governments, the land lease to Chinese-controlled growers is out of the purview of the committee. There is no formal institution that stands for lessors' rights in case of soil degradation occurring from the lease to melon growers.

The environmental issue in land rental has repercussions for melon growers. As a large scale land lease to melon growers raises concerns about corruption of village administration as well as environmental issues, Sagaing Regional Government reportedly considered a ban on land lease to melon growers (Htet Khaung Lin 2019). Tightening of land lease would severely check the growth of melon production.

Poor quality agricultural inputs combined with limited access to credit

There have been rumors about the circulation of poor quality fertilizers and pesticides in Myanmar (Food Security Working Group 2015; Peeters et al. 2015). The **Fertilizer Law** had been enacted in October 2002 and was revised in March 2015, administered by the Land Use Division of DOA, while the **Pesticide Law** had been adopted in May 1990 with the by-law Notification 4/91 in July 1991 and was amended in January 2016 under the jurisdiction of the Plant Protection Division of DOA. However, the enforcement of the laws and regulations has been weak as the authorities have deficient capacities for regular checks on the quality of the products, resulting in the circulation of unapproved pesticides as well as bad quality fertilizers and pesticides.

Myanmar relies on imports for the supply of both fertilizers and pesticides. For chemical fertilizers, domestic production has been limited to urea at around 200,000 MT per year, while the imports are estimated around 1,200,000 MT comprising urea (600,000 MT), NPK[13] compounds (400,000 MT), granular superphosphate (90,000 MT), and potash (20,000 MT) as of 2014 (IFDC 2015).

[13] NPK stands for nitrogen (N), phosphorus (P), and potassium (K).

Approximately 900,000 MT are imported via cross-border trade mainly from China via Muse, with small quantities also by land from Thailand and India. The imports via Yangon port is estimated to be around 150,000 MT. Major importers include Shu San Trading, AWBA group, and Diamond Star (Armo), and the collective import share of the six largest importers is estimated to be above 90%.[14] For pesticides, the total volume of imports recorded by the Plant Protection Division of DOA is 10,205 MT in 2013, but this figure does not include unofficial imports.

Mixing of low and high quality products may take place at the various stage of the marketing channel of agricultural inputs. The marketing channel comprises importers/distributors, dealers, and sub-dealers before reaching to farmers. Importers/distributers sell the imported fertilizers with their own brand name after repacking. These importers/distributors dispatch sales agents to large dealers in regions that involve in wholesale transactions with smaller dealers as well as retail sales to farmers. Sub-dealers are mostly retailers who serve remoted rural villages. According to IFDC (2015), as of November 2014, there were 270 registered importers/distributors of which approximately 80 companies imported regularly, and 3,093 dealers registered to the Land Use Division of DOA. Sagaing Region has 231 registered dealers, whereas Mandalay Region has 474. In addition to the possibility that inferior quality products enter Myanmar across the border, repacking of products within the country can take place at any segment of the marketing channel.

Farmers' financial constraints would expose them to more risk of poor quality agricultural inputs. According to the survey of IFDC (2015) of fertilizer dealers, compared with large dealers in the upper stream of the agro-input marketing channel, small and medium dealers and sub-dealers more often offer agricultural inputs on crop term and allow farmers to make payment after harvest, which is frequented by farmers under tight financial conditions. However, the downward segment of the marketing channel is more exposed to the risk of low quality products as there are more chances of repacking until the product reaches farmers.

Since the crop year of 2018, MFVP has coordinated the collective purchase of fertilizers combined with group lending from a commercial bank. In 2018, ten leading melon farmers formed a group to purchase 607 MT (12,140 bags of 50 KG) of fertilizers collectively from importers, who usually offer a volume discount for a large order. Furthermore, this farmer group applied for a group lending in which ten farmers served guarantors for the loans of the other members with each other. The bank disbursed money to the fertilizer importers, while the farmers received fertilizers from the

[14] Apart from local companies, Yara, a Norwegian multinational of fertilizer producer, has opened a subsidiary company incorporated in Myanmar for import and distribution of fertilizers in September 2017 (Su Phyo Win 2018).

importers. Still, the farmers were liable to the bank. Purchasing fertilizers directly from importers reduce the risk of buying poor quality fertilizers. However, participation in the scheme was limited to large farmers who were able to pledge their assets as collateral.

Collective purchases of fertilizers and pesticides have the potential to spread to other farmers who are more financially constrained. In 2019, MFVP plans a collective purchase of fertilizers where eight leading farmers purchase 502.5 MT of fertilizers on behalf of their own and other farmers. A limitation of this collective purchase is that its size is bound by the value of the collaterals that the leading farmers can pledge.

Seed supply and shortage of preferred seeds

Melon seeds are supplied by imports from various countries. A pioneer foreign company in melon seed distribution business is the Taiwanese company, Known-You Seed. In the 1990s, the company sent sales agents to agricultural supply shops near the fruit wholesale market in Mandalay, which helped dissemination of horticultural crops in the Central Dry Zone. Others include Thai subsidiaries of multinational seed companies such as Seminis (Monsanto) and Syngenta. As seeds are imported through various channels without registration to MOALI, there remains a risk of low quality seed circulated to melon growers. Moreover, imported seeds do not always perform well under Myanmar's climate.

Gradually, Chinese seeds come to dominate the market for at least two reasons. First, Muse broker houses import these seeds and supply them to growers, which forms a convenient distribution system. Second, more importantly, Chinese varieties are popular among buyers in mainland China. As shown in the survey by Su Thanda Zaw (n.d.), the 855 variety of watermelon and the Shwe variety of honeydew melon have obtained high proportion in the market. Given the uncertainty of seed performances, positive externalities exist for a variety to diffuse in a region; as more growers cultivate a variety, its demonstration effects attracts growers further. This process could induce concentration of cultivation in a small number of varieties.

As growers prefer the seed brands of proved performance, the Shwe variety seed of Zheng Tai Co. Ltd., Shandong Province, China, has become particularly popular to such an extent that the demand exceeds the supply through Muse broker houses. As such, Muse brokers ration the sales of this seed, which can impede the growth of melon production and exports. This situation may also strengthen oligopolistic power of a small number of Chinese-owned brokers who have access to the seed supply in China. Diversification of the marketing channels of popular seed brands would be the first step for the stable supply of quality seeds.

Lack of incentives for growers to adopt Myanmar GAP

Good Agricultural Practice (GAP) is an effort in production process management to ensure sustainable agriculture. Myanmar's effort of GAP stretches back to the adoption of ASEAN GAP in 2006. The ASEAN GAP is a guideline on production of fresh fruit and vegetables, comprising four modules of sustainable agriculture in terms of (1) food safety, (2) environmental management, (3) workers' health, safety and welfare, and (4) produce quality. The ASEAN GAP, unlike other GAP protocols, does not have a farm certification scheme. Drawing on the existing GAP protocols of some member countries such as myGAP of Malaysia, the ASEAN GAP aimed at harmonization of GAP protocols of the member countries for promotion of intra-ASEAN trade of fresh fruits and vegetables. All member countries were encouraged to create a GAP certification system in line with the ASEAN GAP. In Myanmar, DOA of MOALI has been striving to establish the country's own GAP certification scheme, called Myanmar GAP.

In 2016, DOA published the Myanmar GAP protocol along with the GAP certification scheme for 15 crops including (1) watermelon, (2) melon, (3) mango, (4) avocado, (5) pomelo, (6) tomato, and (7) cabbage.[15] Regarding the Myanmar GAP as a farm certification scheme that commends farmers who adopt sustainable agricultural process management, DOA functions as both the accreditation body and a certification body. As the accreditation body, DOA administers the Myanmar GAP protocol and approves auditors. As a certification body, DOA certification team audits farms and farmers to certify their compliance to the protocol and issue GAP certificates. DOA has approved private agricultural consulting companies as certification body of the Myanmar GAP and allow them to issue Myanmar GAP certificates.[16] As DOA exempts farmers from the auditing fees except for laboratory examination costs whereas private certification bodies do not, farmers seldom use the latter for their application for the Myanmar GAP.

While the Myanmar GAP is a public standard administered by DOA, it is not a statutory regulation. Nor does Myanmar GAP certificate signify that the produce from the certified farm complies with MRLs; the Myanmar GAP certificate does not substitute for a sanitary certificate which is often a requisite document for fruit exports. Unless recognized and requested by consumers, Myanmar GAP certificate does not pay premium for the farmers who adopt it.

It is useful to distinguish the differences between Myanmar GAP and GLOBALG.A.P. The origin of

[15] The other eight items are (8) rice, (9) maize, (10) pulses, (11) groundnut, (12) onion, (13) sesame, (14) pepper, and (15) coffee.

[16] An example of such consulting firms is Control Union (Myanmar) Ltd., a subsidiary of the Dutch company, Control Union B.V.

GLOBALG.A.P. is EurepGAP which was procurement standards for agricultural produce set by EUREP (Euro-Retailer Produce Working Group) representing European supermarket chains and their major suppliers in 1997. EurepGAP was a private standard and a farm certification scheme for these European food supply businesses to meet the demand of their customers for food safety and sustainable agriculture. In September 2007, EurepGAP was renamed as GLOBALG.A.P. While it is a private standard, retailers in the European Union market commonly require GLOBALG.A.P. certificate to their suppliers so that it turns out to be de facto requisite document for exporters of agricultural produce to European Union. In Myanmar, there is a certification body of GLOBALG.A.P. and some farmers obtained the certificate. By contrast, while Myanmar GAP is a public standard, the certificate has been rarely recognized in the foreign market.

The Myanmar GAP is still in a nascent stage, so that its adoption among farmers or recognition in the market is low. In 2018, two growers of muskmelon were certified Myanmar GAP certification for the first time. In 2019, three melon growers and one watermelon grower obtained Myanmar GAP certificate. Despite the campaign for farmers by DOA and MFVP to raise their awareness, the adoption rate remains evidently low. While MFVP proposed to launch trading of Myanmar GAP certified produce in the NEGPC wholesale market segregated from trading of conventional produce, their campaign is yet to reach the buyers in mainland China. Hence, the premiums for Myanmar GAP melons are still absent, which deters farmers from adopting it.

Raising GAP adoption is a challenge common in the member countries of ASEAN. For Thai fruit exports to China, based on the bilateral agreement of SPS measures, the Chinese authorities require the proof that the imported fruits are the produce from the field certified to QGAP—the farm certification scheme by Thai Ministry of Agriculture and Cooperatives. Such a regulatory requirement has enhanced the GAP adoption among farmers concerned in Thailand.

Quality of the Business Environment

Box 2 Overview of business environment issues related to Myanmar's melon sector

- Road transportation issue: unreliable services of freight companies
- Security conditions in Northern Shan State and checkpoints alternative to Muse/Wanding
- A 2% advance corporate income tax levied on exports
- Settlement of border trade with China and unofficial money transfer system that spurs unofficial businesses
- Investment climate for foreign companies in trading of fresh fruits

Road transportation issue: unreliable services of freight companies

Among melon growers, complaints are widespread as to the quality of freight services linking their farms with the Myanmar-China borderland. The market of freight services is typically segmented by social networks. At the time of harvest, melon growers contact freight service brokers, "*gates*" (local syndicates of freight service providers), or Muse brokers for arrangement of transportation, who then dispatch an open freight truck (16MT truck of 8 MT truck) to the farm. On the day of harvest, fruits are selected and graded on the farm and loaded onto the open freight truck with simple packing using carton sheets and paddy straw as shock absorber. Trucks usually depart before evening and drives the distance of 450 to 600 kilometers overnight to Muse. Depending on the distance and traffic, it takes one or two nights to get to the NEGPC where auctions start at 7:00 AM.

Complaints are about the duration of transportation and damages on fruits during transportation. The Mandalay-Muse road is the only trunk road connecting the production areas with the market. Several perilous passes on the road such as the Goke Hteik pass suffer from frequent congestions, resulting a delay in delivery. The longer the fruits are in the traffic, the more the commercial value diminish. However, it is not clear who is responsible for the delay and damage on fruits. Eventually, farmers have to accept any losses occurring from damages on fruits.

While the quality of freight service is not consistent among operators, the segmented nature of the freight service market does not allow individual farmers to judge the quality and purge low quality service providers from the market. In this regard, consolidating the individual reviews would be useful in standardizing the quality of freight services.

Security conditions in Northern Shan State and checkpoints alternative to Muse/Wanding

Another issue concerning the road transportation is the security in Northern Shan State. The occasional armed conflicts between the army and the anti-government forces blocked the traffic of Mandalay-Muse road, which caused disruption of the melon exports. For two weeks from December 27, 2018 to January 9, 2019, the Kyin San Kyawt Road connecting the 105 mile trade zone and the Wanding checkpoint was shut down. The disruption engendered huge losses on farmers as they were responsible for fruits until they were handed to the Chinese buyers in Wanding. Security in the border areas is one of major issues for the competitiveness for Myanmar's melon exports to China via border trade.

Developing a border checkpoint alternative to Muse-Ruili is challenging as the security grip of Myanmar's central government has been often contested by armed anti-government groups. Table 8 and Figure 10 illustrate 11 checkpoints along the border between Yunnan Province of China and

Myanmar. The numbers in Table 8 correspond to those in Figure 10. A large part of the borderland in Kachin and Shan States are under the grip of insurgency ethnic groups, which leaves only the areas between Lwejel and Kyu Hkok under the control of Myanmar's central government (Bi 2010).

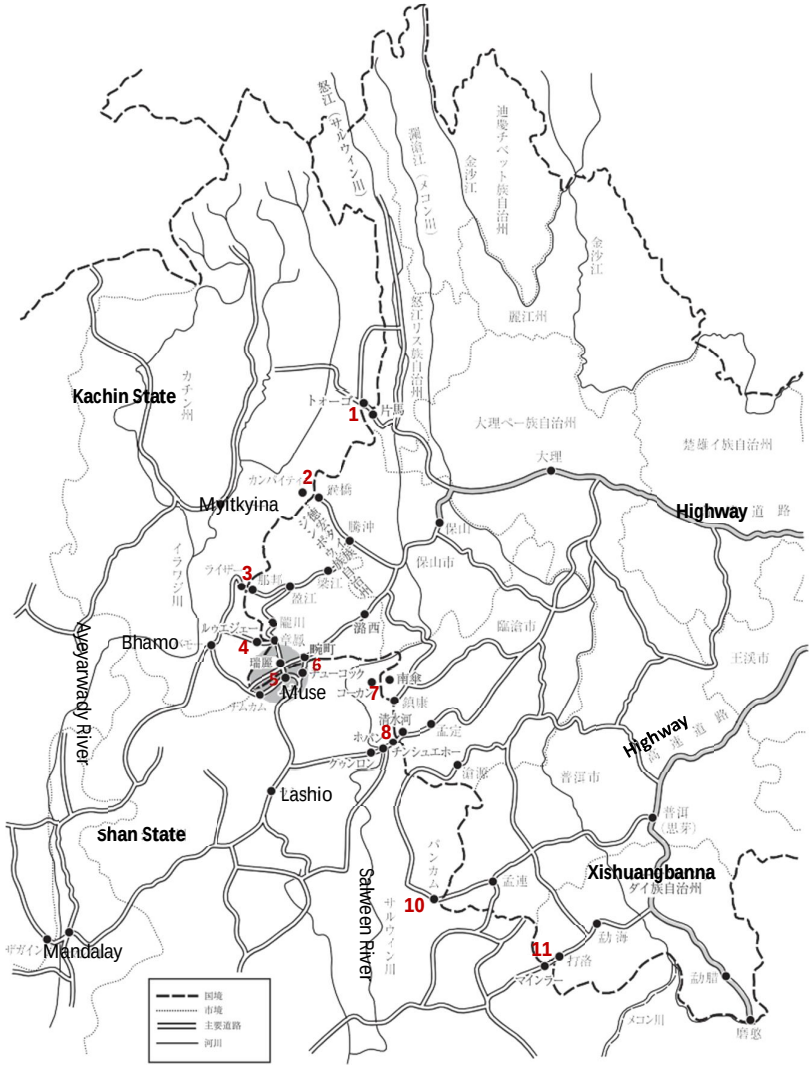
Table 8 Border checkpoints between Yunnan Province, China and Myanmar

	China's administration					Myanmar 's administration		
	Gate name		Name of city/county	Class	Open in	Gate name	State	Class
1	Pianma	片 馬	Nujiang	2nd	1991	Htawgo	Kachin	
2	Yingjiang	盈 江	Dehong	2nd	1991	Laiza	Kachin	1
3	Zhangfeng	章 鳳	Dehong	2nd	1991	Lwejel	Kachin	1
4	Houqiao	猴 橋	Baoshan	1st	2000	Kanpitetee	Kachin	
5	Ruili	瑞 麗	Dehong	1st	1978	Muse	Shan	1
6	Wangding	畹 町	Dehong	1st	1952	Kyu Hkok	Shan	1
7	Nansan	南 傘	Linchan	2nd	1991	Ko Kang	Wa	
8	Qingshuihe	清水河	Linchan	1st	1991	Chin Shwe Haw	Shan	
9	Cangyuan	滄 源	Linchan	2nd	1996	Panwine		
10	Menglian	孟 連	Pu'er	2nd	1991	Pang Kham		
11	Daluo	打 洛	Xishuangbanna	2nd	1991	Maila	Shan	1

Source: Bi (2010: 375)

In addition, Chinese authorities do not install customs and quarantine offices at all checkpoints. Checkpoints are classified into those established by the State Council as the 1st class international border gate and those by Yunnan Province as the 2nd class gate. The 1st class international border gates are equipped with customs and quarantine offices, but it is not always the case for the 2nd class gates. On the other hand, Myanmar's central government sets up customs at only five gates. Only in two border points coincide China's 1st class international gates and Myanmar's gates with customs offices.

Figure 10 Map of border checkpoints



Source: Bi (2010: 374)

A 2% advance corporate income tax levied on exports

Inadequate tax compliance among citizens and businesses impairs the country's tax revenues to the lowest level around the world, which constitutes one of reasons for the authorities to exploit the international trade for taxation. Since April 2012, the Internal Revenue Department (IRD) has levied on importers and exporters the advance corporate income tax at the time of import/export declaration at the Customs[17]. This prepaid tax has been causing problems for melon exports to

[17] KPMG (2018) and Deloitte (2019)

China.

Myanmar's tax revenue to GDP (Gross Domestic Product) ratio has been in the 5-6% range, one of the lowest among developing countries (IMF 2019). In addition to the outdated tax collection system, tax evasion by businesses and individuals have held back the tax revenues. Despite the tax reforms since 2012 including the rationalization of tax rates of commercial taxes and the phased introduction of self-assessment system for corporate income tax, the growth in tax revenues has been modest. According to the International Monetary Fund (IMF) statistics in Table 9, the ratio of tax revenues to GDP rose from 5.6% in 2013 to 6.5% in 2016. Regarding the proportion of direct tax (income tax and asset tax) and indirect tax (commercial tax, excise tax, and customs duty), direct tax slightly decreased from 37.5% in 2013 to 36.9% in 2016.

Table 9 Structure of tax revenues in Myanmar (% of GDP)

	2013	2014	2015	2016
Taxes	5.6	5.9	6.1	6.5
Taxes on income, profits, & capital gains	2.1	2.2	2.3	2.4
Taxes on property	0.0	0.0	0.0	0.0
Taxes on goods and services	2.8	2.8	3.0	3.4
Taxes on int'l trade & transactions	0.6	0.8	0.6	0.6
Other taxes	0.1	0.1	0.2	0.1

Source: IMF *Government Finance Statistics*

One of the reasons for the low revenues from income tax in Myanmar is the limited human resources for tax collection at IRD. As a countermeasure, the self-assessment tax system was introduced in 2014 for some top 130 of the estimated 20,000 companies, which was expected to streamline tax filing. The self-assessment system has been gradually expanded since then. In 2017, the Large Taxpayer Office had jurisdiction over the top 711 companies, while the taxation of other companies were administered by the Medium and Small Taxpayer Offices. Besides, self-employed businesses and farmers are leaking from the income tax system. The corporate income tax rate has been reduced to 25% from 30% in March 2012 (Notification No.111/2012). The income tax rates for individuals range from 0% to 25% under the progressive taxation, and withholding is applied to employees of companies.

In developing countries confronting a challenge of low tax compliance, the income of companies involved in trade is relatively easy to capture and is therefore often heavily taxed. In Myanmar, a

10% export tax had been levied since early 1990s, and the tax rate was reduced to 7% in July 2011, and to 2% in August of the same year before the abolition in March 2012. Not to mention, import duties have been levied at various rates. At customs, clearance is suspended unless taxes are paid, making it easier for the authorities to collect taxes.

With the abolition of the export tax in April 2012, a 2% advance income tax was introduced in Myanmar. Presuming that income tax liabilities of an export company is proportional to the export value of that company, 2% of the export value is levied at the time of export declaration as advance corporate income tax, and it is credited against the company's income tax liabilities. If the total amount of advance corporate income tax exceeds the income tax liabilities at the end of the term, the company can claim a refund. This system is applied not only to exporting companies but also to importing companies against their imports.

It should be noted that this 2% advance income tax is a direct tax to be borne by importers as well as exporters. Its imposition is similar to *ad valorem* indirect taxes such as commercial tax, customs duties and excise duties. In the case of indirect tax, since the importer pays the tax on behalf of their consumers, the importer must pass the taxed amount on to the consumers. However, 2% advance income tax is a prepaid direct tax levied on their income, which should be borne by exporters and importers themselves.

There are pros and cons of 2% advance income tax. Given the inadequate tax compliance, the advance income tax levied on international trade is an effective means of collecting corporate income tax in Myanmar. However, a major critique about this system is the delay in tax refunds. As far as a company's profits at the closing of account in the end of year are above 8% of its export value (8% of the export value as profits multiplied by 25% income tax rate yields 2% of the export value as the company's tax liabilities), the prepaid amount of 2% advance income tax goes below the income tax liabilities. However, the profits of some companies may be less or they even fall in deficits, which necessitates them to reclaim the prepaid income tax at the closing of account is zero. It is reportedly not always smooth for such companies to receive refunds of their 2% advance income tax from the IRD.

This 2% advance income tax has caused another problem for melon exports to China. In melon exports, the flow of business is not compatible with the advance income tax system. There are three aspects in the flow of business of melon exports: flows of goods, ownership of goods, and payment among growers, brokers and buyers in mainland China. First, melons are brought from growers to brokers, and brokers negotiate the price with buyers in mainland China. Second,

however, the ownership of melons shifts from growers to the buyers, and brokers never possess melons. Brokers match melons with the buyers, taking a sales commission from growers. Third, payments are from the buyers in mainland China to growers via brokers. Brokers receive payments from the buyers and make remittances to growers after deducting the sales commission fees. In principle, brokers' revenues are only the sales commission which is 5% of the export price.

With this watermelon export, the North East Gate Public Company (NEGPC), a wholesale market whose main shareholders are 15 fruit brokers, appears as the exporter in the export documents. Therefore, the IRD levies a 2% advance income tax on NEGPC. NEGPC passes on this tax to individual brokers that have arranged melon exports. These brokers in turn pass on it to growers. In fact, brokers charge the growers a 2% of the advance income tax in addition to 5% of the sales commission. In other words, NEGPC's corporate income tax—direct tax on its taxable income—is shifted to growers as if it were indirect commercial tax. The consequence is that NEGPC has been commended as one of the largest income taxpayer in Myanmar, ranked 30-60th in the list of top taxpayer companies.[18]

There are at least two problems with this advance income tax on melon exports. First, NEGPC is likely to have overpaid the corporate income tax. NEGPC is a wholesale market operator, whose main revenue is facility usage fees collected from brokers. Brokers usually earn 5% of the export value from growers as sales commissions from which they pay facility usage fees to NEGPC. If NEGPC charges 1% of the export value as such fees and there is no deductible expenditure, NEGPC's corporate income tax will be 1% of the export value multiplied by the tax rate, 25%, which amounts to 0.25% of the export value. The 2% advance income tax is clearly excessive compared to NEGPC's revenues. However, there is no sign that NEGPC has received tax refunds for possibly overpaid corporate income tax.

A more serious problem is that NEGPC and brokers pass on the advance income tax to growers. In Myanmar as well as in many developing countries, farmers are usually exempted from commercial tax when they sell their products in the domestic market (Khan 2001). However, for the melon export value chain, it is a common practice that brokers pass on their tax burden to the growers.

The 2% advance corporate income tax on melon exports is essentially a system for the convenience of IRD to collect income tax from NEGPC. Since NEGPC's revenue is mostly the facility charge of the wholesale market collected from brokers, it is not appropriate to levy a 2% tax as their advance

[18] In the list of largest corporate income tax payers, NEGPC was ranked 35th in 2014, 34th in 2015, and 67th in 2016.

income tax. It is considered more reasonable to calculate the advance income tax of NEGPC and the brokers taking into account the actual business practice.

The example of the garment industry is useful when we consider advance income taxes on melon exports. The garment export takes the form of processing on consignment called CMP (cutting, making, and packing); foreign buyers consign the process of cutting, sewing, and packing by providing the intermediate goods (i.e., textile) free of charge, and Myanmar factories export the finished goods to the destinations directed by the foreign buyers, and receive the processing fees only. However, even in the case of consignment processing, the export declaration is made at the full price of the garment product for export customs clearance. In this processing on consignment, the processing fee received by the garment factory is significantly smaller than the export declaration price of the finished garment, so the 2% advance corporate income tax is exempted for CMP exporters. If the same logic is applied to melon exports, it is considered appropriate to impose a 2% advance income tax on their commissions for melon brokers and NEGPC rather than the export value.

Settlement of border trade with China and unofficial money transfer system that spurs unofficial businesses

Unofficial cross-border money transfer system called *hundi* is often used for the settlement of border trade with China, and it is also the case for melon exports. Unofficial financial services allow unofficial businesses to thrive,[19] and the unfair competition from unofficial businesses deter official businesses from entering the sector, which checks the growth in exports. Containing unofficial financial flows is thus compatible with export growth.

For melon exports, the buyers in mainland China make payments in Chinese yuan (CNY), either in cash or by bank transfers. The Chinese financial authorities approve Myanmar residents to maintain CNY bank accounts in Ruili. Muse fruit brokers have CNY bank accounts in which they receive payments from the buyers in mainland China. In fact, the payments by Chinese buyers do not involve international bank transfer, but these are merely domestic bank transfers from the viewpoint of Chinese financial authorities.

Myanmar exporters who receive payments in their CNY bank accounts utilize an unofficial currency exchange method called *hundi*. In Myanmar, there are importers who need to raise CNY for payments to their suppliers in mainland China. These Myanmar importers also maintain CNY bank accounts in Ruili. *Hundi* is exchange of positions between those who need to send out money to a

[19] APG (2018).

foreign country and those who need to bring in money from a foreign country to Myanmar. In particular, Myanmar exporters transfer their deposits from their CNY accounts to Myanmar importers' accounts. At the same time, Myanmar importers make payments in Myanmar kyat to Myanmar exporters. These complete the currency exchange and international money transfers simultaneously. There are specialized *hundi* dealers who accommodate the orders of currency exchange and money transfers.

Compared with convenient unofficial money transfer system, official bank transfers had been costly at least for two reasons. First, they involved currency exchange twice, from CNY to US dollar and to Myanmar Kyat. Second, banks require official documents for international remittances. By contrast, documents are not necessary for the unofficial money transfer system, which is highly compatible with unofficial trade. Should have melons been imported to China unofficially, official international transfers through the banking system is not available for Chinese importers. Nonetheless, Muse brokers would be still able to receive payments at their CNY bank accounts in Ruili since Chinese authorities would not scrutinize domestic account transfers.

However, there are some risks for Myanmar residents to maintain CNY deposits in Yunnan Province. Chinese authorities occasionally foreclosed these accounts for surveillance against money laundering and smuggling. In March 2018, 217 accounts of Myanmar residents at the branches of the Agricultural Bank of China were foreclosed. In June 2017, the largest scale bank account foreclosure happened wherein 1,000 accounts were frozen in Ruili branches of the Agricultural Bank of China, China Construction Bank, and Industrial and Commercial Bank of China. There were similar incidents in November 2016 and December 2014. Such bank account foreclosures severely disrupted the border trade.

In January 2019, the Central Bank of Myanmar (CBM) made an agreement with the People's Bank of China (China's central bank) that enables CNY settlement for international transactions between two countries. The melon buyers in mainland China can now make payments to Myanmar exporters by international bank transfer in CNY. A drawback of this policy change is that CBM does not approve CNY deposit accounts at banks in Myanmar. As a result, Myanmar exporters receiving inward CNY remittances from China must convert them immediately into Myanmar Kyat. This impairs the convenience of the newly established official CNY cross-border transactions. As the businesses in the borderland including Muse brokers often engage in both exports and imports, they receive payments in CNY as well as make payments in CNY, which necessitates them to maintain CNY balances. CBM's approval of CNY deposit accounts for Myanmar firms would improve the convenience of official bank transfers for cross-border settlements, which is conducive to

regularization of cross-border trade.

Investment climate for foreign companies in trading of fresh fruits

Currently, official investment by Chinese entrepreneurs in melon marketing is absent. Having investment of the buyers in mainland China in fruit buying stations in production areas would facilitate the access of local producers to the Chinese market. As the investment environment for marketing of fresh fruits is uncertain, identifying the obstacles for foreign companies to invest in fruit marketing is an essential step for export promotion.

Until the early 2010, it was **Burma Companies Act (1914)** that shaped the policy of the Myanmar Government towards foreign investment. The Act stipulated in Article 2 (A) and (B) that unless 100% possessed and controlled by Burmese entities, a company was regarded as a foreign company. In Article 27, it further stipulated that exporter/importer registration was necessary for them to engage in international trade. Since the registration had been rarely approved, however, foreign companies had been effectively prohibited from exports.

The current government has been striving to improve the investment climate for foreign business. **Myanmar Companies Law (2017)** clarifies in Article 1 that foreign company is defined as a company incorporated in Myanmar in which foreign corporations and foreign persons possess more than 35 percent of the ownership. Therefore, this law treats a company with foreign ownership below 35 percent as a local one. Furthermore, **Myanmar Investment Law (2016)**, which merged Foreign Investment Law (2012) and Citizen Investment Law (2013), treats foreign companies and Myanmar ones equivalently except for some restricted sectors which are listed in Ministry of Planning and Finance Notification No. 35/2017 and Myanmar Investment Commission Notification No. 15.2017. Myanmar Investment Commission (MIC) is an inter-ministerial body that administers preferential schemes for investment such as long-term property lease and tax incentives for foreign investment, whereas Directorate of Investment and Company Administration (DICA) manages non-preferential schemes. These two notifications comprise, but not complete, a negative list of business sectors for which foreign investment is restricted. In principle, foreign investment in any business sectors except those of restricted ones are permitted in the law.

However, the implementation of the law is not favorable for foreign companies. MIC Notification No. 15/2017 includes a clause that foreign investment whose business involves export and import shall comply with the policy of Ministry of Commerce (MOC), whereas MOC reserves discretion as to approval of exporter/importer registration of foreign-related companies. Without the registration, any company cannot apply for export/import licenses or conducting international trade of

non-license items. In principle, MOC does not approve companies with any foreign ownership for the exporter registration to engage in export of unprocessed agricultural produce.

An exceptional case for companies with foreign ownership is that they are permitted for exports of crops they have produced. If a foreign company operates crop cultivation, it can be approved for the exporter registration and exports of their own produce. For mango exports, there is a case that a company with foreign ownership below 35% is permitted for trading fresh fruits. However, it is not certain if such a company is permitted for exports of fresh fruits that they purchase from other producers.

In June 2019, MOC promulgated **Notification No.24/2019** (June 2019) which approved joint-venture companies and foreign companies to export seven items procured locally, including (1) meat and fish, and (2) value added crops such as rice as well as other processed crops (powder of beans, corns and sesames). For rice (rice and broken rice), foreign companies are required to bring in initial minimum investment of USD 3 million as well as to obtain membership of Myanmar Rice Association. This is a considerable improvement in investment climate. Further liberalization is awaited for promotion of melon exports.

Market Entry Issues

Box 3 Overview of market entry issues related to Myanmar's melon sector

- Lack of information about Chinese markets

The current melon export to China relies on Muse brokers who hold auctions at the NEGPC wholesale market that attracts hundreds of agents of the buyers in mainland China. These brokers and their staff excel at the Chinese language that enable them harsh negotiation with the Chinese buyers. The brokers play additional important roles in the melon value chain including provision of quality seeds and agricultural inputs on credit, arrangement of transportation, and collection of bills from the buyers in China.

A drawback of the current melon trading system, however, is that market information is not shared between suppliers (Burmese farmers) and the buyers (agents of buyers in mainland China) in the arm's length transactions. Burmese farmers are acquainted with the brokers in Muse, but they hardly know who the consumers are and where their produce is consumed. All the information that farmers can obtain are from Muse brokers. Farmers are informed of the proportion of rejected

fruits, but exchange of information about the market trend or the preference of Chinese consumers is rare, which inhibits them from product upgrading.

Moreover, even Muse brokers can access information only from their immediate buyers. As shown later in this report, the traditional distribution model of fresh food products in China involve multiple layers of agents and distributors. Bird's-eye view of the whole melon value chain is beyond the reach of Muse brokers. There are rooms for MOC to collect and disseminate market information among stakeholders. In this regard, MOC has decided to deploy an economic attache to the Consulate General in Kunming, Yunnan Province of China.

Where We Want to Go

Vision

The following vision has been agreed among the stakeholders to guide the melon sector and its export development efforts.

> **Develop the export-oriented intensive horticulture harmonizing high value creation and environmental sustainability towards rural livelihood improvement.**

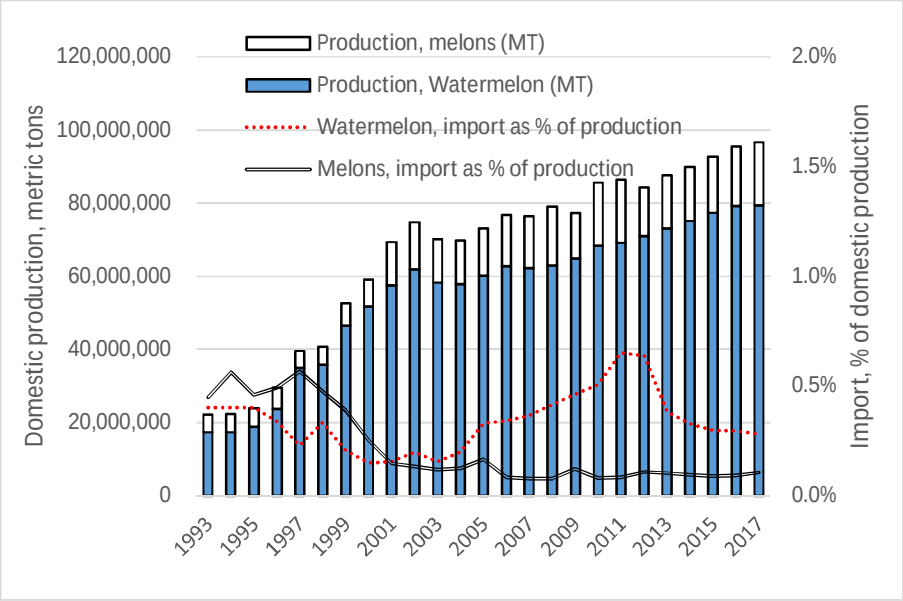
The immense opportunities for the Myanmar melon sector lie in its natural endowment that the country is adjacent to China—the world's biggest consumer of melons—and that its climate allows counter-seasonal production to the market. The melon sector is still at the thin edge of the wedge of the Chinese market opportunities. The sector's vision will be achieved by fully capitalizing on its potential, yet with environmentally sustainable agricultural production.

Market Identification[20]

China is the world's biggest producer and consumer of melons. According to the statistics of the Food and Agriculture Organization (FAO), in 2017, production of watermelon and muskmelon amounted to 79.5 million MT and 17.1 million MT, respectively.[21] China's imports of watermelon and muskmelon as percentage of domestic production are shown to be 0.28% and 0.11%. However, it should be noted that the Chinese import statistics does not capture the imports from Myanmar. China's melon harvest season stretch from May to November. Central Region (Henan, Hebei, Shandong, Anhui, and Jiangsu) Provinces have harvesting from May to June, and they are followed by Northeast Region (Heilongjiang and Liaoning) Provinces in July to October. Out-of-season crops are harvested in Guangxi Province in the South in November, and pre-season crops are cultivated with greenhouse in Hainan Province. Melons imported from Myanmar are valued as out-of-season crops in the market.

[20] This section heavily draws on Producer Marketing Association (2016).
[21] The average yield per acres in 2017 is 17.3 MT for watermelon and 14.2 MT for muskmelon.

Figure 11 Melon production in China and the proportion of imports to local production, 1993-2017



Source: FAO Stat

China's fresh fruit market is diverse and has been undergoing significant changes in two regards (Produce Marketing Association 2016). One is the so-called "supermarketization." Supermarkets and hypermarkets have exhibited a consistent growth, replacing the traditional wet markets. Their share of all retail sales reached 50% in 2014, while wet markets are still popular for retail outlets of fresh food products including imported fresh fruits.

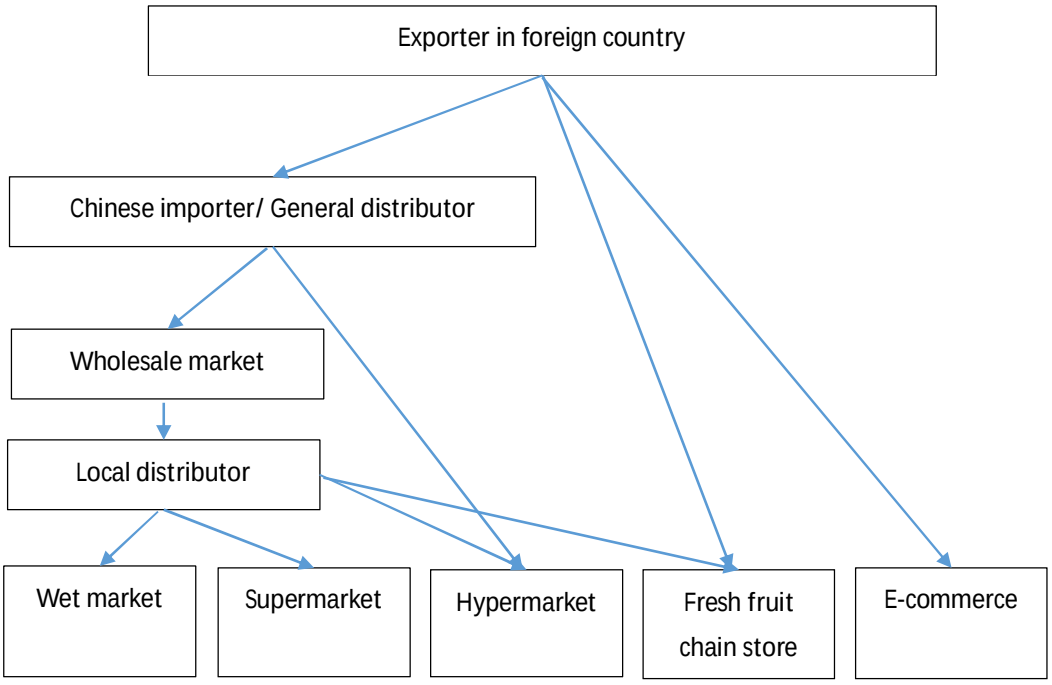
The other is the rise of new business models comprising specialist fresh fruit chain stores and E-commerce. Fresh fruit chain stores are the business model that specializes in retail sales of fresh fruits. Its outlets are convenience-store type small ones but specialize in fresh fruits. The pioneer in this category is Shenzhen-based Padoga established in 2002. The number of Pagoda's outlets is 3,700 stores in 70 cities across China as of 2019 and its annual sales in 2018 was reportedly above CNY 10 billion (USD 1.4 billion).[22] Another type of new business is E-commerce, on-line shopping platforms. Fresh fruit e-commerce often involves cross-border B2C (business to consumer) transactions, where customers are importers of fruits wherein preferential VAT rates are applied for their small-scale imports. Large e-commerce platforms merged fresh fruit e-commerce companies. Alibaba group invested in Yiguo.com, and JD.com in FruitDay. Finally, another business model is a hybrid of e-commerce and conventional retailing, so-called O2O ("online-to-offline"), where

[22] Yu (2019).

customers order fruits online and pick up products at the physical shops of the operators. This model includes Suning Commerce Group which was also merged by Alibaba Group. These new businesses serve the high-end fruit markets with affluent urban dwellers in large cities.

Figure 12 depicts China's imported fruit distribution flows, which contrast the traditional distribution model with the emerging model for the new businesses. The traditional distribution model channels fruits mostly for wet markets and supermarkets in regional cities. The traditional distribution model comprises numerous tiers of intermediaries and distributors. The margins of these intermediaries would suppress the profits of exporters. The distribution model for the new businesses has evolved to eliminate third-party agents and distributors, moving to the direct distribution model where retailers deal directly with exporters in foreign countries. Rather, it is getting the norm that Chinese retailers or their related companies invest in fruit producing countries such as Thailand to procure fruits to supply their on-line or off-line outlets. Such investment facilitates their logistic management that ensures quick delivery of perishable fruits. The shorter distribution model enhances traceability of produce, which is more compatible with food safety.

Figure 12 China's imported fruit distribution flows



Source: Modified from Figure 5 in p. 14 of Produce Marketing Association (2016)

While imported fruits shall be subject to China's stringent regulations, the implementation of SPS measures are not always consistent, depending on entry ports. The land port connecting Hong Kong and Shenzhen has been "grey channels" for foreign fruits to access the Chinese market; complex regulations leave rooms for local government and customs officials to make their interpretation (Collins and Sun 2010). Compliance to SPS requirements such as the quarantine measures before shipment often impairs the commodity value of fruits. Circumventing the regulations allow traders to make profits. Grey channels are also utilized for imports of the fruits that are not on ASISQ's positive list of fruits permissible for imports to China, by repackaging fruits and manipulating the labels of the country of origin. As such, grey channels have been more compatible with the traditional distribution model of fruits where fruit traceability are not valued much.

Grey channels with discretionary application of SPS measures have been also observed at the Muse-Ruili border checkpoint. Being not on AQSIQ'S positive list, avocado and pineapple had been tolerated for imports in this border checkpoint until it was banned in 2019. Similarly, Myanmar melons have been accepted without the phytosanitary certificate. As Chinese authorities strengthen inspection and quarantine, however, the risk is looming that Myanmar's fruit exporters need to strictly adhere to the SPS regulations.

While further studies are required on how Myanmar melons are channeled in the Chinese markets, the absence of the phytosanitary certificate or the country of origin certificate implies that Myanmar melons go through grey channels. The use of grey channels might inhibit Myanmar melons from accessing the affluent emerging markets of the Chinese new businesses that put value on compliance to regulations as well as traceability of food products.

Role of Investment to Move into New Value Chains

The market segment that Myanmar melons are going to target is the new retail businesses such as specialty fresh fruit chain stores and e-commerce that have affluent customers in the large cities. To penetrate into that market segment, it is indispensable to invite affiliate companies of the new retail businesses in Myanmar. In Thailand, affiliate companies of such new businesses actively invest to ease fruit procurement. Such investment often employs contract farming and injects liquidity to producers, which accelerates growth in production. While foreign investment in the marketing of unprocessed agricultural produce carries off the margins that local middlemen have been appropriating, more foreign investment will bring in competition among them, which will suppress their margins and eventually benefit producers. Moreover, the investment of Chinese new

businesses do not necessarily mean the decay of the existing trade in Muse given the persistent wet markets for fresh food products across China.

How to Get There

This section presents the framework for the implementation of the strategies encapsulated in the vision for the melon sector: *Develop the export-oriented intensive horticulture harmonizing high value creation and environmental sustainability towards rural livelihood improvement*. The framework is illustrated by four modules recounted as strategic objectives. In the next section, the strategy is decomposed into a detailed plan of action to be taken by the stakeholders.

Strategic Objectives

Achievement of the sector vision is to be pursued through execution of four strategic objectives. These strategic objectives present the guideline for the development of the melon sector.

The first strategic objective aims to bolster intensive horticulture through coordination of business service providers. This strategic objective is to be achieved by:

- Farmers' collective purchases of quality agricultural inputs—seeds, fertilizers, and pesticides—combined with group lending to farmer groups
- Abolition of a 2% advance payment of corporate income tax levied on melon exports
- Establishing a monitoring system with information technology to nurture a competitive freight service sector

The second strategic objective is to build a mechanism to promote sustainable use of farmland. This strategic objective is to be performed by:

- Scientific research to establish best practice in uses of agro-chemicals in melon cultivation
- Raising awareness among farmers of alternative pest management less dependent on non-degradable plastic sheets by means of, not restricted to, provision of training of trainers (ToT) programs on pre-harvest and post-harvest technologies
- Raising the capacities of DOA to provide GAP training to their extension staff by increase in budget allocation
- Promotion of domestic consumers' recognition about food safety and GAP

The third strategic objective aims to diversify trade channels with China by regularizing trade relationship. This objective will be sought by:

- Strengthening the capacities of quarantine management and administration of SPS measures through provision of lab facilities and manpower to the Plant Protection Division of DOA
- Trade negotiation with Chinese competent authorities for regularization of the melon export:

removal of China's restriction which limits the entry point of Myanmar melon to Ruili

- Building the capacities of MyanTrade and MFVP to collect, analyze and disseminate market information
- Having trade-related departments and organizations collect information about China's trade policy and practice
- Commissioning a market research of China's fresh fruit market
- Deploying commercial attaches to collect trade information in China
- Promotion of Myanmar GAP among buyers in mainland China who differentiate quality produce and pay premiums

The fourth strategic objective aims to let Myanmar farmers pair with responsible foreign investment endowed with technologies and capital. This objective will be sought by:

- Amendment of regulations pertinent to foreign investment in exports of agricultural produce
- Lobbying for introduction of controls on unofficial investment in production and marketing of melons
- Streamlining financial flows between Myanmar and China by approving Myanmar commercial banks to accept CNY-denominated deposits of Myanmar firms and individuals
- Compilation and analysis of melon production and export data on a regular basis
- Supporting participation of MFVP and potential exporters in trade fairs in China
- Development of contract farming through partnership opportunities at trade fairs in China

Importance of Coordinating Actors

The main actors of the melon NES are melon growers, which makes a stark contrast with the NES of other sectors. Melon growers here include new entrants who will start melon cultivation in the next five years, in addition to the existing growers. For the previous NES for fisheries and garment, processing factories and exporters were the primary actors around whom the plans of action were structured. In the NES of rice as well as pulses and beans, again, wholesalers, millers and exporters are the targets where the NES worked on. Compared with these processing firms and exporters, melon farmers are fragmented in terms of their geographic locations and are diverse in terms of their entrepreneurial capabilities. Besides, interests of melon export value chain actors are not always unanimous. As such, MFVP need to perform indispensable roles to form a consensus among farmers, to represent their interests, and to interface them with governmental organizations and external actors such as buyers in mainland China.

The deficiencies in financial and human resources are also a challenge that MFVP confronts. MFVP

would benefit from inviting entrepreneurial exporters of melons to its board members in order to bolster its capabilities for the implementation of PoA in the NES. Their first-hand experiences in exports ensure MFVP to successfully implement the NES strategic objectives. Hiring permanent secretarial staff for the melon sector at MFVP would underpin effective monitoring and evaluation of the NES.

The PoA activities of governmental body are broadly concerned with (1) improvement of business environment and (2) market information services. Improvement of business environment includes updating regulations to conform to the needs of stakeholders in the value chain. This includes reconsideration of the tax system and the regulations of foreign investment. Regarding market information services, due to its public goods nature, it is in undersupply. It is reasonable for MOC to allocate its limited resources for marketing information services and promotion of foreign investment in fruit marketing.

Plan of Action

The following action plan illustrates the activities to be taken by the various stakeholders for achievement of the sector vision. The activities are clustered according to four strategic objectives. This table serves as the guideline for implementation of the melon NES over the next five years.

Sr	Operational Objective	Activities	Beneficiaries	Targets	Leading Implementing Partner	Supporting Implementing Partner
	1. To bolster intensive melon production through coordination of business service providers					
1	Coordination of business service providers	(1.1)Farmers' collective purchase of quality agricultural inputs (seeds, fertilizers, and pesticides) combined with group lending to farmer group	Melon Producers	Establishing the support mechanism	•Muse brokers •Commercial Banks •Myanma Agricultural Development Bank	• Commercial Banks • Myanma Agricultural Development Bank • Agricultural supply companies (seeds, fertilizers and pesticides)
		(1.2) Abolition of a 2% advance corporate income tax levied on melon exports	Melon Producers Melon Exporters	Streamlining corporate income tax collection	• Internal Revenue Department	• Ministry of Planning and Finance
		(1.3) Establishing a monitoring system with information technology to collect complaints of freight service providers	Melon Producers Melon Exporters	Knowledge sharing of information concerning freight services	• Ministry of Transport and Communication • Consumer Affair Department, MOC • Myanmar Fruit, Flower and Vegetable Producer and Exporter Association • Myanmar Melon Producer and Exporter Association	• Association of High-way Transportation Business Owners

2. To establish a mechanism for sustainable use of farmland						
2	Environmentally sustainable agriculture	(2.1) Conducting research relating to the best practice of chemical input utilization in melon production that reduces impacts on environment	Melon Producers Land Lessors	Environmental Sustainability	• Department of Agriculture • Department of Agricultural Research • Myanmar Melon Producer and Exporter Association	Local and International Development Partners (donors)
		(2.2) Agricultural extension services about uses of melon cultivation bed cover plastic sheets	Melon Producers Land Lessors	Promotion of good agricultural practices	• Department of Agriculture • Myanmar Melon Producer and Exporter Association	Local and International Development Partners (donors)
		(2.3) Launching environmental monitoring mobile teams to inspect the sustainable use of farm land	Melon Producers Land Lessors	Regular monitoring of farmland use	• Department of Agricultural Land Management and Statistics • Department of Agriculture	Local and International Development Partners (donors)
		(2.4) Imposing environmental sustainability clauses in land rental contract as a requirement	Land Lessors	Protection of land lessors right	• General Administration Department, Ministry of Home Affairs • Village Tract Land Use Committees • Department of Agricultural Land Management and Statistics	• Regional and State Governments
		(2.5) Providing ToT training programs for	Melon Producers	Promotion of good	• Department of Agriculture	Local and International

		agricultural extension services relating to pre-harvest and post-harvest activities in GAP practices	Melon Exporters	agricultural practices in pre-harvest and post-harvest activities	• Myanmar Fruit, Flower and Vegetable Producer and Exporter Association • Myanmar Melon Producer and Exporter Association	Development Partners (donors)
		(2.6) Producing and marketing of GAP products that are safe for consumers	Entire Value Chain	Public awareness campaign of food safety	• Department of Agriculture • Myanmar Fruit, Flower and Vegetable Producer and Exporter Association • Myanmar Melon Producer and Exporter Association	• Department of Agriculture • Ministry of Commerce

	3. To diversify trade channels with China by regularizing trade relationship					
3	Trade channel diversification and regularization	(3.1) Enhancing the capacities of laboratories and technical staff at Plant Protection Division for sanitary and phytosanitary measures	Melon Producers Melon Exporters	Prompt issuance of SPS documents for exports	• Plant Protection Division of Department of Agriculture	Local and International Development Partners (donors)
		(3.2) Collecting, analyzing and disseminating market information	Entire Value Chain	Establishment of market information system	• Myanmar Fruit, Flower and Vegetable Producer and Exporter Association • Myanmar Melon Producer and Exporter Association	• MyanTrade • Ministry of Commerce
		(3.3) Study on market, trade policies and trade technologies of China by the trade related organizations and departments	Entire Value Chain	Establishment of market information system	• MyanTrade • Department of Trade • Ministry of Commerce • Muse Commodity Centre	• Myanmar Fruit, Flower and Vegetable Producer and Exporter Association • Myanmar Melon Producer and Exporter Association
		(3.4) Searching and linking with Chinese buyers who give price premiums for the quality products and Myanmar GAP products	Entire Value Chain	Establishment of market information system	• MyanTrade • Department of Trade • Ministry of Commerce Muse Commodity Centre	• UMFCCI • Myanmar Fruit, Flower and Vegetable Producer and Exporter Association • Myanmar Melon Producer and Exporter Association

	4. To promote foreign investment endowed with technologies and capital					
4.	Promotion of responsible foreign investment	(4.1.1) Elaboration of regulations pertinent to foreign investment in trading of unprocessed agricultural products	Entire Value Chain	Promotion of foreign investment	• Ministry of Commerce	• DICA
		(4.1.2) Discussing and finding ways to improve investments more in melon production and marketing (Discussing and finding ways to get local and foreign investments in order to create melon seed production business)	Entire Value Chain	Improvement of local and foreign investments in exports	• Ministry of Commerce • Department of Agriculture • Department of Agricultural Land Management and Statistics • Myanmar Melon Producer and Exporter Association	• DICA • Myanmar Fruit, Flower and Vegetable Producer and Exporter Association • Respective Departments under the Regional and State Governments
		(4.1.3) Regularizing financial flows by approving Myanmar banks to accept CNY-denominated deposits from Myanmar firms and individuals	Entire Value Chain	Normalizing financial flows between Myanmar and China	• Central Bank of Myanmar	• Myanma Economic Bank • Private banks
	Data collection and data management	(4.2.1) Collecting, compiling and analyzing the melon production and export data on regular basis	Entire Value Chain	Timely dissemination of market information	• CSO • Department of Consumer Affairs • MyanTrade • Department of Agriculture • Myanmar Melon Producer and Exporter Association • Customs Department	• Ministry of Commerce • Myanmar Fruit, Flower and Vegetable Producer and Exporter Association
	Matching producers	(4.3.1) Subsidization scheme for producers and	Melon Producers	Creation of cost	• Myanmar Fruit, Flower and	• MyanTrade

	with buyers	exporters to participate in exhibition in China	Melon Exporters	sharing scheme	Vegetable Producer and Exporter Association • Myanmar Melon Producer and Exporter Association	• Department of Agriculture • Department of Consumer Affairs
		(4.3.2) Promotion of "Contract Marketing System/ Contract Agreement" between producers and Chinese importers	Melon Producers Melon Exporters	Creation of Contract Marketing System/ Contract Agreement	• Myanmar Fruit, Flower and Vegetable Producer and Exporter Association • Myanmar Melon Producer • and Exporter Association	• MyanTrade • Ministry of Commerce

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