

## **AN OVERVIEW OF FRUIT SUPPLY CHAIN IN MALAYSIA**

Nor Azlina Zakaria Abdul Rahman Abdul Rahim

Faculty of Mechanical Engineering,  
Universiti Teknologi Malaysia, 81310 UTM Skudai,  
Johor DT, Malaysia

### **ABSTRACT**

*This paper presents an overview of fruit supply chain in Malaysia. This study attempts to provide a clear view of fruits supply chain in Malaysia with reference from previous studies conducted in other countries. Roles of different actors in the functioning of the fruit supply chains are presented. The paper adopts a case study approach, with data collected through interviews and observations. The findings identify the fruit supply chain is similar between independent farmers as well as contract farmers as a producer with main actors along the supply chain consist of the producers/farmers, collectors/wholesalers as intermediaries, retailers and consumers/customers. Any differences between those are mainly in the level of concentration among participants at each stage in the chain. Value of this paper arises from providing a detailed analysis of a fruit supply chain in the developing world whereas there have been only a small number of studies published in the literature.*

**Keywords:** *Supply chain; fruit supply chain; fruit industry*

### **1.0 INTRODUCTION**

An agricultural supply chain encompasses all the input supply, production, post-harvest, storage, processing, marketing and distribution, food service and consumption functions, including the external enabling environment. Agriculture remains an important sector of Malaysia's economy, contributing 10.5% to the national Gross Domestic Product (GDP) and providing employment for 13% of the population in 2011. Fruit industry is one of the important sources in agriculture with estimated market potential for RM 5,243.40 Mil (FAMA, 2011). With low commodity price and the desire to broaden the agricultural base, fruit is identified as one of the rising stars in the agricultural sector. For Malaysia's fruits industry, there is still lack of clear view on the supply chain management although the production already started since 30 years back, hence it is coordinating, supervising and monitoring under government's Ministry of Agriculture and Agro-Based Industry (MOA). Determination of every entity in the supply chain is very important to identify the strengths and weaknesses in order to improve and ensure sufficient capacity supply of fruits are achieved. This study provides the model of fruit supply chain in Malaysia with a case study in Federal Agricultural Marketing Authority (FAMA). FAMA was a marketing agency, which established under Ministry of Agriculture and Agro-Based Industry that plays a major role to monitor, coordinate, control and develop product marketing of Malaysian's Agriculture, including import and export.

### **2.0 LITERATURE REVIEWS**

The supply chain is seen to play a positive role in the growth of business performance because many literature reviews have proved that supply chain principles can improve the competitive position (Premkumar, Suhaiza and Mohamed, 2009). Tan *et al.*, (1998) defines a supply chain as a network of business units and facilities that produce raw materials, transform them into intermediate goods and final products, and deliver these products to

customers through a distribution system. On average, fruits have been contributing to about 4% to human nutrition (ESPAC, 2007). Consumption of fruits and vegetables both the usual one and that in the workplace, is higher in women, older individuals and those with higher level of education (Danial *et al.*, 2010).

There are number of studies did by researcher in fruits supply chain in developed country, however less conducted in developing country. M. Lemanowicz *et al* (2009) presents an overview of the fruits supply chains in Poland, Spain, Greece and Netherlands. The participants involved along the chain consist of nurseries who produced the fruit trees, fruit producers or growers who will then grow the trees, intermediaries, wholesalers, retailers and lastly consumers. Nurseries did not involve in Malaysia's fruit supply chain the fruit trees were planted by the farmers themselves. Most of the farmers received subsidy of seeds and fertilizers from the government, as well as the advice support from Department of Agriculture (DOA) since they started the crops until harvesting activities. However, quality and productivity of fruits harvested determined and controlled by the farmers. In Italy, Maurizio *et al.*, (2010) divided the fruit supply chain into three chain drivers. They are producer driven, large retailer driven and Ho.Re.Ca (hotel, restaurant and catering) driven. The characteristic is similar to supply chain in Malaysia, where it mentioned the traditional retailer depends on the wholesaler for fruit supply while large retailers received the supply from co-operative. Larger retailers need more secure and consistent supply, and contract farming scheme is one of the solution to guarantee the market supply.

In Taiwan, Pei-Chun Lin and Liang-Shan Wu, (2009) focused on evaluating the criteria used to select suppliers of fresh fruits in the supermarket retail chains in Taiwan via direct purchasing. Fresh fruits and vegetables retailers in Taiwan mainly consist of supermarkets (including hypermarkets) and traditional retail markets (including street vendors). This situation is also similar in Malaysia where these two retailers hold the major percentage of fruit marketing segment. There are two or more intermediaries between farmers and end consumers. Farmers require a middleman in the distribution channel because their production volume is insufficiently large enough per single farmer. Furthermore, the distance to downtown customers is too lengthy without a suitable transportation mode and marketing networking. Wholesalers mediate the interaction between farmers and customers buy buying in bulk and selling in smaller lots for distribution to downstream customers. This relevant information provides a guideline to this study and focus on the concentration of each level in the supply chain.

### **3.0 MALAYSIA FRUIT INDUSTRY**

Agriculture sector in Malaysia is governed by Ministry of Agriculture and Agro-Based Industry (MOA). For fruits sector, there are four organizations involved directly with farming and marketing. There are DOA, FAMA, LPP and MPIB. First stage started before the farmers wanted to crop any fruit, they called it as 'Agronomy'. FAMA would advice them about the current statistic, suitable commodity and suitable time to do the crop in order to fulfill current demand. DOA plays the role to advice on type of land, seeds and fertilizers appropriate to be used. 'Lembaga Pertubuhan Peladang' (LPP) or Board of Farmer's Organization will register these farmers under regulatory body and responsible in giving engineering assistance such as tractors and irrigation system. For research development, Malaysian Agriculture Research and Development Institute (MARDI) provided consultancy and technical services to the farmers, such as disease control and how to optimize the harvesting output. MPIB or Malaysian Pineapple Industry Board is one of the bodies under MOA to coordinate activities and process research related to pineapple as it is the highest type of fruit produced in Malaysia. Aside from those organizations mentioned above, we have one financial institution namely AGROBANK specially in giving credit assistance to the farmers for agricultures cultivation. The second part during the fruit's cultivation, DOA, FAMA, MARDI as well as MPIB for pineapple will have a scheduled visit to ensure the successful of cultivation. Finally, FAMA would purchase the fruits upon requested after fruits harvested.

Malaysia produces a wide variety of tropical fruits such as pineapples, durians, watermelons, starfruits, bananas, papayas and mangoes. Malaysian tropical climate is very favorable for the production of various exotic fruits, especially since Peninsular Malaysia seldom experiences hurricanes or droughts and increase the capability to boost tropical fruit exports. Malaysian fruit industry is important socio-economically, as it is estimated that not less than 135,000 small holders are involved in fruit cultivation in Peninsular Malaysia, ranging from one to two hectares each in size (MOA, 2010).

Fruit crops use around 375,000 hectares (5.4%) of land in Malaysia (DOA, 2008). Malaysia imported about RM 193.80 Mil worth of fruits in 2011 while its export amounts to RM 269.07 Mil. Malaysian tropical fruits are mainly exported to markets in Singapore, Thailand, Hong Kong and Indonesia while mainly imported from China, USA, South Africa and Thailand. Per capita consumption of tropical fruits in Malaysia was 44.88 kg in 2011 (FAMA, 2011). There are 18 commodities of tropical fruits which been advised by FAMA to be grown by the growers based on the demand and marketing potential requirements. Table 1 shows the supply and demand, slack/surplus and per capita consumption for each of the fruit commodity for the year 2011.

Table 1: Tropical fruit’s consumption in Malaysia for 2011

Fruits Commodity	Supply (SS)		Demand (DD)		Slack/Surplus (SS-DD)		Per capita (kg/person / year)
	(RM Mil)	(MT)	(RM Mil)	(MT)	(RM Mil)	(MT)	
Pineapple	412.25	434,015	964.03	544,349	(551.77)	(110,334)	1.37
Watermelon	202.16	250,252	469.58	287,438	(267.41)	(37,186)	4.93
Starfruit	23.01	12,438	275.01	64,622	(252.00)	(52,184)	0.26
Papaya	41.98	52,458	166.28	96,251	(124.30)	(43,793)	1.35
Guava	29.84	21,103	383.60	140,888	(353.76)	(119,785)	1.09
Mango	143.75	57,269	725.64	132,146	(581.89)	(74,877)	2.95
Durian	667.76	307,779	1,176.71	235,466	(508.96)	72,313	4.92
Rambutan	66.69	88,229	326.25	97,270	(259.56)	(9,041)	2.17
Ciku	13.13	6,562	16.32	3,433	(3.19)	3,128	0.08
Langsat	41.59	25,694	180.95	48,544	(139.36)	(22,850)	0.40
Mangosteen	55.75	33,543	49.80	14,377	5.95	19,165	0.28
Cempedak	45.73	58,886	11.65	2,287	34.08	56,599	0.47
Jackfruit	97.10	28,535	3.17	3,419	93.93	25,116	0.10
Banana	353.15	306,923	520.07	217,581	(166.92)	89,342	7.06
Grapefruit	22.92	12,118	56.54	19,231	(33.62)	(7,113)	0.13
Citrus	149.93	107,626	451.75	117,500	(301.82)	(9,874)	1.75
Dragonfruit	52.54	11,722	71.49	10,633	(18.95)	1,088	0.24
Coconut	1,315.18	627,104	2,935.22	794,178	(1,620.05)	(167,073)	15.33

(Source: FAMA’s marketing main statistic, 2011).

From the table above, we can see that most of the fruits’ commodity undergone slack or shortage supply. This scenario could be the reason of low fruit consumption among Malaysian and reduce the opportunity to penetrate the export’s market, in order to fulfill insufficient domestic demand. Thus, a clear view of fruit supply chain structure should first be analyzed to identify where this problem possible arise.

#### 4.0 STRUCTURE OF FRUIT SUPPLY CHAIN

This chapter presents the structure of fruit supply chain in Johor state. Located in south of peninsular Malaysia, Johor own the highest production and biggest planted area in Malaysia. Data collected from the interviews and statistic reports on fruit market’s development in Malaysia. Semi structured interviews is conducted with respective personnel from Department of Agriculture (DOA) Johor, Federal Agricultural Marketing Agency (FAMA) Johor and Malaysian Pineapple Industry Board (MPIB). The purpose for the interviews is to collect relevant information and what is the role concentrated from different actors along the fruit supply chain, and generally it is similar in other states also. Figure 1 shows the supply chain structure in Johor, starting from the farmers until the end customers. There are many types of intermediaries involved and detail explanation on each participant will be given afterwards.

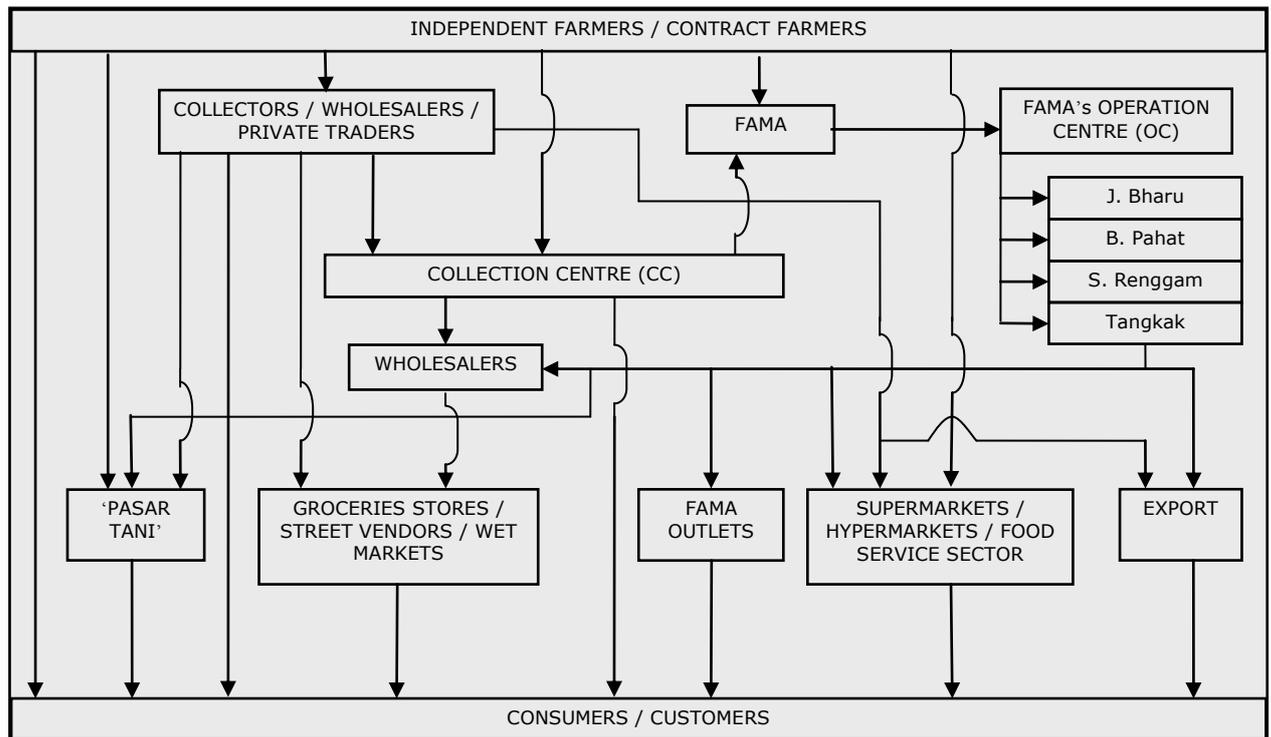


Figure 1: Fruit supply chain in Johor.

From the figure shown above, there are several levels involved in fruit supply chain from ‘farm to fork’. It is better to separate the explanation on each type of the actor, based on the functional roles and also quantitative statistics related.

#### 4.1 Farmers / Producers

In this chain, fruits were cropped and harvested from the farmers, where they act as a producer. Farmers in Malaysia divided by two types, whom called independent farmers as well as contract farmers. Independent farmers did not make any contract agreement with other parties to purchase fruits once harvested. They fully own the cropped land and free to sell their products to any buyers. In 2010, there are around 375,000 hectares of land use for fruit crops purposes (MOA, 2011). Size of the farms owned is various. From 208 samples taken by Fatimah (2010), Table 2 shows the farm area owned by independent farmers and contract farmers with FAMA.

Table 2: Farm area own by independent and FAMA’s contract farmers.

Farm Area (Acre)	Independent Farmers (%)	Contract Farmers (%)
<1.00	11.4	2.4
1.01 – 5.00	50.9	41.5
5.01 – 10.00	20.4	9.8
10.01 - 25.00	8.4	26.8
25.01 – 40.00	5.4	26.8
> 40.01	3.6	7.3

(Source: Fatimah Arshad, 2010)

From the table, we can see that independent farmers averagely own smaller area compared to the contract farmers. For small farmers, normally they don’t possess their own transport for fruits delivery to buyers and customers as their production volume insufficiently large enough. They also have small resources margin for labor, transportation and equipments. Distance to downtown customers too lengthy thus they practically have no direct relations with buyers. Due to that, they normally depend on the collectors or wholesalers for marketing purpose.

Contract farmers averagely own bigger area. Their production volume is higher and fruits sold to other parties, such as FAMA, cooperatives or fruits processing companies upon contract agreement which have been made. According to FAO (2001), contract farming defined as “an agreement between farmers and marketing firm / processors for production supply of agriculture produce in the future, normally with the pre-determined price level”. Farmers signed the contract to have guarantee market on fruits production and company has their own source of supply. Contract farming reflects to give benefits to buyers and sellers especially in this type of very high uncertainty product. Normally, private contract owner would make an agreement to collect and purchased 100% fruits harvested by the farmers with pre- agreed price. In a case of FAMA’s contract farming, farmers would agree according to the percentage of total fruits harvested, and farmers are freely to sell the balance to other parties. Most of the value added activities as grading, packaging and labeling is done at the farm area as they want to reduce the unnecessary waste in urban area. Some of the farmers accredited with Good Agriculture Practice (GAP) certificate especially to penetrate hypermarkets and export market.

**4.2 Collectors / Wholesalers / Private Traders**

There are several numbers of intermediaries involve along the chain. Collectors involve when the farmers could not manage to transport fruits by themselves. Some of them would collect different type of fruits from several farmers before selling to the customers. FAMA had introduced a program under the name ‘3 wheels motorcycle’ and ‘agro caravan’ where it is subsidized to small entrepreneur to collect fruits from several small farmers to be brought into ‘Pasar Tani’ and collection center, some might able to directly sell to the end consumers. With this, small farmers gain benefits to increase their profit as well as the collectors. Meanwhile, wholesalers would purchase fruits for bigger amount compared to the collectors. Bigger transportation mode such as lorry is used. Private traders are the one who purchase fruits from their contract farmers to be supplied in processing companies or markets. Collections and deliveries from these actors made mostly in daily basis depending on the fruits availability.

### 4.3 FAMA

FAMA also play a role in second level of the chain as a direct buyer regardless independent or contract farmers. For independent farmers, FAMA would collect the fruits at farm upon requested, while contract farmers will have a proper harvesting schedule as a guideline. Table 3 shows the purchasing type offered by FAMA to the farmers.

Table 3: Type of fruits purchasing offered by FAMA.

No.	Type of purchasing by FAMA	Type of farmers	Description
1	Direct purchasing	Non-contract (independent) and contract farmers	FAMA would buy and collect the fruits at the farm or collection centers upon request from the farmers.
2	Purchasing contract according to percentage	Contract farmers	50% from the harvested fruits purchased by FAMA and the rest up to the farmers
3	Purchasing contract according to seasonal lease	Contract farmers	- Advances given by FAMA maximum 20% of production value - Advances calculated as a debt and will be deducted from the sales proceed with FAMA

(Source: FAMA, 2012)

Although act as government's incorporated, FAMA able to offer with good price, as they have various marketing outlets established. Transportation arrangement is all done by FAMA and operated in their operation center as explained below.

### 4.4 FAMA's Operation Center (OC)

FAMA's Operation Centre (OC) available in each state in Malaysia. There are 51 operation centers available in Malaysia. In Johor, there are four centers located in four main district; Johor Bharu, Batu Pahat, Simpang Renggam and Tangkak. These OC act as a hub for transportation for collecting and delivery purposes according to nearest supply and demand required. They are also called as Distribution Center (DC). Post-harvest handling equipments are also available in cold room storage such as chillers and freezers to reduce damage of fruits harvested, if any inventories of fresh fruits required before distribution. Communications and information sharing for supply and demand operated still in manual mode, mostly done via telephone except for the hypermarket supply which done via delivery order. As an authority body involved in fruits marketing, we can say FAMA is a major intermediaries in this supply chain. Some operation center also took supply from other OC depending on the fruits availability and demands required.

### 4.5 Collection Centre (CC)

Collection centre (CC) is a venue where functions as a daily temporary depositary and a meeting place between buyers-sellers to facilitate and set the sales and purchase price. Collection centre is built and supported by FAMA near to the farms area with aims to provide ways to reduce post-harvest damage. Building completed with roof top and cements floor to provide more appropriate place for fruits piled. It is built with an open building for temporary type and closed building for permanent type.

Farmers, collectors, wholesalers and private traders could bring their fresh fruits in bulk quantity and sell them to the buyers with agreed price, lower from the market price. Instead in farm area, the value added activity sometimes being done in CC area such as grading and packaging. In 2010, there are 16 collection centers available in Johor and 122 total centers available all around Malaysia (FAMA, 2011). As these venues operated in daily basis, farmers could perform daily harvest as well. Rather than the fruits being piled up at the farm area without proper handling, it considered as better place and could increase the profit for sellers. FAMA also would sometimes purchase and collect the fruits from collection center.

#### **4.6 Wholesalers**

At this level, wholesalers involve once again in the fruit supply chain. Wholesalers prefer to purchase at collection center due to various choice of fruits. Some of them able to directly sell the fruits to the customers as they own the retail shops or hawkers stall. Some of them would also purchased from FAMA as a second source.

#### **4.7 'Pasar Tani'**

'Pasar Tani' is well-known morning market in Malaysia supported by FAMA and DOA as one of the market retailers. It has been introduced since 1985 and normally operated at morning, on weekly basis for each location. It can reach up to 100 stalls in each location selling varieties of fruits, vegetables and other agriculture products from the farmers. Farmers would either bring the fruits by themselves to 'Pasar Tani' if they possessed their own transport, or otherwise handled by collectors or wholesalers. FAMA itself sometimes would supply the fruits to the entrepreneurs to increase their product varieties.

There are 52 locations of 'Pasar Tani' in Johor, with 1,865 entrepreneurs involved. Recorded the market value worth for RM 32 Million in 2010 (MOA, 2010). FAMA provide the infrastructure and easy payment scheme for the facilities available at markets such as canopies, tables, baskets etc. This is one of the very successful programs from MOA for agriculture farmers in Malaysia. Customers prefer to purchase in 'Pasar Tani' as it offered lower price and various choices of fruits compared to other modern retailers such as supermarkets and hypermarkets.

#### **4.8 Groceries stores / Street vendors / Wet markets**

Groceries stores, street vendors and wet markets act as traditional retailers in fruit supply chain. They receive the supply mostly from the wholesalers and some of them are the owner of the premise. Delivery in large quantities is required to reduce the operation cost. Daily deliveries give an advantage to the retailers, as freshness of the fruits could be kept longer. However, there is no electronic purchasing system used between the suppliers and buyers. All the transaction is done manually. The demand is not fixed and depends on the availability of fruits. Added value such as grading and packaging are not as critical as in the hypermarkets and the price is lower compared to modern retailers.

#### **4.9 FAMA Outlets**

FAMA outlets consist of fresh fruit open kiosk, stalls, market and groceries stores which subsidized and licensed under FAMA authorization. It has been introduced in 2006. Name given such as 'Gerai Buah-Buahan Segar GBBS', 'AgroBazaar', 'Kedai Rakyat 1 Malaysia KRIM' and 'K-shop'. These outlets supported by FAMA financially, advisory and infrastructure. The main purpose for these outlets is to overcome the fruit surplus issue with expand marketing channel while giving opportunity to small entrepreneurs. Otherwise, farmers would normally force with low price offered by the buyers, as they need to sell the fruits before out of shelf life. They received supply mostly from FAMA's operation centre for each region. Reported by MOA (2010), profits value from seven 'KRIM' outlets are RM1.1

Million, from 14 ‘AgroBazaar’ outlets are RM 5.83 Million and 26 ‘GBBS’ outlets in Johor are RM 453,000 for the year 2010.

#### **4.10 Supermarkets / Hypermarkets / Food service sector**

Supermarkets, hypermarkets and food service sector received the supply from wholesalers or directly from FAMA’s operation centre (OC). Some food service sector owns their contract farmers, to ensure more consistent and sufficient supply for production. Main product categories are juices and fruit ingredients for the food industry such as jams, ice cream and dried fruits. Some of the processing techniques performed include preserving, juice extraction, slicing, freeze chill and vacuum fried. Most of the products sold in domestic market and some exported to other countries. Domestic markets distributed in FAMA outlets, supermarkets and hypermarkets.

Consistent supply required from supermarkets and hypermarkets for 12 months availability. They probably set high standards; low price but in high quality. Freshness is the most important criteria for product replenishment. For example, operation centre in Johor Bharu supply with weekly delivery of rockmelon to four branches of Jusco AEON in Johor Bharu. Consumers prefer to purchase the fruits from these retailers due to the convenient factors although higher price offered compared to traditional retailers. Table 4 shows number of fruit suppliers to some supermarkets and hypermarkets in Malaysia 2010.

Table 4: Fruits supplier to supermarkets and hypermarkets in Malaysia in 2010.

NO.	Supermarket / Hypermarket	Fruits Supplier			
		Farmers	Wholesalers	Operation Center	Others
1	Carrefour		✓		
2	Econsave Cash & Carry	✓			✓
3	Pantai Timur Hypermarket			✓	
4	The Store		✓		
5	Billion		✓	✓	
6	Pacific Departmental Store		✓		
7	Pasaraya B5		✓		
8	TF Value Mart		✓		
9	Pasaraya Aktif		✓		
10	JUSCO Stores			✓	
11	UDS Ocean		✓		
12	Giants		✓		
	<b>TOTAL</b>	<b>1</b>	<b>9</b>	<b>3</b>	<b>1</b>

(Source: Fatimah Arshad, 2010)

From the table shown, majority of the supermarkets and hypermarkets purchased their fruits from the wholesalers. Purchased the fruits from one entity instead of different number of farmers might reduce the transaction and operation cost. Upon this, it would be difficult for farmers to make direct marketing channel and delivery to the hypermarkets unless they were selected as contract farmers by the companies.

### 4.11 Export

Export value for fruits in Malaysia for 2011 was RM269.07 Million according to FAMA (2011). Fruits exported enjoy higher prices even though an additional 5% import tax is levied. Wholesalers, private traders and FAMA able to penetrate export market if they can supply in good quality required from other country. However, they are required to apply for exporting license to enable them for export-import activities. Branding with ‘Malaysia Best’ could also increase the export value. Graph 1 shows the net balance value from 1990-2011 and Table 5 shows the exported countries involved for fruits.

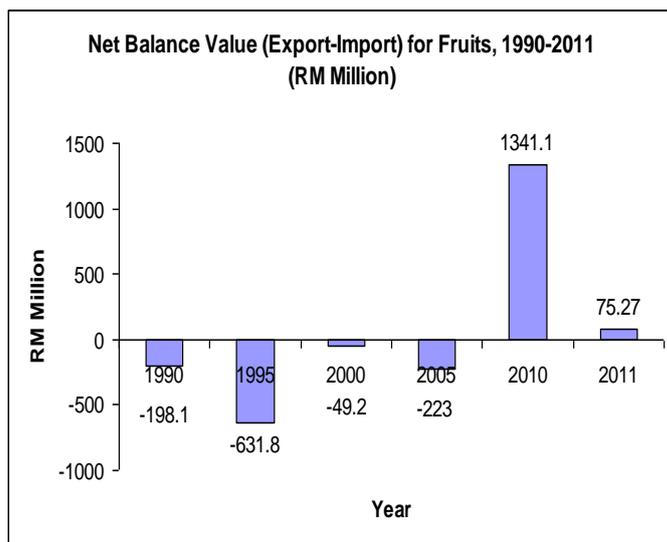


Table 5: List of exported countries for fresh fruits commodity.

Export Country	Fruit Commodities
China	Durian, Pineapple, Starfruit, Jackfruit
Australia	Pineapple (Josapine)
Japan	Mango (Harumanis), Papaya
USA	Starfruit, Papaya, Jackfruit, Rambutan, Durian

(Source: DOA, 2011)

Graph 1: Net Balance Value (Export-Import) Malaysia for fruits, 1990-2011.(Source: FAMA, 2011)

We can see from the graph, in a duration from 2005-2010, the net balance value is rapidly increasing compared to the previous years. This was due to the government’s policy under ministration of Dato’ Seri Abdullah Ahmad Badawi, our 5<sup>th</sup> Prime Minister who encourage an agriculture sector as major trading activities despite the industrial sector. We also expected closer value for five years ahead.

### 4.12 Consumers / End customers

Each actor in the fruits supply chain has access to sell the fruits directly to the consumers. The higher numbers of intermediaries involved, the less profit return to them. And the higher the price offered for fresh fruits. However, sometimes it is necessary to involve middlemen, as they have larger marketing channel and contact, while the farmers can solely focus on the farming. Statistics from the Food and Agriculture Organization (FAO) indicate that from 1980 to 2003, fruits consumption in Malaysia averagely 150 grams per capita per day. However, the combined fruits and vegetables consumption of 228 grams per day was far below the target for 400 grams, or five servings. This suggests that Malaysian is not consuming enough of fruits and vegetables compared to other staple foods such as meat and rice. Steven and Andrew (2011) stated that; higher education levels, age with 41 years old above with higher income, non-smokers and consumers in less cosmopolitan areas consumed more fruits.

## 5.0 CONCLUSION

The supply chain is seen to play a positive role in the growth of business performance because many literature reviews have proved that supply chain principles can improve the competitive position (Premkumar, Suhaiza and Mohamed, 2009). Up to now, limited studies try to look on supply chain agriculture sector in Malaysia. Many of the studies have occurred within the developed world, with only a very limited range of examples from the developing world available in the literature. This scenario seems to be lacking somewhere and there are improvements and awareness needed especially to categorize Malaysia as major exporter of fruits. In order to improve the efficiency and effectiveness of supply chain, network distribution must first be clearly defined before gaps and issues could be determined. Unless there is no shortage between demand and supply and based only on the same price per unit all over the world, this consideration might be ignored. Otherwise new system to optimize the supply chain integration is very much needed.

## REFERENCES

1. Daniel Henrique Bandoni, Kelly Cristina de Moura Bombem, Dirce Maria Lobo Marchioni and Patricia Constante Jaime, 2010. "The influence of the availability of fruits and vegetables in the workplace on the consumption of workers". *Nutrition and Food Science*, 40(1), 20-25.
2. Fatimah Mohamed Arshad , 2010. "Sikap petani buah-buahan dan sayur-sayuran segar kepada perladangan kontrak: Beberapa implikasi polisi". Food and Agriculture Policy Institute, UPM. Discussion on Contract farming, *Organised by Federal Agriculture Marketing Authority (FAMA)*, Shah Alam, Selangor.
3. Federal Agricultural Marketing Authority, 2011. "*FAMA marketing main statistic 2011, 5<sup>th</sup> Edition*". Ministry of Agriculture and Agro-based Industry.
4. Hj. Sahbani Saimin, Abd. Ghariff Ramin, Sebastian Chew, Mohd. Hafiz Mohd. Adnan, 2008. "Market price watch and FAMA's role in Malaysian agricultural marketing". *Asia and Pacific Commission on Agricultural Statistics*. APCAS/08/12, 22<sup>nd</sup> Edition.
5. Jose Blandon, 2006. "Supermarket supply chain for fresh fruits and vegetables: opportunities and challenges for small farmers". *A thesis presented to The Faculty of Graduate Studies*, University of Guelph.
6. Larry C.Y. Wong, 2007. "Development of Malaysia's agricultural sector: Agriculture as an engine of growth?". *Conference on the Malaysian Economy: Development and Challenges*, ISEAS Singapore.
7. M. Lemanowicz and A. Krukowski, 2009. "Comparisons of qualitative and quantitative issues in the fruit supply industries in the Netherlands, Poland, Greece and Spain". *Journal of Horticultural Science & Biotechnology*, ISAFRUIT Special Issue 13-17.
8. Pei-Chun Lin and Liang-Shan Wu, 2011. "How supermarket chains in Taiwan select suppliers of fresh fruit and vegetables via direct purchasing". *The Service Industries Journal*, 31(8), 1237-1255.
9. Premkumar Rajagopal, Suhaiza Zailani and Mohamed Sulaiman, 2009. "Assessing the effectiveness of supply chain partnering with scalable partnering as a moderator".

*International Journal of Physical Distribution & Logistic Management*,39(8), 649-668.

10. Steven T. Yen and Andrew K.G. Tan, 2011. "Fruit and vegetable consumption in Malaysia: a count system approach". *EAAE 2011 Congress*, Zurich, Switzerland.
11. Tan, G.W., Shaw and M.J., 1998. "Applying component technology to improve global supply chain network management." *International Conference on Information Systems*, December 13-16, 296-301.
12. United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), 2007. "Enhancing export competitiveness of Asian fruits". *Economic and Social Commission for Asia and the Pacific*, ESCAP/APCAEM, Beijing, China.