AN OVERVIEW OF THE SUPPLY CHAIN MANAGEMENT OF MALAYSIAN VEGETABLE AND FRUIT INDUSTRIES FOCUSSING ON THE CHANNEL OF DISTRIBUTION

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ABSTRACT

The paper delineates three fundamental characteristics of the local supply chain for vegetables and fruits in Malaysia where the marketing channels are still traditionally driven from the wholesalers' perspectives. Produce is procured from farmers by wholesalers and then channelled to the hypermarkets and retailers. Most of the produce attributes are lacking in terms of quality, packaging, Good Agriculture Practices (GAP), traceability and safety characteristics. Most producers do not grade or pack their products and most of the production and marketing practices in the current supply chain are still traditional practices with only minor adoption of modern marketing practices being applied. This study indicates that production contract is not being practised. However, transactions on marketing or supply contracts do exist in the supply chain system. However, only a small number of farmers are involved in marketing contracts. The current system still relies on the old system of procurement and supply practices. The current supply chain management lacks attributes, such as the issues of consumer packaging, branding, and the promotion of organic farming towards sustainable agriculture. Thus, the involvement of government agencies and private sectors is essential in the promotion of production contracts to farmers.

Keywords : Fresh fruit and vegetables, supply chain management, channel of distribution

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INTRODUCTION

Malaysia is a net importer for vegetables and the Malaysian horticultural industry is a contributing sector in the economy as it supplies fresh fruit and vegetables to the population. The trade performance of fresh fruits and vegetables (FFV) however has not improved much despite the various incentive programmes implemented by the Malaysian government through its Third National Agricultural Policy. The country imported about RM1.17 billion worth of vegetables in 2003. This figure is five times greater than the total value of exports which stood at RM0.2 billion. The vegetable production sector has responded to the market demand by initiating a planting acreage of between 33000 to 44000 hectares in the last decade. For the fruits industry in Malaysia, the production of some types of fruit meets the domestic consumption.

Before hypermarkets were established in the Malaysian agro-food marketing sector, the marketing of fruits and vegetables was carried out in a traditional and conventional way in terms of its organisation, structure and distribution. The marketing channel involved a number of market intermediaries which resulted in high marketing costs. The producers were 'isolated' from the 'market centres' due to the lack of information exchanges. Hence, the producers were not producing enough to fulfil the market demand. Consequently, farm produce suffered from problems of low quality and inconsistent supply. Poor market infrastructures also aggravated their problems.

At present, the food retail industry has been growing rapidly in parallel to changes in the developed economy. This development was brought by globalisation in particular to the free flow of capital between countries. This development however poses a challenge to the traditional distribution network. The new structure demands fast and efficient delivery of high and consistent quality of farm produce and consumer-centred marketing strategies.

Recently, there has been an emergence of modern retail stores in the fresh fruit and vegetable sectors, namely supermarkets and hypermarkets that are continuing to rise in numbers, especially in major urban cities. In order to protect the small retailers, the Malaysian government has recently introduced new guidelines on the opening of new hypermarkets in an attempt to slow down their rapid growth.

There is evidence to show that the Malaysian fruit and vegetable industry is affected by this change. The inability of local producers to meet the continuous demand of high quality fresh produce from these hypermarkets is an indicator that the production sector has not been able to keep up with the changes. The slow progress of the exports of these items in terms of demand for the tropical produce in the overseas market is another sign that the sector suffers from some structural setbacks. However, a majority of Malaysians are still purchasing their fresh produce from traditional stores which accounts for 28.7% of all sales in the similar product category despite all the changes that have taken place in the marketing of fresh produce.

A study conducted by Mad Nasir and Jinap (2005) indicates that there are differences

between the hypermarket marketing channel and the traditional marketing practice. Under the traditional system, the farmers' produce has to go through a number of intermediaries before it reaches the consumers. In the case of marketing through hypermarkets, farmers could either sell their produce direct to or through the processors who then sell it to the hypermarkets; hence shortening the distribution channel. Under the traditional system, on the other hand, the price is generally determined through 'personal negotiation' while the sale to the hypermarkets is normally formalised in the form of a contract; hence the price is set by the suppliers and the hypermarkets.

Supermarkets and hypermarkets are expected to perform strongly in the future. It is very unlikely that independent grocery stores will be able to bridge the pricing advantage and provide convenient and comfortable shopping environment as offered by these two types of outlets. Under such a scenario, a comparative study of the traditional and the new marketing structure will be able to provide some insights to 'the marketing gap and problems' faced by farmers in keeping up with changes. The problems envisaged include poor farm level marketing practices, inefficient flow of information across market levels and price discovery mechanism, high transportation costs, inefficient post-harvest practices among others. All the information obtained is valuable in assessing the farmers' readiness to integrate with the new marketing structure.

LITERATURE REVIEW

Definitions of Supply Chain Management

Agrifood chains and networks play an important roles in providing access to markets for producers from developing countries as well as for local, regional and export markets. Changes in agrifood systems affect the ability of agro-industrial enterprise to compete; small and large alike will have to innovate and reduce costs while being more responsive to consumer needs. This is where Supply Chain Management (SCM) can help. SCM is the integrated planning, implementation, coordination and control of all business processes and activities necessary to produce and deliver as efficiently as possible products that satisfy market requirements (Jack et al., 2007).

SCM has been growing in importance since the early 1990s although the approach, or rather the concept, was introduced back in the early 1980s (Oliver and Webber, 1982) and has become a very important topic in modern business research. A supply chain is a system whose constituent parts include material suppliers, production facilities, distribution services and customers connected by feed-forward flow of materials and feed-back of information and financial capital (Stevens, 1989). SCM is concerned with the linkages in the chain from the primary producer to the final consumer. It seeks to break down the barriers between each of the units so as to achieve higher levels of service and substantial savings in costs (Kearney, 1994). The importance of a dedicated SCM, albeit very much

practised in the manufacturing sector is now becoming more visible than ever in the food and fresh produce industry.

In the early 1990s, academics first described SCM from a theoretical perspective in order to clarify how it differed from the traditional approaches in managing the flow of materials and the associated flow of information (Christopher, 1998). Nowadays, the management and co-ordination of the fresh produce supply chain have become increasingly important as companies need to minimise distribution and inventory costs while maximising market opportunities which result from fundamental changes in consumer preferences and tastes. There is an apparent development in the competition between supply chains rather than products or companies in the commodity sector (Boehje, 2000). This competition is believed to be driven by the rigid food safety regulations, productivity, efficiency, transparency and branding which come together with essential communication in the supply chain. Mentzer et al. (2001) classify SCM into three categories, namely a management philosophy, the implementation of a management philosophy and a set of management processes.

Agriculture Marketing System and Supply Chain Management in Malaysia

According to Fatimah et al. (2006), the major differences between the traditional agricultural marketing system and the new supply chain system can be summarised in terms of the major marketing functions such as production, buying and selling, procurement, product development, pricing, processing, logistics, Information Communication and Technology (ICT) applications and market information. It can be summarised as follows:

1) The new supply chain focuses on the process rather than the economic agents as in the traditional marketing paradigm;
2) The focal intermediaries are the retailers as compared to the wholesalers in the conventional system;
3) The production marketing network is closely knitted and based on value-chains;
4) The marketing channels are short of well-defined functions;
5) The production and processes are driven by technology in order to customise products;
6) Private labeling is available for food safety; and
7) Logistics is the backbone of the new supply chain.

From a policy and institutional standpoint, most government interventions and programmes in Malaysia are invariably overtly 'production-centric' so much so that the farming/ production sub-system is not well linked or integrated (and often 'out-of-sync') with the post-harvest sub-system. The power of supply chains is the value-adding potential at each level of the chain when agriculture is viewed in its broader and more holistic, agribusiness perspective. This will offer the basis for agriculture to drive overall development by leveraging on the inherent advantages and potential of nations at the inputs, processing, wholesale and retail trade as well as international trade levels. In so doing, agriculture via its linkages in the supply chain, will also contribute to the overall national economic growth from agro-based industries and value adding as well as agro-based services and consultancies at all levels of the supply chain (Wong, 2007).

METHODOLOGY

The primary data for this study were collected through a market survey using face-to-face interview with selected market participants such as retailers (hypermarkets, supermarkets, wet markets and retail outlets), wholesalers, transporters, processors, packers, assemblers and the producers. This was undertaken by using the SCM framework in understanding the dynamics of the new agro-food marketing network and design (Figure 1).

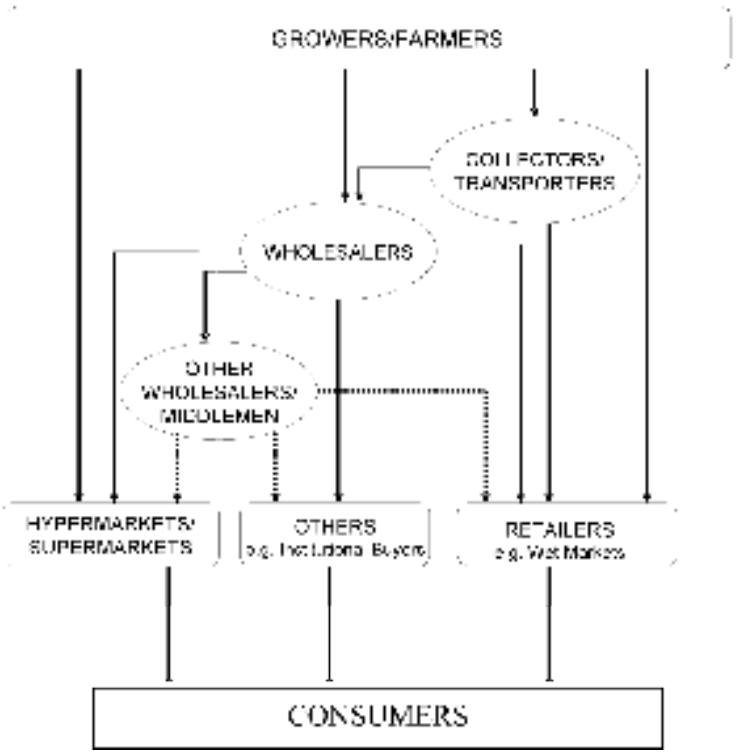

Figure 1: The Supply Chain Management Framework

Six states in Peninsular Malaysia were selected for a field survey in order to gather information on the existing SCM in the country. The total number of respondents representing five different players in the SCM was 483; of which 208 were farmers, 117 were wholesalers, 136 were retailers, 14 were hypermarkets/supermarkets and the remaining 8 were transporters (Table 1). Cameron Highlands, one of the biggest vegetable-producing areas in Malaysia, was among the places visited.

Table 1: Types and Number of Respondents

Types of Establishment	No. of Respondents
Farmers	208
Wholesalers	117
Retailers	136
Hypermarkets/Supermarkets	114
Transporters	8
Total	483

The survey targeted twelve types of vegetable and fruit companies that had excellent market potential and developmental prospects. The selected vegetables were divided into leafy vegetables, legumes, fruity vegetables and tubers (Table 2). During the survey, different sets of questionnaires were used for different players in the supply chain. For instance, the questions on marketing practices and contract farming were posed in the questionnaire for farmers. For wholesalers, the questions focused on buying and selling practices. Retailers were asked about their selling and buying practices and also about relationships with hypermarkets. The questions on supply sources and relationships with wholesalers were posed in the questionnaire for hypermarkets. Responses from the completed questionnaires were then entered into the Statistical Package for Social Sciences (SPSS) program. Open-ended responses were encoded before the analysis process. In order to check for any inaccuracies in the entry process and to test for normality of the data, the frequency distributions for each question were obtained. After correcting for data entry errors, the frequency distributions provided the major data input for the descriptive analysis.

Table 2: Selected Vegetables and Fruits

Selected Vegetables by Category	Selected Fruits
Leafy Vegetables: i. Pak Choy ii. Water Spinach iii. Cabbage	i. Water Melon ii. Papaya iii. Mango iv. Pineapple v. Banana vi. Guava vii. Rambutan viii. Durian ix. Duku Langsat x. Jackfruit xi. Pitaya (dragon fruit) xii. Star Fruit
Legumes: i. Long Bean ii.Ladies' Finger / Okra	
Fruity Vegetables: i. Tomatoes ii.Brinjal iii.Chillies iv. Cucumber	
Tuberous Vegetables: i. Sweet Potato ii.Ginger iii. Sweet Pumpkin	

In the descriptive analysis, measures such as the mean, standard deviation, frequency distribution and variability are calculated. These types of statistical analyses are useful in describing the data, identifying the location of the central point and for defining how various aspects of the data are related.

FINDINGS AND DISCUSSION

In this paper, the socioeconomic profile of farmers, wholesalers, retailers, transporters and hypermarkets will be presented. This is undertaken in order to understand the real profile of each actor in the Malaysian fresh fruit and vegetable supply chain. Apart from that, the procurement practices undertaken by each actor will also be further discussed.

Socioeconomic Profile of Respondents

A total of 208 farmers were interviewed for this study. The distribution of the farmers surveyed according to state consisted of 29 farmers from Kedah, 51 from Pahang, 28 from Kelantan, 7 from Terengganu, 22 from Perak, 36 from Selangor and another 35 from Johor. Table 3 shows the socioeconomic profile of the farmers. The distribution of the farmers by age suggests that a majority of them had been actively involved in farming. A majority of the farmers, i.e., 27.4%, were in the 41-50 years age category. Another 25% were in the 31-40 years age category while about 24% were somewhere between 51 and 60 years. In other words, 76.4% of all the farmers represented those who were somewhere between 31 and 60 years' old. The distribution of the farmers by gender shows that 185 of them were male (88.9%) and the rest were female (11.1%). The Malays represented the largest number of the farmers (56.3%) followed by the Chinese (34.6%) and the Indians (6.7%). In terms of education, 28 of them (13.5%) had never received any formal education, 70 (33.7%) had received only primary education, 92 (44.2%) had received secondary education and 18 (8.7%) had obtained tertiary education.

Table 3: The Socioeconomic Profile of Farmers

Variables	Frequency (N=208)	Percentage (%)
Age		
21 - 30	18	8.7
31 - 40	52	25.0
41 - 50	57	27.4
51 - 60	50	24.0
> 61	31	14.9
Gender		
Male	185	88.9
Female	23	11.1
Ethnicity		
Malay	117	56.3
Chinese	72	34.6
Indian	14	6.7
Others	5	2.4
Education Level		
No Education	28	13.5
Primary	70	33.7
Secondary	92	44.2
Tertiary Education	18	8.7
Farming Business		
Full Time	193	92.8
Part Time	15	7.2
Number of Years in Farming		
1 – 10	74	35.6
11 – 20	64	30.8
21 – 30	45	21.6
31 – 40	20	9.6
41 – 50	2	1.0
51 – 60	2	1.0
> 61	1	0.5

A total of 193 farmers (92.8%) were involved in full-time farming while the rest (7.2%) worked on the farm on a part-time basis. In terms of experience, 35.6% of them had been involved in farming for 1-10 years while 30.8% for 11-20 years. Only about 2.5% of the farmers had been involved in farming for more than 40 years.

Most of the farmers (49%) worked on a farm between 1.01 – 5.00 acres in size followed by those who worked on a farm between 5.01 – 10.00 acres in size (18.3%). Only 4.3% of the farmers worked on a farm of more than 40 acres. The average farm size was 2.70 acres. For the distribution of the farmers by type of land ownership, 96 farmers (46.2%) owned the land, 75 (36.1%) rented the land, 2 (1%) used mortgaged land, 5 (2.4%) farmed on

government land while another 25 (12%) used land with a Temporary Occupation Licence (TOL). In terms of labour, most of the farmers employed foreign workers since there were not many locals who sought employment in the agricultural sector. The production of selected vegetables grown by local farmers in 2006 is shown in Table 4.

It can be seen from Table 4 that some farmers produced more than one type of vegetables. The production of selected fruits planted by the farmers in 2006 is shown in Table 5. Similar to the vegetable farmers, some fruit farmers grew and produced several different types of fruit crops.

Table 4: Average Farm Production of Selected Vegetables (Kg/Year)

Types of Vegetable	No. of Farmers	Min.	Max.	Standard Deviation	Average
Spinach	18	1200	365000	111096.79	104247
Tomato	19	5000	145000	51029.23	65686
Sawi *(Mustard Greens)*	27	75	299300	90317.87	64883
Cucumber	38	25550	90000	16182.41	58699
Water Spinach	46	100	156000	54537.67	51627
Pak Choy	18	12000	58265	17074.21	47640
Cabbage	27	2000	52000	15759.84	23211
Brinjal	30	2000	50000	15247.02	21451
Sweet Potato	13	1400	34514	13039.87	15864
Long Bean	44	1000	43800	11842.89	15511
Chilies	44	300	30000	7300.91	10022
Ladies' Finger	22	80	18500	4340.72	4245

Table 5: Average Farm Production of Selected Fruits (Kg)

Types of Fruit	Number of Farmers	Min	Max	Standard Deviation	Average
Pineapple	9	2000	489600	217488	191066
Banana	24	500	100000	42172	30504
Mango	7	4000	72000	28295	29921
Papaya	6	5000	73000	27271	29041
Watermelon	7	10000	70000	22737	29000
Guava	10	1800	73000	28865	24642
Durian	13	180	7883	2713	3022
Rambutan	10	300	5000	1881	2310
Jackfruit	9	125	3100	1167	1336
Duku Langsat	2	200	800	424	500

In terms of value-added activities undertaken by farmers, 62.4% of them graded the fruit and vegetable after harvesting, while 21% of them undertook packaging activities. The main reasons given by the farmers for packing their own fresh produce were to maintain product quality and to obtain better price offers. Meanwhile, time constraint was found to be the main reason for farmers who do not undertake packaging of their produce. For branding, most of the farmers (96%) did not practice branding because most of them claimed that such a practice was impractical as there would be no price changes to the produce in addition to having to bear additional costs.

Table 6 shows the socioeconomic profile of the wholesalers. Most of the wholesalers (76) were the sole proprietors, including those who ran a family business. This was followed by those who worked under the private limited companies (25) and partnership (8). The majority of them were male (96). Furthermore, the Chinese constituted the majority of the wholesalers (76) followed by the Malays (37) and the Indians (3).

Most of the respondents were from Cameron Highlands (22) while the states of Johor and Selangor accounted for 21 wholesalers for each state. Finally, 45 of them had been running their business for 10 to 20 years followed by 43 with less than 10 years and 17 with 21 to 30 years of experience.

For the distribution of wholesalers by the type of core business that they had undertaken, two-thirds of the wholesalers had more than one core business. However, most of the wholesalers (42) had only one core business followed by wholesaler cum transporters (33) while the rest had a mixed type of activities.

Table 6: Socioeconomic Profile of Wholesalers

Variables	Frequency (N=117)
Type of Business Ownership	
Family/Sole Proprietorship	76
Partnership	8
Limited Company	7
Private Ltd Company	25
Others	1
Gender	
Male	96
Female	21
Ethnicity	
Malay	37
Chinese	76
Indian	3
Others	1
Business Location	

Table 6 (Continued)

Cameron Highlands	22
Johor	21
Kedah	11
Kelantan	14
Pahang	11
Perak	13
Selangor	21
Terengganu	4
Years of Experience in Business	
<10	43
10-20	45
21-30	17
31-40	10
>41	2

There were four types of retail stores captured in this study for the retailers; 46.27% of the retailers ran their business at the wet market, 32.84% owned a fruit stall, 15.67% sold their fruits/vegetables at the night markets and another 5.22% were convenience store owners. In terms of the distribution of retailers according to location, Johor Bahru had 19 respondents. This was followed by Jerantut (14) and Muar, Morib as well as Cameron Highlands, which had 10 retailers each.

Table 7 shows the socioeconomic profile of the transporters. Half of the respondents ran a family business while the remainder operated private limited companies. All of the respondents were male. 75% of them were Chinese and 25% were Indians. 50% of the respondents had less than 10 years of experience, 37.5% had been involved in their business between 10-20 years while the remaining 12.5% had been involved in their business for more than 20 years.

In terms of the distribution of transporters based on lorry capacity, 62.5% of the respondents owned lorries with a capacity of less than two tonnes. Another 25% owned three-tonne lorries while the remaining 12.5% owned lorries with more than a three-tonne capacity.

Table 7: Socioeconomic Profile of Transporters

Variables	Frequency (N=8)	Percentage (%)
Type of Business		
Family/Sole Proprietor	4	50.0
Private Limited	4	50.0
Gender		
Male	8	100.0
Ethnicity		
Chinese	6	75.0
Indian	2	25.0
Experience (years)		
<10	4	50.0
10-20	3	37.5
>20	1	12.5

For deliveries, one respondent delivered the produce two, three and four times a week. Two other respondents delivered three times per week while the rest of the respondents made seven (7) delivery trips a week. The study also revealed that 50% of the transporters charged RM0.20 per kilogram of vegetables or fruits transported. Another 25% of the transporters charged RM0.30 per kilogram of vegetables or fruits transported while the rest charged RM30.00 per trip. In order to optimise the use of their haulage, 50% of the respondents stated that they normally brought back some other vegetables on the return trip.

For the hypermarkets and supermarkets profile, 14 hypermarkets and supermarkets were involved in this study. Fifty percent of the respondents had less than 5 years of experience in their business while the rest had been in operation for at least 6 years. One of the respondents had more than 25 years of experience in the business (7.1%). In terms of the type of business the hypermarkets currently operated, 57.1% was public limited companies while another 42.9% was limited companies.

For the distribution of hypermarkets by equity ownership, 78.6% of the respondents' equity was local and the rest was foreign equity or other. In terms of the locations of the hypermarkets, three hypermarkets selected for this study were situated in Ipoh and Kota Bharu while two others were located in Raub. The remaining six were situated in Jerantut, Alor Setar, Baling, Batu Pahat, Jerteh and Shah Alam.

Distribution and Procurement Practices by the Players in the Fruit and Vegetable Supply Chain

For the distribution of vegetables by farmers, the results of the study indicate that the wholesalers played an important role as the intermediary between the producers and the

retailers. Approximately 63.6% of the farmers sold their vegetables to the wholesalers compared to 25.5% and 9.1% who supplied to the collectors/transporters and other middlemen, such as night markets respectively. It is noted that the Federal Agricultural Marketing Authority (FAMA) also obtained some vegetable supply from the farmers through contract farming. In addition, almost 74% of all transactions took place at the farm itself and 17.3% was conducted at the collection centre.

The result also reveals that the wholesalers also played an important role as an intermediary in the fruit distribution process. Approximately 57.9% of fruit farmers sold their fruits to the wholesalers, more than double the number of those supplying theirs to the collectors/ transporters. Only 3.5% of the farmers supplied their fruits to other middlemen, such as night markets and provision shops. Furthermore, 63.2% of all transactions between fruit farmers and middlemen took place at the farm and another 15.8% at the collection centre. Lastly, 10.5% of the fruit farmers met the middlemen, in particular the collectors/ transporters, at the road side in order to sell their fresh produce.

For the wholesalers, approximately 59% of all types of vegetable were obtained from farmers while the rest was purchased from other wholesalers. For the sources of fruit supplies for the wholesalers, approximately 51% of the wholesaler's fruit suppliers were farmers while the remaining 49% was other wholesalers.
For the distribution of their fruits and vegetables, a similar marketing channel used in fruit wholesaling was also used by the vegetable wholesalers. The vegetable wholesalers sold about 46% of the vegetables to other wholesalers, 24% to night markets and 18% to institutional buyers. It was also found that the transactions were mostly conducted in cash, and that cash accounted for 53% of all types of payment terms. This is followed by cash and credit (23%) payments within 16 to 30 days (12%).

For retailers, as a whole, the wholesalers also played an important role in bringing vegetables from the farmers to the retailers. The retailers procured approximately 70% of their vegetable supply from the wholesalers and almost 30% direct from the farmers. There were also vegetable supplies from other market intermediaries, such as collectors and transporters, but the amount was too insignificant to be considered in this study. Similar to the vegetable procurement practices, the wholesalers appeared to be an important market intermediary in bringing fresh fruit from the farmers to the retailers. As seen in this study, 79.2% of the fruit supplies were obtained from wholesalers while nearly 21% was purchased directly from farmers. Less than 1% of the fruits were procured from other suppliers.

For hypermarkets and supermarkets, the wholesalers once again played an important role in bringing vegetables from the farmers to the hypermarkets. Approximately 71% of the hypermarkets purchased their vegetables from the wholesalers and another 21% was purchased from other middlemen or packaging centres. Only 7.1% procured vegetable supplies directly from farmers. The wholesalers also appeared to be an important market intermediary in bringing fresh fruit from the farmers to the hypermarkets. The bulk of the fruit supply was procured from wholesalers (64%) followed by middlemen/packaging

centres (21%). Meanwhile, farmers and other suppliers made up 7% of the supplies each. Besides obtaining supplies through the conventional channels, some hypermarkets/ supermarkets undertook work on contract arrangements with their suppliers. As seen from this study, a majority of the hypermarkets/supermarkets held marketing contracts with the wholesalers. The type of contract employed was mainly informal.

Fresh Vegetable Supply Chain

From the results of the survey, the following findings with regard to the distribution of fresh fruits and vegetables from the farm to the retailers can be summarised as presented in Figures 2 and 3. The solid lines represent the flow and distribution of fresh fruits and vegetables obtained from the computation of the survey results. The dotted lines represent the flow and distribution of fresh fruits and vegetables obtained from the extrapolations of the survey results and discussions with market experts.

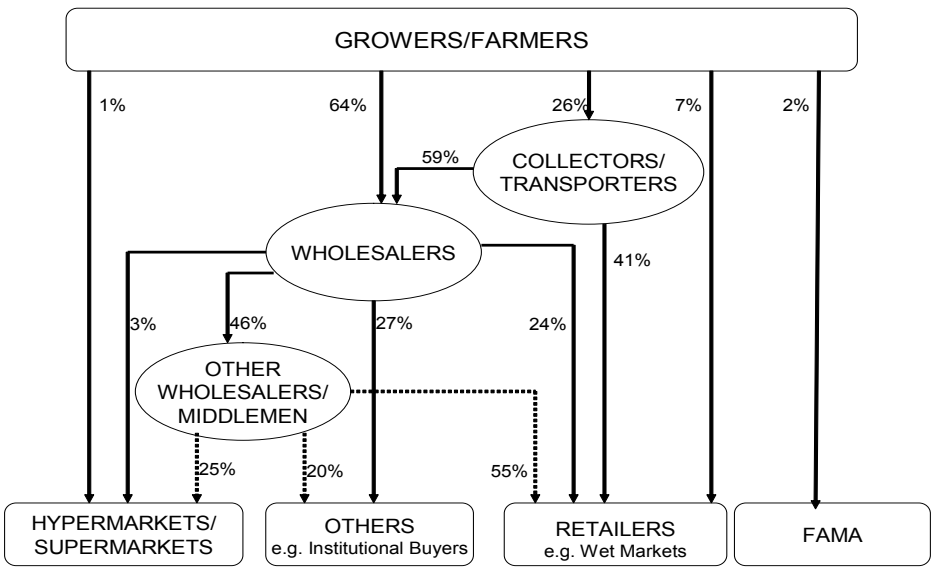

Figure 2: Fresh Vegetable Supply Chain

The players in the fresh vegetable supply chain consisted of growers, collectors or transporters, wholesalers, retailers and hypermarkets or supermarkets. At the first marketing level, a major portion of the growers' produce which is 64% went to the wholesalers. Another 26% went to the collectors/transporters, 7% to the retailers, 2% to the direct marketers (for example, FAMA) and 1% to the hypermarkets. At the collectors' level, 59% of the collectors worked with the wholesalers while the remaining 41% dealt with the retailers. From the main wholesalers, 46% trickled down to the other wholesalers, 27% went to the institutional buyers and 24% went to retailers. The remaining 3% went to the hypermarkets. At the other wholesale level, 55% went to the retailers, 25% went to the hypermarkets while the remaining 20% went to the institutional buyers.

Fresh Fruit Supply Chain

In the fresh fruit supply chain, the major players also consisted of growers, collectors or transporters, wholesalers, retailers and hypermarkets or supermarkets.

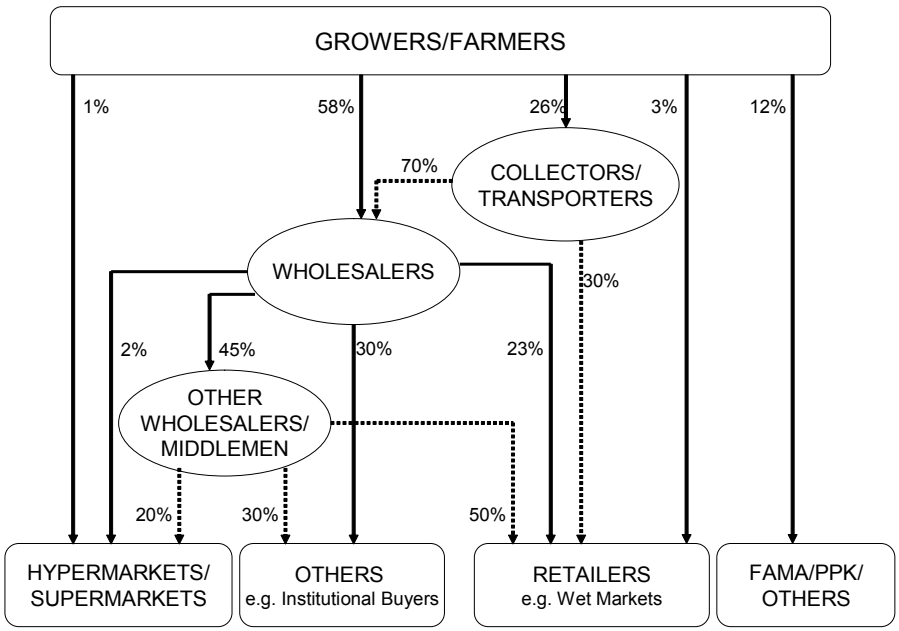

Figure 3: Fresh Fruit Supply Chain

At the first level, a major portion of the growers' fruits (58%) went to the wholesalers. Another 26% went to the collectors/transporters, 12% to Federal Agricultural Marketing Authority (FAMA)/Pertubuhan Peladang Kawasan (PPK)/others, 3% to the retailers and 1% to the hypermarkets. From the collectors, 70% of the produce was channelled to the wholesalers while the remaining 30% went to the retailers. From the wholesaler, 45% trickled down to the other wholesalers, 30% went to the institutional buyers and 23% went to retailers. The remaining 2% went to the hypermarkets. At the wholesale level, 50% went to the retailers, 20% went to the hypermarkets while the remaining 30% went to the institutional buyers.

CONCLUSIONS

The present movement and distribution of fresh fruits and vegetables from the farm to the retailers is dominated by wholesalers. More than half of the fresh fruits and vegetables produced flows through the wholesalers. In addition to that, the second level wholesalers also play a major role in collecting and distributing fresh fruits and vegetables. This is particularly true for retailers who are far from the wholesale market and procure produce in small quantities. By the same reason, the role of collectors and transporters are equally important for remote and smaller farms where it is not economically viable for growers to carry their produce to the market using their own means of transport. Hence, the role of transporters/collectors is deemed more efficient.

The emergence of supermarkets and hypermarkets has not given much impact to the aspiration of the Malaysian government to match supplier-hypermarket linkages. This is evidenced by a very small proportion of farmers' produce being marketed directly to the hypermarkets. The number of farmers who are involved in contract farming is also insignificant although the informal marketing contract does take place. The proportion of fresh fruit and vegetable distributions along the supply chain indicates that the marketing system practised is still traditional and conventional in nature. The dominance of multilevel traditional wholesalers and other intermediate institutions calls for intervention by the Malaysian government in order to enhance the welfare of small producers and consumers by shortening the supply channel.

On the other hand, consumer preferences as well as the consumption patterns and styles are also changing due to easy access to information. Markets are adjusting themselves by responding to consumers' needs and wants. Hence, future agricultural marketing policies and programmes must address these market environments. At the same time, contributions from small farmers to the fresh fruit and vegetable supply chain must not be ignored. The emergence of transnational hypermarkets and agribusiness firms in Malaysia must also benefit both local fresh fruit and vegetable producers/consumers in order for them to become strategic partners to local players in the supply chain of FFV. As the source of consistent and good quality fruits all year round, hypermarkets must also ensure safe and healthy produce for the consumers.

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