

Full Length Research Paper

Good agricultural practices (GAP) of tomatoes in Malaysia: Evidences from Cameron Highlands

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The demand for healthy and safety tomatoes have been increased in both at the export as well as domestic markets in Malaysia. The aim of this paper is to investigate the effectiveness of the good agricultural practices (GAP) in the production and marketing of tomatoes in the Cameron Highlands; which is an important vegetable growing area in Malaysia. The study adopted the case study method to obtain the necessary data on the farming system of both GAP-practicing tomato producers and those of conventional farmers (who were non-practicing GAP). The study found that the large scale farmers, who practiced GAP, have been successful in improving productivity and income (1.7 times higher) through exporting quality tomatoes compared to the farmers who produce tomatoes without practicing GAP. The small scale farmers, who did not practice GAP, lacked access to credit for investment, as well as technical support. The Malaysian certification scheme needs to be upgraded, extended and monitored to ensure the quality of the produce.

Key words: Good agricultural practices (GAP), marketing-channel, tomato production, food-safety, Cameron Highlands.

INTRODUCTION

Food safety and quality has become a serious concern in the production and marketing of tomatoes in Malaysia over the past decade. Malaysian consumers rely on vegetable imports which accounts for 77% of domestic consumption of total fresh vegetables during 2004 (MOA, 2006a, b). In recent years, imports have increased faster than domestic production. The per capita vegetable consumption was 40 kg in 2003 and is expected to increase to 47 kg in 2011 due to increase in consumer's income, changing lifestyle and growing concern for healthy food.

Among the local vegetables, tomatoes are one of the few vegetables that are able to penetrate domestic retail sector as well as export market. Cameron Highland in

Pahang State of Peninsular Malaysia is the most important area for tomato cultivation. With a year round cool temperature, Cameron Highlands area is conducive to raising good quality tomatoes throughout the year.

The Malaysian government has promoted an export-oriented agriculture and established food production parks to encourage the commercialized large scale vegetable farmers during the 9th Malaysia Plan 2005 to 2010 (Ministry of Agriculture, 2006a). The area for tomato cultivation has increased more than three-fold, from 513 ha in 1997 to 2,200 ha in 2008 with annual rate of growth 13.8%. The production of tomatoes increased from 11,004 tonnes to 75,850 tonnes during this period (with annual rate of growth 18.4%). Malaysia exported a total RM54 mn worth of tomatoes in 2008, compared to only RM9 mn in 1997.

The increasing awareness about food safety has brought up strict regulation imposed by the tomato importing countries. To meet this requirement, the

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Malaysian government encourages tomato producers to venture into organic farming so as to enhance the exports of high quality safe tomatoes. To accelerate good agricultural practices (GAP) on the farms, the Malaysian Farm Accreditation Scheme or Malaysian Farm Good Agricultural Practice Scheme (SALM) was introduced in 2002 to ensure safe and quality produce that can effectively compete in both the domestic and international markets (Department of Agriculture, Malaysia, 2007). The GAP formerly known as EurepGAP, is a special standard that contains no legal compulsion in terms of practicing it and is carried out on a voluntary basis. Bayramoglu et al. (2010) stated that tomato has got the highest field of implementation under the EurepGAP fresh fruits and vegetables standards. A number of studies have been conducted on the contributions of the EurepGAP standards to the economy of a country or a region (Dolan and Humphrey, 2000; Will, 2003; Galdos, 2004; Aloui and Lahcen, 2005; Mausch et al., 2006; Asfaw, 2007).

There are evidences to show that small farmers are not able to meet the strict quality requirements set by retail chains. For instance, Giant in Malaysia had 200 vegetable suppliers in 2001 but by 2003 the number was reduced to 30 (Shepherd, 2004). Despite their late entry into the Malaysian retail sector, the new store-based retailers accounted for as much as 60% of fruit sales and 35% of vegetable sales in Malaysia in 2002 (FAO, 2005).

The objective of this study is to assess the effectiveness of the GAP in the production and marketing of tomatoes in the Cameron Highlands, Malaysia. This paper describes whether tomato producers are benefitted from practicing GAP in Cameron Highlands compared to those of conventional farmers. The paper is organized as follows; methodology and the data source; results and discussions of this study; description of the characteristics of tomato farmers, farm production, harvesting, marketing and supply chain of tomatoes; effectiveness of SALM certification in the export markets and risk management of GAP farming; conclusions and recommendations.

METHODOLOGY AND DATA COLLECTION

According to Food Agriculture Marketing Authority's (FAMA, Malaysia) estimate, there were 200 farmers in Cameron Highlands in 2002. Only 10 farmers have received the SALM certificates for vegetable farming since 2002. The SALM registered farms get priority in the market-preferred supplier list of the supermarkets. However, majority of the tomato produced from SALM farms are exported to Singapore (through bilateral agreement) that allowed access without customs detention.

The list of farmers was obtained from the local FAMA office, containing their names, addresses and contact telephone numbers. This study adopted the case study method to obtain the necessary data on the farming system of both GAP-practicing tomato producers and those of conventional farmers who practice traditional farming systems. The study took place in the northern zone of Cameron Highlands, which is the most important area for tomato cultivation. Three GAP-practicing tomato producers were selected from this region. The farm size of these producers ranges

from 10 to 24 ha. Another three farmers who practice traditional farming were also selected as a basis for comparison. These producers are working on a smaller farm size, ranging from 1.2 to 1.6 ha. There is no similar size of non-GAP practicing tomato farmers available in this area. Therefore, the research was not able to locate farmers with similar landholding size to those that practice GAP as samples for comparison.

An unstructured questionnaire was used to capture the information on the farmers' farm practices, costs and returns of tomato production, marketing channels and farming risks. The sampled farmers were interviewed in depth by the research team at their farms. Interviews were carried out in the appropriate languages (English, Mandarin and Bahasa Melayu) and each session lasted around two hours. Tape recorders were used to record conversations and later transcribed into English. Farmers were asked about personal details, their farming practices, marketing channels and their perceptions on food safety and other environmental concerns. After the interview, the research team visited the farms to observe the method of inputs applications, harvesting and processing to have a clear understanding on their farming practices. Discussions were also held with the laborers who were working at the farms for further clarifications and verifications.

RESULTS AND DISCUSSION

Sample characteristics

The majority of the populations in this area are Chinese and farming is the major economic activity. Some farmers have shifted their farming techniques from conventional farming to a more environmentally sustainable and high-yielding farming practices in accordance to consumers' preferences. The farmers who obtained SALM certificates and followed GAP are highly experienced in farming technologies. All three of them have over ten years of practical experience in tomato cultivation (Table 1).

This indicates that young and educated individuals are still attracted to participate in the tomato cultivation in contrast to the general belief that young professionals are not inclined to go into farming. The farmers practicing GAP are also involved in other activities such as wholesaling, transporting and exporting. They are able to perform these multi-tasking functions as they own transport facilities and a packaging house besides other communication facilities. In other words, their production and marketing activities are integrated, which is in stark contrast to the conventional farmers who specialize only in production activities.

The farmers believe that the high demand for Cameron Highlands' tomato is attributed to its perceived high quality due to the soil characteristics and environmental condition in the highlands. Improvement in farming technology allows the farmers to adopt different varieties of high-yield tomatoes to increase income. The majority of the farmers have small farm sizes and they produce tomatoes both for their own consumption and for sale. The commercial farmers occupy a considerable area of land to grow tomato for the market. These farmers are market-oriented in their farming practices particularly in ensuring consistent supply of high-quality tomatoes to the

Table 1. Profile of farms and farmers studied.

Characteristic	Farmers with SALM			Conventional farmers		
	A	B	C	X	Y	Z
Age (years)	65	32	50	40	48	72
Education (years)	10	14	5	7	5	2
Experience (years)	40	10	10	22	10	40
Area cultivated (ha)	15	24	10	3.2	2	2.4
Number of varieties grown	4	4	6	3	4	3

market.

It is observed that the farmers have acquired farming experience through learning by doing over a long period of time. The major sources of information have been personal communication with the local agricultural extension agencies, exchange visits to overseas farms, neighboring farmers, relatives or friends, and input suppliers.

Farm production

The total area under vegetable cultivation in Cameron Highlands was 7 050 ha (Department of Agriculture, 2003), producing an average of 1 530 tonnes of tomato per month. The average yield of tomatoes is estimated based on the farmers' experiences. The farmers inform that tomatoes are highly perishable produce and very sensitive to temperature and weather. The yield of the tomatoes varies between the GAP-certified and traditional farms. The average yield of tomatoes under the protected environment is around 4 to 4.5 kg per plants while it is about 2.5 to 3 kg in the open environment. In the protected environment (under plastic shield), the duration of tomato production cycle is longer (7 months) while in the open environment the duration of tomato cycle is only 5 months. The market price of a tomato from GAP-certified farms is always higher due to its size, appearance and quality. The average price for GAP tomatoes is MYR2.50/kg and MYR1.75/kg for conventional tomatoes.

Production cost of tomatoes

The vegetable farmers of Malaysia have increasingly concerned about rising competition in the domestic and export markets. The cost of production of tomatoes is presented in this area.

Land: The farmers obtained their land for vegetable farms from the government under leasing arrangements [Temporary Occupation License – (TOL)] for 40 years. They have to pay a fixed amount of lease fees for the land annually. Modern farming methods such as hydroponics and fertigation require large initial investments.

Under these techniques, tomato plants are covered with plastic roof, they are grown in plastic bags filled with compost, water pipes are channeled into the bags for irrigation. Some of the plots are fixed with paved floor; the cost per acre of such infrastructure is about MYR160 000 (US\$47 059). However, the costs per acre of fertigation with plastic-covered floor are about MYR90 000 (US\$26 500).

Labour: The farmers interviewed in Cameron Highlands rely fully on foreign laborers for farming activities. The laborers are employed for long term and are paid on a monthly basis. They have been working with particular farms over a long period of time and have gathered practical experiences in tomato cultivation. The farmers pay an average salary of MYR800 per month per worker; however, some experienced laborers are paid more than MYR1 000 monthly. They are provided with minimum shelter within the farm compound and basic medical benefits.

Seeds and seedlings: The farmers rely on imported seeds, mostly from the Netherlands and Taiwan (Province of China). Different varieties of tomatoes are grown in Cameron Highlands. Recently seeds from Japan have been available. The cost of the Japanese variety is relatively high compared with that of other varieties. According to one respondent who is currently growing a Japanese variety, it is the best quality in terms of taste and shelf life. The tomato seeds are available from the local suppliers. The farmers in general complain about the increase in input prices in the last decade.

Irrigation costs are minimal, as natural water supply from upper catchments in the areas is used as irrigation for farming. The farmers use water pumps to irrigate different levels of plots on the highlands. Under the fertigation technique, the initial investments are relatively high to install water pipes for irrigation. The production cost is higher for GAP practicing farmers compared with conventional farmers (Table 2).

The GAP practicing farmers spend relatively higher costs on fertilizers, while the traditional farmers spend more on labor. The labor cost is estimated from the total annual labor days spent for tomato cultivation in one production cycle. About 15% of total costs are spent on maintenance of plastic shields in the GAP-certified farms.

Table 2. Average cost of tomato production (MYR/ha/year).

Input	GAP practicing farmers		Conventional farmers	
	MYR	%	MYR	%
Labour cost	20 261	21	26173	39
Seed	5 782	6	5 369	8
Irrigation	6 177	7	8724	13
Fertilizer (fertigation)	28 416	30	7382	11
Pesticides	8 648	9	13 422	20
Compost (in plastic bag)	11 119	12	-	-
Depreciation or maintenance	13 590	15	1342	2
Fencing or bamboo stick	-	-	4698	7
Total cost of production	93 995		67 111	
Cost per plant	3.50		2.30	

Table 3. Costs and returns of tomato farming cycle.

Cost and return	GAP practicing farmers	Conventional farmers
Packaging (MYR/kg)	0.10	0.06
Transport costs (MYR/kg)	0.17	0.12
Overall management cost (MYR/kg)	0.45	0.10
Yield per plant (kg)	4.00	2.50
Value of production per plant (MYR)	9.00	4.40
Other costs per plant (MYR)	2.88	0.70
Total costs per plant (production and other costs) (MYR)	6.38	3.00

On the other hand, bamboo sticks are used to hold the plants in the open traditional farm and the costs of its maintenance is about 2% of total production cost.

Post harvest activities

The well-off farmers have their own machines for grading and packing, which is done at their farms. Only three privately owned big sorting and packaging machines are available in the whole of Cameron Highlands. The cost of each machine is about MYR30 000 (US\$8 824). There are also a few small-size processing machines available which cost MYR7 000 (US\$2 000) each. The farmers use carton for packaging. The capacity of each carton is 10 kg of tomatoes and the cost of the carton is about MYR1. The cost of packaging per kg of tomatoes is 10 sen for the GAP practicing farmers who send their produce to Singapore. The traditional farmers also use carton to send their produce to the local markets but the packaging cost per kg is 6 sen. Most of the farmers have their own transports to carry goods to Singapore, Thailand and other selling destinations. The transport costs per kg of tomato to Singapore and Thailand is 17 sen while the average cost of transportation is about 12 sen to local wholesale markets (Table 3).

The post-harvest costs which include sorting, packaging and transport are 72 sen per kg for GAP practicing farmers and 28 sen for the traditional farmers (Table 3). Considering the value of production per plant and total production costs per plant shown in Table 3, the net profit per plant for GAP-practicing farmers is MYR2.62 and RM1.40 per plant for traditional farmers. Given the number of plants per area referred to before, the profit for GAP-certified farms is MYR71 211/ha/cycle and MYR41 511/ha/cycle for the traditional farms.

The certification done by DOA is free of charge to tomato farmers. Despite the high cost of investments, the GAP practicing farmers are happy with the new improved technologies as they increase productivity and return. Tomatoes are sorted and graded based on size and ripeness. Higher grades fetch better prices. The physical appearance of tomatoes grown in the traditional farms is not so attractive and the market price for these products is lower compared with the tomatoes from GAP-certified farms.

The traditional farmers face greater risks of pest and disease outbreaks on their crops. Sometimes farmers get lower yield of tomatoes due to continuous rain and cloudy weather, fungus attack and poor seed quality. The farmers have no means of insuring this production risk but leave it to nature to take its course. According to

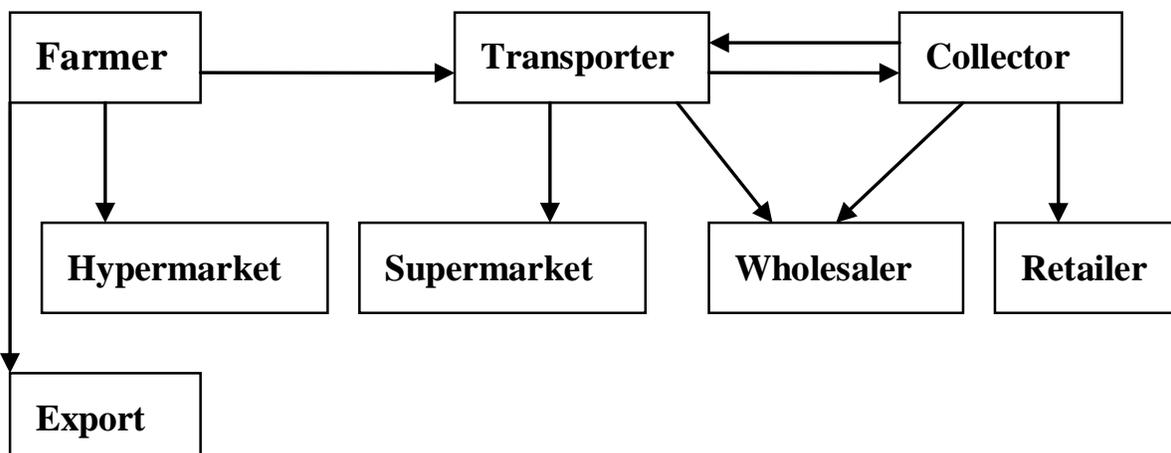


Figure 1. Marketing channel of tomato from the GAP practicing farmers in Cameron Highlands.

them, the losses in certain planting seasons are sometimes compensated or offset with good harvests in the other seasons.

Marketing channel

The growers were asked to whom they usually sold their produce. It was found that the transporters played an important role in the marketing chain of tomatoes in Cameron Highlands. A number of small old jeeps (Land Rovers) owned by farmers are available in this area. They use the jeeps to carry inputs to the farms as well as transporting the produce to the processing house for sorting and packaging. A number of trucks and Lorries (owned by the transporters) are also available for transportation of produce to different destinations including *Selayang* wholesale market in Kuala Lumpur, Singapore and Thailand. The local private transport association is efficient in managing the distribution of tomatoes in the region.

Most of the farmers who were interviewed own trucks. They use the trucks to send their produce to the buyers as well as renting them out to others for additional income. Each truck has been assigned specific destinations to avoid overlapping. The transport association fixes up the rates for carrying goods to different places through a mutual agreement with the local farmers. Some transport owners act as collectors or assemblers for distant farmers. They play the role as an intermediary between the conventional farmers and the wholesalers. Normally, the collectors are able to buy produce at a relatively lower price from these farmers as they have less access to market information. The collectors then sell to the wholesalers at the market prices and earn higher margins than the transporters who sell direct to the buyers.

Figure 1 shows the marketing channel of tomatoes in Cameron Highlands. The GAP-practicing farmers sell as

high as 60% of their produce to Singapore supermarkets (National Trades Union Congress (NTUC) and Giants hypermarkets), Thailand, Hong Kong and Japan. These farmers also assemble, sort and package the tomatoes on the farm and they send the produce using their own transport to the buyers.

The GAP practicing farmers export their produce directly to their overseas buyers. In other words, the marketing chain for these farmers is shorter compared with that of the conventional farmers. The farmers who export their produce state that about 60% of their produce is destined to overseas markets, while the rest of their produce is sent to local hypermarkets such as The Store, Tesco, Pacific, Makro and other supermarkets. They use their own transports to deliver their produce to local hypermarkets. Again, no intermediary is involved in this marketing chain. Although, they receive a higher margin through this channel, the farmers have less incentive to supply to the local hypermarkets because their high quality produce are not given due recognition.

In contrast, the conventional farmers rely on the transporters or collectors to sell around 75% of their tomatoes to the wholesalers and supermarkets. They receive lower margins due to the involvement of the transporters and collectors. They sell the remaining 25% of their tomatoes directly to the hypermarkets. As for the price of their produce, they are determined by the wholesalers based on the supply–demand situation in the market. No contract (formal or informal) is made between the farmers and their buyers regarding the supply arrangement. As a result, the farmers are generally sceptical on the “reasonableness” of the price received from the wholesalers.

The farmers maintain a close linkage with the foreign buying agencies like the NTUC and Giants in Singapore, hypermarkets in Japan in the last ten years or more. They have relatives and friends in China, Singapore and Thailand. They visit each other and learn about vegetable farming technologies. They use telephones and emails as

communication channels to update information on tomato production and marketing in Asia and other countries. The knowledge acquired is disseminated to the farmers in their area.

Export marketing

The vegetables grown in Cameron Highlands are of good quality and popular in domestic as well as overseas markets. Their trading relationships and networks with the local and Singaporean markets provide the signals on consumers' taste and preferences. Singapore is the nearest export market for Cameron Highlands' tomatoes and the farmers are always in close contacts with their buyers either through telephone or email. This close relationship enables the farmers to be in touch with the consumer market, particularly in terms of taste and preferences. Direct marketing to buyers in Singapore enables the producers to minimize transaction costs and earn better returns on their produce. The advent of supermarkets in Malaysia has somewhat increased the demand for high-quality and safe food catering to the affluent consumers in the urban areas. This development has also contributed to the increase in demand for high-quality tomatoes from this area.

According to the GAP-practicing farmers, they have started to apply good agricultural practise in Cameron Highlands ten years ago. This was prompted by the growing awareness of food safety issues among consumers in the export markets as well as stiff competition among farmers to capture overseas markets where quality is one of the major determinants of competitiveness. The GAP-practicing farmers have been successful in introducing new technologies such as hydroponics, fertigation or mulching on their farms. As a result they are able to produce high-quality tomatoes. The large scale farmers were successful as their exports passed the strict quality rulings of the Singaporean market. This gave them the confidence and incentives to improve their tomatoes further.

On the other hand, the conventional farmers have no direct access to the export markets. Hence, they rely on selling their produce to the local wholesalers. They also sell their tomatoes to the collectors, transporters and other wholesale markets. They are unable to adopt the new technologies because of lack of access to information on production and marketing of tomatoes as well as limited credit facilities. Farmers perceive that GAP demands higher costs of production as they have to invest in shelters and other inputs. This perception has discouraged them to adopt GAP on their farms.

Product quality and market accreditation

The commercial farmers who have their own established markets (overseas and local) applied for SALM

certification to have better market access. It is found that SALM-registered farms received priority in the local hypermarkets and supermarkets as preferred suppliers. SALM-certified firms are eligible and qualified to use the SALM logo on their cartons.

It was reported that at times, the farmers fail to supply certain amount of tomatoes to the buyers (particularly for the export market). People were informed that during shortage of supply, the exporter-cum-farmers usually buy tomatoes from conventional farmers (who do not practice GAP) to fulfill the market requirement. In this regard, the SALM-certified farmers do not fully comply with the rules to maintain the quality of produce. According to the locals, there is no laboratory available to investigate the quality of the produce and the buyers at large are perceived as being indifferent to quality. The physical appearance is the main consideration for the buyers in choosing the produce. This practice of outsourcing from the traditional farmers proved to be costly as these tomatoes were rejected by the Singaporean authority due to excessive chemical residues.

Although, SALM programme is recognized within the country, it does not receive international recognition with the exception of Singapore. It has been agreed through a bilateral arrangement with Singapore that the produce of SALM-certified farms are allowed to precede to retail distribution centers without detention at the Singapore customs. It appears that the quality demand and pressure from the export markets have forced the commercial farmers to adopt GAP in vegetable production. Small farmers are not able to expand their farms to take advantage of the economies of scale because of limited support from the government. In the local markets, the wholesalers dictate the price of tomatoes and pay lower price to the traditional farmers. In the medium term, it appears that the poor farmers will not be able to adopt GAP due to various economic constraints. On the contrary, the GAP farmers state that they need at least two years to experiment with any new technology before adoption.

The commercial farmers who are competing in the international market are very concerned about the quality of their produce. They seem to be very confident about using the chemicals as their tomatoes thus, far have not been rejected by the Singaporean buyers. Very few farmers practice Integrated Pest Management (IPM) on their farms because IPM farms require higher weeding costs. We observe that the workers are very careful in carrying out harvesting and post-harvest activities. Workers are not allowed to smoke in the farm area. After harvesting, the tomatoes are washed with clean water and wiped properly before packaging by the workers. Most of the laborers are male; only a few farms employed women workers mainly for sorting, cleaning and packaging work. The workers wear clean dress and use hand gloves for sorting and cleaning. However, packaging and sorting in the traditional farms are not

being done safely. The workers do not wear clean dress and gloves during sorting and packaging of tomatoes.

Risk management for tomato farming

The farmers were asked about their perception on farming risks in undertaking good farming practices. Both SALM-certified farmers and traditional farmers inform that they face some risks and uncertainties in implementing farming practices. Unfavorable weather, high prices of inputs and price fluctuation of the produce are the key problems for tomato farming. The rainy and windy weather in the months from September to January results in low tomato yields in Cameron Highlands. The traditional farmers who cultivate in the open farms have higher risk for their produce. They need to finish their harvesting before the rainy seasons. They face these problems almost every year, but the extent of these problems varies between farmers. The price of tomatoes is highly volatile throughout the year. Tomato seeds are imported from other countries. The farmers acquire the tomato seeds from local input suppliers. The farmers rely on foreign laborers for farming. We observe that the top management responsibilities are always shared by family members or relatives. In view of the high wage rate for local labor, it is probable that the farmers also assign overall farm management to the foreign workers. Lack of access to information on the quality of inputs and marketing of outputs is the biggest barrier facing the farmers. The traditional farmers are generally relying on the transporters or collectors for price and other marketing information. Compliance to the SALM certification rules at the farm level is rather low as the government has no provision to conduct any spot check at the farm level for assessing tomato quality.

CONCLUSIONS AND RECOMMENDATIONS

This study investigates and compares the farming practices of selected farms where tomatoes are grown under good agricultural practices (GAP) certification and those that practice a traditional farming system in Cameron Highlands, Malaysia. A case study method was employed to solicit the relevant information on the farming practices, perceptions on the Farm Accreditation Scheme (SALM) and its economic impact and implications. Three GAP-certified tomato farmers and three conventional farmers were selected for analysis.

The study shows that the relatively rich farmers who communicate with other farmers overseas and who have strong financial ability are able to introduce GAP successfully on their farms. The farmers have improved their knowledge in farming practices through their trading linkages over a long period of time with Singapore and other countries. The GAP-certified farms are able to penetrate the Singaporean consumer market under the

banner of SALM. The traditional farmers still depend on the wholesalers, collectors and transporters to sell their produce at local markets with lower margin. In the local markets, the wholesalers dictate the price of tomatoes and pay lower price to the traditional farmers. In the medium term, it appears that the poor farmers will not be able to adopt GAP on their farms because of low financial capacity as well as lack of information on the scheme. GAP is yet to penetrate to the small scale farmers who practice conventional farming.

Although, SALM programme is recognized within the country, it does not receive international recognition with the exception of Singapore. In this regard, a third party certification is deemed necessary to ensure proper implementation. This would mean that efforts should be made to promote SALM aggressively in other markets to make way for high-quality Malaysian produce.

Generally, the level of awareness on GAP among the conventional farmers in the Cameron Highlands is low. Hence, promotional campaigns have to be intensified to increase awareness. Besides, training and extension services have to be conducted on an extensive scale to ensure that larger farming community benefit from the scheme. Due to lack of quality control arrangements, the farmers are reluctant to have formal contracts with the supermarkets for their tomatoes. A private quality control system should be developed to improve trust between the farmers and the buyers. Technical support should be provided to the farmers by the quality control authority in coordination with the local government agencies.

The farmers utilize imported inputs for their farms. The applications of inputs, particularly pesticides and chemicals, are not monitored. The farmers rely on their own experiences and personal judgment as to what is "harmful" and "not harmful" to human health. No proper training and guidance are provided to the farmers on good agricultural practices. Clearly, an extension programme is needed here to train the farmers on the correct agricultural practices to ensure safety of the produce for consumption. Strict control over selling of banned pesticides should be taken by the authority.

Expansion of the markets for organic produce worldwide may encourage the producers to apply organic principles on their farms. In order to encourage farmers into organic farming, adequate market incentives should be provided to the farmers in the form of cheaper credits, better market infrastructure, technical support and adequate fiscal incentives.

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