

VEGETABLE MARKETING AND SUPPLY CHAIN OF HPA-AN TOWN

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Abstract

Vegetables are major daily consuming item for human beings. Because of daily consuming item and cheaper price than meat, vegetable supply is important for people live not only in urban area but in rural area. In Hpa-an, although more than thirty types of vegetable are sold, eight major items are lime, tomato, corn, carrot, gourd, etc. Four vegetable markets are found in Hpa-an and vegetables come from various sources such as village tracts of Hpa-an Township, Thailand, Mawlamyine, Aungban, Tatkone, Thahtone, Yangon, Belin, Belukyun, etc. In supply chain, wholesale market, retail markets and customers are major links in vegetable supply chain of Hpa-an. Objectives of this paper are to examine types and sources of vegetables sold in markets in Hpa-an, to explore the flow of vegetables in Hpa-an, to investigate supply chain vegetables marketing in Hpa-an and to find out existing problems in vegetables marketing. Primary and secondary data derived from field survey, interviews, and secondary sources were analyzed and problems and issues related with vegetable market were presented.

Keywords: Vegetables, market, flow, supply chain, types of vegetable

Introduction

Vegetables are assumed as essential for well-balanced diets since they give vitamins, minerals, dietary fiber, and phytochemicals (Food and Nutrition Sciences, 2012). Most vegetables are noticeably low in fat and calories and vegetables give nutrients indispensable for health. Eating vegetables may decrease threat for heart disease, including heart attack and stroke (Nutrients and health benefits, 2014). Vegetable cultivation and production are one of the pillars on employment and income generation in the rural areas (World Development, 2007).

Vegetable farming is labor-intensive and its cultivation depends on high demands. Growing vegetables is a good practice in developing and rural areas (Ines Hajdu, 2015). A world vegetable survey showed that there are 392 vegetable items cultivated worldwide, representing 70 families and 225 genera (Kays and Dias, 1995). A growing number of urban consumers are also demanding safe vegetables (Figuié, 2004).

A supply chain is active process and includes the continuous flow of information, merchandise, and funds between different stages. The buyer is a fundamental part of the supply chain (Athalye, 2015). Worldwide the total volume traded in vegetables has increased fivefold from 1965 to 2005 (FAO, 2007). Vegetables are often highly perishable products and most of the vegetable are consumed in nearby areas. But, to meet the need for local demand, vegetables are used to import from nearby countries. Myanmar also imported vegetables from Indonesia, China, Thailand, etc.

In Hpa-an, vegetables are grown and also imported from Thailand through Myawaddy that is a very small border town engaging in transit trade and brokers trade vegetable through Myawaddy (Yu Yu Naing, 2012).

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Vegetable wholesaling and retailing are found in markets of Hpa-an. Hpa-an was selected to present vegetables markets playing wholesaling, retailing, and supporting for local people from geographical point of view.

Objectives

- To examine types and sources of vegetables sold at the markets in Hpa-an
- To explore the flow of vegetables to Hpa-an
- To investigate the supply chain vegetables marketing in Hpa-an
- To find out existing problems in vegetables marketing

Data and methodology

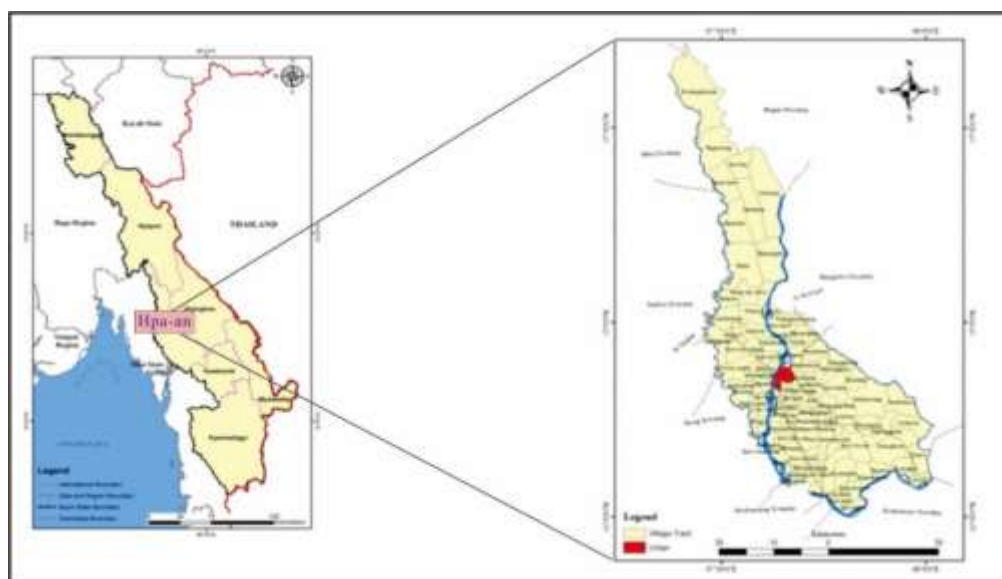
To present vegetables markets of Hpa-an, exploratory approach was used. Four wholesalers, four retailers and ten customers were interviewed and questionnaires were distributed to fifteen wholesalers, fifteen retailers and thirty customers. Survey period was from January, 2020 to July, 2020.

The survey is mainly done to collect primary data on types and sources of vegetables, buying, selling, the demand, price, vegetable flow in the vegetable market. Focus group discussion has also been carried out with the shop owners, users and local people of the vegetable market. To assess the current status of vegetable markets of Hpa-an, it is needed to outline the underlying logistical supply chain routes of vegetables. Therefore, supply chain of vegetables was presented.

All the primary and secondary data from field survey, interviews, Township Development Committee, and secondary sources were analyzed and problems and issues related with vegetable market were presented.

Geographical Background of Hpa-an

Hpa-an is located between the North latitudes $16^{\circ} 30' 15''$ and $17^{\circ} 42' 30''$ and between the East longitudes $97^{\circ} 22' 30''$ to $98^{\circ} 0' 10''$. It has an area of 2901.02 square kilometers (716857 acres).



Source: MIMU

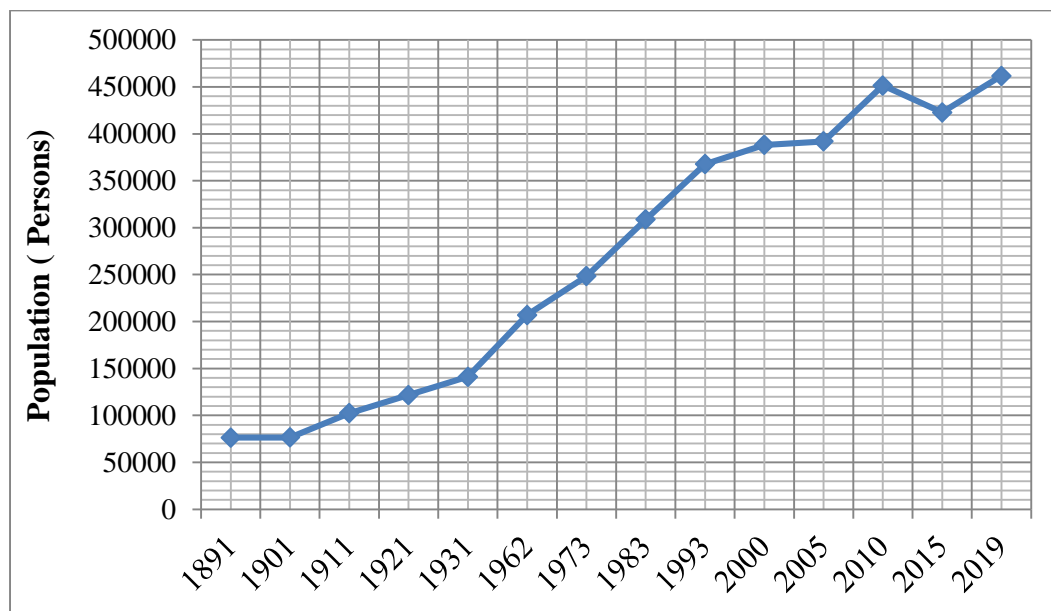
Figure 1 Hpa-an Township (left) and Hpa-an (right) in Kayin State.

In Hpa-an Township, northern part is higher than southern part. The area with an elevation below 25 metres (82 feet) covers more than 60 percent of the Township's area. The low land area supports annual crop cultivation including vegetable cultivation. Vegetables are also grown on Kaing-kyun land in Hpa-an.

Mean temperature of Hpa-an is 27.72°C and the coldest month is December with mean temperature of 26.11°C. The hottest month was May with mean temperature of 29.85°C. The average annual rainfall of Hpa-an, was 2396.31 millimeter (94.34 inches). According to the Koppen's classification, Hpa-an Township experiences Tropical Monsoon type of climate (Am). Vegetables are grown not only in the rainy season but also in cool dry period.

Soils of the township are Meadow Alluvial Soils (Fluvisols), Brown Meadow Soils (Gleysols), Meadow Gley Soils (Gleysols) and Red Brown Forest Soils (*Rhodic Ferralsol*). Vegetables are grown on where the soils are unsuitable for vegetable cultivation by means of land preparation.

In 1973, total population was 248362 persons and it increased to 461606 in 2019. Like other area, population and demand for vegetable also increases. People living in Hpa-an are major customers of vegetable markets. In 2019, urban population was 62842 persons (14percent) and the rural population 398764 persons (86 percent). Not only rural population but also people living in urban area cultivate vegetables.



Source: Labour, Immigration and Population Department, Hpa-an

Figure 2 Population Growth of Hpa-an Township

Results and Findings

Vegetable Markets in Hpa-an

Four vegetable markets are found in Hpa-an, Yaebaw Market (No-1, Sanpya Market) in Ward No-2, Yebaw Market (Mann Aung Market) in Ward No-5, Maebaung Market (No-2, Sanpya Market) in Maebaung Village and Thiri Market in Ward No-6. Yaebaw Market is a major market that is a wholesale as well as retail market in Hpa-an.



Source: General Administrative Department

Figure 3 Vegetable Markets of Hpa-an

In Hpa-an, most vegetable growers sell their vegetables to brokers who come and collect vegetables from the villages and then, fetch to the Yaebaw Market at which broker and transporter, wholesalers, retailers, and customers meet for the purpose of supplying vegetable in Hpa-an and other towns such as Mawlamyine. Therefore, Yaebaw Market is a major place for vegetable marketing.

Retailers from Yebaw, Maeabang and Thiri markets buy vegetables from Yaebaw Market with wholesale price and they again sell in other small markets with retail price. Most vegetables flow to Maeabang Market and remaining three markets play vegetable retailing only and they mainly serve the people of nearby areas.



Source: Author (22.6.2020)

Plate 1 Yaebaw Market (No-1, Sanpya Market)



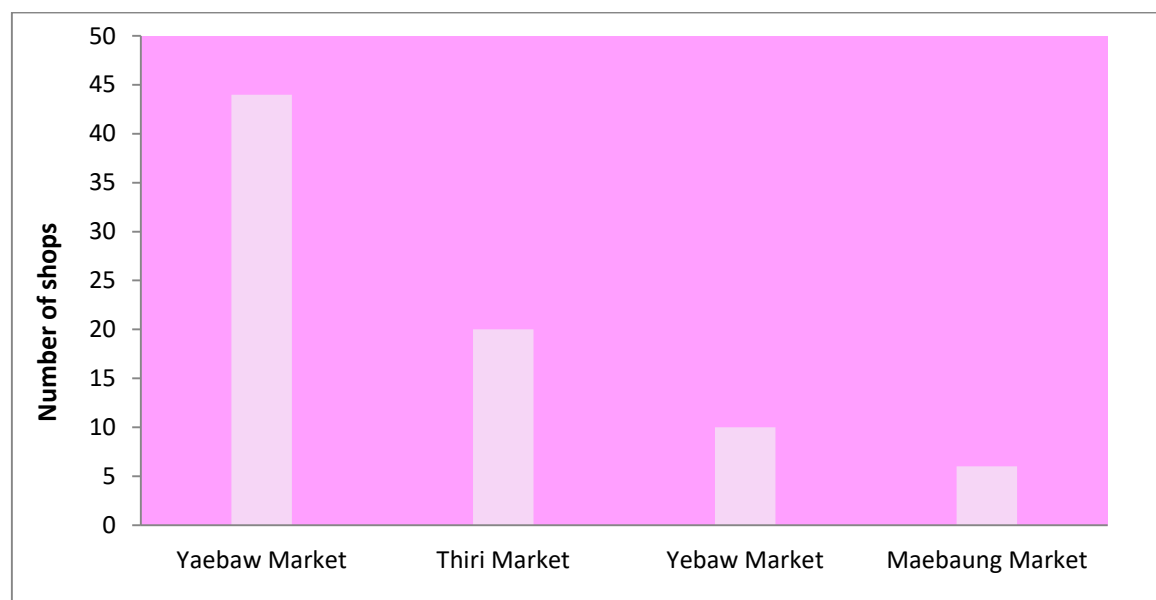
Source: Author (27.6.2020)

Plate 2 Maeabang Market (No-2, Sanpya Market)



Moreover, Hpa-an has a Farmers' market but it was omitted as it is not a regular market and it was found once per month.

The number of shops is largest in Yaebaw Market (No-1, Sanpya Market) due to large wholesale market and better accessibility and smallest in Maebaung Market (No-2, Sanpya Market) located fringe area of Hpa-an.



Source: Market Development Committee

Figure 4 Number of Vegetable shops in Hpa-an

Types of vegetables

Hajdu, 2015, grouped vegetables in to five types: leaf vegetables (lettuce, cabbage), fruit vegetables (pepper, cucumber, and tomato), root vegetables (carrot, radish, and sweet potato), bulb vegetables (garlic, onion) and flower vegetables (cauliflower, broccoli). But, to present the paper, vegetables are grouped into three types: leaf vegetables, fruit vegetables and root and bulb vegetables.

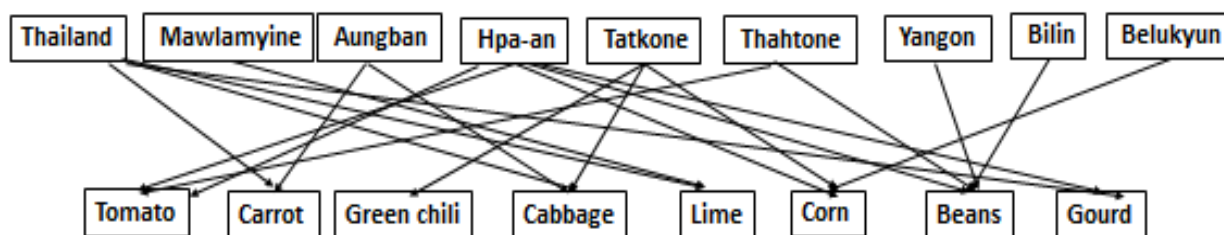
In Hpa-an, major vegetable items sold in the markets are fruit vegetables such as bottle gourd, pumpkin, cucumber, eggplant, lime, tomato, okra, drumstick, etc., leafy vegetables such as roselle, mustard, lettuce, cabbage, Chinese cabbages, acacia pennata, bell pepper etc. and root and bulb vegetables radish, carrot, young bamboo shoot, sweet potato and potato.

Sources and flow of Vegetables

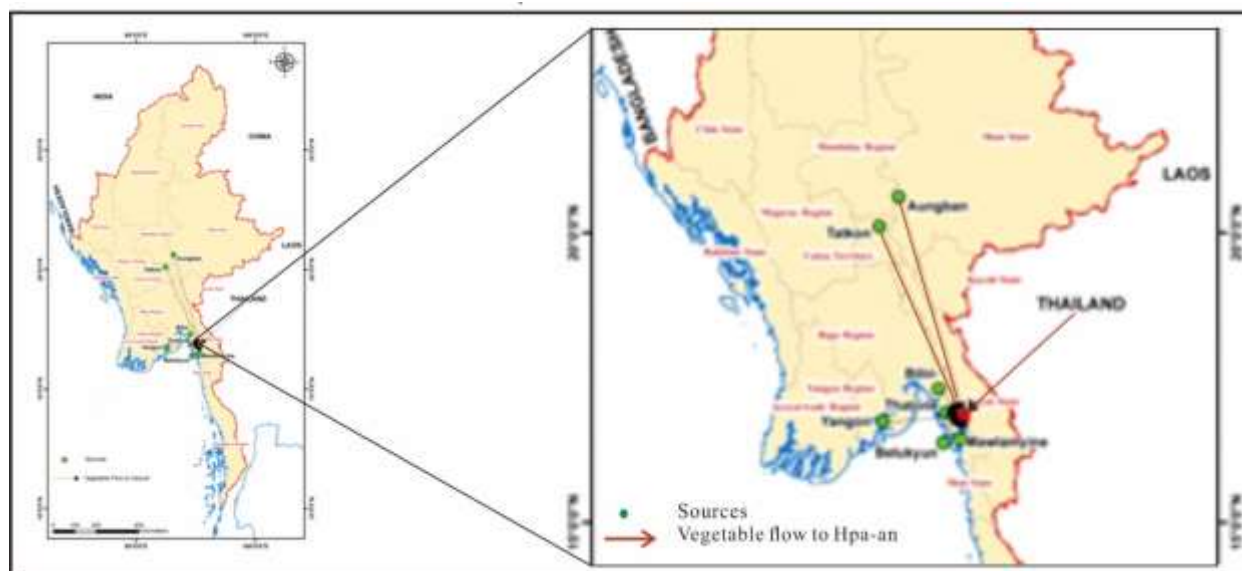
In Hpa-an, vegetables are mainly grown on Kaing-kyun land and most vegetables are produced there. Moreover, small number of vegetables are also grown in le land and in residential compound. In the study area, cabbage, cauliflower, lettuce, gourd, tomato and coriander are grown in the winter season and water crests, roselle, radish, string beans, ground, lady finger, egg-plant, pumpkin and cucumber are cultivated in the rainy season.

Although more than thirty items of vegetable are sold in vegetable markets in Hpa-an, most common nine items: tomato, carrot, green chili, cabbage, lime, corn, beans and gourd were selected to present sources and flow of vegetables.

Vegetable market in Hpa-an come from various sources, village tracts of Hpa-an Township, Thailand, Mawlamyine, Aungban, Tatkhone, Thahtone, Yangon, Belin, Belukyun, etc.



Flow Chart: Flow of Vegetables



Source Market Development Committee

Figure 5 Vegetable Flow of Hpa-an

Most vegetables are carried from Thailand through Myawaddy and amount of vegetable fetch from Thailand is second largest in amount of vegetable sold in Hpa-an. Vegetables fetched by pickup cars from Thailand are less fresh than those produced in Hpa-an due to time spend on the way. Most vegetables especially leafy vegetables are not suitable for long-term storage. But, transporting vegetables with refrigeration is not found in the area.

Although Myawaddy and Hpa-an take only three hours, vegetables may have been plucked a day before sending to Hpa-an. But these vegetables are better physical appearance and large in size. Therefore, vegetable fetched from Thailand are best selling items because of customers' preference. Nearness to Thailand is locational advantageous for Hpa-an vegetables market. Although Aungban located in Shan State is far from Hpa-an, carrot and cabbage are brought from there.

Hpa-an produces many vegetable items and vegetables produced from Hpa-an are more fresh and cheaper due to low transport cost. But, some vegetables such as carrot, sweet potatoes, green chili, etc. produced in Myanmar cannot compete to those produced in Thailand due to better appearance.

Seasonal changes in vegetable supply pattern

According to interviews with vegetable sellers, seasonal changes in vegetable supply pattern are found in the area. In the rainy season, cabbage, cauliflowers, rosella, watercress, lime, lettuce, and young bamboo shoots are major supplied items and horseshoes, coriander, ridge gourd and radish are less supplied items due to highly perishable, less durable, and high risks in cultivation. Major supplied items in winter are green chili, drumstick, maize, cabbage, cauliflowers and eggplant, sweet potato, etc. and less supplied items are snake beans, tomato, broccoli, and cucumber.

Vegetables marketing Calendar

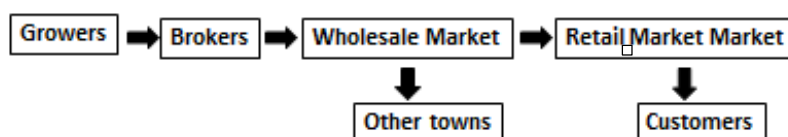
Months	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Major items in the rainy season							Cabbage, cauliflowers, rosella, lime, lettuce, and young bamboo shoot					
Major items in Winter	Green chili, drumstick, maize, cabbage, cauliflowers, eggplant, tomato and sweet potato										Green chili, drumstick, maize, cabbage, cauliflowers, eggplant, tomato and sweet potato	

Rainy
 Winter

Source: Open talks and Interviews with vegetable sellers

Supply Chain of Vegetables

In studying supply chain of the vegetable markets, growers, brokers, sellers of wholesale market, seller of retail markets and customers are included. But, on the other hand, from wholesale vegetable market of Hpa-an, vegetables are fetched to other nearby towns especially Mawlamyine. To present supply chain of the vegetable, sellers of wholesale market, seller of retail markets and customers were stressed because they directly play important role in supply chain of the vegetables in Hpa-an.



Source: Open talks and Interviews with vegetable sellers

Flowchart: Vegetables supply chain in Hpa-an

Wholesalers

Brokers send vegetable produced from other area in Myanmar and Thailand to Hpa-an. Traders from other area as well as Hpa-an use high way cars, private cars or motorbikes for their trading operations to send vegetable to wholesale market. But some use hired transport vehicles because their cash are mainly used in investment for buying much amount of vegetables. Wholesalers are intermediaries and they are major link between brokers and retailers. Wholesalers need more investment for buying many vegetable items.

Wholesale market sells the vegetable from 6 a.m. to 5 p.m. Retailers from three markets buy vegetable at Yaebaw Market. From wholesale market of Hpa-an, vegetables such as young bamboo shoot, eggplant, etc. are carried to Mawlamyine. When vegetables imported from Thailand are sold, trimming of leafy vegetables is not needed to be carried out because of systematic packaging. Vegetables collected from other areas within Myanmar are needed to be cleaned and repackaged again. Wholesalers' first priority is physical appearance of the vegetables for the purpose of selling high price.

According to interviews, the vegetable items that give high profit for sellers are beans, cabbage, watercress and roselle, but, low profit are coriander, carrot, tomato, mustard, etc. Due to fragile and perishable items in wholesale market. Wholesalers encounter the loss when heavy rain, flooding, etc. happen after collecting vegetables from brokers. But it rarely occurs, and it is found once per two or three years.

According to questionnaires' answers, 72 percent of the wholesalers buy vegetables in cash down system and remaining 28 percent practice the. system of buying on credit payable at the next purchase.

Retailers

Vegetable retailing has been considered as a very low-margin business (Sengupta, 2008). Retailers use much smaller amount of investment than wholesalers. The cost of vegetable including transport cost is high when the marketplace is far from the farmland. As a consequence, the amount collected and sold by the retailers is small and as economic benefit.

Retailers are intermediaries between wholesalers and customers. In general, all the retailers are inevitably dependent on the local wholesales market selling various vegetable items with wholesale price. Price change in wholesale market affects the supply and demand of retail market.

According to interviews with retailer, vegetables from Thailand are more expensive due to transport cost but they give high benefit due to high market demand caused by better physical appearance. The vegetables that cause losses are coriander, whit lettuce, bell chili, etc. due to high perishability. The vegetables that give high profit are rosella, water cress, tomato produced in Hpa-an due to cheaper price, common use, preferences and, carrot, sweet potato imported from Thailand due to better physical appearance.

Customers

Customers play the last part of the supply chain because of end point. In Myanmar, research works stated that consumer preference based on cleanness, size, ripeness, and form, etc. (The MIMU, 2015). Although consumers' preferences differ from one person to another depending on sex, age, socioeconomic status and other factors, some criteria are the same among consumers (Udomkun et al, 2018). According to interviews, appearance and freshness of vegetables are vital factors affecting customer's choice and plays important role in vegetables marketing, particularly leafy ones.

At present, people become aware on food safety issues due to a number of food-related incidents and reported outbreaks worldwide. The World Health Organization (WHO) has reported up to 30% of the people of developed countries suffer from foodborne diseases since 1985. But, the rate in developing countries is unidentified. Vegetable safety includes conditions and actions that are necessary during cultivation and preparation (Badrie, 2016). Langiano et al., 2012, said that over 30 to 40% of foodborne illness cases result from the home and is still progressively increasing.

According to questionnaires' result, 72 percent of the respondents aware the pesticides used in vegetable cultivation affect human health in Hpa-an. But they do not know foodborne diseases caused by unsystematic vegetable cultivation. According to interviews, the knowledge on pesticides-used vegetable cultivation is available from friends, radio, and relatives. Although they would like to pay less in vegetable buying, their main priority is freshness.

Conclusion

Hpa-an has four vegetable markets in which one wholesale and retail market and three retail markets are included. Fruit vegetables such as bottle gourd, pumpkin, cucumber, eggplant, etc. and leaf vegetables such as roselle, mustard, lettuce, cabbage, etc. are mainly sold. Vegetables are mainly come from Hpa-an, Thailand, Mawlamyine, Aungban, Tatkone, Thahtone, Yangon, Belin, Belukyun, etc. Vegetables from Thailand are brought through Myawaddy that is a very small border town engaging in transit trade including vegetable trade. Vegetables are carried by highway cars, private cars, and motorcycles.

Vegetables produced in Hpa-an cannot compete that produced in Thailand due to lack of knowledge on poor growing methods, packaging, and physical appearance. Farmers use chemical fertilizers and pesticide in vegetable cultivation to get an appealing appearance. Wholesalers and retailers know that effects of chemical input use in cultivation, they lack practice and action on systematic vegetable cleaning.

Supply chain of the vegetable includes growers, brokers, sellers of wholesale market, seller of retail markets and customers in which latter three are mainly found in vegetable market of Hpa-an. Supply chain of the vegetable shows links between wholesalers, retailers and customers. Wholesalers get higher benefit than retailers due to higher investments.

In Hpa-an, like other areas, people become aware health and longevity and relation between food and health. It is needed to plan sufficient safe vegetable availability for local people. Moreover, it is necessary to educate people on organic or natural vegetables consumption that is low risk on health. It is needed to pay more attention to effects of pesticide in vegetable consumption and to educate health risks. Further researches on vegetables marketing such as quality and price of the vegetable, consumer preferences, perception of consumers on vegetable consumption and health, etc. should be done in the future to be safe vegetable supply for the people live in the area.

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