



UNIVERSITI PUTRA MALAYSIA

***VALUE CHAIN ANALYSIS AND MARKET FACTORS OF PINEAPPLE
(Ananas comosus L. Merr.) PRODUCTION IN JOHOR, MALAYSIA***

KHADIJAT JAJI

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By

KHADIJAT JAJI

**Thesis Submitted to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the Degree of Master of
Science**

May 2016

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Abstract of the thesis presented to the Senate of Universiti Putra Malaysia in
fulfilment of the requirement for the degree of Master of Science

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May 2016

Chairman : Norsida Man, PhD
Faculty : Agriculture

Pineapple (*Ananas comosus* L. Merr.) is a tropical, perennial, and economically important fruit with encouraging market potential in the global market. It is the first crop grown as a commodity crop in Malaysia and raised the country's position to a very significant level in the world between the late 60s and early 70s. However, the contribution of Malaysian pineapple to the global market in the recent time has been experiencing downward trend, resulting to a set-back in its competitiveness. Therefore, the knowledge about the series of activities, the chain actors involved from pineapple production to consumption, as well as limitations of the chain is considered necessary. Following this scenario, this study focused on value chain analysis and market factors of pineapple production in Johor, Malaysia with specific objectives to map the value chain and marketing channels of pineapple and identify the factors associated with market outlet choice of the pineapple producers; to identify factors influencing pineapple market supply; and to determine the most influencing factors affecting quantity of pineapple supply. A cross-sectional study design was adopted in this study. A well-structured close ended questionnaire via face-to face survey was used to collect primary data from 170 farmers, 20 wholesalers, 30 retailers, and 6 processors. Both descriptive and inferential statistics were used to analyze the data. Descriptive statistics was used to map pineapple value chain and marketing channels. Factors affecting pineapple supply was identified using factor analysis, while multiple regression analysis was employed to determine the most influencing factors affecting quantity of pineapple supplied by the farmers. Based on descriptive statistics, the value chain and marketing channels map showed that the major actors in the study area are pineapple producers, assemblers, wholesalers, FAMA, retailers, processors, exporters, and consumers. The choice of marketing channels by pineapple farmers in the study area was based on the factors such as price of product, grading, timely payment, and mode of payment respectively. The result also revealed that pineapple value chain is constrained by lack of access to credit, high inputs price, shortage of labor, unfair price quotation, poor market information, high transport cost, lack of demand, aging farmers, and poor chain governance. Six (6) factors identified as the factors affecting pineapple supply using factor analysis are credit

access, pineapple varieties, distance to the market, cost of inputs, price of pineapple and extension services. Quantity of pineapple supplied was found affected positively by farming experience, farm size, credit access, pineapple variety, cost of inputs, price of pineapples, and extension services at 5%, 1%, 1%, 5%, 1%, 5% and 5% significant level respectively. Therefore, this study recommends the need for designing appropriate intervention mechanisms focusing on the aforementioned factors to improve the status of pineapple value chain and uplift the smallholder pineapple farmers.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**ANALISIS RANTAIAN NILAI NANAS (*Ananas comosus* L. Merr.) DI
JOHOR, MALAYSIA**

Oleh

KHADIJAT JAJI

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Nanas (*Ananas comosus* L. Merr.) adalah sejenis buah tropika, yang telah lama wujud dan penting dari segi ekonomik kerana mempunyai potensi pasaran global yang menggalakkan. Ia adalah tanaman yang pertama ditanam sebagai tanaman komoditi di Malaysia dan telah meningkatkan kedudukan negara ke tahap yang sangat signifikan dimata dunia pada akhir tahun 60-an dan awal tahun 70-an. Walau bagaimanapun, sumbangan nanas Malaysia di pasaran global pada masa kini, mengalami polar penurunan dan menyebabkan ia tidak berdaya saing. Oleh itu, pengetahuan mengenai turutan aktiviti, kaitan antara pihak-pihak pengendali dalam pengeluaran nanas, serta kekurangan dalam rantaian aktiviti tersebut perlu diketengahkan. Berdasarkan senario ini, kajian ini dibuat untuk menganalisis rantaian nilai dan faktor-faktor pemasaran nanas di Johor, Malaysia dengan objektif khusus untuk memetakan rantaian nilai dan kepelbagaian saluran pemasaran nanas dan mengenalpasti faktor-faktor yang berkaitan pemilihan tempat pemasaran di kalangan pihak pengeluar nanas; mengenalpasti faktor-faktor yang mempengaruhi pemasaran nanas; dan menentukan faktor yang paling memberi kesan terhadap kuantiti pemasaran nanas. Satu reka bentuk kajian keratan rentas telah dilaksanakan dalam kajian ini. Kaji selidik berstruktur tertutup telah digunakan untuk mengumpul data primer secara temubual daripada 170 petani, 20 pemborong, 30 peruncit, dan 6 pemproses. Statistik deskriptif dan inferensi telah digunakan untuk menganalisis data kajian ini. Statistik deskriptif digunakan untuk menerangkan memetakan rantaian nilai dan kepelbagaian saluran pemasaran nanas. Faktor-faktor yang boleh menjejaskan bekalan nanas telah dikenal pasti menggunakan analisis faktor, manakala analisis regresi berganda telah digunakan untuk mengenal pasti faktor-faktor yang sangat mempengaruhi kuantiti bekalan nanas oleh petani. Hasil pemetaan rantaian nilai dan kepelbagaian saluran pemasaran nanas menunjukkan bahawa pengendali utama di kawasan kajian adalah pengeluar nanas, orang tengah, pemborong, FAMA, peruncit, pemproses, pengeksport dan pengguna. Pemilihan saluran pemasaran oleh petani dalam kajian ini adalah dipengaruhi oleh faktor-faktor seperti harga barangan, penggredan, pembayaran yang tepat pada masanya, dan cara-cara pembayaran. Hasil kajian ini juga menunjukkan bahawa rantaian

nilai nanas adalah terbatas oleh kekurangan pembiayaan, harga input yang tinggi, kekurangan tenaga buruh, sebut harga yang tidak adil, maklumat pasaran yang lemah, kos pengangkutan yang tinggi, kekurangan permintaan, petani yang semakin berumur, dan pengurusan yang lemah. Enam (6) faktor yang telah dikenal pasti sebagai faktor yang mempengaruhi bekalan nanas menggunakan analisis faktor adalah akses kepada pembiayaan, jenis-jenis nanas, jarak ke pusat pemasaran, kos input, harga nanas dan perkhidmatan pembangunan. Kuantiti nanas yang dibekalkan didapati telah dipengaruhi secara positif oleh pengalaman pertanian, saiz ladang dan akses kepada pembiayaan dan perkhidmatan pembangunan masing-masing pada 5%, 1%, 1%, 5%, 1%, dan 5% tahap signifikan. Oleh itu, kajian ini mencadangkan keperluan membentuk mekanisma intervensi yang sesuai dengan memberi tumpuan kepada faktor-faktor yang dinyatakan di atas bagi meningkatkan status rantaian nilai nanas dan mengukuhkan kedudukan pekebun kecil nanas di Malaysia.

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I certify that a Thesis Examination Committee has met on 06 May 2016 to conduct the final examination of Khadijat Jaji on her thesis entitled "Value Chain Analysis and Market Factors of Pineapple (*Ananas comosus* L. Merr.) Production in Johor, Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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LIST OF ABBREVIATIONS

APO	Asian Productivity Organization
AusAID	Australian Agency for International Development
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement
DfID	Department for International Development for the United Kingdom
DOA	Department of Agriculture
DOS	Department of Statistics
ETP	Economic Transformation Programme
FAMA	Federal Agriculture Marketing Authority
FAO	Food and Agriculture Organisation
GCC	Global Commodity Chain
GDP	Gross Domestic Product
GIZ	German Agency for International Development
GNI	Gross National Income
GVC	Global Value Chain
INRA	Institut National de la Recherche Agronomique
ITC	International Trade Centre
KMO	Keiser-Meyer-Olkin
MARDI	Malaysian Agriculture Research and Development Institute
MOA	Ministry of Agriculture and Agro-Based Industry
MPIB	Malaysian Pineapple Industry Board
NAMBoard	National Agricultural Marketing Board
NAP	National Agricultural Policy
NGO	Non- Governmental Organization
NKEAs	National Key Economic Areas
OLS	Ordinary Least Square
PCA	Principal Component Analysis
PEMANDU	Performance Management and Delivery Unit
PRA	participatory Rural Assessments
SWOT	Strengths, Weaknesses, Opportunities, and Threats
UNCTAD	United Nations Conference on Trade and Development

USAID

United States Agency for International Development

VCA

Value Chain Analysis

VIF

Variance Inflation Factors

WFP

World Food Programme



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CHAPTER 1

INTRODUCTION

1.1 Introduction

Agriculture, as an important sector significantly contributes to the economic development in different ways, especially in the income generation, provision of employment opportunities for greater number of the labor force, improvements in rural development, and poverty reduction in the most developing countries (Diao et al., 2007). However, overcoming challenges such as rural poverty, unemployment, and low farmers' income requires a fortifying agricultural sector. World Bank (2008) reveals that using agriculture for development in conjunction with innovation is the main pathway to acquire sustainability of smallholder farming and to get rid of poverty.

In Malaysia, agricultural sector also contributes about 12 percent to the national gross domestic product (GDP), provides raw materials for domestic agro-based industries and reduces the unemployment rate through job creation (Malaysian Business, 2010). Despite all these importance, there are number of issues and challenges facing agriculture. Among them are predominance of small scale producers, ageing farming community, little motivation to finance mechanization, obstacle to meet food safety standards, lack of sufficient knowledge about good agricultural practices and limited access to market facilities (FAMA, 2013).

The Third National Agricultural Policy (1998-2010) and Ninth Malaysia Development Plan (2006-2010) which developed as supplementary to achieve increase in efficiency, productivity and competitiveness of Malaysian agriculture have stressed the upgrade of fruit industry in which pineapple industry is not left out. The emphasis of these two policies was based on increase in production through expansion in cultivation area to satisfy the growing demand for fresh and processed tropical fruits, both in domestic and export markets.

The third National Agricultural policy (NAP) (1998-2010) identifies agricultural sector as the third engine of growth, after manufacturing and service sectors to control 1997 Asian Financial Crisis. The policy focused on increasing the competitiveness of the agricultural sector with main goal of increasing income via maximum resources usage in the sector, increasing agricultural contribution to national GDP and increasing income of producers. The specific aims of the third National Agricultural Policy include: to increase food security; to increase efficiency and competitiveness of the sector; -to strengthen connection with other sectors; to generate new sources of growth for the sector and to manage and make

use of natural resources for the sustainability of development (Ministry of Agriculture, 1999).

Another developmental program that recognized the significance of agricultural sector is Economic Transformation Program initiated by the Malaysian government with the purpose of turning Malaysia into a high income economy by the year of 2020. The program is controlled by the Performance Management and Delivery Unit (PEMANDU), an office under the Prime Minister Department of Malaysia. In 2010, 12 National Key Economic Areas (NKEAs) expected to have a great prospective to contribute considerably to economic growth of Malaysia were identified by the Performance Management and Delivery Unit (PEMANDU), in which agricultural sector is included.

The main aim of Agriculture National Key Economic Areas (NKEAs) is based on the transformation of a conventionally small-scale agricultural production-based sector into a large scale agribusiness industry that adds to economic growth and sustainability. This transformation is planned to be achieved through four key subject matters: capitalizing on competitive advantages, tapping premium markets, aligning food security objectives with increasing Gross National Income (GNI), and participating in the regional agricultural value chain. Regarding the four subject matters, Agriculture National Key Economic Area (NKEA) is expected to produce RM28.9 billion in incremental Gross National Income (GNI) and 74,600 jobs by 2020 mostly in rural areas to transform the rural economy (Economic Transformation Programme ETP, 2011).

National Agro-Food Policy (2011-2020) is the current government's policy on agriculture introduced to succeed the Third National Agricultural Policy. This policy was designed to cover the period between 2011 and 2020 and focused on sufficient qualitative food supply, competitiveness and sustainability of agro-food industry, and increase in the income of agriculture entrepreneurs. Specifically, this policy outlined seven strategic directions towards the development and significant contribution of the sector to the national economic growth. Those strategic directions are: to safeguard national food Security; to increase the contribution of agro food industry; to complete the value chain; to empower human capital; to strengthen the activities of research and development, innovation and the use of technology; to create the environment for private sectors led businesses; and to strengthen the role of agricultural organizations (Ministry of Agriculture and Agro-Based Industry, 2011).

1.2 Malaysian Pineapple Industry

Malaysian pineapple canning industry has been in existence for more than a hundred years ago. The industry is relatively small compared to palm oil and rubber industries, and managed and coordinated by Malaysian Pineapple Industry Board (MPIB), an agency under Ministry of Agriculture and Agro-Based Industry (MOA) which was established in 1957 under the 1957 Pineapple Industry Ordinance. Pineapple industry contributes significantly to the country's socio-economic development in terms of improving livelihoods of smallholder farmers through incomes generation. It contributes to the nation's economic development and growth of other supporting economic activities such as packaging, transportation, labeling, and other value addition activities, particularly in Johor.

Pineapple (*Ananas comosus* L. Merr.) is a tropical, perennial, drought-tolerant, juicy, fleshy fruit with color ranges between yellow to creamy white with sweet taste and rich flavor. It is the leading edible member of the family Bromeliaceae with over 2,000 species (Bartholomew et al., 2003). Pineapple was introduced to Malaysia in 16th century by Portuguese and Spanish explorers and started to be cultivated in Singapore, Johor and Selangor as cash crops in year 1921 during the shoot up period of rubber production. Pineapple plantation continued to expand in peat soil areas especially in Johor and in other states such as Selangor, Kelantan, Sarawak and Penang (MPIB, 2013). The state of Johor is known as the largest pineapple producer in 2011 with the quantity of production estimated at 80,389.22 metric tons (MPIB, 2011). The varieties of pineapple such as Moris Gajah, Moris, (Mauritius), Sarawak, Gandul, N36, Yankee, Josapine, Maspine and MD2 are commonly planted in Malaysia. The varieties of pineapple cultivated for fresh consumption purpose are Moris, Sarawak and Josapine, Gandul for canned pineapples and fruit juice, while N36 and Maspine are produced for consuming fresh and processing into canned pineapples and fruit juice for local and export fruit market. Malaysian pineapples has high market demand in countries such as Japan, United Arab Emirates, European countries, Singapore, West Asia and others (MPIB, 2013).

1.2.1 Pineapple Production in Malaysia

Pineapple production in most of pineapple producing countries mainly involves both smallholder producers and estates plantations. There has been a steady and reasonable increment in the trend of pineapple production worldwide from 15.83 million metric tons in the year 2002 to 24.16 million metric tons 2012 as shown in Table 1.1 below. However, just a slight increment over the 2012 production volume was recorded in the year 2013 with 24.79 million metric tons.

Table 1.1: Global Pineapple Production from 2002 to 2013 (in million metric tonnes)

Year	Production in million metric tonnes
2002	15.83
2003	16.16
2004	16.80
2005	17.67
2006	19.64
2007	19.90
2008	19.49
2009	19.97
2010	21.04
2011	22.88
2012	24.16
2013	24.79

Source: FAOSTAT (2014)

The global pineapple production in 2013 was estimated at 24.78 million metric tons with Costa Rica, Brazil, Philippines, Thailand, and Indonesia as the top five pineapple producers in the world. They all produced about 10 million tons of pineapple. Although, from the past record Brazil has been the largest pineapple producer over the past ten years until 2011 when Thailand took over. Other important producers include China, India, Nigeria, Mexico and Colombia. Malaysia also is not left out among the countries contributing to world's market pineapple supply, as Malaysian pineapple was estimated at 315.977 metric tons to the global market and ranked nineteenth pineapple producing country as shown in Table 1.2 below (FAOSTAT, 2014).

Table 1.2: World Top Pineapple Producers in 2013 (Metric tonnes)

Country	Production (MT)	Rank
Costa Rica	2.685.131	1
Brazil	2.483.831	2
Philippines	2.458.420	3
Thailand	2.209.351	4
Indonesia	1.837.155	5
China	1.776.361	6
India	1.571.000	7
Nigeria	1.420.000	8
Mexico	771.942	9
Colombia	643.039	10
Ghana	636.540	11
Vietnam	585.120	12
Venezuela	564.202	13
Dominican Republic	485.737	14
Angola	479.357	15
Peru	438.576	16
Benin	358.869	17
Tanzania	358.253	18
Malaysia	315.977	19
Guatemala	243.570	20

Source: FAOSTAT (2014)

In Malaysia, pineapple is reported to be the first crop grown as a commodity crop with high export potential. This enabled her ranking as one of the top three pineapple producers in the world between late 60s and early 70s, however, the ability to remain competitive suffered a great hitch (Othman and Buang, 2010). This setback has been attributed to different factors among which is switching of pineapple farmers to other crop like palm oil which they believed to be more profitable and easier in terms of production activities. As a result of this, pineapple industry has been experiencing shortage of land area for the production of pineapple (Lin, 2009). The decline in the pineapple plantation area was so obvious among the smallholder sector until 2007 when industry experienced increment (5,923ha) in the plantation area of the smallholder sector (Table 1.3). Notwithstanding, the reduction in the pineapple plantation area continued yearly till 2011 when the plantation area was 1,310ha. Contrary to smallholder sector, the plantation area for pineapple estate growers has been exhibiting a constant and continuous pattern since year 2000 up till 2011 when the increase of around 20% was reported between 2010 and 2011.

Table 1.3: Trend of Pineapple Plantation Size Based on Registered Smallholder Farmers And Estates from the Year 2000-2011 (Hectare)

Year	Smallholder Farmers (ha)	%	Estate (ha)	%	Total
2000	2,271	52.88	2,023	47.12	4,294
2001	1,321	39.50	2,023	60.50	3,344
2002	1,366	40.30	2,023	59.70	3,389
2003	1,434	41.48	2,023	58.52	3,457
2004	1,477	42.19	2,023	57.81	3,500
2005	1,943	44.45	2,428	55.55	4,371
2006	2,383	49.53	2,428	50.47	4,811
2007	5,923	70.92	2,428	29.08	8,351
2008	2,425	49.97	2,428	50.03	4,853
2009	2,068	45.99	2,428	54.01	4,496
2010	2,675	52.42	2,428	47.58	5,103
2011	1,310	32.25	2,752	67.75	4,062

Source: Malaysian Pineapple Industry Board (2011)

Malaysian pineapple production has been experiencing fluctuation over the years as can be seen in Figure 1.1 below which shows the trend of pineapple production in Malaysia from the year 2008 to 2013. In the year 2008, the quantity of pineapples produced by Malaysia was estimated at 384,673 tons, subsequently, pineapple production has been reducing continuously for three years before a significant upsurge in 2012 when production increased from 309,331 tons in 2011 to 334,400 tons in 2012. However, the increase in production failed to continue as production dropped to 315,977 tons in 2013 (Agrofood Statistics, 2013; FAOSTAT, 2014).

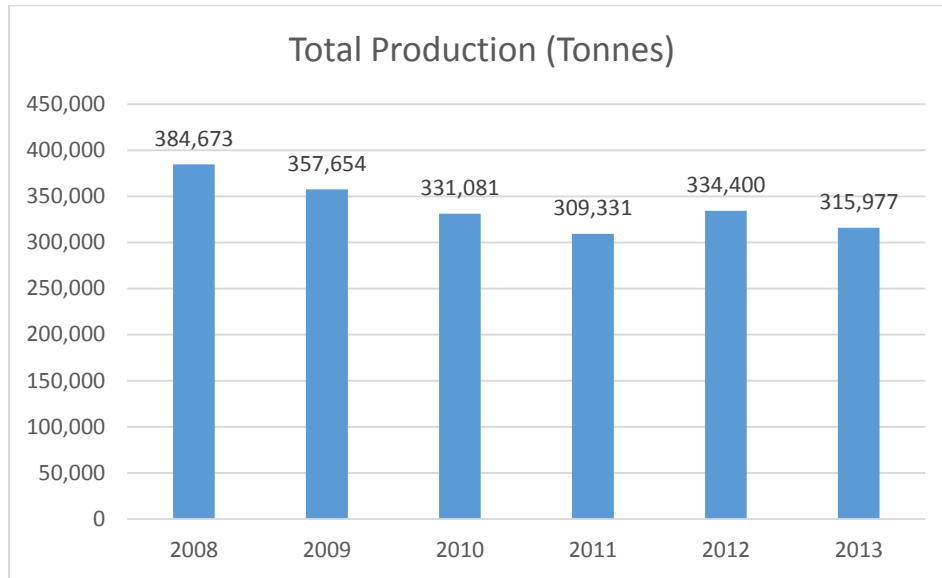


Figure 1.1: Trend of Pineapple Production in Malaysia from the Year 2008 to 2013
(Source: Agrofood Statistics, 2013; FAOSTAT, 2014)

1.2.2 Smallholders

In most developing countries, economic development and ability to meet the basic needs of the growing populations are greatly depending on the growth of the agricultural sector (Datt and Ravallion, 1996). The role of smallholder producers in agricultural development is very important as their contributions are acknowledged in terms of income generation and distribution, food security, employment, and foreign exchange earnings (Hlongwane et al., 2014). Furthermore, adequate income generation by the smallholder farmers for better livelihoods which in turn leads to economic improvement is achievable through the transformation of farming from mainly subsistence system to a smaller or larger commercial businesses connected to both domestic and global markets (Michael, 2013; Webber and Labaste, 2010). As in the case of general pineapple production in Malaysia, the production by smallholder farmers has also been facing instability for the past a decade (Table 1.4). The trend of pineapple production by smallholder farmers showed a decrease trend from 2001 till 2004, when production increased by about 14% over 2003 production quantity.

Meanwhile, the decline in production still set in until 2008, when there was a marked increase in production by around 46% compared to the previous year from 12,109 in 2007 to 98,895 metric tons. In 2009, production was decreased by around 12%, from 98,895 metric tons in 2008 to 59,164 metric tons in 2009, and increased again by around 11% before it sharply decreased again in 2011 by around 16%, from 75,158 metric tons to 44,905 metric tons. The decrease in the total pineapple production is reportedly attributed to reduction in size of plantation area for the smallholder pineapple farmers (Table 1.3).

Table 1.4: Trend of Pineapple Production by Smallholder Farmers from 2000-2011 (MT)

Year	Smallholder Farmers	%
2000	10,053	14.15
2001	7,738	11.90
2002	8,328	11.89
2003	8,743	11.98
2004	21,089	25.84
2005	20,549	23.69
2006	14,594	17.41
2007	12,109	17.40
2008	98,895	63.35
2009	59,164	51.47
2010	79,158	62.13
2011	44,905	46.31

Source: Malaysian Pineapple Industry Board (2011)

In this case, taking economic development and raising smallholders' livelihood into account, with the significance of pineapple fruits in the market worldwide, therefore, value chain which is increasingly acknowledged as analytical tool for economic growth and poverty reduction is important in the pineapple industry to gain more insight in the activities taking place in the industry, hence, potential problems in the industry chain could be identified for the benefit of the chain actors.

1.3 Role of Malaysian Pineapple Industrial Board (MPIB) and Federal Agricultural Marketing Authority (FAMA) in Pineapple Marketing

Malaysian Pineapple Industry Board (MPIB) / Lembaga Perindustrian Nanas Malaysia (LPNM) previously named Lembaga Perusahaan Nanas Tanah Melayu is a Statutory Body established in 1957 purposely for the development of pineapple industry. The agency (MPIB) is under the Ministry of Agriculture (MOA) and plays a role of agricultural extension services provider towards the development of country's agriculture. Among the services rendered by Malaysian Pineapple Industry Board (MPIB) are trainings on farming activities and management, fertilizer application, and market connection and provision of subsidies both in kind and cash forms for the farmers who meet the requirement.

The role of MPIB as stated in the 1957 Pineapple Industry Act (Act 427) which was revised in 1990 include the following:

- 1) The financing of agronomic and processing research programmes for the industry;
- 2) The negotiation of agreements on prices and grade of pineapples for sale to canneries;

- 3) The regulation of the production, grading and marketing of pineapple for sale to canneries and of canned pineapple;
- 4) Administration of quality control and health regulations;
- 5) Administration of cess fund and making recommendations regarding the rate of cess;
- 6) Collection of statistics and maintenance of statistical records of the industry;
- 7) Any other matters affecting the industry.

(Pineapple Industry Act 1957:Pp. 10)

The Federal Agricultural Marketing Authority (FAMA) is another agency apart from Malaysian Pineapple Industry Board (MPIB) that plays a very significant role in the marketing of agricultural products. The Federal Agricultural Marketing Authority (FAMA) is an agribusiness organization under the Ministry of Agriculture and Agro-based Industry. FAMA was established in 1965 for the supervision, coordination, regulation and improvement of the marketing of agricultural products, such as fruits and vegetables, for domestic, export and import markets.

The central role of FAMA as a strong intermediary in the supply chain of agricultural products includes expanding the size of market of agricultural produce; increasing the income of the farmers; advising farmers on the production of safe and high quality products according to the market demand; and safeguarding the constant supply of agricultural and agro based products at reasonable prices to consumers.

1.4 Value Chain Approach

Value chain approach has been employed among development donor organizations, such as AusAID, DfID, GIZ and USAID as an analytical tool through involving smallholders into the production of market oriented high value crops to boost the rural agricultural development and to increase the incomes of poor people in rural areas. Value chain approaches have also been used to analyze the dynamics of markets and to investigate the interactions and relationships among the chain actors (Nicholas and Jonathan, 2013; Mitchell et al. 2009; Anandajayasekeram and Gebremedhin, 2009).

The concept of value chain refers to the series of activities involved in transforming raw materials and other inputs into final products or services delivered to end users. "A value chain describes the full range of activities required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use" (Kaplinsky and Morris, 2001). Value chain is significant as it looks into the relationships between networks

of input suppliers, producers, traders, processors and distributors (UNCTAD, 2000).

According to Kaplinsky and Morris (2001), agricultural value chain analysis is considered as a heuristic device to clearly understand the organization, operation and performance of the chain actors. Agricultural value chain involves the flow of products, knowledge and information between smallholder farmers and consumers. It systematically maps chain actors and their functions in production, processing, transporting and distribution and sales of products. Therefore, it is essential to understand the network, linkages, and the flow of products and information among the pineapple chain actors.

1.5 Problem Statement

Pineapple industry is one of the important agricultural sectors in Malaysia which plays a role in country's earnings as one of the world pineapple suppliers and rural poverty reduction (MPIB, 2013). Consequently, pineapple has been considered in the national agricultural policies as one of the commodities to be developed aiming at meeting the demand for the domestic and international markets due to its economic potential and commercial value. However, the production of pineapple in Malaysia has been tending towards a decline trend since 2009 (Agrofood Statistics, 2013; FAOSTAT, 2014).

The rapid growth in the world's population and increase in the consumers' awareness towards the health benefits obtainable from fruits, had resulted to increase in the demand for fruits globally (Reid and Buisson, 2001; Sabbe et al., 2008). This development has provided a great opportunity for the smallholder farmers to expand their production rate resulting to an increase in their incomes and sector's contribution to GNI.

In spite of ever growing global demand for pineapple fruit and Malaysia's tropical climate and strategic geographical location, Malaysia's contribution to the world's pineapple market is quite low compared to that of counterparts such as Thailand and Philippines (FAOSTAT, 2014; Agrofood Statistics, 2013). Therefore, the country's competitiveness in the international fruit market has suffered a great misfortune which mostly attributed to the factors such as shortage of land area, high cost of production and ageing farming community among others (Lin, 2010; Othman and Buang, 2010; FAMA, 2013).

While the Malaysian agricultural development policies are designed to increase the productivity, competitiveness of the agricultural sector, sustainability of agro-food industry, and increase income of the producers for the significant contribution of the sector to the economic growth of the country, competitiveness of pineapple

sector is considered important. In order to accomplish this, considering the economic importance of pineapple in the market, value-chain analysis as a relevant strategic tool for increasing competitiveness is viewed as an approach through which understanding of the network, linkages, and quantity of product flow among pineapple value chain actors can be achieved. Value-chain analysis has also been used to identify where and how chain's participants could introduce efficiencies, reduce costs and maximize value. This strategy was initially popularized by (Porter, 1985).

Furthermore, marketing of agricultural commodity is an essential and challenging task as its production in agricultural industry. Marketing plays a significant role in the course of making product available for the end users, meeting the overall goals of food security, poverty alleviation and agricultural sustainability, mostly among smallholder farmers in developing countries, as well as in agricultural development in general (Altshul, 1998; Lyster, 1990). According to Awoyinka (2009), an efficient marketing system triggers the agricultural production and further improves the supply. Emana (2008) also claimed that the farmers who operated subsistence and semi-subsistence agriculture eventually come up with low marketable surplus making them to be in low equilibrium poverty trap. He added that the way out for such farmers is to exercise transformation from the low marketability semi-subsistence farming to high level market-oriented farming.

Marketing channels in which farmers participate play an essential role in farmers' incomes and the overall goals of economic development. Tsourgiannisa et al. (2008) reported that, the profit made by farmers during the course of selling their products is determined by the chosen marketing channel. Despite the importance of marketing in the operation of agricultural commercialization, smallholders' participation in different markets could be hindered by different factors such as transaction costs and other sources of market imperfections (Sadoulet and de Janvry, 1995 as cited in Moti, 2007).

A study on pineapple in Malaysia by Rajendran et al. (2012) revealed the level at which pineapple farmers patronize different marketing channels. Their result showed that only a small percentage (4%) of the farmers were found having processors as their channel of distributing their produce. This seems pineapple farmers are not fully exploring the various marketing channels available for them. Therefore, it is necessary to explore how pineapple farmers have been utilizing the available marketing channels and what factors associated with their selection of buyers.

Different studies have been conducted on pineapple in the study area, most of the studies examined chemical aspects. Although, there are few relevant studies on socioeconomic and marketing aspects of pineapple (Assis et al., 2014; Rajendran et al., 2012). However, study on value chain and market factors of pineapple has not been done specifically. Therefore, this study aims to analyze value chain and

market factors of pineapple production in Johor by providing the analytical structure of the chain in order to have a better understanding of the linkages among the chain actors, as well as constraints and opportunities along the pineapple value chain. In addition to this, since the value chain analysis also looks into market dynamic of the product, those demographic and technical factors affecting market supply quantity of pineapple, as well as the factors associated with market outlet choice of pineapple farmers worth investigating. These type of studies will provide the basis for policy interventions towards increasing production, farmers' income and economic development.

1.6 Research questions

Research questions for this study are:

- 1) Who are the actors in pineapple value chain in Johor and what are their linkages?
- 2) What are the various marketing channels used by pineapple farmers in the study areas?
- 3) What are the factors associated with market outlet choice decisions of pineapple farmers?
- 4) What are the constraints facing pineapple value chain in the study areas?
- 5) What are the factors influencing pineapple supply to the market?
- 6) What are the most influencing factors affecting quantity of pineapple supply to the market?
- 7) What are the effects of demographics on quantity of pineapple supply to the market?

1.7 Objectives of the Study

1.7.1 General Objective

The general objective of this study is to analyse value chain and market factors of pineapple production in Johor, Malaysia.

1.7.2 Specific Objectives

The specific objectives of this study are:

- 1) To map value chain and marketing channels of pineapples and identify the factors associated with market outlet choice of the farmers;
 - 2) To identify the factors influencing pineapple supply to the market;
- and

- 3) To determine the most influencing factors affecting quantity of pineapple supply.

1.8 Significance of the Study

As previously stated, competitiveness is a vital quality which indicates the country's productivity level. Value chain analysis plays a significant role in pinpointing the strengths and weaknesses of an industry towards improvement in the competitiveness. Value-chain analysis certainly provides valuable information on connection between chain actors, who adds value and where, as well as market dynamics. It helps to pinpoint pressure points and weaker links where returns are low for the purpose of improvements (Schmitz, 2005).

This study generated an analytical structure of pineapple value chain. Thus, this structure provides insights into the interaction between chain actors to understand what challenges and opportunities exist, links in the value chain where interventions are needed for the enhancement of production. The information generated from this study could be beneficial for the various actors in the pineapple value chain. It could also be used by government agencies such as Malaysian Pineapple Industry Board (MPIB), Federal Agricultural Marketing Authority (FAMA), and Ministry of Agriculture at large. The information can also benefit non-governmental organizations, research and development organizations, extension service providers, and policy makers to formulate appropriate policies towards development of pineapple sector. The result of the study can also acts as guidelines for interventions towards improvement in the efficiency of the pineapple production and marketing system in the study area and as a source of information to future researchers in the pineapple industry.

1.9 Terms and Limitation of the Study

Value chain: It is a group of actors involved in the series of activities that are required to make the product available for the consumers.

Value chain analysis: A systematic and analytical tool to explain the connection between all actors in the chain of production and distribution.

Market supply: refers to the actual quantity of product taken to the markets regardless of the need for household consumption and other requirements.

Marketing channel: For the purpose of this study marketing channel refers to the distribution channel through which farmers sell their pineapples.

This study was conducted in the state of Johor where the important information was collected from sample households, wholesalers, retailers and processors. Since the study is limited to Johor, the results of this study may have limitations to make generalizations to the country as a whole. However, it may be useful for areas with similar context with the study areas. Also, ability of the respondents to proffer authentic information determines the validity of the findings.

1.10 Organization of the Thesis

This study consists mainly of five (5) chapters which include introduction, literature review, methodology, results and discussions, and finally summary, conclusions and recommendations.

Chapter 1 deals with the Introduction of the study. This chapter covers information about the agricultural sector in Malaysia, pineapple industry in Malaysia, national agricultural policy for agricultural development, Malaysian pineapple agencies, global pineapple production, smallholder pineapple farmers, value chain approach, problem statement, objective of study, significant of study, terms and limitation of the study and finally, the thesis organization.

Chapter 2 presents the theoretical background of this study and the empirical studies relevant to this research. This chapter first covers the historical background of value chain, followed by value chain framework, an approach on which the study was based. Other concepts relevant to the study such as market supply and marketing channels were also reviewed.

Chapter 3 describes the study area and methodologies employed for this study. The procedure for sampling, methods and approaches of data collection as well as methods used to analyze the data for the study were explained

Chapter 4 presents the results and discussions of the research findings, interpretation of results and the discussion were also detailed.

Chapter 5 provides the summary, conclusions and recommendations derived from the study. The limitations of the study and area for further research were also included in the chapter.

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