UNIVERSITI PUTRA MALAYSIA

IMPACT OF SELECTED ASEAN COUNTRIES' PRICE POLICY ON MALAYSIAN RICE INDUSTRY

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By

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

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Abstract of the thesis presented to the senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science.

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April 2015

Chairman: Professor Datuk Mad Nasir Shamsudin, PhD

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The Association of South East Asia Nations (ASEAN) regional integration framework embodied in the Vision 2020 is an ambitious program which is encompassing the socio-political and economic arena of the ten country members. The ASEAN Free Trade Area (AFTA) is the arm by which the ASEAN region is achieving economic integration through the elimination of tariff and non-tariff barriers between countries members. The Common Effective Preferential Tariff (CEPT) Scheme is the main mechanism to move ASEAN towards the direction of the AFTA. The ASEAN Economic Community (AEC) shall be the goal of regional economic integration by 2015.

Rice is a staple food in the Asian region, a key indicator of national food security and a main source of income for millions of farmers. All these features have drawn the attention of their policy makers to intervene for sometimes at a pure economic basis, sometimes for both economic and socio-political motivations. These governments direct and indirect interventions in the agricultural sector in general and in the rice sector in particular affected the structure of rice crop production, consumption and trade in not only their respective domestic markets but as well at the global rice market level. Few words have described the global rice market: a thin (almost 8% of world rice productions are traded), fragmented in rice type and quality and a geographic concentration of production (over 90% of rice are produced and consumed in Asia).

In Malaysia, rice import is mainly performed within ASEAN region, with Vietnam and Thailand. Currently there is an import duty for rice imports at 20 percent under the Common Effective Preferential Tariff Agreement (CEPT) of AFTA and 40 percent under the Agreement on Agriculture (AoA) of the WTO. Actually there's a sole importer in the country, Padiberas National Berhad (BERNAS), a private entity with the privilege from the government to import rice at duty free rates, but also vested with social obligations on behalf of the Government on the rice industry. Therefore the current policy is an import quota of roughly 35% of domestic rice consumption imposed to the sole rice importer BERNAS.

Rice policies in Thailand have always been geared toward domestic production and improving production for trade. Since 2001, the Thai government introduced the Paddy Pledging Program which has been in use on and off since the introduction. The objective of the rice price pledging scheme was to provide a loan at low interest rate to farmers who needed cash in the early harvesting season so that the farmers can keep their products from selling at low price and delay sales until prices rise later. The government has been storing the purchased rice and selling the stock itself at any time. The price support helped farmers increase their income but it worsened the trade competitiveness of Thai rice.

Present rice policies in Vietnam are a balance between maintaining domestic food security and promoting rice exports. Government intervention is limited in the domestic market and a majority of rice exports in the country are made through state-owned trading enterprises (50% share), particularly by the Vietnam Food Association (VFA). VFA buys rice from farmers to keep the domestic price of rice stable, maintains rice export registration requirements and the Minimum Export Price (MEP) based on the Government regulation on rice exports, in order to regulate the flow and prices of rice exports.

Both the rice pledging program in Thailand and the floor rice export price in Vietnam are price supportive program which only differ in their mechanisms. The first is intended to famers, to increase their income, thus the farmers' paddy price and subsequently the export price; the later is intended to rice exporters to assure a minimum profit, thus rice farmers' income.

The general objective of this study was to assess the impact of selected ASEAN countries' price policy on Malaysia rice industry, with these following specific objectives of developing a system dynamics model for the Malaysia rice industry incorporating the ASEAN rice industry variables, to simulate the impact of change in policy instruments of ASEAN rice policy namely the Vietnam rice floor export price and the on and off Thailand rice pledging program on Malaysia rice industry, at last to provide rice market foresights and policy recommendations to Malaysia rice industry.

The system dynamics methodology was the mean by which this study intended to learn and to understand the Malaysia rice industry variables relationship with the ASEAN rice industry variables (Thailand and Vietnam rice export quantities and prices). A causal loop diagram was first developed, then it was converted in a stock a flow diagram to perform some computer simulation (with the help of Vensim software) based on three (3) scenarios including the base line scenario which was drawn based on the World Bank commodity prices forecast until 2025, the first scenarios were concerned with an increasing of export prices of Vietnam and Thailand as the results of removing their policies, an increase of 20 and 40 percent from the base line projection were specifically designed , the second scenarios were looking at downing export prices trend of 10 and 30 percent from the base line scenario.

Simulation results from export price scenarios indicated that an increase compared to their base line projections of export prices will decrease the Malaysia rice self-sufficiency level, while the inverse, a decrease of export prices compared to their base line levels will increase the rice self-sufficiency level. All these variations of rice self-sufficiency levels were than one (1) percent.

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

"KESAN DARIPADA DASAR HARGA NEGARA-NEGARA ASEAN TERPILIH INDUSTRI PADI MALAYSIA"

Oleh

MIRIMO DANIEL

April 2015

Pengerusi: Profesor Datuk Mad Nasir Shamsudin, PhD

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Persatuan Negara-negara Asia Tenggara (ASEAN) merupakan rangka kerja integrasi serantau yang termaktub di dalam Wawasan 2020. Ia adalah satu program yang merangkumi sosio-politik dan ekonomi yang terdiri terdiri daripada sepuluh buah negara anggota.

Kawasan Perdagangan Bebas ASEAN (AFTA) merupakan cabang di mana rantau ASEAN mencapai integrasi ekonomi melalui penghapusan tarif dan bukan tarif di antara negara-negara anggota. Skim Tariff Keutamaan Sama Rata (CEPT) adalah mekanisme utama untuk menggerakkan ASEAN ke arah perlaksanaan AFTA. Komuniti ekonomi ASEAN (AEC) perlulah menjadi matlamat kepada integrasi ekonomi serantau menjelang 2015.

Beras merupakan makanan ruji di rantau Asia dimana ia merupakan satu petunjuk utama dalam keselamatan makanan negara dan merupakan sumber pendapatan utama bagi berjuta-juta petani. Semua ciri-ciri tersebut telah menarik perhatian pembuat polisi untuk campur tangan dalam asas ekonomi yang tulen dan dalam kedua-dua ekonomi dan motivasi sosio-politik. Campur tangan kerajaan secara langsung dan tidak langsung dalam sektor pertanian umumnya dan sektor padi khususnya telah menjejaskan struktur pengeluaran, penggunaan dan perdagangan padi bukan sahaja dalam pasaran domestik malahan juga dalam pasaran global. Terdapat beberapa perkara diterangkan dalam pasaran beras global dimana (hampir 8% daripada pengeluaran beras dunia didagangkan), dibahagikan mengikut jenis beras, kualiti dan tumpuan pengeluaran geografi dimana (lebih 90% beras dihasilkan dan digunakan di Asia).

Di Malaysia, beras diimport terutamanya negara ASEAN dengan Vietnam dan juga Thailand. Terkini, terdapat duti import bagi beras dimana 20 peratus di bawah Perjanjian Bersama Tarif Keutamaan Samarata (CEPT), AFTA dan 40 peratus di bawah Perjanjian Pertanian (AOA), Pertubuhan Perdagangan Dunia (WTO). Terdapat pengimport tunggal di Malaysia iaitu Padiberas Nasional Berhad (BERNAS) yang merupakan, sebuah entiti swasta dengan hak istimewa yang diberi

oleh kerajaan untuk mengimport beras pada kadar duti percuma, tetapi perlu melaksanakan hak dan tanggungjawab sosial bagi pihak Kerajaan di dalam industri beras. Oleh yang demikian, dasar semasa bagi kuota import adalah sebanyak 35% daripada penggunaan beras dalam negeri yang dikenakan kepada pengimport tunggal beras iaitu BERNAS.

Dasar beras di Thailand sentiasa menjurus ke arah pengeluaran dalam negeri dan meningkatkan pengeluaran untuk perdagangan. Sejak tahun 2001 lagi, kerajaan Thailand telah memperkenalkan Program Cagaran Padi yang digunakan secara tidak meluas. Objektif skim cagaran harga beras adalah untuk memberi pinjaman pada kadar faedah yang rendah kepada petani yang memerlukan wang tunai pada awal musim penuaian supaya petani boleh mengelakkan produk mereka daripada di jual pada harga yang rendah dan menunggu sehingga harga jualan meningkat. Kerajaan menyimpan beras yang dibeli dan menjual stok beras itu sendiri pada bila-bila masa sahaja. Bantuan harga beras telah membantu petani meningkatkan pendapatan mereka tetapi ia menjadi lebih teruk akibat persaingan perdagangan beras dari Thailand.

Kewujudan dasar beras di Vietnam adalah seimbang, di antara mengekalkan keterjaminan makanan dalam negeri dan menggalakkan eksport beras.

Campur tangan kerajaan adalah terhad dalam pasaran domestik dan kebanyakan pengeksportan beras di negara ini dibuat melalui syarikat milik negara perdagangan (50% saham), terutamanya Persatuan Makanan Vietnam (VFA). VFA membeli padi daripada petani untuk mengekalkan dan menstabilkan harga beras di dalam negeri seterusnya mengekalkan keperluan dalam pendaftaran eksport beras dan Harga Minimum Eksport (MEP) berdasarkan peraturan pihak Kerajaan dalam eksport beras, sebagai usaha untuk mengawal aliran dan harga eksport beras.

Kedua-dua program penyandaran beras di Thailand dan harga lantai beras eksport di Vietnam merupakan program harga sokongan dimana perbezaannya adalah dari segi mekanisme. Keutamaan adalah kepada petani, di mana ia dapat meningkatkan pendapatan mereka, dengan itu harga padi petani dan harga eksport adalah sama, seterusnya adalah untuk pengeksport beras bagi memastikan keuntungan minimum, dan juga pendapatan petani.

Objektif umum kajian ini adalah untuk menilai kesan terpilih polisi harga negara ASEAN tentang industri padi Malaysia, seterusnya objektif khusus ialah dapat membangunkan model sistem dinamik bagi industri beras Malaysia, menggabungkan pembolehubah industri beras ASEAN, untuk mensimulasikan kesan perubahan dalam dasar instrumen beras ASEAN iaitu harga lantai beras eksport di Vietnam dan program penyandaran beras dalam dan luar Thailand bersandarkan pada industri beras Malaysia dan akhir sekali adalah untuk menyediakan pasaran beras dan cadangan bagi dasar industri beras Malaysia.

Metodologi sistem dinamik adalah dimana kajian ini bertujuan untuk mengetahui dan memahami pembolehubah industri beras Malaysia sama ada mempunyai hubungan dengan pembolehubah industri beras ASEAN (kuantiti eksport dan harga beras di Thailand dan Vietnam).

Bermula dengan gambar rajah gelung, dan kemudiannya ia ditukar menjadi gambarajah aliran bagi melakukan beberapa simulasi komputer (dengan bantuan perisian Vensim) berdasarkan tiga (3) keadaan termasuk senario garis asas yang telah disediakan berdasarkan harga komoditi Bank Dunia dimana ramalan sehingga 2025. Senario pertama melihat kepada peningkatan harga eksport Vietnam dan Thailand sebagai keputusan untuk menghapuskan dasar mereka, peningkatan sebanyak 20 peratus dan 40 peratus dari unjuran garis asas telah direka secara khusus. Disamping itu, senario kedua adalah melihat kepada penurunan trend harga eksport 10 peratus dan 30 peratus daripada garis asas.

Keputusan simulasi daripada senario harga eksport menunjukkan peningkatan berbanding dengan unjuran garis asas harga eksport dimana akan mengurangkan tahap sara diri beras di Malaysia. Di samping itu, penurunan harga eksport berbanding dengan paras garis asas akan meningkatkan tahap sara diri bagi beras. Kesemua variasi tahap sara diri beras merupakan daripada satu (1) peratus.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science.

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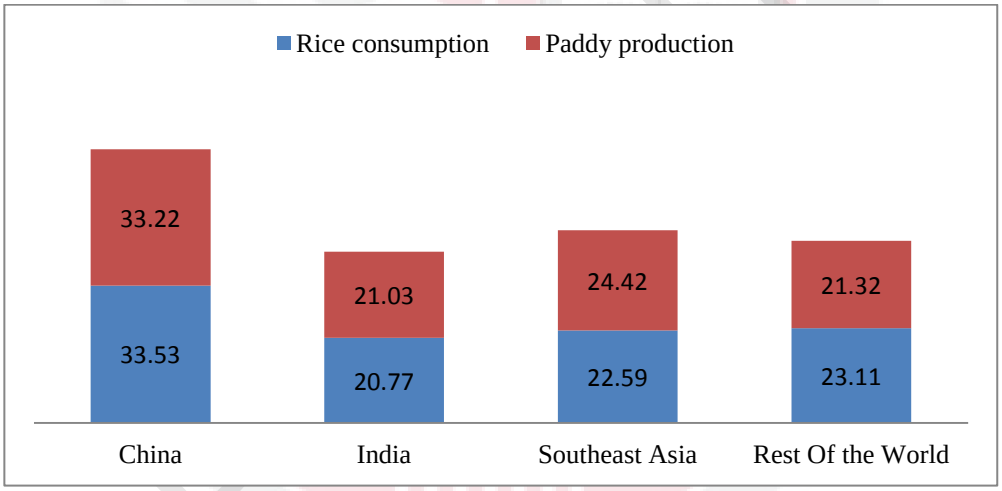
AEC:	Asean Economic Community
AFET:	Agriculture Futures Exchange of Thailand
AFTA:	Asean Free Trade Area
AGRM:	Arkansas Global Rice Model
AOA:	Agreement on Agriculture
ASEAN:	Association of East Asian Nations
ASEAN-FAF:	ASEAN Cooperation in Food, Agriculture and Forestry
BERNAS:	Padiberas National Berhad
CEPT:	Common Effective Preferential Tariff
EPP:	Entry Point Projects (in the NKEA)
FAOSTAT:	Food and Agriculture Statistics
FAO GIEWS:	FAO Global Information and Early Warning System
GATT:	General Agreement on Tariffs and Trade
GDP:	Gross Domestic Production
GE:	General Equilibrium
IRRI :	International Rice Research Institution
LDC:	Least Developed Countries
MARD:	Ministry of Agriculture and Rural Development (Vietnam)
MEP:	Minimum Export Price
MIRAGE:	Modeling International Relationships in Applied General Equilibrium
MIT:	Massachusetts Institute of Technology
MOT:	Ministry of Trade (Vietnam)
MSE:	Mean Square Error
NKEA:	National Key Economic Area
P.E:	Partial Equilibrium
RMSE:	Root Mean Square Error
	SSL: Self Sufficiency Level
VFA:	Vietnam Food Association
VINAFOOD I and VINAFOOD II:	Vietnam Northern and Southern Food Corporations
WTO:	World Trade Organization

CHAPTER 1

INTRODUCTION

1.1 Background

Rice is the main staple food in Asia; it plays a key role in determining the food security level in many countries, as well an important source of income for rural farmers. Despite the fact that rice is produced in five (5) continents, Asia continent is the hub with 90 percent of the world rice production, China and India both representing more than 50 percent and the South East Asia accounting for almost 25 percent of the world rice production. While the rice consumption throughout the world as well share almost the same pattern with the rice production, China and India stood again for more than 50 percent of the world rice consumption, while the Southeast Asian region averaged 23 percent[1].



Source: International Rice Research Institute (IRRI) Statistics (2014)

Figure 1: World Rice Statistics, Average Percentage (1980-2009)

Beside rice production and consumption, it's worth mentioning rice trade, which is basically the transfer of production surplus between countries, from regions where food is produced at the most competitive prices to regions where there is a solvent demand, the ratio of the volume traded over the volume produced for rice commodity between 2008-2012 was almost 8 percent in 2012, less than other main grains, wheat (22 percent) and maize (12 percent)[2].

[1] International Rice Research Institute (IRRI) Statistics (2014), http://ricestat.irri.org:8080/wrs2/entrypoint.htm
[2] ITC calculations based on UN COMTRADE statistics (2014), http://www.trademap.org/tm_light/SelectionMenu.aspx

The thin volume traded, observed in the global rice market is neither trivial nor of simple matter of coincidence, it is more the result of domestic rice market structure of almost rice producing countries which has impinged the world rice market, for the major rice producing countries are the same major rice consuming countries and also leading rice exporters and importers in the world.

There are principally three (3) varieties of rice traded on the international market, Indica (long grain), Japonica (medium grain) and fragrant rice (basmati and jasmine) and , each of which can be marketed with different percentage of broken (determining its "quality") or at different processing stages (paddy, husked or milled). The long rice grain trade is relatively subject to low tariffs while the medium rice grain trade is hindered by extremely high protection rates (Calpe, 2006).

World rice market is characterized by few exporting countries dealing with many importing countries; Thailand, Vietnam, India, Pakistan and USA accounting for 80 percent of world rice export[3]. The fact that the bulk of rice exports is coming from few countries makes trade in rice particularly susceptible to changes in domestic production and government policies in those countries.

The demand pattern of the world rice market is much more scattered, with many rice importing countries from the five continents and with different consumer's preferences. But for countries where rice is a staple food the demand is not responsive to price and income.

One key characteristic have appeared within rice importing and exporting countries, the phenomena of state trading with the monopoly over the rice trade or sometime competing with private sector, but which were vested with the obligation of farmer's and consumer's welfare.

Recalling the special status of rice crop in producing countries, a staple food, a food security indicator and a source of income for farmers, the rationale of different government interventions in the rice production, processing, retailing and trade in domestic and international rice market, to achieve or to maintain national food security goal can be understood. Therefore government's interventions in their domestic rice sector and international trade are partially responsible of the global rice price volatility. Nevertheless trade reform is an ongoing movement, whether unilateral, bilateral or multilateral to liberalize trade by the reduction or elimination of tariff or non-tariffs barriers.

[3] Food and Agriculture Organization statistics (2014) http://faostat.fao.org/site/339/default.aspx

1.2 ASEAN Rice Policy

1.2.1 ASEAN at Glance

The Association of South East Asia Nations is a regional institution of ten countries (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam) with the motto " One Vision, One Identity, One Community" which summarize the principle and goal of the organization.

ASEAN countries can be divided into three sub-groupings in terms of agriculture's share in the country's GDP and employment. The first group would be Singapore and Brunei, which are entirely non-agricultural economies. The second group is those of the middle-income economies of Indonesia, Philippines, Thailand and Malaysia whose farming population consists of about 10 to 40 percent of the total labor force and with the agriculture's GDP share of less than 15 percent. The third group would be those of the less developed economies of Cambodia, Laos, Myanmar and Vietnam with farming population of more than 40 percent of the total population and GDP share of more than 15 percent.

Table (1) is summarizing key information on the ten country members of the ASEAN organization such as their surface areas and recent statistics of 2013 of their population size, Gross Domestic products (GDP), the agricultural value added as of the share of their GDP and at last the employment in Agriculture as of the share of their total employment.

Table 1: Summary of ASEAN country members' key statistics

Country	Surface Area (sq. km)	Population (2013)	GDP ((000) current US$), 2013	Agricultural Value added(% of GDP) 2013	Employment in Agriculture (% total employment), 2013
Brunei	5,770	417,784	16,111,135.8	0.73	---
Cambodia	181,040	15,135,169	15,249,684.4	35.55	51
Indonesia	1,904,570	249,865,631	868,345,645.5	14.43	35.01
Lao	236,800	6,769,727	11,141,187.7	27.98	---
Malaysia	330,800	29,716,965	312,435,494.6	9.33	12.6
Myanmar	676,590	53,259,018	---	---	---
Philippines	300,000	98,393,574	272,017,377.7	11.83	32.2
Singapore	699	5,399,200	297,941,216.1	0.03	---
Thailand	513,120	67,010,502	387,252,164.3	11.98	39.60
Vietnam	329,314	89,708,900	171,391,820.4	18.38	47.40

Source: World Bank Statistics, 2014

One interesting observation is that the incidence of agriculture in terms of labor force is always higher than the incidence in terms of GDP.

1.2.2 ASEAN Trade Liberalization Framework

The ASEAN Vision 2020 is an initiative and challenge to achieve regional integration by year 2020, it is comprised of three pillars; the ASEAN Political-Security Community, the ASEAN Economic Community and the ASEAN Cultural Community.

The ASEAN Economic Community (AEC) is aiming to establish an economic integration, to create a stable, prosperous and highly competitive ASEAN economic region in which there is a free flow of goods, services, investment and freer flow of capital, equitable economic development and reduced poverty and socio-economic disparities in year 2020.

In the process of working towards the economic integration, ASEAN Cooperation in Food, Agriculture and Forestry (FAF) has been adopted to enhance the competitiveness of food, agricultural and forestry products in international markets and to empower farmers through the promotion of agricultural cooperative, the assurance of food security is also a fundamental goal of ASEAN.

The ASEAN Free Trade Area (AFTA) is the arm by which the ASEAN region is achieving economic integration through the elimination of tariff and non-tariff barriers between countries members. The Common Effective Preferential Tariff (CEPT) Scheme is the main mechanism to move ASEAN towards the direction of the AFTA. It requires that tariff rates levied on a wide range of products traded within the region be reduced to no more than five percent. Quantitative restrictions and other non-tariff barriers are to be eliminated.

At the multilateral level, all ASEAN countries members are members of the World Trade Organization (WTO), aiming to free trade for the benefit of all its countries members through rounds of negotiations among governments.

The Agreement on Agriculture (AoA) is an international treaty of the WTO. It was negotiated during the Uruguay Round of the GATT and entered into force with the establishment of the WTO in 1995. The agriculture negotiations were brought into the Doha Round when it was launched in 2001. Broadly, the objective is to reduce distortions in agricultural trade caused by high tariffs and other barriers, export subsidies, and some kinds of domestic support. The negotiations also take into account social and political sensitivities in the sector and the needs of developing countries.

The 9th WTO Ministerial Meeting which was held on 3rd to 6th of December 2013 in Bali, Indonesia resulted in the "Bali package" trade agreement. The package consists of three (3) key issues: trade facilitation, some issues of the Least Developed Countries (LDCs), and agriculture.

The Ministerial Conference, which is the main decision-making body of the WTO, meets every two years for the purpose of moving forward in the trade negotiations being conducted under the terms of different WTO agreements.

Agriculture issue in the negotiations covered the food security concern in developing countries, the export subsidies as part of the export competition and tariff-rate quota administration (WTO, 2014).

1.2.3 ASEAN Rice Policy Review

A majority of the ASEAN country members are rice producing nations, they are striving to grow enough food to meet their domestic rice market demands, and it is either the surplus or the gap between their rice demands and supplies which are basically the rice trade flows in the regional and international rice market. Their rice demands are driven by an increasing demography, while their rice productions are boosted by the improvement of crop yield due to the improvement of technologies in the agricultural field also known as the green revolution.

In terms of rice trade status, the ASEAN country members can be divided into two blocks, the rice exporting nations such as Thailand and Vietnam which are among world largest rice exporting countries, while the rice importing nations such as The Philippines, Indonesia and Malaysia are part of the world largest rice importing countries.

However, despite their trade status, the ASEAN rice exporting and importing nations are sharing the same concern of food security, that means to achieve and/or to maintain their rice self-sufficiency levels by holding some public control over their domestic rice markets, these government policies are not only towards the domestic rice production and consumption sectors, but also over the movement of rice in and out of their countries through a set of trade measures, from an institutionalized state trading with either a market monopoly or sometimes competing with the private sector, to more advanced quantitative trade restrictions.

1.2.3.1 Malaysia

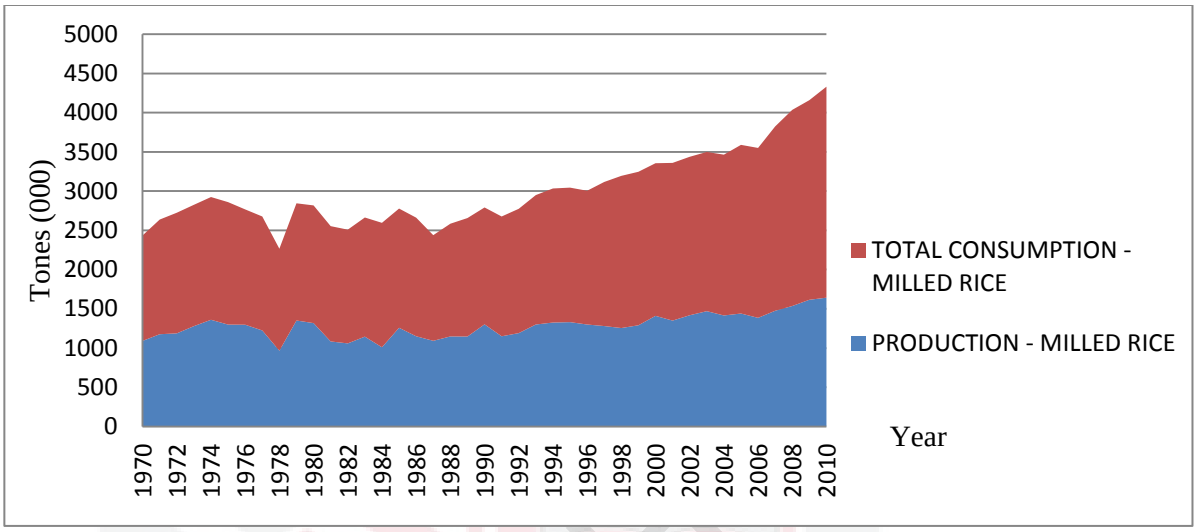
Statistics of ten years (2002-2012) of important food and agricultural commodities in Malaysia ranked by value placed the rice/paddy at the fifth place, while ranked by volume rice/paddy came at the third position[4]. Both in terms of rice production quantity or import volume, the Malaysian rice sector is considered as a small nation in the global rice market, however the domestic rice sector has always been given special treatment because of its social, political and economic importance (Ramli, et al., 2012).

The government policies on rice are mainly focused on poverty elimination and sectorial growth. As the poverty among paddy farmers is high in Malaysia, the government regards this as an important and sensitive political issue (Vengedasalam, et al., 2011).

The Self-Sufficiency Level (SSL) in particular is a crucial target that determines the government's allocation and expenditures on the sector. The targeted rice SSL varied

[4] Food and Agriculture Organization statistics (2014), http://faostat.fao.org/site/339/default.aspx

between 80 to 85 percent in the First National Agriculture Policy (1984-1991), an average of 72 percent in the Second National Agriculture Policy (1992-1997), at a minimum level of 65 percent in the Third National Agriculture Policy (1998-2010) and recently 70 percent under the new National Agro-Food Policy (2011-2020).



Source: FAOSTAT, 2014

Figure 2: Gap in Malaysia rice production and consumption, for the period 1970-2010

Malaysia rice import is mainly performed within the ASEAN region, mainly with Vietnam and Thailand, with an average of 91 percent of the total Malaysia rice import quantities for the period ranging from 2004 to 2013[5].

As of 2014 in Malaysia, the import duties for rice imports are 20 percent under the Common Effective Preferential Tariff Agreement (CEPT) of AFTA and 40 percent under the Agreement on Agriculture (AoA) of the WTO.

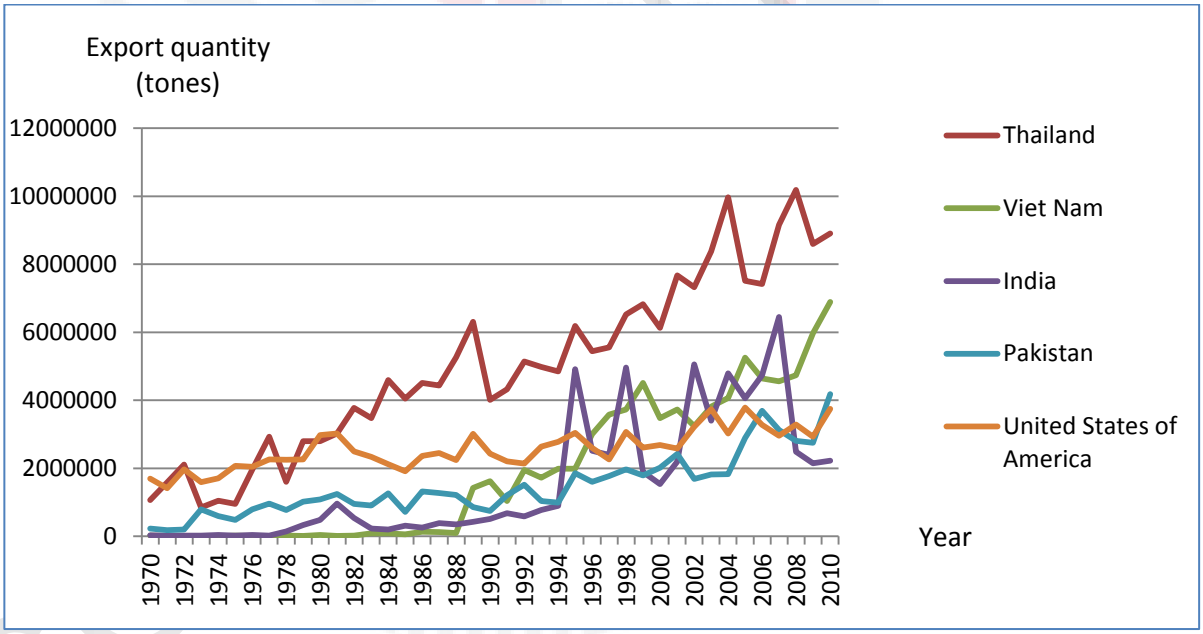
However, the existence of the sole importer, Padiberas National Berhad (BERNAS; a private entity given the sole right to import rice to Malaysia) has the privilege from the government to import rice at duty free rates (Vengedasalam, et al., 2011), thus BERNAS performs certain social obligations on behalf of the Government in the rice industry of managing and maintaining the Government Rice Stockpile of 292,000 MT at any point in time to sustain national rice consumption of about 45 days (Tobias, et al., 2012, p.24) and to ensure that the country has sufficient supply of rice at all times. The stockpile serves as an emergency food security buffer as well as to stabilize rice supplies and prices in the country. Moreover BERNAS is honored to be identified as the organization to implement two of the 16 Entry Point Projects (EPP) under the National Key Economic Area (NKEA) for Agriculture Sector with triple objectives of increasing paddy production, boosting the income of farmers and achieving national food security (BERNAS 2013).

[5] ITC calculations based on UN COMTRADE statistics (2014) http://www.trademap.org/tm_light/SelectionMenu.aspx

Currently, the National Agro-Food Policy (2011-2020) is targeting to maintain a Self Sufficiency of rice at 70 percent, obviously the remaining 30 percent of domestic rice consumption will be supplied by the import performed by the sole rice importer BERNAS (license will expire in 2021), thus the removal of rice trade barriers in Malaysia will consist about allowing the sole importer (BERNAS) to face competition and to remove the rice import restriction.

1.2.3.2 Thailand

Thailand for many decades has been able to maintain its leading position as the world largest rice exporter. For the period spreading from 2008 to 2012 Thailand only produced around 4.88 percent of the total world production, but its export constituted almost 30 percent of world rice exports. This is in contrast to, for example Vietnam and India which have produced respectively 5.78 and 21 percent of world rice production and have exported 18 and 10 percent or world rice exports[6].



Source: FAOSTAT; 2014

Figure 3: World five leading rice exporting countries by Volume (tones)

During the past 10 years (2002-2012) domestic rice sector was the most important food and agricultural commodities ranked in terms of monetary value produced, and the second in terms of quantity produced after sugar cane sector[7].

[6] International Rice Research Institute (IRRI) statistics (2014), http://ricestat.irri.org:8080/wrs2/entrypoint.htm
[7] Food and Agriculture Organization statistics (2014), http://faostat.fao.org/site/339/default.aspx

All Thailand rice exports are long grain including the fragrant jasmine rice, which are relatively less protected than medium grain in world trade (Wailes, 2004). In general, Thai rice yield is low because of the prevalence of rain-fed ecosystems and farmers' preference to grow high-quality, low-yielding traditional varieties that command a premium price in the domestic and world markets.

Rice policies in Thailand have always been geared toward domestic production and improving production for trade (Tobias, et al., 2012).

In 2001, the Thai government introduced the Paddy Pledging Program which has been in use on and off since the introduction. The policy functions as a mortgage program in favor of the producers. Since the guaranteed price was set much higher than the market price, the policy became too costly for the government because it ended up with very large procurements. The price support helped farmers increase their income and it gained support from millers who also benefited from the price support. However, the pledged prices resulted in distortions in production and caused trade problems. Rice importing countries delayed their imports to await cheaper rice from other rice exporting countries (McLean, et al., 2013).

Thai rice prices in 2012 were $100-140/MT higher than major competitors Vietnam and India, a direct result of the government's Paddy Pledging Program (Wade and Prasertsri, 2012).

As a direct consequence of the paddy pledging program, the government stockpile built up enormously to reach an estimated 15-16 million tons in warehouse as for October 2014, hence the junta vowed to dispose unsold rice through four channels: general auctions, government-to-government sales, direct sales and the Agricultural Futures Exchange (AFET)[8]. Though the paddy pledging program ended in February 2014[9], tidings as of October 2014 are mentioning the Thai government proposal of a new on-farm pledging program for 2014-2015 paddy main-crop fragrant and glutinous rice to limit downward pressure on prices during the harvest time[10].

1.2.3.3 Vietnam

In 1986; a wide range of policy measures known as Doi-Moi (renovation) was introduced to promote Vietnam's transition to a market economy (Nghiep and Quy, 2000). Few years later in 1989, Vietnam changed its status from a rice net importing country to a rice net exporting country, since then the position of Vietnam among major rice exporters seemed consolidated.

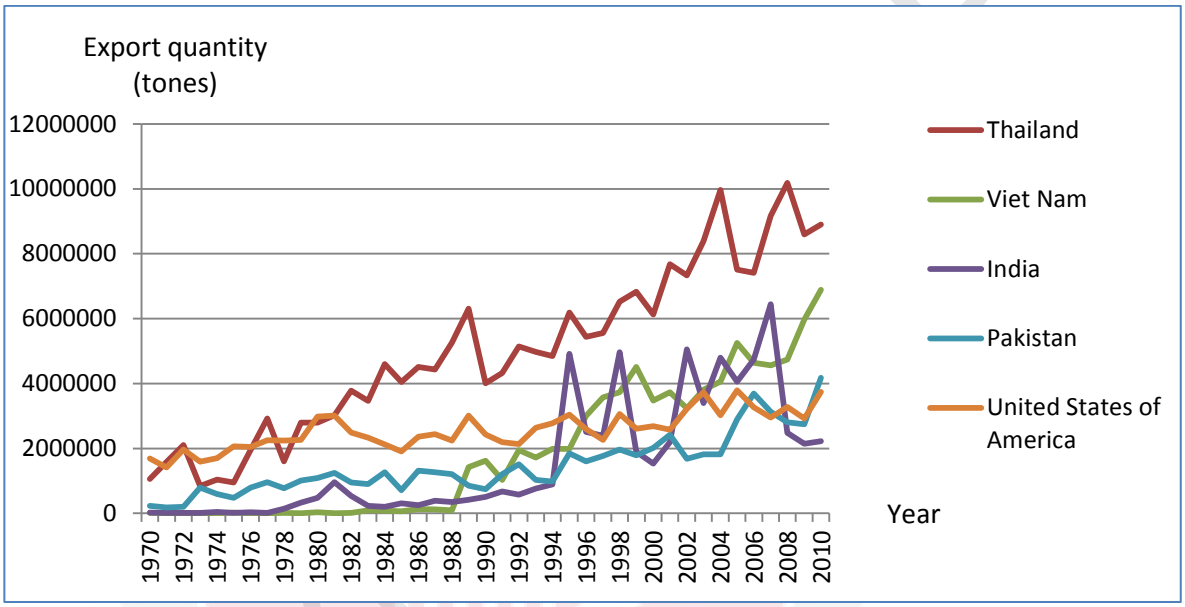
[8] http://www.bangkokpost.com/business/news/437455/another-rice-auction-slated-this-week

[9] http://www.oryza.com/news/rice-news/thailand-national-rice-policy-committee-terminates-rice-mortgage-program

[10] http://www.oryza.com/news/rice-news-asia-pacific/thai-government-considers-new-farm-pledging-program-2014-15-main-crop

Rice industry is the leading agricultural sector in Vietnam, for example between 2002 and 2012; rice sector was far the most import food and agricultural commodities both in terms of quantity produced and monetary value [11].

Vietnam's exports between 2005 and 2010 made up 17.25 percent of total world rice exports measured in volumes, but only 13.77 percent in value terms. This is an indication that Vietnam was primarily serving lower value export markets in contrast with India, USA and Pakistan which have made up respectively 14.5, 11.7 and 9.7 percents of total world rice exports measured in volumes but with 11.8, 10.8 and 10.4 percents in value terms[12].



Source: FAOSTAT; 2014

Figure 4: World five leading rice exporting countries by Value (thousand of US dollar)

Prior to 2001 Vietnam government controlled the volume of the rice export through a national rice export quota set each year by the Ministry of Agriculture and Rural Development (MARD), the State Planning Committee, and the Ministry of Trade (MOT) based on estimates of domestic supply and utilization. Practically the quota system was a two-step allocation procedure which has secured the government a significant degree of 'flexibility' to respond to the prevailing domestic crop situation. The flexible quota has been used not only to increase exports, but also to restrict them. The rights to export rice under the national quota were allocated to the two regional state-owned trading enterprises and a number of provincial state-owned trading enterprises (VINAFOOD I in Hanoi and VINAFOOD II in Ho Chi Minh City) (Nielsen, 2003).

[11] Food and Agriculture Organization statistics (2014), http://faostat.fao.org/site/339/default.aspx
[12] International Rice Research Institute (IRRI) statistics (2014), http://ricestat.irri.org:8080/wrs2/entrypoint.htm

As of 2011, Vietnam rice policies are a balance between maintaining domestic food security and promoting rice exports. Government intervention is limited in the domestic market and a majority of rice exports in the country are made through state-owned trading enterprises (50 percent share), particularly by the Vietnam Food Association (VFA). VFA buys rice from farmers to keep the price of rice stable and also to prevent rice importers from haggling for prices too low during the harvest season (McLean, et al., 2013). Rice exports are mainly medium and long grain with moderate to intermediate quality commanding a lower export price than in Thailand (Tobias, et al., 2012).

The Vietnam Food Association (VFA) maintains rice export registration requirements and the Minimum Export Price (MEP) based on the Government regulation on rice exports, Ordinance 109/2010/ND-CP is in order to regulate the flow and prices of rice exports (Ward, 2013).

The 109/2010/ND-CP decree of November 4, 2010 on rice export business was effective since January 1, 2011[13], it is the governing law in force as for 2014 which is regulating the commercial export of paddy and rice of all categories with three objectives and principles as it is referred in the Article 10 of to "increase commodity rice sale and assurance of interests of rice growers", "the balance of export and domestic consumption, contribution to the valorization of domestic rice prices" and "the fulfillment of international commitments, assurance of efficient export".

The Article 14 emphasizes on the regulation of rice commodity for export. The first price regulation is the "average directed price of paddy" which is determined by the Ministry of Finance at the beginning of the crop harvest as the basis for regulating market prices and to guarantee the average profit for rice farmers.

The Ministry of Finance in coordination with the Ministry of Agriculture and Rural Development have in charge to survey and to determine the production cost and the average cost price of paddy in the entire rice production sector, and based on the average cost price of paddy, the Ministry of Finance shall determine and announce the directed paddy price. The directed paddy price policy mechanism is implemented as follow; "When the market price of rice is equal to or higher than the directed price of rice, the State makes no interventions" but "When the market price of rice is lower than the directed paddy price, the State takes specific measures to keep the market price of rice not lower than the directed paddy price while ensuring efficient rice export"

The Article 15 entitled " Valorization of domestic rice prices" is a step forward in the domestic rice market stabilization , it stipulates that when the domestic rice price is higher than the limit currently prescribed by law, the States will guide rice exporters in promptly supplying their rice circulation reserves (as it is stated in Article 11 that rice exporters shall regularly maintain a circulation reserve equal to at least ten percent of their rice exports of the previous six months), for the domestic rice market.

[13] http://www.lawfirm.vn/?a=doc&id=1877

The Article 19 entitled " Floor export price of rice" is par excellence the policy which is considered in the current study, as it is at the basis of the signed and registered export contracts by Vietnam rice trade partners. It is determined under the supervision of the Ministry of Finance in coordination with the Ministry of Industry and Trade, the Ministry of Agriculture and Rural Development, provincial-level People's Committees and the Vietnam Food Association.

The setting up of the floor export price of rice is based on two main principles: to be in conformity with domestic and world market developments, and in conformity with the announced directed paddy price and domestic purchase price of commodity rice, and business costs and profits of rice exporters.

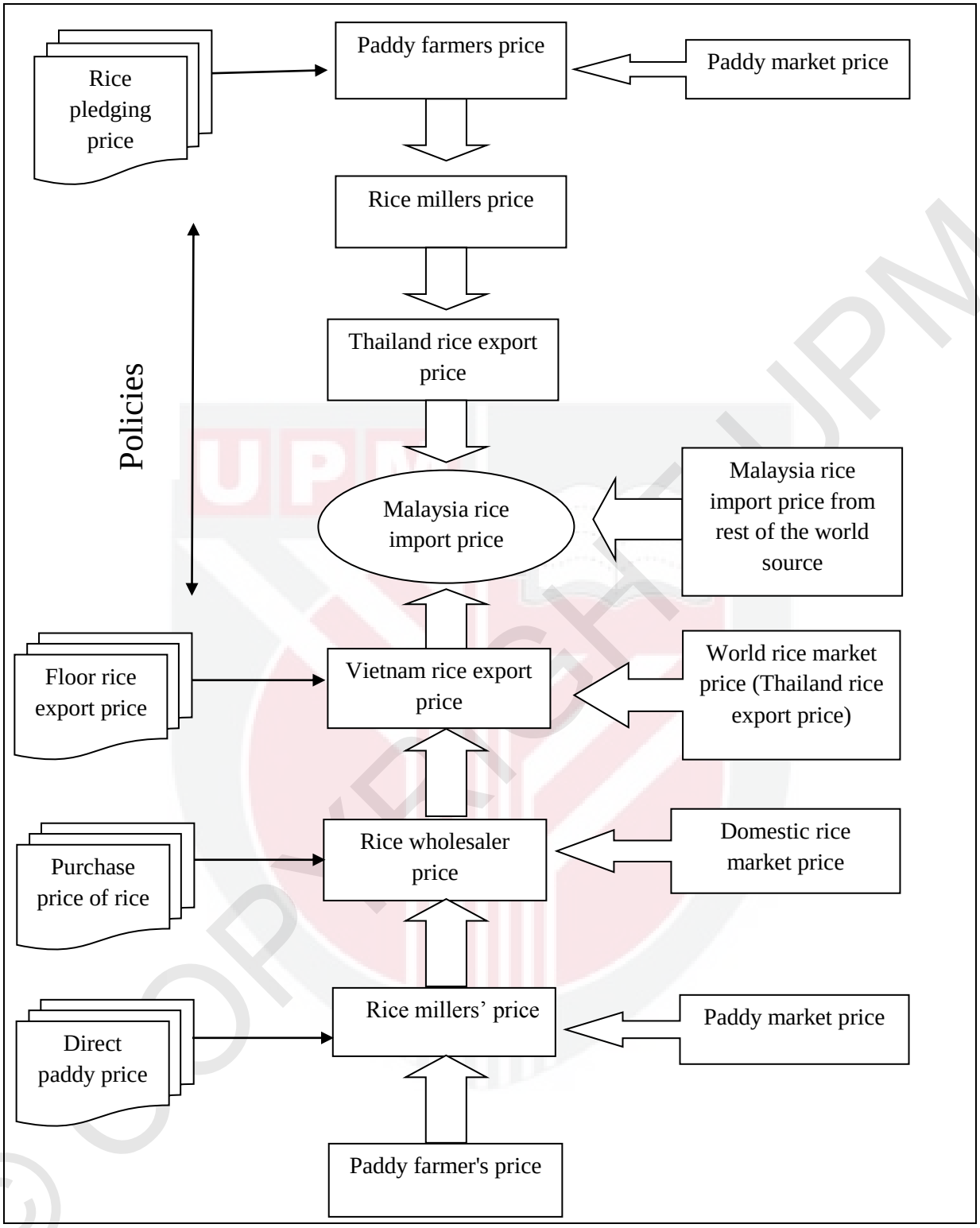


Figure 5: Summary of ASEAN Trade Barriers (Policies) on the Malaysia Rice Trade

1.3 Problem Statement

The Malaysia rice industry is by far the most strategic in the national food sub-sector, the main important cereal crop by production volume and monetary value[14], the main staple food and a key indicator of national food security level. Paddy famers who were about 300,000 farmers in 2013, represented roughly 19 percent of the agricultural employment[15], however with a singularity of being the main livelihood to the population of rice farmers and with a high incidence of poverty (Rabu and Mohd Shah, 2013). Thus besides ensuring food production to the nation, the rice farmers population are also the targets of government poverty alleviation and rural development programs.

The Malaysia government assistances in the agriculture sector and in particular in the rice farming is expressed explicitly in the successive National Agriculture Policies (NAP), with three main purposes. The first objective is to ensure the national food security, where the rice self-sufficiency is portrayed as the measurement of the policy success, the targeted rice self-sufficiency level varied between 80 to 85 percent in the First National Agriculture Policy (1984-1991), an average of 72 percent in the Second National Agriculture Policy (1992-1997), at a minimum level of 65 percent in the Third National Agriculture Policy (1998-2010) and recently 70 percent under the new National Agro-Food Policy (2011-2020). The second objective is to raise farmer's income and paddy productivity and the third objective is to ensure food supply to consumers at reasonable costs.

Through different targeted rice self-sufficiency levels, it is clearly proved the need of foreign rice supply sources as the rice imports to fill the gap between the national paddy/rice production and the domestic rice consumption, moreover a national rice stockpile is maintained to serve as an emergency food security buffer as well as to stabilize rice supplies and prices in domestic rice market. The rice import and the maintenance of the rice stockpile are both performed by the same institution, Padiberas National Berhad (BERNAS), which has a monopoly position in the national rice trade and industry, though it has been vested with social obligations on the behalf of the government in the rice industry.

The Malaysia non comparative advantage of the rice farming industry is transpiring in the lowering of the rice self-sufficiency targets and levels, it is characterized as less efficiently managed compared to industrial farms (Mailena, et al., 2014). It is noticed also through a web of policy interventions among others the rice import quota, which is mainly purposed to shield the domestic rice market from the world rice market uncertainties and particularly of the rice overflow from competitive ASEAN rice markets, which have averagely accounted for 91 percent of the total Malaysia rice import quantities for the period ranging from 2004 to 2013, particularly from Thailand and Vietnam, which at the same period, are representing 33.65 and 55.6 percent respectively, of the total Malaysia rice import quantities.

[14] http://faostat.fao.org/site/339/default.aspx

[15] http://www.statistics.gov.my/dosm/uploads/files/3_Time%20Series/Malaysia%20Time%20Series%202013/20Guna_Tenaga.pdf

However, for Malaysia rice trade partners, Thailand and Vietnam, the ASEAN rice market and the Malaysia rice imports are a small portion of their annual total rice exports. In the case of Thailand for the period lying between 2004 to 2013, the ASEAN rice imports and the Malaysia rice imports are representing 12.64 and 3.6 of the total rice exports respectively. While for the case of Vietnam, the available statistics for the period between 2002 to 2011 is indicating that, the ASEAN rice imports and the Malaysia rice imports are representing 49.7 and 8.81 of the total rice exports respectively as well [16]. There is a simple and yet important observation from these statistics that, in the ASEAN rice market and in particular a rice importing nation like Malaysia, a market concentration of rice supply sources is observed, thus the performance of rice trade is subjected and affected by its rice trade partners policy regimes and market peculiarities.

As of 2014, Thailand and Vietnam governments were applying a price support policy which was impinging on their rice export prices. In the case of Thailand, price support to farmers also known as the Thai rice pledging program was the only policy implemented on and off by the government in the last decade. However, Thailand's rice market was competitive even with the existence of domestic pricing distortion policies. While in the case of Vietnam, a rice floor export price was implemented to stabilize domestic rice market price and to maintain minimum profit for rice exports.

Therefore the ongoing trade liberalization in the ASEAN rice market is expected to bring some changes. The implementation of ASEAN Economic Community (AEC) agenda, which will be in force as of 2015[17], will affect its country members unevenly, where the already non-competitive domestic rice industries at the regional and global level will have to reconcile with the rice exporting nations market peculiarities. Thus concerns over rice trade liberalization is a complex issue for policy makers to anticipate how the Malaysia rice industry will behave if and when the existing trade barriers in the ASEAN rice market are removed, to adjust their rice industry parameters to meet the desired state of rice self-sufficiency level.

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of the current study is to assess the impact of selected ASEAN countries price policy on Malaysia Rice industry.

[16] ITC calculations based on UN COMTRADE statistics (2014), http://www.trademap.org/tm_light/SelectionMenu.aspx

[17] http://www.asean.org/communities/asean-economic-community

1.4.2 Specific Objectives:

1. To develop a system dynamics model for the Malaysia rice industry incorporating the ASEAN rice industry variables such as the Thailand and Vietnam rice export prices;
2. To simulate different scenarios of the impact of change in policy instruments of ASEAN price policy, namely the Vietnam rice floor export price and the on and off Thailand rice pledging program on Malaysia rice industry
3. To provide rice market foresight and policies recommendation to Malaysia rice industry.

1.5 Significance of the Study

The future holds in it some mystery, but for wise policy makers to be prepare against all eventualities is a today task, the major challenge is to know and to understand the system under which they are operating, to find the leverage points to achieve their desired objectives.

A system is made of interdependent group of items forming a unified pattern, both physical and informational decision rules governing the physical structure. A physical structure is crucial in a system, but rarely a leverage point, because changing it is rarely simple. The leverage point is in proper design in the first place. After the structure is built, the leverage is in understanding its limitations and bottlenecks and refraining from fluctuations or expansions that strain its capacity (Meadows, 1999).

Therefore the system dynamics model of the Malaysia rice sector is the main outcome of the current study, a tool in the hand of policy makers to assess with various scenario simulations of the Impact of the ongoing movement of removing ASEAN price policies on the Malaysia rice industry.

This study is in the line with previous related studies with the concern of the impact of trade liberalization on the global as well as ASEAN rice market, but the beauty of the methodology applied is into taking account of nonlinear relationship among variables of the system, the feedback loop mechanism, time delays, and the incorporation of all variables that are relevant to the problem endogenously. Thus the model simulation results are driven not by the external factors, but by the internal structure of the model. The internal structure made of the feedback loops formed by the interdependency between variables.

1.6 Organization of the Thesis

The thesis has five chapters. The first chapter is the Introduction of the study; it is all about setting down some general points to the background of the research. Still in the introduction, the Association of South East Asia Nations organization (ASEAN) was overviewed, specifically the framework under which the organization country members are liberalizing their rice trade and current policies in Malaysia, Thailand

and Vietnam rice industries. The remaining of the first chapter dealt with the problem statement, objectives and the significance of the study.

The second chapter is the literature; an attempt to review some relevant studies on issues related to trade liberalization in rice trade, different models existing to analyze the global rice market such as the Arkansas Global Rice Model (AGRM), the RICEFLOW Model and the MIRAGE model, at last the review of some system dynamics model applied studies.

The third chapter is the research methodology; it is comprised of the conceptual and the theoretical framework. The current study conceptual framework is embodied in the System thinking, a broad topic which was illustrated in one of its tools, the Iceberg diagram. The system thinking is a door open to the System dynamics methodology, the very methodology applied in this study. After a brief introduction of the system dynamics methodology, steps of the system dynamics modeling were presented and different types of data needed to undertake this study.

The actual research of the Impact of Selected ASEAN Countries Price Policy on Malaysia Rice Industry started then, first by the drawing of the Malaysia rice industry causal loop and the conversion the causal loop into stock and flow diagram.

The fourth chapter is the results and discussion of the study, before running any scenario simulation, the prerequisite step is to validate the system dynamics model structure with different tests, to build confidence over the model structure capability to reproduce real world behavior patterns of key variables of the Malaysia rice industry. Therefore the error checking test, dimensional test and extreme condition test were performed to test the model structure, and the behavior reproduction and the behavior sensitivity tests were performed to test the model behavior.

After have conducted all the model validity tests and have been satisfied with the test results, the model was then reliable to further the research analysis. In the research results analysis, the description of the different scenarios including the base line scenario was first presented and then the results obtained from every scenario and their comparisons to the base line scenario to gain more insights.

The fifth and last chapter is the summary and conclusion of the research, the recapitulation of the whole work done is presented and its implication for future studies, at last the highlights of the study limitations.

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