

## Chapter 5

# Industrialization and Sustainable Food Security: New Challenges for Malaysia

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### 5.1 Introduction

Government of Malaysia in 1984 decided to transform the country from an agricultural country to an industrial country. Introduction of industrial policy was in part a result of Mahathir's Vision 2020 for Malaysia to become a highly developed nation by the year 2020 (Hirschman 2013). According to Mahani (2004), the government aims to make Malaysia as an industrialized nation by focusing on high-value products. As a result, it causes a contraction in the agriculture sector and hence affects sustainable food security (Hill et al. 2012). Indeed, the agriculture sector is the main food supply to deal with the increasing demand in tandem with population growth (Anderson et al. 2012). This has led to the increase in the threat to food security, especially in terms of food availability. However, this does not mean that the government does not take action to prioritize this issue. Food security is emphasized in every agricultural policy. For example, staple foods such as paddy, fruits and vegetables are grown in most states (Ministry of Agriculture and Agro-based Industry 2012). Nevertheless, there is still a shortage of food supply compared with the increasing demand of the population (Mahmudul et al. 2013). Ismail (2011) even harshly criticizes the food security policy by lamenting its failure to ensure sustainable food production. In light of this shortage, government has to import critical commodities from various countries such as Australia, China and Thailand (Ministry of Finance Malaysia 2011). Furthermore, the rapid increase in population to 30.05 million populations in 2014 also puts

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pressure on Malaysia at the same time. Building upon this scenario, this study aims to examine whether the existing agricultural policies are able to restore the situation through more effective land management. This is important since the introduction of the policy by the government to enhance the agricultural production of food can minimize the threat in relation to food security.

## 5.2 Literature Review

### 5.2.1 Conceptual Framework of Food Security

The concept of food security has been in existence for the first time officially in the Food and Agriculture Organisation of the United Nations (FAO) in 1974 (Maxwell 1996). However, it was debated as early as in 1937 by the International Committee on Nutrition (Padilla 1997). This concept arose from the concern over the amount of food offerings and global stability. But in 1994, food security has seen more serious attention when Haq introduced the concept of human security in the United Nations Development Programme (UNDP) (Gasper 2005). Introduction of human security has been seen as a new dimension in creating a well-being society (Acharya 2001; UNDP 1994). Until now, the concept of food security as defined by FAO has undergone several evolutionary improvements to take into consideration the idea previously introduced by Haq and the World Bank. Recently, FAO (2002) defines food security as 'a situation that exists when all people at all times have access to physical, social and economic to adequate food, safe and nutritious food to meet their needs and have food preferences for an active lifestyle and healthy life' (Devereux et al. 2012; Erb et al. 2012). In light of this new development, Bizikova et al. (2013) have pointed out that success in addressing threats to food security is dependent on four key pillars for food. It is food availability, food access, food utilization and food stability (Cafiero 2013; Ericksen et al. 2009).

1. Food availability: This pillar emphasizes the individual's ability to obtain sufficient food in the quantities required. In this case, the availability of food is dependent on the provision of food by the country in meeting the needs of its population (FAO 2006). Typically, there are three main methods applied by countries to ensure the availability of food security. First, 100 % of food production in the country; second, 100 % of food imports from foreign countries; and third, a mixture of both methods of food production in the country (FAO 2006).
2. Food access: This pillar emphasizes the ability of individuals to access and obtain food (FAO 2008). Self-sufficiency for their use can be achieved through one or a combination of methods such as the production of food by an individual and by the individual stockpiling food, buying food, feed or food aid loans (Gross et al. 2000). However, the ability of an individual to access and acquire food depends on income and food prices. Meanwhile, at the national



- level, access to food refers to food production by country and supported by the importation of food if it is not enough (Inter-American Institute for Cooperation on Agriculture 2009).
3. Food utilization: This pillar emphasizes the usefulness of food taken by the beneficial food to meet the nutritional needs of the individual self (International Federation of Red Cross and Red Crescent Societies 2007). In this case, the usefulness of nutritional food for themselves is determined through adequate food intake. This is due to the fact that adequate nutrition is a concern for an individual in maintaining the efficiency of the body and at the same time avoiding any disease. Among other things, this pillar is also concerned about health care, especially in life. To meet this need, the ability to get clean water and food-processing knowledge were given priority (United States Agency for International Development 2007).
  4. Food stability: This pillar emphasizes the individual's ability to obtain sufficient food at all times (Ericksen et al. 2011). Aimed at guaranteeing food stability, this pillar is critical in ensuring sustainable food production. This includes the risk of contingencies such as the unavailability or lack of food due to the economic crisis, political crisis or unexpected climate changes, resulting in flooding and drought. Among other things, the stability of the food also refers to enough food at each cycle of seasonal foods (Stamoulis and Zezza 2003).

However, food security in this paper will be explored within the provision of traditional food production. In doing so, the focus would be on government policies in agriculture particularly in regard to food production that involves paddy, fruits and vegetables.

## ***5.2.2 Challenges Against Food Security in the Industrial Era***

Government's ability to defend the Malaysian food security in the industrial is often being questioned despite the emphasis on agricultural-food policy. This is pertinent after taking into account the inability of the government to accommodate the growing demand for food in the country. Following these concerns, the paper will analyse the issue of food security based on three critical challenges: (1) realignment of national policies from agricultural based to industrial based, (2) conversion of agricultural land; and (3) increased imports of food.

### **5.2.2.1 Realignment of National Policies from Agricultural Based to Industrial Based**

Focusing on industrial sectors highlighted by the government starting in 1984 had sunk agriculture output (Rajah Rasiah 2011). The impact of this action can be felt

until now despite several agricultural policies being introduced to increase the food production. This policy change causes the direction of Malaysia's development plans to change from an agricultural based to an industrial based (Chamhuri et al. 2005). The focus on industrialization has seen an increased in export for manufacturing products such electrical goods, automotive, and textiles. However, after the 1997 economic crisis, the government has demonstrated a strong commitment in creating food security. Various policies have been developed such as the Third Agricultural Policy, National Biotechnology Policy and Agro-food Policy as a reflection of the importance of this issue. Various strategies adopted include the development of high-value agriculture, agriculture-driven research and development (R&D) as well as increase the productivity and competitiveness of the agriculture sector (Ministry of Agriculture and Agro-based Industry 2011; Ministry of Science, Technology and Innovation 2005; Ministry of Agriculture of Malaysia 1999). However, the continuing focus on the development of a more vibrant industrial sector has again caused the agricultural sector to take a back seat. Specifically, the development expenditure budget allocation for agricultural purposes has been declining steadily for the past few years. On the other hand, the industrial sector has seen an incremental increase in its budgetary allocation over the years (Martadha and Akmal 2012). It is unavoidable that industrial sector is perceived to be in a better positioned as the engine of economic growth compared with agricultural sector (Kamarudin et al. 2006). Because of that the country has steadily experienced a decline in food production and other agricultural activities.

#### 5.2.2.2 Conversion of Agricultural Land

The rapid development of the industrial sector resulted in competition for agricultural land for food (Muhammad et al. 2011). For example, existing agricultural land had to compete for the use of food crops and commercial crops. Table 5.1 shows a comparison between an area of major food crops of paddy, vegetables and fruits with commercial crops of rubber and oil palm. Commercial crops were found to have a large area planted instead of food crops. In fact, there are many existing lands for food production have been taken and modified for commercial agricultural purposes (Fatimah and Mad Nasir 1997). The increased in commercial food production has, in turn, reduced the land for agricultural purposes (Ruhaidini 2013). The issue becomes worse as the agricultural lands are converted for residential areas and industrial sites. This is because from 1997 to 2012, a total of 106,000 ha of paddy fields or the equivalent of 50,000 football fields has been converted to residential areas (Aruna 2012; Dayang Hajyrayati 2012; Golam Hassan 1998). It is further heightened by the findings of the Department of Statistics (2012) that found that rural-urban migration is by 6.4 % between 2010 and 2011 and 21.9 % due to the boom in industries.



**Table 5.1** Comparison of total area major food crops planted with commercial crops (000 ha)

Crop	1985	1990	1995	2000	2005	2010	2011
Paddy	649	662	666	400	611	677	683
Vegetables	14	31	36	42	77	52	53
Fruits	119	177	244	345	379	239	240
Rubber	1,948	1,836	1,679	1,344	1,259	999	998
Palm oil	1,447	2,029	2,539	3,376	4,051	4,853	5,000

Source Compilation from different available resources such as Malaysian Department of Statistics and Ministry of Agricultural

### 5.2.2.3 Increased Imports for Food

Although the importation of food from abroad can increase the availability of food in the country, it also gives the opposite effect. The risk of rising prices and the threat of reduction or termination may occur if the delivery of food exporting countries faces crisis such as flooding, drought and rising food prices worldwide (Ahmad and Sani 2012; Qureshi et al. 2013). Exporting countries will produce the food for the consumption of their own people before the commodity is exported. The magnitude of such crisis occurred in 2007 and 2008 (Braun 2008) when the prices of food jumped excessively. Early signs of this crisis occurred when grain production faced difficulties in meeting global demand, hence causing the prices to triple (Mittal 2009). Similarly, Vietnam as the world's second largest exporter, followed by China and India, has banned the export of paddy completely in early 2008 (Slayton 2009; Tenebaum 2008). This situation creates panic in food importing countries as they are vulnerable to food insecurity (Koizumi 2013). Thus, dependency on external food is a worrying scenario particularly that Malaysia is a net importer of food (Fatimah et al. 2010; Lembaga Pembangunan Pelaburan Malaysia 2013). This issue is even more serious when the food trade balance shows a deficit figure. From 2001 to 2005, the percentage of this deficit had increased by 42.12 % from 1995 to 2000, 46.12 % before the big swell to 72.00 % in the period from 2006 to 2010 (Kementerian Pertanian dan Industri Asas Tani Malaysia 2012).

## 5.3 Theoretical Framework

Arguments to the food security policy setting are based on the theory of elites. The theory expounded by Pareto, Mosca and Michels in the late nineteenth century is that the community is a pyramid and classified according to the function of society itself. According to Berberoglu (2005), those who are on the top layer are an elite group that serves as a temporary government to the lower layers of the society. This theory asserts that although an elite group is a small group but they have power in the government, especially in the agenda-setting and decision-making

(Kirby et al. 2000). Thus, the elites are responsible for the use of power to meet the needs and desires of the community of the governed. This is due to the power used by an elite group to pursue their interest to achieve a specific goal. The elites are using power as a tool to protect their interests and influence society (Brym and Lie 2010). According to Hinrichs (2003), a political system that is occupied by an elite group is also closely associated with the development of food security policy agenda. The study by Jayne et al. (2002) shows that this elite group has the autonomy to exploit public resources and become involved in decision-making (Arcand and Wagner 2012). Consequently, the reality of the agriculture sector especially food production is subject to the intervention and influence of this influential elite group (Sosya et al. 1999). Thus, the elite group involved in *influencing and formulating policy should recognize the importance of social welfare on food security* (Dover 1995). This can be accomplished by putting more resources to ensure sustainable food production (Jaffe Lopez 2010).

## 5.4 Research Methodology

The approach used in this study is a qualitative approach. In examining the issue of food security, there are some researchers such as Gallaher et al. (2013), Hoddinot et al. (2013), and Riley and Legwegoh (2013) who have used a qualitative approach to their study. In terms of research design, this study relies heavily on a content analysis as used in a similar study by Sneyd et al. (2013). However, in this study, the sources analysed include planning documents and development. Specifically, the analysis involves scrutinizing 5-years development plan of the Fifth Malaysia Plan (1986–1990) to the Tenth Malaysia Plan (2011–2015). Justification for the selection of these documents is that they contain the basic policy of Malaysia such as goals, strategies and achievement of national food security. The study will examine the documents, select, screen and set the text content of the words, figures and printed message based on the theme of agriculture particularly food crops. It is analysed with reference to step, approach, strategy, planning or implementation undertaken by the country to increase food production through better management of agricultural land for paddy, vegetables and fruits.

## 5.5 Findings and Discussions

Although the government shifts its focus to industrial based, the issue of food security is still paramount to creating stability in the country (Ahmad Zubir et al. 2010; Noorfazreen and Asmak 2011). The findings of the content analysis showed that there were 46 measures taken to increase the production of paddy, vegetables and fruits through land management as Table 5.2. Specifically, 20 policies (43.48 %) focused on the management of land for paddy cultivation, 15 policies



**Table 5.2** Land management for the purpose of the food security policy for the production of paddy, vegetables and fruits (frequency)

	5 MP	6 MP	7 MP	8 MP	9 MP	10 MP	
	1986–1990	1991–1995	1996–2000	2001–2005	2006–2010	2011–2015	
<i>Paddy</i>							Total
Focused 8 paddy field	2	1	–	–	1	–	4
Plantation estate	1	–	2	–	–	–	3
Group farming	1	2	2	–	–	–	5
Change of land use	1	1	–	–	–	–	2
Agriculture integration	1	–	–	–	–	–	1
Efficient farm management	–	–	2	–	–	–	2
Contract farming	–	–	-1	–	–	–	1
Levelling of land	–	–	1	–	–	–	1
Land consolidation and rehabilitation	–	–	–	–	-1	–	1
Total	6	4	8	0	2	0	20
<i>Fruits</i>							
Intensive land use	–	2	–	–	–	–	2
The use of idle land	–	1	–	–	–	–	1
Zoning	–	–	1	–	–	–	1
Estate management	–	–	1	–	–	–	1
Production areas	–	–	–	1	–	–	1
Agricultural technology park	–	–	–	1	–	–	1
Horticultural garden city	–	–	–	1	–	–	1
Satellite farms	–	–	–	1	–	–	1
Agriculture integration	–	–	–	1	–	–	1
Opening up new land	–	–	–	1	–	–	1

(continued)

Table 5.2. (continued)

	5 MP	6 MP	7 MP	8 MP	9 MP	10 MP	
	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2015	
Fruit production zone	-	-	-	-	1	-	1
Cluster development	-	-	-	-	1	-	1
New production zones	-	-	-	-	1	-	1
Farm contracts and strategic alliances	-	-	-	-	-	1	1
Total	0	3	2	6	3	1	15
<i>Vegetables</i>							
Horticultural crops	-	2	-	-	-	-	2
Planting in situ	-	1	-	-	-	-	1
Cultivation in the highlands	-	1	-	-	-	-	1
Cultivation on ex-mining land	-	-	-	-	-	-	1
Farming without soil based	-	-	1	-	-	-	1
Hydroponic	-	-	-	1	-	-	1
Aeroponic	-	-	-	1	-	-	1
Opening up new land	-	-	-	1	-	-	1
New production zones	-	-	-	-	1	-	1
Farm contracts and strategic alliances	-	-	-	-	-	1	1
Total	0	5	1	3	1	1	11

Source: A compilation of data over the years from various government documents



(32.61 %) focused on the management of land for the cultivation of fruits and 11 policies (23.91 %) focused on the management of land for the cultivation of vegetables.

### ***5.5.1 Land Management for Paddy Cultivation***

Under the management of land for paddy cultivation, there are nine items identified that serves as the basis for land management for food. The items in question are eight paddy field (4 frequency), plantation estate (3 frequency), group farming (5 frequencies), change of land use (2 frequency), integrated farming (1 frequency), efficient farm management (2 frequency), contract farming (1 frequency), levelling of land (1 frequency), as well as land consolidation and rehabilitation (1 frequency). All items are accounted for another 20 or equivalent to 43.48 % frequency. In the context of focusing on the cultivation of paddy, the government has attempted to optimize the use of land to paddy cultivation by carrying out twice a year. Similarly, an area of 9,000 ha of agricultural land paddy was provided with drainage and irrigation between 1986 and 1990 (Malaysia 1986). But before that the government has developed a similar facility for the land area of 69,000 ha between 1976 and 1985 (Malaysia 1976, 1981). At the same time, the government has also encouraged the exchange of small-scale paddy farming to the implementation of a mini estate, group farming and contract farming production techniques to create a more efficient and more effective land management. This effort continues to increase revenue through better land management, more efficient water management, use of high-yielding seeds, and increase the intensity of cultivation and post-harvest loss reduction (Malaysia 1991). Thus, a more systematic land management can indirectly increase food security for paddy production.

### ***5.5.2 Land Management for Fruit Cultivation***

Meanwhile, under the management of land for the cultivation of fruits, there are 14 items that serve as the basis for this theme. The items concerned are intensive land use (2 frequencies), the use of idle land (1 frequency), zoning (1 frequency), estate management (1 frequency), production areas (1 frequency), agricultural technology park (1 frequency), horticulture garden city (1 frequency), satellite farms (1 frequency), agricultural integration (1 frequency), opening up new land (1 frequency), fruit production zone (1 frequency), cluster development (1 frequency), new production zone (1 frequency), as well as farm contracts and strategic alliances (1 frequency). All of these items contributed to 15 frequency or equivalent to 32.61 %. Influenced by soil management practices for paddy cultivation, land management for fruits also exhibits the same trend of change in land-use patterns

of small scale to large scale. Cultivation of fruits has also been introduced with intensive land management through zoning, agricultural technology parks, mini-estate crops, group farming and contract farming. These lands have been opened by the authorities of the regional development along the state government. As a result of these efforts, new lands were opened for the purpose of increasing the area planted with fruit. Between 1985 and 2010, covering an area of 120,000 ha of land has been devoted to the cultivation of fruits (Malaysian Department of Statistics 2001, 2011). This production was done on a large scale in food production zones and satellite farms for fruits and focused on the type of selected fruits that have potential for export (Malaysia 2001, 2006). Even so, the government at the same time also encourages the private sector to exploit idle lands for cultivation of fruits to encourage horticultural crops.

### **5.5.3 Land Management for Vegetable Cultivation**

However, under the management of land for the cultivation of vegetables, there are ten items that serves as the basis for this theme. The items concerned are horticultural crops (2 frequency), planting in situ (1 frequency), cultivation in the highlands (1 frequency), cultivation on ex-mining land (1 frequency), farming without soil based (1 frequency), hydroponic (1 frequency), aeroponics (1 frequency), opening up new land (1 frequency), new production zones (1 frequency), as well as farm contracts and strategic alliances (1 frequency). All of these items contributed to 11 frequency or equivalent to 23.91 %. The results of the analysis also found that soil management techniques on a large scale have an effect when it is extended in planting vegetables. Between 1985 and 2010, 38,000 ha of land have been devoted to the cultivation of vegetables (Malaysian Department of Statistics 2001, 2011). Thus, the opening of new land, the introduction of new production zones and the development of contract farming will be able to give high returns in the context of the production. By means of large-scale agriculture, the government will ensure the provision of extension services provided by the government will improve vegetables production. Yet at the same time, the use of existing land for vegetables has also been enhanced. The use of modern farming technique incentives such as horticulture, hydroponics and aeroponics has been developed to achieve the goal without land-based agriculture. Among other things, the government also optimizes the mined land and high land for vegetable farming.

### **5.6 Conclusion**

The emphasis on the production of paddy, fruits and vegetables through land management proves that food security is important. This factor is evident when the government seeks the optimal use of agricultural land. Improved infrastructure,



such as irrigation systems as well as improved soil management, and change in focus from small-scale farming to large-scale farming, such as the implementation of a mini estate, group farming and contract farming, are among government initiatives to increase food production. This is done so that the existing agricultural land for paddy, fruits and vegetables can be managed better by applying modern farming techniques and technology. However, the government should create awareness and education among farmers so that they can instead focus on a larger scale for food production. This step is important because it can increase the growth of agricultural production of food. In addition, the government has also opened up new agricultural land as permanent food production zones and satellite farms. Preparation for funding agriculture, modern agriculture management techniques and systematic cultivation, and use of new technology are among recent strategies introduced by the government to increase food production. In sum, the modernization and commercialization of agricultural sector are taken to ensure a sustainable food security for the nation for years to come. This is done amidst the vision of the country to become a highly developed nation by the year 2020.

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