

Selected Research Issues in the Malaysian Agricultural Sector

(Isu-isu Penyelidikan Terpilih di dalam Sektor Pertanian Malaysia)

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The agriculture sector remains a significant development factor in Malaysia even though its share to the nation's GDP has shrunk pronouncedly from some 30% in the 1970s to only 7% in 2013. Such statistics may not, however, reflect the true significance of the Malaysian agricultural economy. While the agricultural sector of the past decades was mainly associated with the production of raw commodities and primary processing activities, its current importance may be seen in terms of the sector's contribution to the total economy, via its inter-sectoral linkages and multi-functional roles. This paper highlights a number of issues that have bearings on the future roles of the agricultural economy in Malaysia. These include the emerging notion of agricultural multi-functionality, efficient allocation of land to various agricultural sub-sectors, deforestation and oil palm expansion, shortages of domestic labor, food-fuel dilemma, and extensive use of agrochemicals. Policy implications and/or suggestions for future research are deliberated for each issue.

Keywords: Malaysian agricultural economy; Malaysian agricultural issues; multi-roles of agriculture; sustainable agricultural development

ABSTRAK

Sektor pertanian masih berperanan secara signifikan kepada pembangunan ekonomi Malaysia walaupun sumbangannya terhadap Keluaran Dalam Negara Kasar telah berkurangan secara nyata dari 30% di tahun-tahun 70an kepada 7% sahaja pada tahun 2013. Namun statistik demikian tidak memaparkan kepentingan atau peranan sebenar ekonomi pertanian Malaysia. Di dekad-dekad awal, sektor pertanian lebih terkait dengan pengeluaran komoditi mentah dan aktiviti pemprosesan primari, manakala kepentingannya di masa kini perlu dilihat dari perspektif sumbangannya terhadap ekonomi keseluruhan melalui keterkaitan antara-sektor ekonomi dan kepelbagaian fungsi. Kertas ini membincangkan beberapa isu utama yang mempunyai implikasi terhadap peranan sektor pertanian di Malaysia pada masa hadapan. Ia merangkumi konsep kepelbagaian fungsi pertanian, alokasi tanah yang cekap kepada pelbagai sub-sektor pertanian, penebangan/pembersihan hutan dan perluasan perladangan kelapa sawit, kekurangan tenaga kerja tempatan, dilema makanan-tenaga, dan penggunaan kimia pertanian secara ekstensif. Bagi setiap isu yang dipaparkan, implikasi terhadap dasar atau/dan saranan kajian lanjutan turut dibincangkan.

Kata kunci: Ekonomi pertanian Malaysia; Isu pertanian Malaysia; kepelbagaian fungsi pertanian; pembangunan pertanian lestari

INTRODUCTION

The Malaysian economy has undergone significant structural shifts over the years - from a simple farm-based economy at the outset of the nation's independence, to manufacturing industries through the 1980s and 1990s, and to the services sectors in recent decades. The share of the agricultural sector to the nation's GDP shrank pronouncedly from 34% in 1970, 20% in 1980 to 7.2% in 2013. Nonetheless, as this paper argues, such statistics may not reflect the true significance of the Malaysian agricultural sector. Contemporary agriculture may be

viewed from the broader perspectives of the sector's contribution to the total economy, via its inter-sectoral linkages and multi-functional roles, including its role in sustaining the vitality of rural areas and resources. Such roles of agriculture may not be explicitly captured by the standard national income accounting system.

At the global and national level, increasing awareness on environmental sustainability and green consumerism concerns have given rise to a number of unprecedented challenges, which further impinges upon the agricultural sector in Malaysia. These trends, without adequate adaptation strategies, may impede the ability of

the sector in the long-run to continue contributing to the socio-economic development of the nation, particularly the rural economy.

Given the aforementioned background, this paper highlights some major development and issues affecting the Malaysian agricultural sector. These include the notion of agriculture as a multifunctional resource, efficient allocation of land resource, shortage of domestic labor, deforestation and climate change, food-energy dilemma, and extensive use of agrochemicals. Such multitude of issues without doubt signifies the momentous challenges facing contemporary agricultural policy makers and related institutions in Malaysia. Policy implications and/or suggestions for future research are deliberated for each issue.

THE ISSUES

AGRICULTURE AS A MULTIFUNCTIONAL RESOURCE

Agricultural multi-functionality is the notion that agriculture is not just about food production or any farm level produce. Neither it is any value adding activities within the traditional agricultural supply chain or put simply the agribusiness system. Rather, agriculture also produces jointly a host of other produce in the form of environmental and social externalities. This is illustrated in Figure 1. The figure depicts two broad economic functions of agriculture. First, the production of farm level produce including its associated value added products which are traded in the conventional

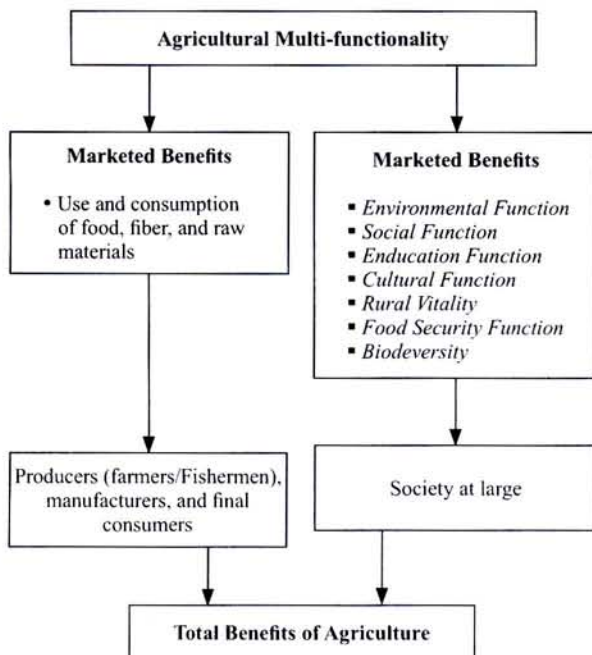


FIGURE 1. Systems Approach to Agriculture (Agricultural Multi-functionality)
Source: Jamal (2010)

markets. The use and consumption of such goods generate benefits in the form of direct use values to farmers, final consumers, and manufacturers. Direct use values may also be termed as marketed benefits. Traditionally, the marketed benefits of agriculture have been the focus of agricultural economics theory and policies.

The second broad function is the production of non-marketed benefits of agriculture or put simply agricultural externalities which accrue to society at large in the form of indirect or non-consumptive benefits. Specific examples of non-marketed benefits of agriculture include ecological functions such as flood mitigation (proven in the case of paddy growing areas), soil conservation, nurturing and purification of water resource, air pollution reduction, watershed protection, heat reduction, and biodiversity preservation. It also encompasses socio-cultural functions such as rural landscape formation, employment buffer, vitality of rural communities, preservation of traditional values and attributes, health and agro-recreational function, educational function, cultural and historical heritage, and food security. Such a systems view of the agricultural economy is indeed consistent with the general notion of sustainable development that calls for a balanced approach towards the environment, economy and socio-cultural properties.

Traditionally, agriculture has always been associated with farm level production. In addition, the measure of its efficiency and competitiveness including the analysis of comparative advantage between countries generally follow the same principles as applies to any industrial or marketed goods. This view, and for that matter the gist of the agricultural economics discipline has now undergone marked changes, given the advent of agricultural multi-functionality.

The idea of agricultural multi-functionality has significant influence on agricultural policy decisions in many countries, particularly in the EU, South Korea and Japan. A wide range of agricultural multi-functional elements has become key components of agricultural policies. For instance, the EU under the Common Agricultural Policies (CAP) established payment schemes that link the production of environmental goods and agriculture. These schemes provide economic incentives or payments to farmers for the provision of basic public goods under a sustainable farming program (European Commission 2014). Currently, many countries including Malaysia are deliberating the concept of payment for environmental services (PES) which signifies recognition to the economic importance of resource sustainability and services provided by the natural environment.

Undeniably, the elements of non-marketed benefits of agriculture have long been recognized in one form or another in the Malaysian development agenda, albeit somewhat segregated across the various line ministries and agencies. However, the multi-functionality notion, which reflects an integrative socio-biophysical system of agriculture to date, has not made significant

headway into the national agricultural policies or regulatory frameworks. While the country acknowledges sustainability, including sustainable agriculture as the overriding development theme, the broader roles of rural socio-ecological externalities of agriculture apparently are yet to be a driving factor in the formulation of agricultural and rural development policies.

Malaysia has accorded the agricultural sector as the third engine of economic growth in the Ninth Malaysia Plan (2006-2010). This follows the realization that the sector has been able to cushion effectively the impact of the 1997/98 Asian financial crisis. For instance, palm oil exports remained robust during the crises period. There was also evidence that the agricultural sector, notably the oil palm subsector was able to provide some 12,500 new employments at the peak of the crisis (Jamal 2007). Hence, protection and enhancement of the multiple roles of agriculture become increasingly evident.

A major challenge in implementing the concept of agricultural multi-functionality in Malaysia relates to institutional and legal issues. There exists a host of government agencies and departments that deal with agricultural (forestry, fisheries, animal farming), plantation and commodities, rural development, as well as the natural environment. Additionally, these agencies and their area of authority – agriculture, plantation and commodities, rural development, and environment, respectively, are under the purview of multiple ministries, namely the Ministry of Agriculture and Agro based Industries, Ministry of Plantation Industries and Commodities, Ministry of Rural and Regional Development, and the Ministry of Natural Resource and Environment. Such multitude of agencies naturally gives rise to the issue of policy inconsistency and inter-agency coordination.

It is important to note here that there exists currently an inter-agency coordinating mechanism within the Ministry of Agriculture and Agro-based Industry at the Federal, State and District levels. However, memberships of this framework are mainly statutory bodies and departments from the same ministry, while much of the coordination activities remain focused on the traditional production and agribusiness augmentation. Non-

agricultural agencies related to rural resources such as the Ministry of Rural and Regional Development and the Department of Environment (Ministry of Natural Resource and Environment) thus far are not members of the said coordinating framework. Incongruence in sectoral policies, which inhibit full complementarily relationship between economics, socio-cultural and environmental interests are best resolved through inter-agency coordination and consultation at all levels. Therefore, there is a need for a common understanding on agricultural multi-functionality and interrelated issues across the relevant ministries and agencies. Inevitably, it will be imperative to establish effective coordination mechanisms for the sharing and planning of related concerns. At the national level, the policies and strategies of the various ministries and agencies in charge of agricultural and rural development as well as the natural environment ought to be streamlined to ensure that Malaysian agriculture operates in a way that serves the farmers and the wider interest of the public.

EFFICIENT ALLOCATION OF AVAILABLE LAND TO AGRICULTURAL SUBSECTORS

In the early years following the Independence of Malaysia (1957), the country launched an ambitious land development program to develop the rural-agricultural sector. It was the most crucial national development strategy for the fledging country. The program focused on conversion of large tracts of forest into agricultural lands, primarily the cultivation of industrial crops such as rubber and oil palm. However, over the years, the less environmentally sensitive forest areas, particularly those in Peninsular Malaysia has been substantially utilized. Figure 2 depicts the aggregate land supply into agriculture has been virtually on a standstill since the mid-1990s. This may be due to strict environment-forest policy enforcement in the country. It is also a reflection of the increasing global and domestic concerns on large-scale deforestation and climate change effects. In response to the scarcity of available land, Malaysia's agricultural policies focused on developing idle and marginal lands.

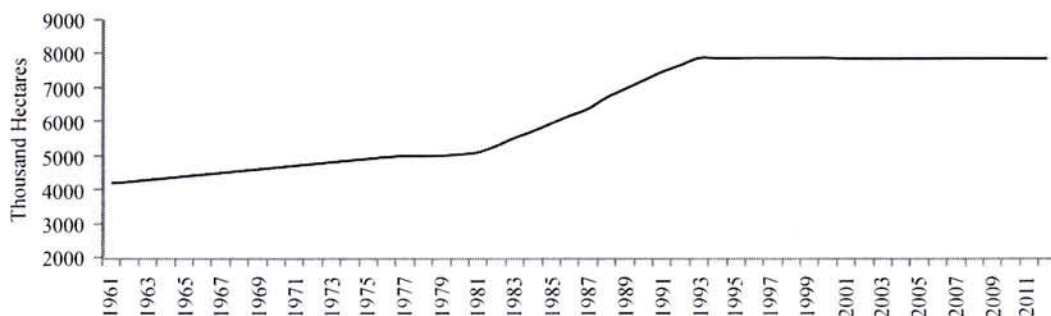


FIGURE 2. Availability of Agricultural Land Area in Malaysia (1961-2012)

Source: FAO-FAOSTAT, Official website

TABLE 1. Changes in Plantation Pattern of Main Agricultural Crops in Malaysia (thousand hectares)

Crops	1987		2012	
	Planted area	Share with respect to total agricultural land area (%)	Planted area	Share with respect to total agricultural land area (%)
Rubber	1881.3	29.4	1041.5	13.2
Oil palm	1640.2	25.7	5076.9	64.5
Coconut	320.6	5	112	1.4
Cocoa	370	5.8	21.7	0.28
Paddy	644.8	10.1	684.5	8.7

Source: Department of Statistics, Malaysia 1985-2012

There was an apparent structural change in the reallocation of land use within the agricultural sector. This mainly relates to oil palm, rubber, cocoa, and coconut (Table 1).

Additionally, Table 2 shows the changes in area under the cultivation of other important agricultural crops in Malaysia. The major shift in terms of absolute quantity of lands occurred mainly in the cultivation of fruits and vegetables. Even so, the absolute changes in the area under cultivation of these crops were minute compared to that of oil palm, rubber, cocoa, and coconut.

Figure 3 depicts the changes in the pattern of planted area for rubber, palm oil, cocoa, coconut, and paddy over the 1984 to 2012 period. The analysis excludes all other crops due to the small absolute changes in their cultivated area.

The figure indicates clearly oil palm area has been on a positive trajectory, while rubber, coconut and cocoa demonstrated a steady decline. Paddy area on the other hand has been rather stable. Technically, wetland paddy is cultivated in areas where oil palm and other perennial crops cannot be grown. Therefore, there was no

TABLE 2. Land Use Changes for Other Agricultural Crops in Malaysia (hectare)

Year	Pepper	Pineapple	Tobacco	Coffee	Tea	Sugarcane	Major Vegetables*	Major Fruits*	Grand Total
1990	11408	9076	10168	17795	3270	21574	30053	177505	280894
1995	9837	7895	10525	11525	2946	22050	35906	257654	358338
2000	13411	15720	15764	12260	3524	21380	39947	314918	436924
2005	12772	14900	8520	8557	1961	14235	35600	287455	384000
2008	13490	15586	6702	3538	1990	4439	39800	268650	354195
2009	13618	15791	7616	3426	1519	4500	-	-	-
2010	14174	15456	3698	5098	2459	4540	-	-	-
2011	14800	16000	4242	5149	2500	4600	-	-	-

Source: Ministry of Plantation Industries and Commodities, Malaysia 2012

* Ministry of Plantation Industries and Commodities (1995, 2001 and 2008a)

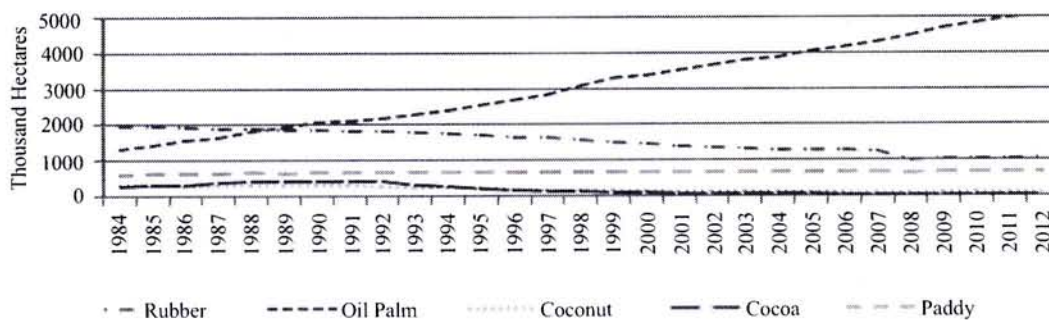


FIGURE 3. Land use Among the Major Agricultural Crops in Malaysia

Source: Department of Statistics, Malaysia 1985-2012

possibility for land substitution between paddy and other main agricultural crops except in the highlands. However, dry paddy cultivation in the highlands represents only about 10% of paddy plantation (Department of Statistics 2009). Since dry paddy cultivation did not significantly change during the investigation period, the increases in oil palm area were more likely at the expense of rubber, coconut and cocoa.

Figure 4 shows how oil palm cultivation expanded as a result of a decline in plantation areas for rubber, cocoa, and coconut in aggregate. This is particularly apparent in the period after the mid 1990s. The period prior to that demonstrated a marked uptrend for oil palm area while the other crops remained relatively stable, suggesting that oil palm augmentation was largely attributed to deforestation. The next section discusses this further. Note that the statistic for paddy is not included here due to the low probability of substitution between paddy and oil palm. Furthermore, the reason for the exclusion of other agricultural crops such as fruits, vegetables, pepper, tobacco, pineapple, sugarcane, tea and coffee in the analysis is that the overall absolute changes in their planted areas are far less relative to that of oil palm, rubber, cocoa, and coconut.

Given the facts that only a few industrial crops (oil palm and rubber) constitute the backbone of the

Malaysian agricultural economy, it will be important to review the overall trajectory of land use in light of global uncertainties in supply and demand factors as well as inter-sectoral linkages within the overall economy. This has far-reaching consequences on the overall long-term sustainability of the Malaysian agriculture. It will be desirable to consider a macro portfolio management of agricultural land allocation in the country to minimize the repercussions of macro-systemic risks while taking into consideration the importance of food crops for food security and industrial crops for overall economic growth.

DEFORESTATION AND OIL PALM EXPANSION

Deforestation relates to the conversion of forest areas to alternative uses such as agricultural, urbanization and others. As illustrated in Figure 5, forest areas in Malaysia fell significantly over the years albeit with declining rates.

Some analysts argued that the decline in forest areas was largely associated with oil palm expansion while others asserted that the oil palm expansion in Malaysia came from both forest areas and shifts in pre-existing crops (Casson 2000; Corley and Tinker 2003). Further, Koh and Wilcove (2008) asserted that specifically during the 1990 to 2005 period, 55–59% of oil palm expansion in Malaysia was due to deforestation, while some 41-

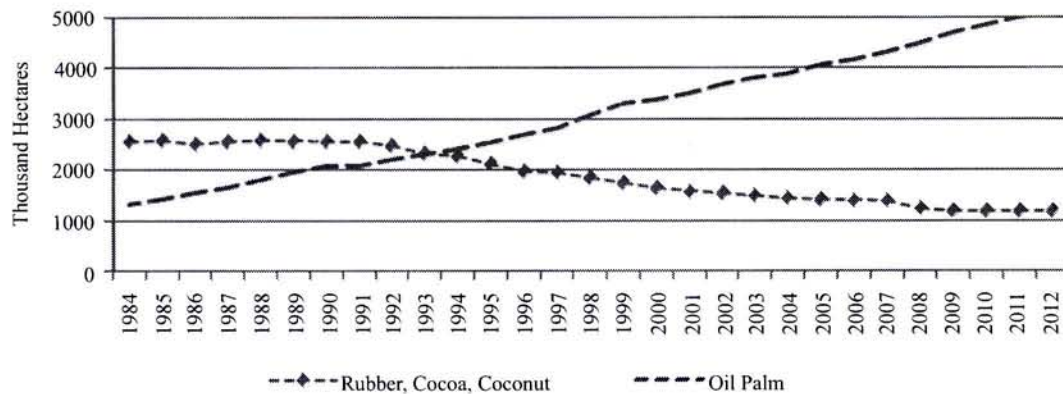


FIGURE 4. Land Use Under Cultivation of Oil Palm, and Other Crops Including Rubber, Cocoa and Coconut in Aggregate

Source: Department of Statistics, Malaysia 1985-2012

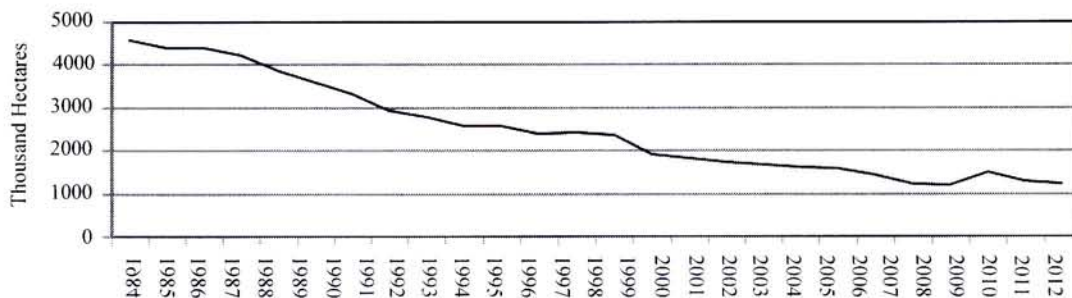


FIGURE 5. Depletion of Forest Area in Malaysia 1987-2012

Source: Based on Year Book Statistics of Malaysia for 1985-2012

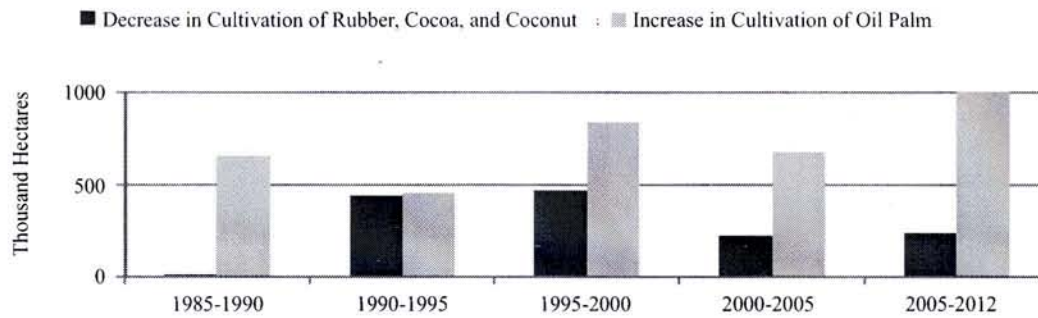


FIGURE 6. Comparisons of Land Use Changes among Agricultural Crops

Source: Compiled based on the Department of Statistics Year Book Statistics of Malaysia for 1985-2012

45% was from conversion of pre-existing cropland such as rubber.

There are also arguments that the clearing of virgin tropical forests were primarily for the logging of timber (WWF 2005; Tan 2009). Consequently, the cleared area was allocated for oil palm cultivation. The many diverse arguments lead to the seemingly elusive question on whether or not oil palm plantation actually caused massive deforestation in Malaysia. We examined this by comparing the shifts in land use for pre-existing crops including rubber, coconut, and cocoa with changes in land area under oil palm plantation.

Figure 6 compares the changes in land taken away from pre-existing crops with the increase in land under oil palm cultivation. In the figure, the first column in each period represents a fall in pre-existing crop plantation while, the second column shows the increase in land use under oil palm plantation.

The total increase in oil palm cultivation is greater than the total decrease in cultivation of other crops in aggregate. This somewhat suggests that further expansion of oil palm has been fueled by other types of land supply. Since the other type of land use also experienced smaller decrease than the increase in oil palm plantation, it is highly likely that the oil palm plantation expansion occurs on deforested land. As indicated earlier by the second column in Table 3, the probable share of pre-existing crops in expansion of new land for oil palm cultivation

deescalated while the share of forests and other land use sources expanded significantly. Over the 1990 to 1995 period, the marginal 2% increase in the cultivation of oil palm was likely to have originated from the other land sources because the fall in pre-existing crops were able to generate some 98% of the oil palm expansion area. In the subsequent periods, respectively, 44%, 66% and 73% of oil palm area likely originated from non-preexisting crop land area. This trend signifies that land under pre-existing crops may no longer be responsive to any shifts in oil palm demand as they did before.

The preceding discussions suggest that future oil palm expansion might pose direct pressure on forest resources with wide implication on biodiversity and microclimate change effects, unless there is a clear policy shift, which emphasizes growth from value adding activities, particularly the high-end downstream industries.

SHORTAGE OF DOMESTIC AGRICULTURAL LABOR

One of the most debated issues facing the Malaysian agricultural sector is the shortages of domestic labor. While the contribution of agricultural employment (including livestock, forestry and fishing) declined very substantially from 26% of total employment in 1990 to 11.4% in 2011 (Tables 4 and 5), there was also a clear shift in terms of employment proportion within the various

TABLE 3. Changes in Share of Pre-Existing Crops (Rubber, Cocoa and Coconut) in Response to Increase in Oil Palm Area

Time Period	Change in oil palm plantation*	Change in plantation of pre-existing crops (rubber, cocoa, coconut)*	Share of pre-existing crops (rubber, cocoa, coconut)	Share of other sources (including forestry area)
	(A)	(B)	(C) = $\frac{ B }{A}$	(D) = 1 - C
1990-1995	453.8	-443.5	0.98	0.02
1995-2000	836.8	-467.5	0.56	0.44
2000-2005	674.6	-226.4	0.34	0.66
2005-2012	1025	-241	0.23	0.73

* Values are in thousands of hectares

Source: Calculated based on the Statistics published by the Department of Statistic, Malaysia 1985-2012

agricultural sub-sectors. Most notably the proportion of labor employed in the oil palm sub-sector increased remarkably, whereas the number of employment in other sub-sectors (rubber, cocoa, and other crops including pepper and tobacco) declined substantially (Ministry of Plantation Industries and Commodities 2010).

TABLE 4. Share of Agricultural Employment with Respect to Total Employment

Year	Agricultural Employment	Percentage with respect to total employment
1990	1738.0	26
1995	1492.7	18.7
2000	1407.5	15.2
2005	1401.4	12.9
2006	1392.4	12.5
2007	1389.9	12.2
2008	1390.9	12
2009	1390.8	12.0
2010	1390.3	11.6
2011	1389.4	11.4

Source: Ministry of Plantation Industries and Commodities Malaysia (2012)

TABLE 5. Shift in Employment Within the Agricultural Sub-Sectors

Year	Oil Palm ^a	Rubber ^b	Cocoa ^c	Pepper and tobacco ^d
1990	115,285	98,386	50,911	84,456
1996	151,162	49,891	21,369	78,866
2000	251,039	25,823	6,903	92,167
2004	365,000	13,385	4,001	75,974
2005	362,000	11,781	3,069	74,025
2006	42,800	11,882	-	66,655
2007	426,000	11,503	-	69,903
2008	438,000	11,076	-	71,109
2009	451,000	10,377	-	70,968
2010	446,368	10,811	-	69,340
2011	477,913	10,888	-	68,876

^a The number of employment represents workers in the plantation subsector only

^b Peninsular Malaysia only and not including smallholder families

^c For the year 2008, employment in cocoa industry included estate workers, smallholder, grinders and chocolate manufacturing (including entrepreneurs)

^d Number of smallholder families involved in pepper plantation, and number of employment at curing stations excluding some 38,000 tobacco farmers.

Source: Ministry of Plantation Industries and Commodities Malaysia (2012)

A grave concern is the increasing reliance of the agricultural sector particularly the oil palm sub-sector on foreign labor. The oil palm farm sub-sector is labor intensive with very low prospect for effective mechanization even in the very long run. Further, there is also little scope for domestic workers to be drawn into finding employment in this sector due to the relative structural unattractiveness, while rapid economic development and strengthening of domestic currencies in the labor-source countries, particularly Indonesia potentially affect labor supply in the intermediate to longer-run. Another related issue is the imposition of current minimum wage policy for domestic and foreign labor across economic sectors including oil palm and rubber sub-sectors.

In short, how labor supply uncertainties and the implementation of the minimum wage policy will affect Malaysian agricultural sustainability and competitiveness in the longer run is quite unknown empirically.

FOOD-FUEL DILEMMA AND PALM OIL 'PRICE WAR'

Another daunting challenge in Malaysian agriculture is the increasing public interests on food security. The widely debated food-fuel dilemma across the globe in light of global climate change and renewable energy development issues is indeed very relevant to Malaysia.

Malaysia is endowed with abundant supply of palm oil and thus the country has a comparative advantage in using palm oil as a renewable feedstock for the production of the relatively environment friendlier biodiesel. Technically, biodiesel is a product of a mix of fossil fuel (diesel) with either crude palm oil or processed palm oil. However, as the biofuel industry expands, both biodiesel and palm oil-based food products ultimately will be competing for the same crude palm oil (CPO) as intermediate input. As illustrated in Figure 7, CPO is produced from crushed fresh fruit bunches (FFBs) which is further processed to produce biodiesel, cosmetics and chemical products, and wide ranges of food products such as cooking and frying oil, margarine, food emulsifiers, and cocoa butter equivalent.

Given that Malaysia's biodiesel industry is synonymous with palm oil, there are concerns that there will be increased competition in the use of the same palm oil input for the manufacture of biodiesel and the aforementioned final products including food. Should there be insufficient supply of feed stocks, and contingent on relative price changes, increases in demand for biodiesel may result in the expansion of oil palm cultivation. This might further aggravate environmental issues including loss of biodiversity, carbon emissions and micro climatic change. Therefore, the potential provision of economic incentives such as biofuel mandates and subsidies may have considerable impacts on related markets in Malaysia especially food products, which utilizes the same CPO intermediate

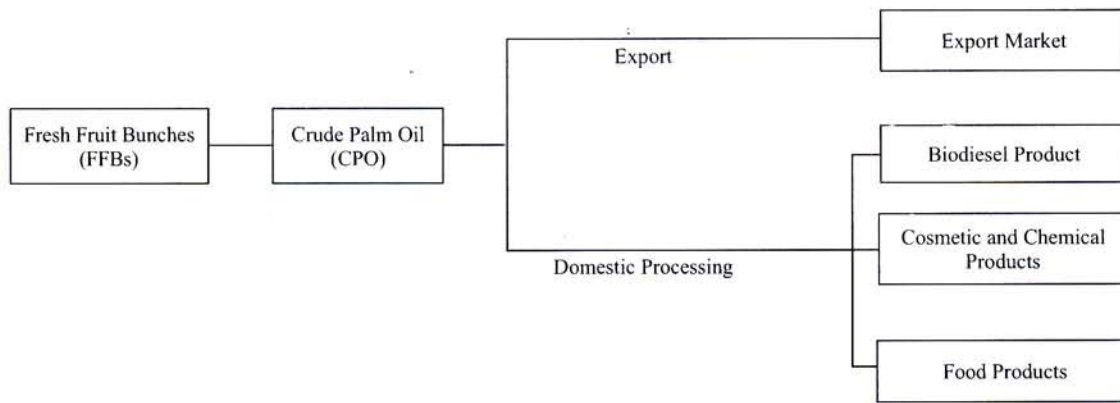


FIGURE 7. Schematic Flowchart of CPO Products.

input. Consequently, in the longer run this may lead to changes in the composition of agricultural outputs in related sub-sectors due to the links with primary input markets - land and labor resources.

Further, the Malaysian government also provides cooking oil (largely palm oil-based) subsidies (via the Cooking Oil Subsidy Scheme) to the tune of 37 percent (ad valorem) to benefit targeted low-income household groups (Jamal and Yaghoob 2011). In light of budgetary pressures, there have been calls for a review of the cooking oil subsidies. Such a move may have considerable impacts on domestic cooking oil prices and outputs. Studies have shown that domestic cooking oil market liberalization pose negative long-run impacts on domestic cooking oil prices and outputs, while the production of biofuel from palm oil may increase substantially (Jamal and Yaghoob 2011).

Another pertinent issue is associated with oil palm trade policies. The introduction of export tax on CPO products by Malaysia encourages the domestic downstream processing of oil palm products while discouraging the export of crude palm oil. However, in recent years there has been an important development in relation to Indonesia's palm oil export policy. In 2012, Indonesia imposed new differential export tariffs on her exports of palm oil, which affected substantially Malaysia's downstream industry, as well as exports. Media reports highlighted that the local palm oil industry lost some RM9 billion in export revenue due to the Indonesian policy (Ooi 2014). As Malaysia and Indonesia both contribute some 90 percent of the global supply of palm oil, and the fact that Malaysia has huge vested interest in related investments in Indonesia, incoherent trade policies between the two countries may effectively manifest into a "price war" with potential adverse welfare impacts especially to Malaysia.

Taking into consideration the wide range of aforementioned issues, it is crucial to review and appraise the impacts of pertinent policy responses affecting biodiesel development, cooking oil market liberalization, and trade policies vis-a-vis Indonesia.

To what extent such policy shocks may affect the competitiveness of the Malaysian oil palm economy, welfare and the environment will be an important research challenge.

EXTENSIVE USE OF AGROCHEMICALS

The Malaysian farming sector is still dependent on agrochemicals including chemical fertilizers and pesticides. These agrochemicals while playing an important role in sustaining the needed yields and ensuring adequate profit levels to producers inevitably lead to increasing environmental damages (such as aquatic biodiversity) and food safety issues. In addition, the substantial agrochemical subsidies provided to the paddy production sub-sector render the use of such inputs inefficient. In the longer-run, it results in even more intensive use of chemical-based inputs as the natural soil base further erodes.

Mineral fertilizers constitute more than 90% of fertilizer consumption in Malaysia. Table 6 shows the upward trend of fertilizer use in the country for 2002, 2007 and 2008. Table 7 further depicts the decomposition of the total nutrient consumption for industrial crops where oil palm stands at 84 %, rubber 9%, rice 6%, while the remaining goes to coconut, sugarcane, cocoa and tobacco.

It is also important to note here that oil palm, as Malaysia's most important industrial crop is notably potash (potassium) intensive. Technically, under-utilization of potash would lead to substantial decline in yield. The main issue with potash as a fertilizer element is the dependence of Malaysia on a few global players (producers and exporters) who possess sufficient market power in terms of price determination.

Similar to chemical fertilizers, the use of pesticides has also increased (Malaysian Crop Life and Public health association, 2008). The impact of pesticides on food safety in Malaysia is a growing concern (Economic Planning Unit 2004). Table 8 shows the value of pesticides consumed for crops vigilance in Malaysia for different years.

TABLE 6. Consumption of NPK Fertilizers in Malaysia (Thousand tons of nutrient)

Crop groups	2002	2007	2008	Share (2008)
Industrial crops	1055	1449	1539	0.97
Fruit crops	32.6	39.8	41.6	0.02
Vegetable crops	3.8	6.1	6.2	0.004
Cash crops and pepper	3.6	5	5.3	0.003
Total	1095	1499.9	1592.1	1

Source: Mohamed Ali Sabri (2009)

TABLE 7. Fertilizer Nutrient Consumption by Industrial Crops in (share)

Type of crop	Share
Oil palm	0.84
Rubber	0.09
Rice	0.06
Other industrial crops	0.01

Source: Mohamed Ali Sabri (2009).

A related issue is the rising concern of health hazards posed by agrochemicals on the farmers themselves. A recent study found unsustainable use of chemicals in the rice sector was associated with health effects among some rice farmers resulting in substantial decline in farm output and farmers income (Department of Agriculture Malaysia, 2010).

There is now a growing effort to review the use of chemical-based farm inputs and to place more emphasis on the use of organic fertilizers. Malaysia is encouraging small-scale producers to move toward sustainable farming to overcome the problems of chemical residues in food production and to protect the environment while improving the trade balance (Md. Wahid Murad et. al 2008).

There are merits for the government to review the major farm support program accorded to rice farmers in the form of agro-chemicals in light of rising awareness

TABLE 8. Consumption of Crop Care Products in Malaysia (RM Million)

	1998	2000	2002	2005	2006	2007
Herbicides	235	273	209	223	223	361
Insecticides	58	68	62	65	66	100
Fungicides	19	23	23	25	26	27
Rodenticides	13	14	13	15	15	16
Total	325	378	307	328	330	504

Source: Agriquest Sdn Bhd. (2010).

* Values are at end user level

on good agricultural practices (sustainable agriculture) and food safety issues. There is a need for «incentive shifting» via the provision of appropriate economic incentives to stimulate the development of the domestic organic fertilizer industry for targeted sub-sectors. Again, to what extent these policy reviews may affect the competitiveness of Malaysian agricultural sector, including related factor markets, the environment, and national welfare will be an interesting research indulgence.

CONCLUSION

The purpose of this paper was to highlight some selected issues affecting the Malaysian agricultural sector. Firstly, we thought that the emerging notion of multi-functional agriculture, which considers agriculture and rural resources in totality, would be an important future policy agenda. Secondly, we espoused the importance of efficient allocation of scarce agricultural lands based on portfolio theory, taking into consideration the roles of both agro-industrial crops for overall economic growth and food crops in light of national food security needs, while minimizing macro-systemic risks that emanate from uncertainties in global factors. The third issue pertains to the dominance of the oil palm sub-sector in the Malaysian agricultural economy, while stressing the problem of unrelenting dependency on foreign labor as well as emerging issues that emanates from changes in Indonesia's palm oil export policy. An important challenge to Malaysian agriculture also relates to the increasing public concerns on food security and the potential effects of the food-fuel dilemma. Finally, the implication of increased intensity in the use of agrochemicals including fertilizers and pesticides was also deliberated.

In short, Malaysian agriculture and rural socio-environmental resources are a symbiosis, having direct implications on agricultural sustainability and the vitality of rural areas. The sector is also increasingly associated with domestic food security and safety concerns as well as trade and global environmental issues. Studies are warranted to identify appropriate policy reviews or new interventions. Consequently, it is also important to quantify the impact of the relevant policy changes on socio economics and environmental variables, as well as the overall macro economy.

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