

## **AGRICULTURAL LAND USE IN MALAYSIA: AN HISTORICAL OVERVIEW AND IMPLICATIONS FOR FOOD SECURITY**

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### **Abstract**

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A study is conducted to describe the historical overview of agricultural land use in Malaysia with the aim of identifying the challenges of agricultural land use in a dynamic economic system. Economic policies were explained with major policies instruments. The effects of these policies on patterns of agricultural land use in 1960 – 2005 were assessed. Findings identified three broad economic eras in Malaysia: Agricultural (1960 - 1974); Industrial (1975 - 1999) and Urbanization eras (2000 - date). Macroeconomic policies that favored industrialization and urbanization had negative effects on agricultural land use by competing with agricultural sectors for production inputs such as labor and capital because the better conditions of service and higher returns per capital in the industrial sector led to the withdrawal of inputs from the agricultural sectors. Subsequent change in tastes due to increased per capita income resulted to a change in agricultural land use in favor of highly rewarding and better-demanded crops (fruits and vegetables) thus causing agricultural land use dynamics. Sustainable agricultural land use in Malaysia, given scarce resource inputs (labor and capital) trade liberalization and globalization will depend on the ability of the country to deepen her application of science and technology for automated agricultural practices, diseases and pests control and high yielding varieties and suitable land administration policies for Malaysia to compete favorably with other major low cost producers.

*Key words:* agricultural land use change, comparative costs advantage, change in taste, economic policies, drivers of land use changes, industrial sectors

### **Introduction**

Government in most cases indicate the direction of the national economic growth through policies such as subsidies, trade liberalization and globalizations, infrastructures development, public expenditures and other monetary policies (Geist and Lambin, 2001). These government policies have effects on agricultural land use dynamics (Buchecker et al., 2003; Braimoh, 2009) immediately or in the long term (Lambin et al., 2003).

For instance, agricultural land use in Malaysia is influenced by the implementation of policies (First to

Third Malaysia Plan and the New Economic Policy [1965 – 1980]) that gave priority to agricultural development as a means to economic growth (Rasiah, 1995; Abdullah and Hezri, 2008). However, agricultural land use in country was later influenced by globalization. For instance, the boom in the global automobile and transport industry provided encouraging price and large market for the Malaysian natural rubber until the discovery of synthetic rubber, which brought about poor price of natural rubber and thus discourage further investment in rubber field expansion and lead to the conversion of rubber plantation to other uses (Sekhar, 2000). Where-

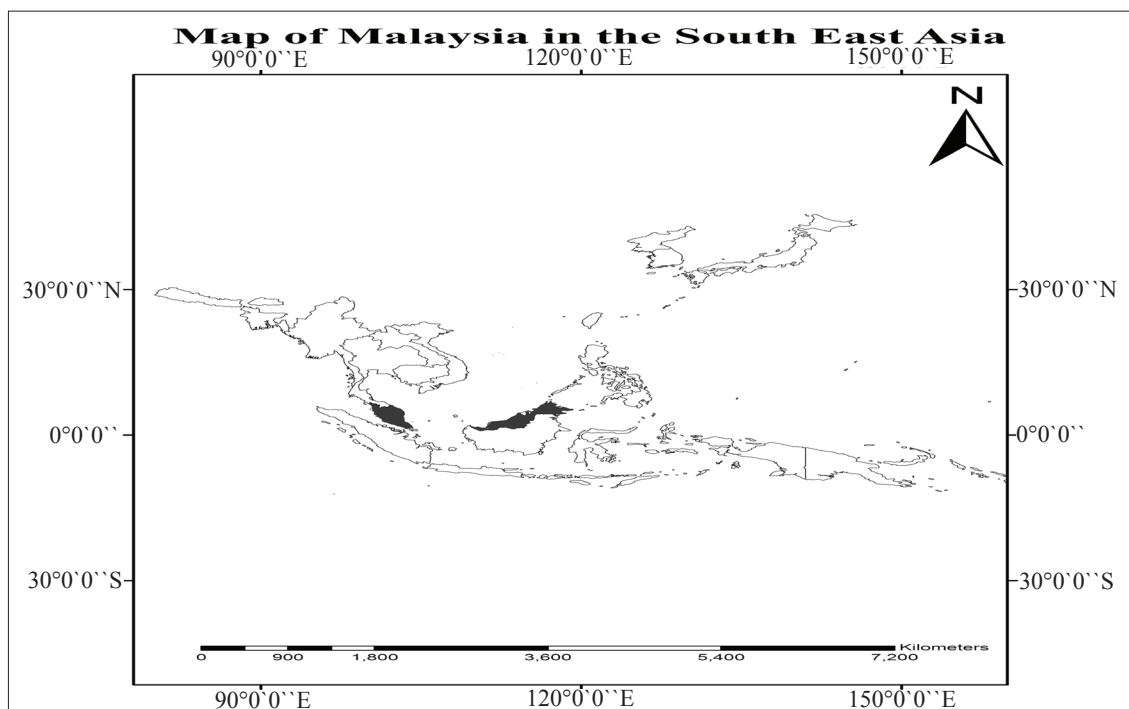
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as, the favorable price enjoyed by oil palm produce in the global market (Lim, 1967 cited in Siwar et al., 2006) saw the conversions of former cocoa, coconut, rubber and paddy fields to oil palm plantation (Hill, 1982).

Reardon et al. (1999) found macroeconomic policies to be major factors affecting farmers' land-use decision-making. For instance, when macroeconomic policies are formulated at the national level in response to globalization or other economic forces, incentives are offered to farmers to cope with the effects of the policies, farmers act on the incentives by adjusting their resource allocation at the farm level (Reardon et al., 1999). Therefore, trade liberalization policies such as (World Trade Organization [WTO] Common Effective Preferential Tariff (CEPT) Schemes of the ASEAN Free Trade Area [AFTA]) have influence agricultural land use in Malaysia (Reardon et al., 1999). These policies positively influenced the Malaysian oil palm industry (Rasiah et al., 2000) but negatively affected the paddy subsector (MDoA, 2003). It had been documented that Malaysia, that was almost self sufficient in paddy production by 1976 had to recourse to rice importation on realization

that other neighboring countries have comparative cost advantage over her in rice production (MDoA, 2003).

Previous studies on the relationships between policies and potential effects on agricultural land use in Malaysia existed in discrete forms (Fee, 1985; Abdullah and Hezri, 2008) and are not suitable for generalizing for the entire country. Study by (Wan, 1985) is outdated and therefore needs to be updated with recent data, whereas studies by APO, 2003 only examined the effects of land use on pollution of agricultural resources. Comprehensive studies of the implications of economic policies on agricultural land use dynamics are kept at the confines of the government agencies and are not immediately available to the academic world. The scarcity of country - wide and updated literatures on this subject matter makes this study a worthwhile and relevant to the academic and political class who might need the outcome for decision-making. The objective of this study is to explain how fiscal policies have affected agricultural land use in Malaysia and to make recommendation for a sustainable agricultural land use in Malaysia.



**Fig. 1. Location of Malaysia**

Source: CIA, 2007

## Material and Method

Malaysia is a tropical, South – East Asian country located between latitudes 2<sup>o</sup> and 7<sup>o</sup> N and longitude 92<sup>o</sup> and 112<sup>o</sup> E (Nieuwolt et al., 1982). Malaysia borders Thailand and Brunei in the north; Singapore and Indonesia in the south. It is divided into three main regions, Peninsular Malaysia, Sabah and Sarawak (Figure 1). Malaysian soils are acidic, highly weathered ultisols and oxisols (International Board for Soil Research and Management - IBSRAM 1985) and of low pH (3.0 - 4.5); base saturation and nitrogen contents (Nieuwolt et al., 1982).

Malaysia has a land area of 32.98 million ha with only about 31% of it being arable (Table 1). Agriculture is one of the main land use in Malaysia (Aminuddin et al., 1990) (Table 1 and Figure 2) and has played a major role in economic development of the country as a source of food, employment, export earner and raw materials for agro based industries (Arshad, 2007) (Tables 2 and Figures 3, 4 and 5). More so, of the Malaysian total arable land, available record showed that over 70% is dominated by tree crops plantation (Wong, 2007) thus threatening sustainable food crop production in the country. More so, the development of agriculture from

**Table 1**  
**Land distribution and land use in Malaysia, %**

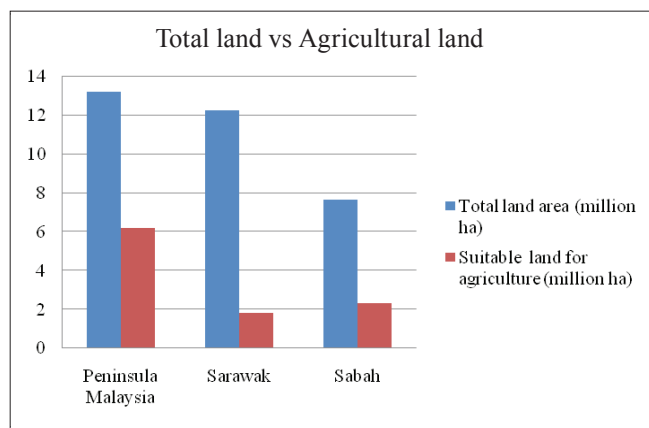
Region	Malaysia	Peninsula Malaysia	Sarawak	Sabah
Total land area, million ha	33.03	13.16	12.24	7.63
<b>Land area suitable for agriculture, million ha</b>	<b>10.31</b>	<b>6.19</b>	<b>1.81</b>	<b>2.31</b>
Land area suitable for agriculture, %	31.2	48	15	31
Land area unsuitable for agriculture, %	68.8	52	85	69

Source: Aminuddin et al. (1990)

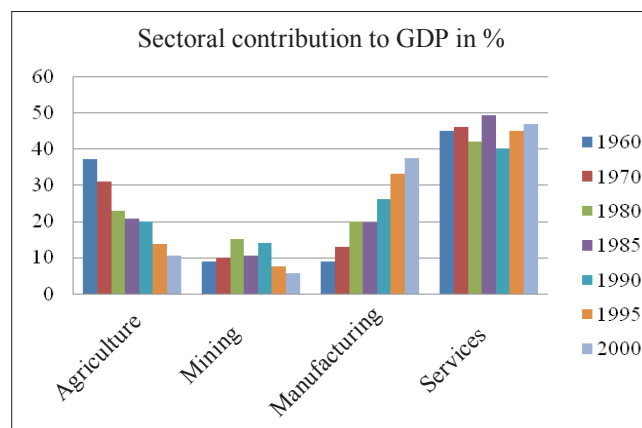
**Table 2**  
**Sectoral contribution to GDP [1960 – 2000, %]**

Sector	1960	1970	1980	1985	1990	1995	2000
Agriculture	37	31	23	20.7	20	13.6	10.5
Mining	9	10	15	10.4	14	7.4	5.7
Manufacturing	9	13	20	19.6	26	33.1	37.5
Services	45	46	42	49.3	40	45	46.8

Source: Jomo (1990) and Bank Negara Malaysia Annual Report, various issues



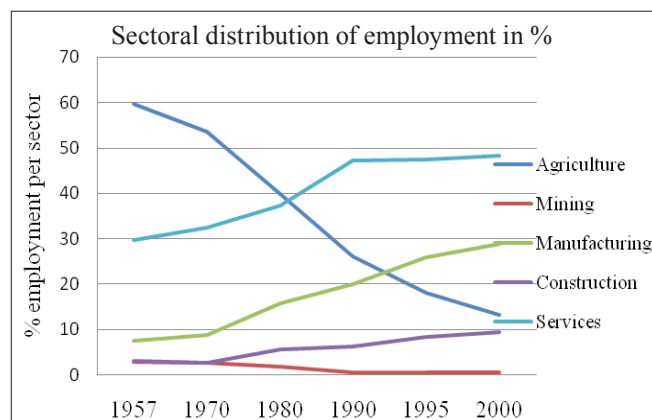
**Fig. 2. Available arable land in different regions of Malaysia**



**Fig. 3. Sectoral contribution to GDP in % 1960 – 2000**

independence until date has been impacted by series of economic policies designed to transform the country into an industrial and a high-income nation (Md Mamudul et al., 2010).

Various methodologies have been applied in explaining the relationships between economic policies and agricultural land use (Nowicki et al., 2009; Braimoh, 2009; Alam et al., 2011). Nowicki et al. (2009) described agricultural land use change with references to exogenous drivers of economic policies to foster the understanding of the driving factors, future trends and the challenges of agricultural land use change in European countries. Whereas, Braimoh (2009) applied multiple regression model analysis to explore the relationships between agricultural land use change and economic policies using aggregated household data as independent variables. However, the paucity of household data in this study made us adopt the methodology described by Nowicki et al. (2009) and Alam et al. (2011). This study assessed agricultural land use for major agricultural crops in Malaysia within the context of Malaysian National Plans (at every five-year interval). Secondary data of agricultural land use for different crops were aggregated from Malaysian Department of Agriculture (MDoA) and Malaysian Department of Statistics (MDoS) and other published literatures. Furthermore, the effects of economic factor on the agricultural growth were also analyzed by their quantitative magnitude over the periods.



**Fig. 4. Sectoral distribution of employment 1957 - 2000**

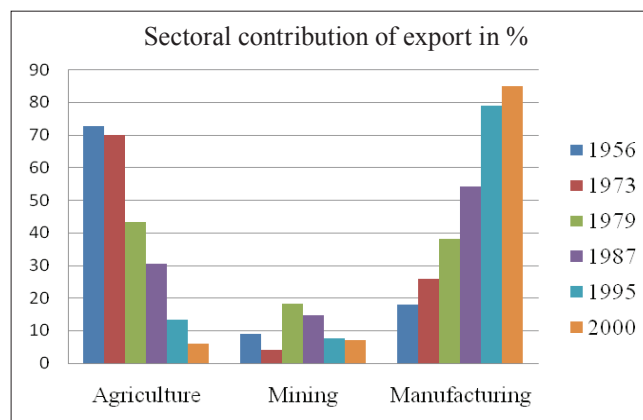
## Results and Discussion

### *Pre Independence Era*

The Draft Development Plan (1950-55) and the First Malaya Plan (1956 – 60) were designed to fulfill the colonial master's interests in primary products (rubber and tin) (Jesudason, 1989) and urban development occurred at the expense of the rural agrarian economy (Aslam and Ali, 2003). More so, about 6.6 million hectares (49.2%) of the total agricultural land was cultivated for commercial agriculture during this period (Fee, 1983). However, the steps that mark the beginning of commercial agricultural development in Malaysia started during this period with the preparation of the first land capability and soil suitability classification in 1956 - 1960 (Panton, 1966). The study identified 5 groups and 120 categories of soils suitable for 26 economic crops.

### *Agricultural Expansion Era (1950's – 1970)*

This era occurred between First, Second Malaya Plan and the First Malaysia Plan (1956 – 1965) which provided opportunity for agricultural development through heavy investments in agricultural (Arshad et al., 2007) and rural development (Jomo, 1990; Searle, 1999). With this investment [15.9% of the Malaysian total budget (Arshad et al., 2007)], agricultural sector in Malaysia witnessed rapid development and it was able to make substantial (highest) contribution to the country's GDP during the period (Table 2). Also, rubber and



**Fig. 5. Sectoral distribution of export 1956 - 2006**

paddy were the main agricultural crops occupying between 67% and 18% of the available agricultural land use respectively while oil palm only occupied 4% of the agricultural land use (Table 6).

## Industrial Era

### Early Industrial Era (1970 – 1990)

The implementation of the New Economic (NEP) and related policies in 1970 – 1990 (Jesudason, 1989) marked the beginning of transformation of Malaysia to an industrial nation (Aslam and Ali, 2003). This economic transformation impacted agricultural development negatively because, subsequent generation of employment and high rate of returns on investment in the industrial sector lead to the withdrawal of production inputs (labor, capital) from the agricultural sector (Table 3 and Figures 6 and 7). The better condition of service and urban lifestyles led to the change in taste of the peo-

ple from carbohydrate to protein rich food (Table 7) and this thus resulted to agricultural land use change for the cultivation of highly demanding and highly priced produce (vegetables, fruits) in order to take advantage of the available markets in these agricultural sub sector.

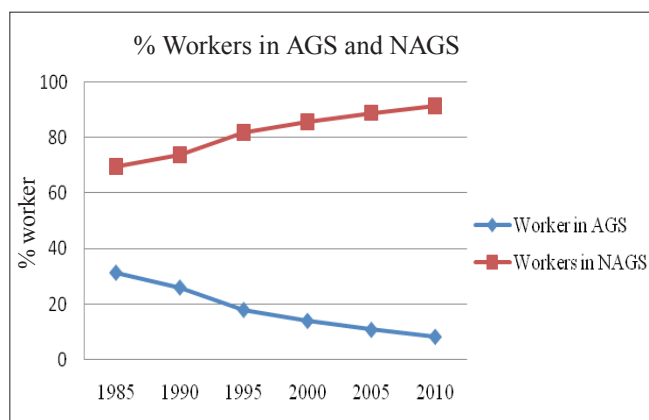
### Late Industrial Era (1990 – Date)

National Development Policy (NDP) and several other Malaysian National Plans (1991 - 2010) was introduced between 1991 – 2010 to transform Malaysia into a fully developed and a high income nation by the year 2020 (Seventh Malaysia Plan: 288; Doraisami, 2004). Within this period, the agricultural sector was overtaken by the manufacturing sector in its contribution to the GDP, employment and national export (Table 5). The associated urbanization further deepened labour shortages in agricultural production similar to what was experienced during economic transformation of Korea, Hong Kong and Taiwan (Huang, 1993).

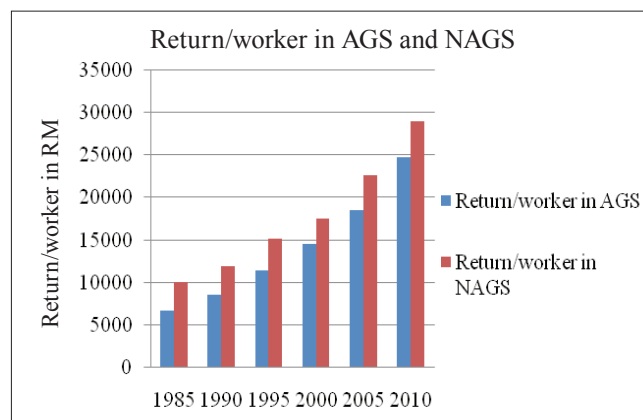
**Table 3**  
Sectoral contribution to employment, %

Sector	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
Agriculture	66.2	62.8	55.7	46.9	39.7	34.8	26	18.7	15.2	12.9
Mining	2.6	3.2	2.8	2.1	1.7	1.11	0.5	0.5	0.4	0.4
Construction	3.7	2.4	2.9	3.9	5.6	6.93	6.3	9.0	8.1	7.0
Manufacturing	3.6	4.9	9.7	11	15.7	15.1	19.9	25.3	27.6	28.7
Services	23.9	22.6	24.7	31.7	19	35.1	24.6	25.1	26.6	27.5

Source: cited in Arshad, F M et al. 2007.



**Fig. 6.** Return per workers in agricultural (AGS) and non agricultural sectors (NAGS) 1985 – 2010



**Fig. 7.** Return per workers in agricultural (AGS) and non agricultural sectors (NAGS) 1985 – 2010

## Implication of Economic Policies for Agricultural Land Use Dynamics

The pattern of agricultural land use in Malaysia showed that in 1965 – 1985 there was an (122%) increase in agricultural land indicating at an annual growth rate of 3.45%. However, during 1986 – 1995 (industrial era) the annual growth rate of agricultural land use reduced to 1.43%. Within the agricultural sub sector, it was also observed that there was a diminishing rate of agricultur-

al land use for rubber, cocoa, coconut and paddy while the corresponding land use for oil palm, vegetables and fruits were on the increase (Table 6). In addition, data on table 6 indicated that since 1960 up till 2005, land use for food crops cultivation has been decreasing. For example, in 1960, land use for food crops production was 31.5% of the total arable land in Malaysia and this decreased to 16.3% by the year 2005 (Table 6). The observed agricultural land use dynamics under changing economic policies have been due to several reasons.

**Table 4**  
Sectoral budgetary allocation [1<sup>st</sup> – 7<sup>th</sup> Malaysian Plans, %]

Sector	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>
Economic	Na	71.6	59.3	75.3	76.2	50.6	47.6
Agriculture	Na	23.1	20.8	11.8	16.0	11.6	8.2
Services	Na	5.3	19.9	12.9	7.8	37.8	44.2
Total	Na	100	100	100	100.0	100	100

Source: Jesudason 1989. Seventh & Eighth Malaysia Plans na = not available

**Table 5**  
Summary of agriculture in Malaysian economy, %

Agriculture	1955	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
Budgetary allocation	Na	23.6	20	26	24	22	21.3	17.1	7.4	4.2	5.8
Contribution to GDP	32.5	33.3	26.9	29.0	27.7	22.9	20.9	18.7	10.3	8.9	8.2
Growth rate	Na	Na	4.0	6.8	4.8	3.9	3.4	5.4	4.6	2.0	1.2
Share of employment	Na	67.7	62.9	55.7	46.9	39.7	34.8	26.0	18.7	15.2	12.9
Share of export	Na	62.1	51.0	55.0	48.3	39.7	28.3	7.9	11.7	6.1	7.0

Source: Jomo 1990 and Bank Negara Malaysia annual report, various issues

**Table 6**  
Agricultural land use change in Malaysia from 1960 – 2005, %

Crops	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005
<b>Industrial crops</b>	<b>68.5</b>	<b>71.7</b>	<b>68.0</b>	<b>69.3</b>	<b>71.7</b>	<b>76.1</b>	<b>81.3</b>	<b>77</b>	<b>80.2</b>	<b>83.7</b>
Rubber	65.7	66.9	58.6	51.2	45.1	39.3	44	30.6	26.1	19.6
Oil palm	2.1	4.0	8.4	16.5	23.0	29.9	30.4	37.9	48.8	63.4
Cocoa	0.0	0.1	0.2	0.7	2.8	6.1	6.3	7.9	4.7	0.5
Pineapple	0.6	0.6	0.6	0.5	0.3	0.2	0.1	0.2	0.3	0.1
Tobacco	0.1	0.1	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.2
<b>Food crops</b>	<b>31.5</b>	<b>28.3</b>	<b>32</b>	<b>30.7</b>	<b>26.8</b>	<b>22.6</b>	<b>17.9</b>	<b>21.7</b>	<b>18.8</b>	<b>16.3</b>
Paddy	17.5	16.8	20.8	19.5	16.5	13.1	10	11.3	7.5	7.1
Coconut	9.2	8.1	8.7	7.4	7.9	6.7	4.7	5.7	4.1	2.8
Vegetables	1.3	0.7	0.5	0.3	0.3	0.3	0.5	0.3	0.8	1.0
Fruits	1.5	1.6	1.6	1.7	2.1	2.4	2.7	4.3	6.4	5.2
<b>Others</b>	<b>1.9</b>	<b>1.1</b>	<b>0.4</b>	<b>1.9</b>	<b>1.5</b>	<b>1.4</b>	<b>0.9</b>	<b>1.3</b>	<b>1.0</b>	<b>0.3</b>
<b>Total '000 ha</b>	<b>2667.0</b>	<b>3066</b>	<b>3445</b>	<b>3887</b>	<b>4446.6</b>	<b>4952.4</b>	<b>6636.3</b>	<b>5716.3</b>	<b>5368.3</b>	<b>6382</b>

Cited in Arshad, F. M. et al. 2007.

## Effects of Economic Policies on Agricultural Land Use for Vegetables and Fruits Production

There were appreciable changes in Malaysian food consumption patterns for fruits, vegetables and proteinous foods against carbohydrate rich food (Table 7). This change in diet is because of increased income, health awareness about balance diet (MDoA, 2003). This affected agricultural land use for the cultivation of fruits, vegetables and orchard against the cultivation of paddy. Therefore turning Malaysia, a once upon self-sufficient country in paddy production to a net importer of paddy (MDoA, 2003). Decreased local consumption of rice implied poor local market for rice and this resulted to conversion of abandoned paddy fields to the cultivation of crops such as oil palm, fruits (orchard) and vegetables (MDoA, 2003).

## Effects of Economic Policies on Agricultural Land Use for Paddy Production

Concern for food security encouraged Malaysian Government to concentrate on rice production during the first and second Malaysia Plans, through New Economic Plan and the First Outline Perspective Plans (1960 - 1975). Fatimah (1996) observed that these policies led to the achievement of local self-sufficiency (95%) in rice production by 1975. However, the capacity of the government to sustain this sufficiency level was later ham-

pered by the globalization and trade liberalization agreement to which Malaysia is a signatory. These free trade agreement opened Malaysian paddy market to competition by other low cost producers and this resulted to the abandonment of paddy fields because imported rice was cheaper than the locally produced rice.

## Effects of Economic Policies on Agricultural Land Use for Rubber

During First and Second Malaya Plan, rubber initiatives received government support including favorable budgetary allocation i.e. 15.9% of the Malaysian total budget (Arshad et al., 2007). Also the establishment of Federal Land Development Authority (FELDA) and Federal Land Consolidation and Rehabilitation Authority (FELCRA) in 1956 for relocation of landless smallholder farmers into big economic farmers. Other institutional supports for rubber cultivation include provision of improved breeds, irrigation systems, application of fertilizers and pesticides. All these efforts, led to the increase in land area used for rubber production from 17 336 ha to 19 820 ha during 1960–1975 (Table 6). However, further expansion of rubber plantation was affected by global decline in price of natural rubber sequel to the discovery and utilization of synthetic rubber (Jaafar, 1994). As a way out of this problem, the government adopted agricultural diversification policy (Jaafar, 1994) which led to the introduction of new crop husbandry - cocoa, pineapple, peppers, fruits, vegetables and oil palm - into Malaysian agricultural fields.

**Table 7**  
Per capita consumption of food items, kg/year

Cons, kg/yr	1985	1990	1995	2000	2005	2010
Rice	102.2	89.8	86.9	85.7	82.8	80.4
Vegetables	42.4	45.5	48.5	52	57.5	63.6
Fruit	39.7	44.3	49.9	53.5	58.9	65.1
Beef	2.4	3.2	4.3	5.3	6.7	8.4
Mutton	0.4	0.4	0.6	0.6	0.7	0.7
Poultry	14.6	19	30	35.3	35.9	36.8
Eggs	11.4	15.7	16.4	16.8	17.2	17.3
Milk	37.2	37.7	51.5	53	56	60.6
Fish	33.4	34.8	39.1	49	53	56

Source: Department of Agriculture, Malaysia, 1999 estimates

## **Effects of Economic Policies on Agricultural Land Use for Oil Palm Cultivation in Malaysia**

The agricultural diversification program of the government led to the introduction of oil palm into Malaysian fields (Jaafar, 1994). Oil palm became an important crop because of its high demand at the local and international markets, shorter maturity period and lower labor requirement (Snodgrass, 1980). In Malaysia, the rate of oil palm land use include 59 414.4ha/year; 92 325.3 ha/year; 98 392.9 ha/year and 99 732.6 in the 1970; 1980 and 1990's 2000's respectively (Abdullah and Nakaghozi, 2006) ie, oil palm cultivation increased from 641 791 ha in 1975 to 3.9 million ha by the year 2004 under suitable agro – economic policies and application of science and technology. The structural change in the socio – political economy of the country because of the industrialization in the late 1980's has brought about significant shortages of agricultural manpower in oil palm plantation. For instance, it was forecasted that the effects of labor shortage (Weisdorf, 2004; Olaniyi et al., 2011) (Figure 6) will results to 300 000 ha of rubber to be untapped, and 30 000 ha of oil palm to be under harvested and increased proportion of idle agricultural land of about 400 000 ha by the year 2010 (MDoA, 1999).

## **Effects of Economic Policies on Agricultural Land Use for Cocoa Production**

The adoption of the National Agricultural Policy (NAP) and Industrial Master Plan (IMP) that gave emphasis to crop diversification led to the development of cocoa cultivation in Malaysia (Jaafar, 1994). The earliest cocoa commercialization started in 1853 when 403 hectares of cocoa were cultivated (MCB, 2007) as an intercrop with coconut (Lee, 1985). By 1989, 450 000 hectares of land has been put under cocoa plantation thus positioning Malaysia as one of the major world supplier of cocoa (ICCO, 2007). High yielding strengthens Moreso, cocoa productivity around this time and diseases resistant varieties distributed to farmers (Lee, 1985). However, a fall in global prices of cocoa in 1992 (from 13 000RM to 1 740RM) had significant negative impact

on the expansion of cocoa plantations thus making many smallholders to destroy/abandon their cocoa plantations for other crops such as pepper and oil palm (MCB, 2007). Meanwhile, the 10<sup>th</sup> Malaysian Plan and the new high prices have the potential to revive cocoa expansion.

## **Idle Agricultural Land in Malaysia**

Idle agricultural land has been defined according to Sections 114, 115, 120 and 121 of Malaysian National Land Code as a land with freehold title or temporary occupation license that is not been cultivated or grazed for three consecutive years. Survey of 1981 by the MDoA put the total idle agricultural land at almost 900,000ha consisting of over matured rubber and coconut under small holding systems. Idle agricultural land occurred because of biophysical, socio – economic and institutional factors. However, agricultural land abandonment due to bio – physical reasons has not been well researched. Whereas abandonment as a results of socio – economic ad institutional factors have been variously studied. For example, the rising opportunity cost of labour in agriculture, aging of farm population (Pazim, 1992), inadequate rural/agricultural infrastructures, declining crop prices (Vincent and Yusuf, 1991), insecure and fragmentation of holdings (Amriah, 1988), governmental policies (rigid land conversion policies), customary laws (Shuaini, 1991; Courtenay, 1986) are institutional factors preventing acquisition of economic farm land for agricultural productivities thus favouring idle land creation.

## **Conclusions**

Malaysian agricultural land use faces many challenges from local and international communities. Locally challenges from intersectoral competition for production resource inputs because there is higher rate of returns per unit input in non-agricultural sector than in the agricultural sector (Figure 7) and internationally by competitions with other low cost producing nations. The structural change in the socio - economy of the country has brought about labor shortages, scarcity and conversion of suitable agricultural land to non – agricultural uses, increasing cost of production (MDoA, 1999).



Industrialization and urbanization in Malaysia has brought about changes in food consumption patterns thereby leading to agricultural land use change as farmers respond to high demands for new agricultural produce (fruits and vegetables). More so, globalization and trade liberalization have exposed Malaysian produce markets to competition from low cost producers (countries with better comparative costs advantages) thus deepening agricultural land use dynamics in favor of highly rewarding agricultural produce (Oil palm, fruits and vegetables). In addition, trade liberalization led to abandonment of paddy fields because the imported rice was cheaper than the locally grown rice thus leading to the creation and subsequent conversions of idle paddy fields.

Given the changing taste of Malaysian citizens and the need for the country to be at least minimally food self-sufficient calls for increased productivities of the current grazing reserves to reduce dependency on exportation of ruminant and non-ruminant feedstock. As the nations of the world witness the globally diversion of food crops into biofuel, diversion of resource inputs into non – agricultural uses, conversions of prime agricultural land to non – agricultural uses, it is obvious that Malaysia like other transiting nations of the world will continue to witness higher food price index, therefore, future agricultural land use and productivity increase Malaysia will depend on the ability of the country to deepen her applications of science and technology in resource use efficiency, diseases and pests control, new crops cultivars and her ability to compete favorably with other low costs producing nations of the world.

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