Malaysian Agricultural Development and Productivity

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Abstract: This paper analyzes the long run changes of aggregate input-output relationships and assesses the impact of agricultural development on the growth rate of Malaysian agricultural productivity over the period 1966-2000. We find that despite the intensified effort to modernize and revitalize the agricultural sector, the average annual growth rate of agricultural production decreased from 8.2 percent in the initial phase of agricultural development (1966-1970) to 5.1 percent in the intermediate phase (1971-1990) and subsequently to 0.3 percent in the modernization phase (1991-2000). During 1966-2000, labor productivity recorded the highest annual rate of growth of 4.6 percent as compared to 2.1 percent of land productivity and 2.9 percent of total productivity. All productivity measures recorded an increasingly slower rate of growth throughout the period of study. This reflects the deterioration in production efficiency in Malaysian agriculture presumably due to technological adjustment and inputs subsidies.
Introduction

Growth in agricultural productivity is of interest to policymakers, because productivity growth is regarded as a necessary condition for welfare improvement and economic development. An increasing agricultural productivity can directly contribute to an increasing rural income, alleviation of poverty and improving the standard of living. Besides providing a constant source of food supply for increasing population, the growth in agricultural productivity would ensure a reliable and sufficient supply of agricultural inputs to the manufacturing sector, especially the agro-based industries and the service sector.

Malaysia has started its agricultural development in the beginning of 1960s with the launching of the First Malaysia Plan (1966-1970). Agricultural development in Malaysia is implemented through land development, regional development, agricultural research and development and agricultural policies. Land development programs are carried out through the opening of new land schemes and in-situ program such as land rehabilitation and consolidation, replanting schemes, modern irrigation schemes and integrated agricultural projects.

Regional development emphasizes on balanced development between rural and urban areas through the basic strategy of locating small-scale industries in modern agricultural areas. Agricultural research is carried out by institutions such as Malaysian Agricultural Research and Development Institute (MARDI), Rubber Research Institute of Malaysia (RRIM), Forest Research Institute of Malaysia (FRIM) and local universities. Besides involving in research activities, these agencies also involve in disseminating their research findings to farmers through extension and support services.


The objectives of our study are to analyze the long run changes of aggregate input-output relationships, and to assess the impact of agricultural development on the growth rate of agricultural productivity. Besides estimating productivity growth for the entire period of 1966-2000, estimation is also made over

The initial phase of agricultural development coincided with the First Malaysia Plan (1966-1970) period. It was a development planning encompassing strategies to increase productive capacity and income of the rural farmer. The intermediate phase covered the period of the First Outline Perspective Plan (1971-1990), provided for the implementation of the New Economic Policy with two-pronged objectives of poverty eradication and restructuring of society. This phase also witnessed the implementation of the First National Agricultural Policy (1984-1991) which was formulated to modernize and revitalize the agricultural sector.

The 1991-2000 period was chosen as modernization phase since it was stated in the Fifth Malaysia Plan (1986-1990) that all measures and efforts taken to modernize and revitalize the agricultural sector, in line with the thrust of the National Agricultural Policy, are expected to show their full impact only in the 1990s. This phase covered the period of the Second Outline Perspective Plan (1991-2000), provided for the implementation of the National Development Policy and witnessed the introduction of the Second and Third National Agricultural Policy.

Measurement of Productivity and Sources of Data

Agricultural productivity can be defined as the efficiency with which agricultural inputs are transformed into agricultural output within given production process. Increase in agricultural productivity results in saving in the use of scarce resources, and indicates an increase in productive efficiency and improvement performance of the agricultural sector. Various measures of productivities have defined in the earlier works of Crosston (1955 & 1970), Kendrick (1966) and Yamada (1975). Productivity can be measured either in terms of partial or total productivity.

Partial factor productivity relates output to a single input, usually land or labor. Partial productivity ratios reflect not only changes in productive efficiency but also changes in input proportions, or factor substitution. In the short run, increase in total productivity reflects changes in labor efficiency and the rate of utilization of fixed plant and equipment. In the long run, it reflects improvements in the technology and organization of production (Kendrick, 1966).
In this study, the following definitions are used to calculate productivities:

Labor productivity = total agricultural output / total agricultural workers

Land productivity = total agricultural output / total agricultural land

Total productivity index = total output index / total input index

The total output index is the index of total agricultural output. The total input index is defined as the weighted average of the indices of land, labor, fertilizer and machinery, with factor shares as weights (Yamada, 1975; Mya Than, 1988; Mad Nasir, Abdul Aziz & Mohd. Arief, 1989). The total input index is estimated as follows;

\[ I_t = \sum s_{it} q_{it} \]  \hspace{1cm} (1)

Where

- \( I_t \) : total inputs index for year \( t \)
- \( s_{it} \) : share of input \( i \) in year \( t \)
- \( q_{it} \) : quantity index of input \( i \) in year \( t \)
- \( i \) : inputs 1, 2, 3 and 4
- \( t \) : year 1, 2, 3 \ldots \ldots T

Since share of inputs data are not available, following the World Bank (1993), we estimated \( s_{it} \) directly using a simple cross economy agricultural production function by regressing annual log of agricultural output on log of land, labor, fertilizer and machinery. The estimated output elasticity coefficients are taken as the factor shares. Table 1 presents the ordinary least-squares estimates for the Malaysian agricultural production function for the whole period 1966-2000. The coefficients of land and labor are found to be significant and Malaysian agricultural sector experienced decreasing returns to scale.
Table 1 Malaysian Agricultural Production Function, 1966-2000

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficients</th>
<th>T-Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>0.404</td>
<td>1.66</td>
</tr>
<tr>
<td>Labor</td>
<td>0.405</td>
<td>2.16</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>0.011</td>
<td>0.18</td>
</tr>
<tr>
<td>Machinery</td>
<td>-0.004</td>
<td>-0.05</td>
</tr>
<tr>
<td>Constant</td>
<td>3.293</td>
<td>1.27</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat.</td>
<td>2.36</td>
<td></td>
</tr>
</tbody>
</table>

This study utilizes an aggregated annual time-series data for the period 1966 to 2000 on agricultural output, land, labor, fertilizer consumption and machinery obtained from the World Development Indicators, 2003 and various issues of the Economic Reports published by the Ministry of Finance, Malaysia. Agricultural output is measured in terms of gross domestic products at 1987 constant prices. Land input is measured in terms of hectares of agricultural land, which includes arable land and land under permanent crops. Labor input is defined in terms of number of persons employed and capital input is proxied by the number of machinery or tractors used. Fertilizer input is measured in terms of metrics tons of fertilizer consumption, which is composed of nitrogenous, phosphate and potash fertilizers.

**Growth of Agricultural Output**

The performance of Malaysian agricultural output for the whole period 1966-2000 is shown Table 2 and Figure 1. Malaysian agriculture output increased by 273.3 percent over the period of thirty four years at an annual rate of growth of about 4.0 percent. Further analysis of output growth rate on every sub-period shows that there has been a downward trend in the performance of the agricultural sector. The average annual growth rate of agricultural production decreased from 8.2 percent in the initial phase of agricultural development to 5.1 percent in the intermediate phase and subsequently to 0.3 percent in the modernization phase.
Table 2 Average Growth Rates of Malaysian Agricultural Output and Inputs, 1966-2000 (percent per annum)

<table>
<thead>
<tr>
<th>Period</th>
<th>Output</th>
<th>Land</th>
<th>Labor</th>
<th>Fertilizer</th>
<th>Machinery</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966-2000</td>
<td>4.0</td>
<td>1.9</td>
<td>-0.6</td>
<td>8.3</td>
<td>8.9</td>
<td>2.6</td>
</tr>
<tr>
<td>1966-1970</td>
<td>8.2</td>
<td>2.3</td>
<td>0.9</td>
<td>14.4</td>
<td>13.3</td>
<td>2.7</td>
</tr>
<tr>
<td>1971-1990</td>
<td>5.1</td>
<td>2.2</td>
<td>0.4</td>
<td>8.8</td>
<td>9.8</td>
<td>2.6</td>
</tr>
<tr>
<td>1991-2000</td>
<td>0.3</td>
<td>1.1</td>
<td>-3.0</td>
<td>4.8</td>
<td>5.4</td>
<td>2.5</td>
</tr>
</tbody>
</table>


Figure 1 Malaysian Agricultural Output Index, 1966-2000
(1966 = 100)
Rapid growth in agricultural output in the initial phase of agricultural development was contributed mainly by the rapid growth in the production of palm oil, fish and livestock (Malaysia, 1981). The declining rates of growth of agricultural output in the later phases were due to the negative growth in forestry and logging, rubber and cocoa production during 1991-2000. The poor performance of agricultural output during these periods were due to the several constraints faced by the agricultural sector, particularly the shortage of labor, lack of suitable land, low level of capital investment; prolong world economic recession and lower prices of certain commodities such as cocoa and pepper (Malaysia, 2001).

In order to relate the agricultural development in Malaysia to the general economy over the period of study, it is necessary to compare the average annual growth rate of agricultural output with the average annual growth rate of total population. As can been seen in Table 2, the average growth rates of agricultural output in the initial and intermediate phases of agricultural development, were always substantially higher than the average growth rates of total population.

However, despite the intensified effort to modernize and revitalize the agricultural sector, as formulated under the National Agricultural Policy, the situation was reversed in the later phase of agricultural development. The average growth rate of agricultural output (0.3 percent) lagged behind the average growth rate of total population (2.5 percent). The growth in agricultural output which was less than the growth in total population indicates the agricultural production was inadequate supply to meet the growing domestic consumption and hence may present a serious food problem in the future and heavy reliance on imported food. For instance, in 2002 Malaysia spent about RM12.43 billion on imported food as compared to only RM7.42 billion worth of exported food (Utusan Malaysia, 14 February 2005).

**Growth of Agricultural Inputs**

**Land**

Over the period of 1966-2000, the total agricultural land area expanded at an average annual growth rate of 1.9 percent. The agricultural land expansion showed a continuous dropped from an annual growth rate of 2.3 percent in the initial phase to 2.2 percent and 1.1 percent respectively during the intermediate and modernization phases of agricultural development. Higher agricultural land expansion during the first two phases was due to greater emphasize on new land development programme concentrated in Pahang, Sabah, Johor, Kelantan and Perak. FELDA developed 49.7 percent of the total 353,300 hectares of new land, of
which 88.3 percent were planted with oil palm, 5.9 percent with rubber and 1.3 percent with cocoa (Malaysia, 1991).

Lower rate of agricultural land growth during the modernization phase was the result of government giving more emphasis on the development of existing agricultural areas through the implementation of integrated agricultural development programmes, the expansion of drainage and irrigation and replanting programmes (Malaysia, 1981). The pace of new land development was further reduced in the middle of 1990s due to the scarcity in suitable new land for agricultural development and the demand to preserve the remaining forest land for ecological and environmental purposes. Hence, facing with the high cost to develop marginal land, the thrust of agricultural development strategies during this period was to concentrate on in-situ development by restructuring and rehabilitating existing lands holding (Malaysia, 1991).

Labor

Agricultural labor in Malaysia experienced a decreasing trend during the period of study. There were a total of 1,690,000 of agricultural labor in 1966 and decreased to 1,408,000 in 2000, a decreased of about 16.7 percent within thirty four years. Agricultural labor grew at an annual rate of 0.9 percent in the initial phase of agricultural development but decrease to 0.4 percent in the intermediate phase. It experienced negative growth rate in the later phase of agricultural development and for the entire period of study.

The lower growth of agricultural labor as compared to total population indicates marked shift in reallocation of labor from the agricultural sector to the secondary and tertiary sectors in the economy. A structural shift in employment is evident where the share of agricultural employment in the economy declined from 52.1 percent in 1965 to 13.1 percent in 2000 (Malaysia, 1971 & 2001).

Fertilizer

Total consumption of fertilizer rose from 115,000 metric tons in 1966 to 1,428,000 metric tons in 2000, an increased of about 1,142 percent over the period of thirty four years or increased at an average of 8.3 percent per annum. The increase of fertilizer consumption was higher in the initial phase as compared to the intermediate and the later phases of agricultural development. The lower growth of fertilizer consumption in the last two phases was due to the gradual withdrawal of
an extensive range of subsidies, including fertilizer. Since 1984, most of free planting materials and input subsidies have been converted into credit schemes in line with the objectives of achieving greater commercialization and developing of strong and self-reliance farming communities (Malaysia, 1986).

Machinery

The number of tractors used in the agricultural sector jumped from 2,600 units in 1966 to 43,300 units in 2000, an increase of about 1,565 percent over three decades or an average growth of 8.9 percent per annum. Consistently higher rates of growth were observed during the initial and the intermediate phases of agricultural development. This higher rate of growth reflects the increasing emphasis towards mechanization resulting from the substitution of capital for labor due to the shortage supply of agricultural labor.

The trends of agricultural land, labor, fertilizer and machinery indices for the period 1966-2000 are shown in Figure 2. Agricultural land and labor were the most stable inputs and in the 1980s agricultural land experienced faster growth than the growth of labor. Among the input factors, agricultural machinery and fertilizer have been growing faster than the other two inputs. The growth of agricultural machinery and fertilizer which was higher than the growth rate of land and labor reflects the increasing use of the modern inputs in substitution for labor and land, the traditional inputs, which are becoming scarce in Malaysian agricultural sector.

![Figure 2 Indices of Malaysian Agricultural Inputs, 1966-2000](image)

(1966=100)
Trend of Agricultural Productivity

Trends of partial and total productivity indices are shown Figure 3 and the average annual growth rates are presented in Table 3.

<table>
<thead>
<tr>
<th>Period</th>
<th>Land</th>
<th>Labor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966-2000</td>
<td>2.1</td>
<td>4.6</td>
<td>2.9</td>
</tr>
<tr>
<td>1966-1970</td>
<td>5.9</td>
<td>7.3</td>
<td>6.4</td>
</tr>
<tr>
<td>1971-1990</td>
<td>2.9</td>
<td>4.7</td>
<td>3.5</td>
</tr>
<tr>
<td>1991-2000</td>
<td>-0.8</td>
<td>3.3</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Labor Productivity

It is apparent from Figure 3 that labor productivity has shown an increasing trend over the period of study. It grew at an average annual rate of 4.6 percent during 1966-2000 and was the highest productivity growth rate as compared to the other productivities. Labor productivity recorded higher annual rate of growth of 7.3 percent in the initial phase, but continuously decreased to 3.3 percent in the modernization phase of agricultural development.
Figure 3 Indices of Labor, Land and Total Productivities in Malaysian Agricultural, 1966 – 2000 (1966=100)

Table 3 Growth Rates of Partial and Total Productivities in Malaysian Agriculture, 1966-2000

<table>
<thead>
<tr>
<th>Period</th>
<th>Land</th>
<th>Labor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966-2000</td>
<td>2.1</td>
<td>4.6</td>
<td>2.9</td>
</tr>
<tr>
<td>1966-1970</td>
<td>5.9</td>
<td>7.3</td>
<td>6.4</td>
</tr>
<tr>
<td>1971-1990</td>
<td>2.9</td>
<td>4.7</td>
<td>3.5</td>
</tr>
<tr>
<td>1991-2000</td>
<td>-0.8</td>
<td>3.3</td>
<td>0.4</td>
</tr>
</tbody>
</table>
Sources of Labor Productivity Growth

Changes in Land Productivity and Land-Labor Ratio

Theoretically, the growth in labor productivity can be achieved through changes in land productivity and/or in land-labor ratio (Yamada, 1987; Mad Nasir, Abdul Aziz & Mohd. Arief, 1989). This means that, to increase the labor productivity per agricultural worker is as important as to increase land productivity per hectare of land area and per capita land area of agricultural worker. The relationship between these variables can be expressed by the following identity;

\[
\frac{Q}{L} = \frac{Q}{A} \cdot \frac{A}{L}
\]  

where \(Q\) is agricultural output, \(L\) is agricultural labor and \(A\) is agricultural land area, then labor productivity, land productivity and land-labor ratio could be indicated by \(\frac{Q}{L}\), \(\frac{Q}{A}\), \(\frac{A}{L}\) respectively. Taking logarithm on both sides of equation (2),

\[
\log \left[ \frac{Q}{L} \right] = \log \left[ \frac{Q}{A} \right] + \log \left[ \frac{A}{L} \right]
\]

(3)

Differentiating equation (3) with respect to \(t\), we get:

\[
\frac{d}{dt} \left[ \log \left( \frac{Q}{L} \right) \right] = \frac{d}{dt} \left[ \log \left( \frac{Q}{A} \right) \right] + \frac{d}{dt} \left[ \log \left( \frac{A}{L} \right) \right]
\]

(4)

\[
\frac{d}{dt} \left[ \log \left( \frac{Q}{L} \right) \right] = \frac{d}{dt} \left[ \log \left( \frac{Q}{A} \right) \right] + \frac{d}{dt} \left[ \log \left( \frac{A}{L} \right) \right]
\]

(5)

For changes between discrete points in time, equation (5) can be written as,

\[
\frac{\left[ \frac{Q}{L} \right]_{t} - \left[ \frac{Q}{L} \right]_{t-1}}{\left[ \frac{Q}{L} \right]_{t-1}} = \frac{\left[ \frac{Q}{A} \right]_{t} - \left[ \frac{Q}{A} \right]_{t-1}}{\left[ \frac{Q}{A} \right]_{t-1}} + \frac{\left[ \frac{A}{L} \right]_{t} - \left[ \frac{A}{L} \right]_{t-1}}{\left[ \frac{A}{L} \right]_{t-1}}
\]

(6)
From equation (6), it can be seen that the growth in labor productivity is contributed by the growth in land productivity and land-labor ratio. By applying equation (6), we review the changes of land productivity and land-labor ratio in influencing the growth of labor productivity in Malaysian agriculture. Table 4 shows that the growth labor productivity for the whole period of study and in the modernization phase of agricultural development was contributed significantly by the increased in land-labor ratio. However, the situation was reversed in the initial and intermediate phases of agricultural development, where increase in land productivity contributed about 61.7 percent to 80.8 percent to labor productivity growth. It may be seen from the statistics in Table 4 that the increasingly slower growth of labor productivity during the whole period of study was due to the declining of land productivity.

<table>
<thead>
<tr>
<th>Period</th>
<th>Labor Productivity Rate</th>
<th>Land Productivity Rate</th>
<th>Land-Labor Ratio</th>
<th>Relative Contribution Labor Productivity</th>
<th>Land-Labor Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1966-2000</td>
<td>4.6</td>
<td>2.1</td>
<td>2.5</td>
<td>45.7</td>
<td>54.3</td>
</tr>
<tr>
<td>1966-1970</td>
<td>7.3</td>
<td>5.9</td>
<td>1.4</td>
<td>80.8</td>
<td>19.2</td>
</tr>
<tr>
<td>1971-1990</td>
<td>4.7</td>
<td>2.9</td>
<td>1.8</td>
<td>61.7</td>
<td>38.3</td>
</tr>
<tr>
<td>1991-2000</td>
<td>3.3</td>
<td>-0.8</td>
<td>4.1</td>
<td>-24.2</td>
<td>124.2</td>
</tr>
</tbody>
</table>

**Land Productivity**

Over the entire period, land productivity increased at an average annual growth rate of 2.1 percent. The growth of land productivity was relatively higher during the initial phase and recorded a negative productivity growth in the modernization phase of agricultural development. The productivity of land input depends upon the amount of other inputs combined with it. Increasing amount of non-traditional inputs in relation to the quantities of land will increase land productivity.

Since the average expansion of land area during 1966-2000 was only 1.9 percent per annum (Table 2), increased in land productivity during this period was to some extent contributed by the increased in the used of non-traditional inputs. Though the used of fertilizer and machinery increased significantly (8.3 percent and
8.9 percent respectively), the growth of land productivity (2.1 percent) and agricultural output (4.0 percent) during this period was relatively low.

Similar phenomenon occurred in the modernization phase of agricultural Development where large increased in non-traditional inputs, fertilizer and machinery, gave insignificant contribution to land productivity and output growth. This may reflects inefficient-input combination and misutilization of resources since dramatic increase in these inputs do not lead to higher growth in land productivity and agricultural output.

**Total Productivity**

The total productivity in Malaysian agriculture increased at an average annual rate of growth of 2.9 percent. The growth of total productivity was 6.4 percent in the initial phase of agricultural development and successively declined thereafter and recorded lower growth of 0.4 percent in the modernization phase.

**Sources of Agricultural Output Growth**

**Increase in Labor Productivity and Labor**

Besides expanding land area and increasing land productivity, the growth in agricultural output can also be realized either through improvement in labor productivity and/or by using more labor. The relationships between these variables can be expressed as follows:

\[
Q = \frac{Q}{L} \cdot L
\]  

(7)

The relative contribution of increase in labor and labor productivity to the increase in agricultural output is shown in Table 5. It is obvious that, for the entire period of study, labor productivity contributed significantly to the growth in agricultural output.
<table>
<thead>
<tr>
<th>Period</th>
<th>Growth Rates</th>
<th>Relative Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Output</td>
<td>Labor Productivity</td>
</tr>
<tr>
<td>1966-2000</td>
<td>4.0</td>
<td>4.6</td>
</tr>
<tr>
<td>1966-1970</td>
<td>8.2</td>
<td>7.3</td>
</tr>
<tr>
<td>1971-1990</td>
<td>5.1</td>
<td>4.7</td>
</tr>
<tr>
<td>1991-2000</td>
<td>0.3</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Conclusions and Policy Implications

During the entire period of study 1966-2000, labor productivity recorded the highest annual rate of growth of 4.6 percent as compared to 2.1 percent of land productivity and 2.9 percent of total productivity. All productivity measures recorded an increasingly slower rate of growth throughout the period of study. Increasingly slower growth of labor productivity during the whole period of study was due to the declining growth of land productivity. Since labor productivity for agricultural worker is usually conceived as an important indicator of the level of labor earning and rural poverty, hence to increase the labor productivity and to eradicate poverty among rural agricultural workers, would means it is important to increase land productivity per hectare of land area.

Lower rate of growth in total productivity, especially in the modernization phase of agricultural development, reflects to some extent the deterioration in production efficiency in Malaysian agricultural sector (Kendrick, 1966). Two sources of inefficiency have been identified, viz. technology adjustment and input subsidies (Aminah 1998). The adoption of modern inputs often requires farmers to change their technology or production practices. This technology adjustment can create inefficiency and lead to declines in total productivity if no improvement in extension services is made to guide farmers for the efficient utilization of new technology. Poor access to agricultural information and extension services would contribute to decrease in productivity and efficiency of farmers (Aminah and Narimah, 1998).
The inefficiency in the usage of modern inputs in Malaysia is also obvious from Table 2 where the use of fertilizer and machinery grew far more than the output growth. This presumably reflects misutilization of resources since dramatic increases in growth of inputs do not lead to growth in agricultural output. The inefficiency in the use of new technology also occurs if the farmers have not had enough time to adjust to new technology. A study of efficiency by Huang (1971) in the three paddy growing regions (Kelantan, Selangor and Province Wellsley) found that, given enough time, inefficiency disappears as farmers adjust to new cultivation techniques.

Input subsidy is another source of technical inefficiency and productivity decline. From the early 1960s and throughout 1970s, many developing countries gave subsidies for fertilizer, tractors and credit to encourage agricultural mechanization and modernization (Sanders and Ruttan, 1978). However, subsidies do not only create allocative inefficiency, but also lead to technical inefficiency and wasting of inputs. Amade (1998), for example, found that inefficiency in Brazil, India and Pakistan rises over time due to high input subsidies.

Malaysia is of no exception. For example, a subsidy for fertilizer in the paddy sector was first introduced in 1951. In 1979 a new scheme was introduced where free fertilizer was given to farmers who cultivate 2.4 hectares or less. For every hectares of paddy planted up to 2.4 hectares, the farmers get a total of 309 kilogram of free fertilizer (Zaleha and Mohd. Ariff, 1986). In their study on the impact of free fertilizer subsidy on economic efficiency of paddy farmers, Zaleha and Mohd. Ariff (1986) found that the subsidy scheme did encourage farmers to use more fertilizer and the extra amount of chemical fertilizers has been used to inefficient levels. Several policy implications can be drawn from the findings of this study. The deterioration technical efficiency may suggest to some extent the inadequacy of support services in agriculture. The allocation for agricultural support services has been reduced substantially from 10.6 percent of the total development allocation for the agricultural sector (RM241.6 million out of RM2279.4 million) during the Second Malaysia Plan, 1971-1975 to only 4.9 percent (RM409.5 million out of RM8286.9 million) during the Seventh Malaysia Plan, 1996-2000 (Malaysia, 1971 and 1996). Thus, the reduction in the allocation for agricultural support services, which includes agricultural credit, research and development (R&D) and extensions and other services, may have had long term impact in reducing agricultural productivity and output growth.

Successful R&D activities in introducing and disseminating new technology to increase agricultural productivity require strong support and commitment from extension agents. The extension staff should comprise of those
of better trained and highly qualified workers. The lack of qualified extension staff is obvious in Malaysia. For instance in 2004, out of 3800 agricultural officers in the Department of Agriculture, only 420 are graduates and 650 are diploma holders. The others are technicians with certificates from agricultural institutes (New Straits Times, 27 June 2004). Effective transfer of agricultural technology normally requires the best qualified extension agents in the fields teaching and helping farmers to modernize agriculture.

Subsidies have been identified as a source of productivity decline and could produce technical inefficiencies. However, in Malaysia most of the farmers have survived because of the existence of various types of subsidies, such as input and price subsidies (Muhammad Ikmal, 1988). Though the removal of subsidies may improve efficiency and avoid wastage, its removal may jeopardize rural poor farmers, especially from the rice sector which operates on heavy subsidies. Existing empirical evidence shows that the removal of subsidies increases the incidence of poverty among rural farmers (Muhammad Ikmal, 1988; Firdausy, 1997).

Here we are facing with the problem of trade-off between efficiency and poverty which presumably can be resolved through integrating small-scale farmers into commercial-scale farming companies, improving agronomic practices, utilizing better resources and technology, adopting sound modern agricultural practices and developing more efficient farm management methods. Starting from the Seventh Malaysia Plan (1996-2000), the government has taken steps to review and gradually withdraw the element of subsidy in agricultural inputs. However, their effect on the efficiency of production could persist beyond the subsidy period.
References:


