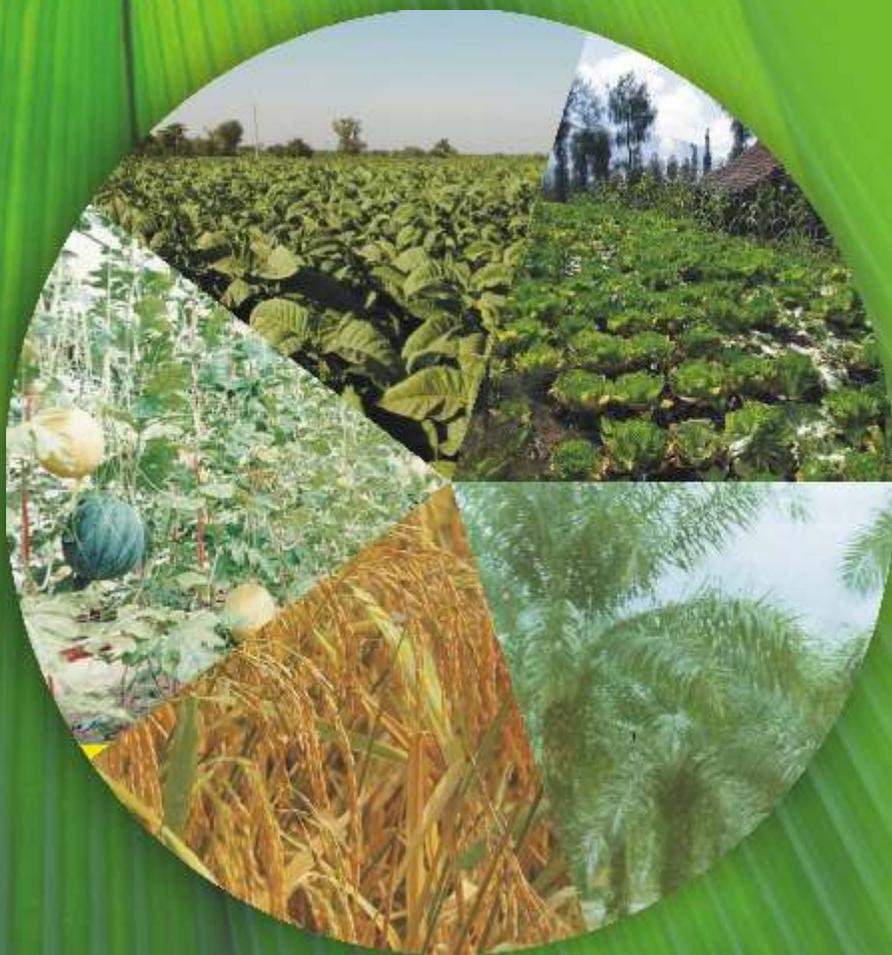


Situation of Agriculture in Malaysia - A Cause For Concern



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ERA CONSUMER MALAYSIA

(Education and Research Association for Consumers, Malaysia)

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ERA focuses on issues ranging from food security, human rights, environment,
consumer rights to women's rights for a socially just and equitable society.*

Agriculture and Food Security: Developments In Malaysia

By T. Indrani, ERA Consumer Malaysia

Introduction

Food security ensures the independence and sovereignty of a nation. History has proved time and again that food is vital to national security. Food crisis sets in when it is not available, or accessible, in sufficient quantities for the local population. Nations have gone to war over food, and will continue to do so, if they are not able to produce enough or buy food for their people. Those who are convinced that another world war is coming believe that it will be over food and they cite, among the many reasons, the burgeoning human population and the diminishing amount of arable land.

Malaysia is one of the many countries in our planet, tiny though it is, where food self-sufficiency is decreasing, year by year. The weakness of the Malaysian agricultural sector is that it largely produces cash crops and little food.

Malaysia is a net food importing country, despite once having produced almost enough food for the local population. It is not that there is no land to produce food: it is just that the priorities are different. Malaysia is a high cost producer of many food products such as rice and certain vegetables¹ and even in the region, it does not have the comparative advantage in food production. Therefore, planning provided for some level of local production, but not self-sufficiency².

Since 1990, Malaysia's food import bill has been enlarging steadily:

FOOD IMPORTS BY MALAYSIA

<i>YEAR</i>	<i>Amount (RM - million)</i>
1990	4,581.80
1996	9,056.20
1997	10,083.57
1998	10,515.51

Source: Ministry of Agriculture

¹ *National Agriculture Policy 1 & 2*

² *National Agriculture Policy 2*

The 1998 food import bill of RM10.52 billion is a very shocking figure for a small country like ours, especially considering that it is a more than two-fold jump in just eight years! It is indeed a very high figure for a country that has all along been agriculture-based, where 35% of the total land area, or 11.63 million hectares, is suitable for agriculture. Malaysia's main imports are cereals, dairy products, vegetables and fruits, according to Statistics Department figures.

MAJOR FOODS IMPORTED (IN % OF 100%)³

<i>Year</i>	<i>Cereal</i>	<i>Vegetables</i>	<i>Dairy Products</i>
1996	27	8.5	10
1997	26	8.4	9.8
1998	27	9.4	9.5

Source: Ministry of Agriculture

Despite these high food import bills, Malaysia is also a food exporter, largely to its neighbours like Singapore. Then, there is also the import and re-export of certain foods, such as fresh vegetables. This is done to “increase our income”, but can anyone see the logic of exporting food that is imported for domestic use?⁴

Our main exports are coffee, cocoa, tea and spices, followed by fish (including prawns and other seafood) and fish products, cereals & rice and also fruits. We also export vegetables, meat, dairy products and animal feed.

The Food Sector, 1970-1980

In the late 1960s and early 1970s, agricultural sector development was important to the overall economic development of the country. This sector contributed to one-third of the Gross Domestic Product (GDP) provided for half of the total employment and 50% of the foreign exchange earnings. In 1970, the agriculture sector posted a growth of 8%.

³ *It is said that many of those food products that we import cannot be efficiently produced in the country efficiently or cannot be produced at all because of our climate.*

⁴ *In 1996, our food export earnings came to RM4,693 million and there was an increase in the year 1997 to RM5,275.2 million and in 1998, our food export earnings were RM6,154.1 million.*

This achievement was the result of the First Malaysia Plan⁵ policies for more and better skilled agriculture workers. The 1MP also aimed to stimulate the adoption of modern and better farming practices and patterns, and encourage crop diversification, by the agriculture community.

These policies resulted in increased food production as farmers became more skilled and improved practices, such as double-cropping for paddy. Local rice production saw a growth of 11.9% a year during the 1MP.

The National Paddy and Rice Authority was established during this period to co-ordinate the various aspects of production, processing and marketing of paddy and rice.

Production in the other areas of agriculture went up as well. Fisheries saw a production increase of 8% a year while livestock production increased by 5.4% a year, especially in the chicken and hog industries. Malaysia then was already dependent on imports for dairy products.

During the 1MP (First Malaysian Plan), the Federal Agriculture and Marketing Authority (FAMA) played an important role in regulatory schemes in the principal paddy growing states of West Malaysia, and initiated paddy trading in Tanjung Karang (Selangor), Kedah, Kelantan and Terengganu. The Agriculture Bank or Bank Pertanian was also established, to strengthen and co-ordinate public sector credit programmes for agriculture.

The Federal Land Rehabilitation and Consolidation Authority (FELCRA) was established in 1966 to alienate and develop land, especially idle land, for agriculture purposes. Subsequently, 18 fringe alienation schemes, comprising 15,000 acres and 2,400 participants, were taken over for rehabilitation. All this contributed to the development of the agriculture sector.

In 1975, the contribution of agriculture sector to foreign exchange earnings was 49.3% and to the GDP, 29.8%. This sector employed about 1.9 million workers, or some 50% of the total workforce. Though there was a small reduction in its contribution to the national economy, the agriculture sector continued to play an important role.

Moreover, this sector was important for the achievement of two key objectives of

⁵ *First Malaysia Plan (1966-1970)*

the New Economic Policy: the eradication of poverty and the restructuring of society.

It was during this period that the Second Malaysia Plan⁶ (2MP) was implemented. The plan period from 1970-75 saw the agriculture sector grow by 5.9%, with 150,000 new jobs created. However, agriculture registered a drop in total employment as a result of the more rapid growth of the other sectors.

Food production increased from 1971-1975 because the government implemented initiatives for food self-sufficiency, learning bitter lessons from the world food crisis of 1972-73. For paddy, the 90% self-sufficiency target was reviewed and increased to 100%. Several measures were adopted during this period, including the provision and improvement of irrigation facilities, the increase of yields through varietal improvement and provision of incentives such as Guaranteed Minimum Price⁷ and the urea subsidy scheme.

Domestic production of paddy increased from 1.6 million tonnes in 1970 to two million tonnes in 1975. It met about 87% of the domestic need that year, the result of government policy that emphasised higher food self-sufficiency by increasing yields. Production incentives were also given to farmers, such as price incentives and input subsidies, and better facilities through the Agriculture Department. The MUDA and Kemubu irrigation schemes were also implemented to increase production of paddy.

With the establishment of the Fisheries Development Authority of Malaysia (MAJUIKAN) during the 2MP, fish landings increased 9.8% a year and the fishing fleet was expanded from 20,300 vessels in 1970 to 22,400 vessels in 1975. MAJUIKAN promoted the extensive use of modern techniques and provided cold storage and processing facilities for the catch.

MAJUTERNAK, the National Livestock Development Authority, was established in 1972 to develop and commercialise the beef and dairy industries. During the 2MP, Malaysia became self-sufficient in the production of poultry and pork and produced 85% of its beef requirements. However, 95% of its milk and milk product requirements continued to be imported. Production of vegetables also increased from 370,400 tonnes in 1970 to 523,100 tonnes in 1975. This increase was due to farm crop subsidies and government incentives to vegetable and fruit growers to increase production.

⁶ *Second Malaysia Plan (1970-1975)*

⁷ *Guaranteed Minimum Price is a ceiling price set by government for paddy – retail & wholesale.*

The strategies under the 2MP to enhance the development of the agriculture sector were to increase employment opportunities through the “sound exploitation” of Malaysia’s land, water and timber resources and also to raise the incomes of farm and plantation workers by increasing productivity and the scale of operation, particularly among the more traditional activities where income is lower. Research was done to raise the income of small farmers, increase the production of export crops, promote agricultural diversification and stimulate import substitution. These strategies contributed to the increase of food production and were geared at the small farmers.

The Third Malaysia Plan⁸ (3MP) policy initiatives were continued under the national development plans of restructuring society and eradicating of poverty. The push was to raise agriculture income levels and increase employment opportunities in the sector through programmes of higher production in existing holdings and opening up new land for agriculture. These objectives were to be achieved through an integrated approach to accelerate agricultural development by providing inputs to large numbers of small farmers so that they could raise yields, and therefore, incomes. These strategies also contributed towards the increase in production of food products during the 3MP.⁹

Even though production in the food sector increased, the agriculture sector’s contribution to the GDP dropped to 22.2% in 1980, with the growth rate of the sector being 4.3% a year. This was due to the global recession of 1974-75, and also because of adverse weather conditions during the second half of the decade.

During the decade, the cultivation of fruits and vegetables expanded as a result of the provision of subsidies and marketing incentives. The acreage for vegetables expanded to 9,000 hectares in 1980.

Livestock production constituted about 6% of total agricultural output in 1980. It expanded at a slow rate of 2.2% a year due to the foot and mouth disease outbreak of 1976-1980. Production of beef, milk and mutton expanded as a result of the pawah programme and beef/dairy projects of the Veterinary Department and MAJUTERNAK.

Milk production increased substantially with the implementation of the dairy

⁸ *3rd Malaysia Plan – 1975-1980*

⁹ *Paddy production increased from 1.6 million tonnes (1970) to 1.9 million in 1980 and yield per hectare increased from 1,055 gantang to 1,260 gantang during the period while acreage under paddy increased from 533,400 hectares (SMP) to 595,600 hectares, of which 56% was under double-cropping. Rice self-sufficiency level increased to 92% in 1980 from 87% in 1975.*

development programme for smallholders. The development of the livestock industry, however, continued to depend on high cost imported feeds. Fisheries also had a production growth rate of 9.8% a year and its contribution in agricultural output was 11.2% in 1980. Development of the aquaculture programme was expanded to supplement marine food production.

During these three Malaysia plans, the government invested a lot on land development for agriculture through various programmes such as FELDA and FELCRA, with a total of RM375.9 million invested under the Fourth Malaysia Plan (4MP).

Under the 2MP, the investment was RM88.18 million and during the 3MP, RM2744.65 million went for land development. The second highest investment by the government was for the development of drainage and irrigation, which contributed to the higher production of paddy and other agriculture and food crops.

Private sector involvement in agriculture during this period was very minimal. It mainly involved land development projects and many projects were joint programmes with the government sector. Under the 4MP, only 139,000 hectares of land were developed by the private sector out of the 888,100 hectares developed. In the 2MP, the private sector developed 115,900 hectares and in the 3MP, a total of 134,615 hectares of land were developed through joint venture and private projects. Agriculture education was also given much attention during this period and besides six agriculture institutions, the National Agriculture University was also established.

Therefore, it can be seen that the emphasis given to the agriculture by the government was largely due to its multifunctional role: the need to improve the livelihood of farmers, to produce food and for economic reasons as the sector contributed a large amount of the country's foreign exchange earnings.

Moving Towards Commercialisation

In the 4th Malaysian Plan¹⁰ (4MP), the overriding objective was to increase income through productivity improvements and the creation of employment opportunities. The NEP was still the base for the development of the agriculture sector in the development plans as this sector had highest poverty rate in the country.¹¹

¹⁰ 4th Malaysian Plan 1980-1985

¹¹ During the implementation of 4thMP, agriculture contribution to the GDP was only 20.3% in 1985 and the growth of the sector was 3.4% a year. In terms of employment, the sector accounted for 1.95 million jobs or 35.7% of total employment in 1985, compared with 1.91 million jobs or 39.7% in 1980. During the period 1981-1985, it generated about 42,300 jobs or 6.5% of the total employment.

Paddy production increased by 1.1% a year from 2,040,200 tonnes in 1980 to 2,258,000 million tonnes in 1985. This amounted to 73.6% self-sufficiency only. In 1980, there was a sufficiency level of 92%. This decline is said to be due to weather conditions, continuing instabilities in yields and cropping intensities, even in the major granary areas, and the increase in amount of abandoned paddy land. The drop was so high that there was an import of RM257.10 million worth of paddy that year. The supply and demand gap was 426,000 tonnes. This was the beginning of high amount of rice imports by the country as the self-sufficiency level of rice was the lowest in 1985 compared to previous years.

VEGETABLE PRODUCTION SECTOR¹²

Year	Production (Tonnes)	Hectarage Planted	Import (Million)
1980	202,100	9,000 hectares	-
1985	124,300	8,090 hectares	RM276

Source: Ministry of Agriculture

Fish and other seafood imports in 1985 came to RM237.2 million. In the livestock sector, beef production increased to 19,199 tonnes in 1985, mutton production decreased to 600 tonnes in 1981 but increased in 1985 to 800 tonnes as a result of rearing of sheep in rubber and coconut estates.

FISH PRODUCTION SECTOR¹³

Year	Total Production	Marine Fish	Aquaculture
1980	743,700 tonnes	732,000 tonnes	10,900 tonnes
1985	697,100 tonnes	689,100 tonnes	8,000 tonnes

Source: Ministry of Agriculture

Production of poultry, eggs and pork was self-sufficient and there was a surplus, which was exported. Milk production increased three-fold due to rearing of better breeds, and increase in the number of dairy farmers as well as improved dairy

¹² This reduction in production was caused by increase in cost production due abolishment of crop subsidies during the NAP I. Fruit production was constant during that period of time.

¹³ The decline in output was supposed to be due to inadequacies of the marketing system for fresh water fish, which culminated in the closing down of large number of fishponds.

management, particularly in areas surrounding milk-collecting centres.

The import of meat, mainly beef and mutton, and milk, came to RM465 million in 1985. MAJUTERNAK, which was supposed to contribute towards the development of the local livestock industry, especially the beef and dairy sector, was dissolved in 1983 and its tasks taken over by the Department of Veterinary Services.

Total food import was RM3,063.00 million in 1985 compared with only RM2,340.3 million in 1980.

During the 4MP, the First National Agricultural Policy¹⁴ (NAP1) was implemented in 1984. The main objective of the NAP1 was maximisation of income from agriculture through efficient utilisation of the country's resources. Maximisation of income was for farmers and the country.

Production of all agricultural commodities, except rice, would be based on technical, including agro-climatic considerations, as well as economic returns. The thrust of the NAP1 was to increase productivity, efficiency and competitiveness in the development of new resources as well as in the fuller utilisation of existing resources. This period of time was the beginning of the agriculture sector moving towards the commercialisation. However, during this period of time food production decreased and food imports were increasing, even though one of the reasons food production decreased was adverse weather conditions.

During the implementation of NAP1, planting materials and certain inputs that had been provided free by the government were replaced by a scheme where planting materials were provided at a nominal fee. Subsidies for all kinds of crops, livestock and fisheries with the exception of paddy, pepper and sago were gradually reduced towards the end of the 4MP period. This contributed to the increase in cost of production for farmers and decreased production that year, even though the strategies of NAP1 stressed cost reducing measures.

Moreover, the Agriculture Ministry privatised a number of projects, mainly those related to food production, to encourage private sector participation. These included aquaculture projects in Puchong and Sungai Dangga, the hatchery centre at Mahang in Kelantan, and the pig section of the abattoirs at Ipoh, Johor Bahru and many other areas.

¹⁴ *First National Agriculture Policy, 1984-1991*

The ministry also privatised ice factories operated by the LKIM¹⁵ at some fishing complexes and the tea factory operated by MARDI in the Cameron Highlands. The privatisation of LKIM projects had an impact on the fisher folk, especially small fishing communities that would have to depend on the private sector, which always charged a premium on everything, even the supply of ice. This increased costs of production.

Large-scale production and increase in farm sizes for the production of all food products was encouraged, especially for vegetables, fruits and livestock. This was for economic productions of scale and also to increase production for domestic demands and export purposes.

FAMA, which was supposed to help farmers earn a better income from fairer prices for their produce by setting up buying centres, gradually moved out of direct domestic marketing activities and instead undertook to provide market intelligence and seek out and develop new markets overseas. This shows the importance given to overseas markets and export-orientated produce.

During the implementation of the Fifth Malaysia Plan (5MP), efforts were taken to revitalise and modernise the agriculture sector, as well as to urbanise the rural areas. The major thrusts during the 5MP were to continue the efforts towards modernising and commercialising the smallholder sub-sector; rationalise the extent of government involvement and increase private sector participation in agriculture.

The agriculture sector grew by 4.6% a year and its contribution was just 18.7% of the total GDP, at a time the NAP1 was still being implemented.

Paddy production was 1,271,000 tonnes in 1990 and the increase in production was only 1.03% because of labour shortage, low returns, poor management and occasional droughts in the non-granary areas of the northern peninsular. Self-sufficiency level was 79.4% – an increase – just under the NAP1 target of 80%.

Vegetable production increased 4% a year to 609,600 tonnes in 1990. The increase in production was due to the intensity of cultivation rather than any increase in hectareage. Malaysia was still a net importer of vegetables as production was not able meet the demands of consumers. In 1990, our import of vegetables was worth RM366.8 million. Livestock is another area in which we depended heavily on imports, even

¹⁵ MAJUIKAN had a change of name to LKIM-Fisheries Development Authority of Malaysia

though we had a surplus in egg, pork and poultry production in 1990. Milk production was only 10% self-sufficient; production of beef only grew by 1.9% a year, which was not in line with the increase in consumption. Livestock imports amounted to RM855.2 million in 1990. In fisheries, even though there was an increase in production to 564,600 tonnes, imports of fish and fish products were still high, coming to RM363.6 million in 1990.

This is a very worrying trend. After five years of the implementation of NAP1, Malaysia's import of food had increased and the rate of self-sufficiency dropped, especially in rice, despite its paddy production being given special privileges under NAP1.

Moreover, it is stated in NAP1 that the production of all agricultural commodities, except rice, will be based on economic returns. At this point, it seems cash crops have been given priority as they caused Malaysia's exports to rise and brought high economic returns. Food crops were therefore sidelined, as costs of production were high and the returns, low.

Mechanisation of the agriculture sector was emphasised under the NAP1, even in the research and development area. This contributed to the increase in cost of production in the agriculture sector, as mechanisation is expensive and could have contributed towards small farmers going out of business. Employment in this sector dropped by about 3.8% in 1990.

The NAP1 was supposed to increase incomes of farmers through increased productivity and efficiency, but then this was not achieved as the high incidence of poverty in the agriculture sector remained. It has increased the role of private sector, with the important projects of agencies like LPN and LKIM being privatised during this time. LPN was privatised during the 5MP and the implementation of NAP1. This was the agency given responsibility over the nation's staple food.

The private sector's role in land development also increased after the implementation of NAP1. During the 2MP, 67.2 % of the total land developed by the private sector involved wholly private sector projects while 42.5% represented joint-venture projects with government agencies. During the implementation of 4MP and NAP1, 76% of the total land developed by the private sector was for private sector projects while during the 5MP, also under NAP1, only 2% of land developed by private sector was by joint venture, with 98% being fully private sector projects. It showed that over the years the role of private sector in the national agriculture scene had increased significantly.

During the implementation of the Sixth Malaysia Plan¹⁶ (6MP), the role of private sector was further increased. Land development was no longer done by FELDA but only by state governments and the private sector, with private companies developing 85% of the total land developed during 1990-95.

Privatisation And Globalisation Of The Malaysian Agriculture Sector

During the 6MP, priority was given to further re-orientating smallholdings towards greater commercial operation to realise economies of scale and to be internationally competitive in the long run. The major policy concern was to ensure that agriculture remained competitive in the international market, and therefore economically viable, though exploration of new crops for their earnings potential.

For products that were not competitive, research and development (R&D) was to be emphasised towards enhancing their competitiveness. The Second National Agriculture Policy (NAP2)¹⁷ was introduced and implemented during the 6MP period and its policy on research and development was also emphasised to ensure the agricultural sector was well on its way to commercialisation that was based on market forces.

NAP2 stressed that the agriculture sector should be market-led, commercialised, efficient and competitive. The strategies of the NAP2 are focused on large-scale production, rural industrialisation and commercialisation. Self-sufficiency in food production is not encouraged, as Malaysia does not have a comparative advantage in food production.

FOOD PRODUCTION SECTOR IN 1995

	<i>Paddy</i>	<i>Livestock</i>	<i>Vegetables</i>	<i>Fisheries</i>
Production (tonnes)	1,373,000	1,400,100	609,600	764,500
Land-used (hectares)	670,000	-		-
Self-sufficiency level	76.3%		71.6%	
Import (RM Million)	356.1	1,473.2	683.4	762.4

Source: Ministry of Agriculture

¹⁶ *Sixth Malaysia Plan - 1990-1995*

¹⁷ *Second National Agriculture Policy - 1992-2010*

Even though import substitution for food crops was stressed under NAP2, imports still increased and food production was relatively low, compared to the production of cash crops. The agriculture sector grew at 2% a year during the 6MP as Malaysia headed towards industrialisation and Vision 2020, meaning that it was left behind. The sector's share in GDP also declined to 13.6% in 1995, while its contribution to total export earnings was 13.1% and contribution to total employment, only 18%.

This decline was the result of government policy to move the country from an agricultural economy to an industrial economy. The basic reason for this shift was that the agriculture sector was considered non-productive and labour- and capital-intensive.

Food crops were therefore neglected and concentration in the agriculture sector was on commodities like palm oil, cocoa and rubber, which besides being of export value, were also important to the local manufacturing sector.

The NAP2 did have a direct bearing on falling food production. Its policies were market driven and slanted towards human resource development for efficient agrobusiness, resource management and agro-based processing. This was much unlike the 1st and 2nd Malaysia plans, where human resource development was based on training in farming, agricultural techniques, fishing and so on.

Investment in agriculture was to be in agricultural commodities that would support industrial growth. This meant food production such as paddy and vegetables, which are not based on industries, were not an attractive sector for investment. Moreover, under NAP1, social and institutional support was emphasised for the development of farming and the improvement of farmers' living standards. However, under the NAP2, institutional development was concentrated on integration of small farms into bigger co-operatives, so as to become competitive with the support given. This is not development for farmers but chasing smallholders out of business, since a large farm will be able to produce more cheaply than small farms.

The Seventh Malaysia Plan (7MP) also saw a reduction in the role of agriculture in the country's economy and a slow growth in the food sector.

The 7MP encourages increased participation in agriculture on a large-scale basis, particularly in the production of food commodities and high-value produce, reorienting production methods to improve competitiveness in the context of a more liberal market environment and reviewing the remaining tariffs imposed on agriculture inputs. At the same time, it calls for the gradual withdrawal of subsidies and encourages greater

market efficiency. All these policies confirm that the agriculture sector was moving towards a more open and competitive agricultural economy and towards free trade.¹⁸

Self-sufficiency in rice needs also dropped to the target level of NAP2, around 65% in 1998. Total area under paddy dropped as concentration was only in the eight major paddy growing areas¹⁹, with the other areas encouraged to change to more productive cash crops.

The production of vegetables registered a positive increase the past three years, but imports continued to rise, from 10% to 16% a year. In 1998 a 16.6% increase in imports was recorded – or an expenditure of RM987.3 million – to import vegetables the previous year. The main imports were onion, shallot and garlic, followed by potatoes, carrots, round cabbage, cauliflower and headed broccoli.

Even though Malaysia has a large food import bill, the export of vegetables continued, and sometimes there is a re-export of imports to Singapore. It has often been claimed that Malaysia exports cheap vegetables and imports expensive ones. Many of these expensive vegetables are definitely not for the masses – which mean that the import bill is high because Malaysia imports vegetables for the rich and the better off. This is neglect of the poor as vegetables they consume are exported and vegetables for the rich are imported.

There is also an increase in imports of livestock and of animal feed as the value of US dollar is higher compared to the Malaysian ringgit.

PRODUCTION AND IMPORT OF LIVESTOCK PRODUCTS

<i>Year</i>	<i>Production (Tonnes)</i>	<i>Import (RM Million)</i>
1996	1,443,200	1,556.2
1997	1,495,400	1,704.7
1998	1,555,500	1,673.3

Source: Ministry of Agriculture

¹⁸ During the 7th Malaysia Plan and NAP2, paddy production increased by a level of 0.9% a year from 1996 to 1998. However, the import of paddy had also been increasing, from RM537.52 million in 1996 to RM701.31 million in 1997 and RM910.52 million in 1998.

¹⁹ The eight major granary areas – Muda, Kemubu, Kerian-Sg. Manik, Barat Laut Selangor, Seberang Prai, Seberang Perak, Besut and Kemari Semarak.

The major contributor to the food import bill, which takes up about 50% of the total livestock imports, is dairy produce – all kinds of milk and cream, milk products, butter, other fats derived from milk, cheese and yoghurt. Malaysia is only 4% self-sufficient in milk now.

Fisheries also show high import and export figures. Fisheries are one of the areas developed for export orientation. Production had a constant increase of 5.8% a year in the last three years (1996-1998) and consumption has increased by 7.1% a year. Production increase is not in line with consumption. The country imports fish products but remains a net exporter of fish products. So why are imports high?

During the 7MP, the NAP2 was reviewed and as the policies were found not to be suitable with the current situation. After the 1997 financial crisis, the Third National Agricultural Policy (NAP3) was introduced and implemented in 1998. It was said that the NAP3 was introduced to ensure food security in the country – but the policies do not indicate this.

The main objective of NAP3 is to enhance food security, increase productivity and competitiveness of agriculture, deepen linkages with the economic sectors and create new areas of growth for agriculture. These objectives do not seem to go in line with food security, for how can competitive agriculture ensure food security?

Moreover, displacement will take place in the workforce in the agriculture sector as labour-saving technologies and improved management are introduced to increase productivity. Already, there was displacement occurring in the agriculture sector due to replanting and development²². Labour-saving technology will increase the number of displaced workers. In the NAP3, the policy for food production is larger-scale operation and commercialisation. As we can see, commercialisation of food production has not contributed towards the self-sufficiency in food production, for this was also the strategy in NAP2. In the early 1970s and though to the 1980s, food production had a much higher self-sufficiency level as commercialisation was not considered.

For paddy production, the targeted self-sufficiency level remained at 65%, as under NAP2. Production was also to be concentrated in the eight major granary areas while the areas outside, which contributed to 30% of local paddy production, were to be converted to other uses, in particular agro-forestry. This would of course increase

²⁰ *Malaysian Agriculture Index 97/98*

²¹ *Third National Agriculture Policy – 1998-2010*

²² *Refer appendix*

Malaysia's import of rice, as there will be 30% less production.

Moreover, the rice industry was to be deregulated, with the repackaging of price subsidy and fertiliser subsidy programmes in order to allow for long-term structural adjustments to fulfil international obligations under the World Trade Organisation. The past three years, only fertiliser subsidy was given for paddy and all other subsidies that were given for food production were gradually stopped after the implementation of NAP1. This has increased the cost of production of paddy and other food crops. What more adjustments can be in store for the farmers and the industry?

In the development of the livestock sector, especially milk, beef and mutton, fisheries and vegetables, the private sector was to play an important role in increasing production and developing the sector. Thus the development of the food sector was privatised and it would no more be the role or responsibility of the government to ensure food production. The vegetable, fruit, fisheries and the poultry and egg sectors as well were to be export-based. So now, food production is for business purposes, not for national security, as seen under NAP1.

The NAP3 strategy is based on an agro-forestry and product-based approach. These strategies are correct for the commercial market but how about food security? If it is going to be a product-based approach, then the concentration will be on enhancing the production of crops with a higher market value. Food products are less profitable, if produced as a social responsibility.

Moreover, research and development programmes are to focus on conducting industrial-driven technologies in collaboration with industry, producing technologies for the public good and the commercialising of research findings.

The policy does not mention anything about improvement in food production or research in ensuring food security. Also to be undertaken are marketing efforts and other areas relevant to ensure efficient marketing of cash crops. This is very unlike the NAP1 policy which emphasised marketing channels, the promotion of farmers' participation in marketing their own products and upgrading physical infrastructure to help farmers.

Private sector involvement has also increased significantly in the agriculture sector. Institutional development is based on the setting up of a private-public sector coordination council to implement NAP3. Private sector participation is also encouraged in large-scale farming for paddy production and investment in research and development. Projects involving the private sector will be intensified to commercialise

research findings and innovations. The agriculture sector is pushed towards globalisation and free trade with the encouragement of foreign investment, and guidelines are to be introduced to enable this. The main components of NAP3 show the trend of the agriculture sector being pushed towards privatisation, free market and globalisation. More proof that food production is neglected can be proven by looking at loans given out by the Agriculture Bank of Malaysia (BPM – Bank Pertanian Malaysia).

ALLOCATION OF LOANS BY BPM FOR THE FOOD SECTOR

<i>Year</i>	<i>Percentage Of Allocation</i>
1970-1975	41.2%
1976-1980	50%
1996	12%
1997	6.7%
1998	26%

As we can see, the total amount of loans given by BPM for paddy production and food production has declined. Emphasis has been given to tobacco production, mechanisation and commercial products. It is very clear that the food production is neglected.

Another Drastic Change

Due to the sidelining of the food production sector in the past few years, Malaysia is dependent on imported food to feed its people. In the last three years the country's food import has increased to RM10 billion. Cereals made up the highest import at 27% in 1998, followed by dairy products at 9.5% a year between 1998 and 2000. Vegetables made up about 9.4% of food imports in the last few years. These figures show a change in eating habits in the country, as the highest imports are Western food that cannot be produced locally.

Therefore, the food demand has changed from rice to cereals and from sawi to cauliflower. The increase in demand for these products is not a healthy trend as Malaysia has become more vulnerable to food insecurity, and with Western food becoming popular. Malaysia is becoming more and more dependent on imported food as the production of rice and other major food commodities is low and also because

of the lifestyle change, with Western food and food habits becoming more popular with the people.

Malaysia is also heavily dependent on inputs used to produce food. For instance, the country is 70% dependent on imported animal feed for the livestock industry. Animal feed contributes 65%-80% to the cost of production of chicken and cattle. Even if Malaysia companies produce the feed locally, the major input for animal feed, such as vitamins, minerals, drugs and preservatives, are imported. For instance, the cost of production of a 2kg chicken is RM 5.62

PRODUCTION COST OF 2KG OF CHICKEN (48DAYS)

Components of Cost	Amount (RM)	Local/Import
Animal feed (soft)	0.97	Imported
Animal feed (rough)	2.80	Imported
Chick	1.00	Local
Medicine	0.20	Imported
Labour	0.40	Local
Structure	0.10	Local
Water & Electricity	0.10	Local
TOTAL	RM 5.62	

Source: Nafas Sdn Bhd

In the total cost of production of a chicken, which weighs 2kg, RM 3.97 worth of inputs are imported and the rest are local. So, 70% of the cost of production is spent on imported inputs and only 30% of the production cost is local input. This confirms that the local food production industries depend on imported inputs to produce food locally.

The livestock industry even depends on imported parent breeders to start the breeding of cattle or sheep. In the farming sector all the chemicals used as fertilisers and pesticides are imported and even if produced locally, the major ingredients are imported. Somehow or other, Malaysia is dependent on imports for food production.

Moreover, as the Malaysian economy moves towards a market-orientated economy, investors in the agriculture sector, in search of better returns on their investments, have diversified the use of agricultural resources such as land and capital to other competing sectors. Therefore, the growth of new industrial, commercial and residential centres are at the expense of the agricultural sector resources. This is evidenced

especially in recent developments, where large tracts of agricultural lands were converted into industrial, commercial or residential purposes. The KL International Airport and Putrajaya projects are the two most recent projects where the agriculture lands were converted to other uses.

The Last Recession

The 1997 financial crisis gave Malaysia a bitter experience of food prices soaring and important commodities like sugar, coconut, chicken and rice seeing price hikes, until now a coconut still costs RM 1 – RM1.30. Prices of other food commodities remain high. There was also a shortage of vegetables, onions and other food products in the market as price increases, because of the financial crisis, also forced a reduction in imports.

Everyday the food prices went up. Even the price of the chicken, which we are self-sufficient in producing, went up as the feed had to be imported. The nation did not have a food crisis but then, for a country that was originally agriculture-based, this shortage of food could have been avoided if policies towards food self-sufficiency had been introduced and implemented. The 1997 crisis taught us not to depend on imports for food: Has this lesson truly been learnt?

Malaysia's dependency on food imports has increased the cost of food in the daily lives of Malaysians. The Consumer Price Index (CPI)²³ shows the increases in prices of consumer goods and can be used to prove that the cost of food in our daily lives has increased due to the importation of food.

CONSUMER PRICE INDEX FOR FOOD

<i>Year</i>	<i>CPI</i>
1995	104.9
1996	110.9
1997	115.5
1998	125.8
July 1999	116.8

Source: Statistics Department Malaysia

²³ *Consumer Price Index – changes in the prices of goods according to weightage. The weightage for food products is 34.9%. Rice, bread and cereals is 5.5%, meat 3.8%, fish 4.9%, egg and milk 2.3% oil and fat 0.7%, fruits and vegetables is 5.4%, sugar 0.6%, other food is 1.1%. Outside food carries a weightage of 9.8%. The base year for CPI is 1994, where CPI is calculated as 100.*

Food is the highest expenditure in CPI, where it carries a weightage of 34.9 out of the full 100 points. In 1998, food contributed 62.8% to the CPI and from January to July 2000, the contribution of food to the CPI was 62.1%.

In 1994, a person used to spend RM271.94 on food. After that, the amount spent on food has increased every year. Even though the increase is small, it is significant. In 1997, the average food bill was RM 314 a month a person and now, according to the August 2000 CPI, the amount spent on food was RM357 – an increase of RM 85 since 1994. This amount may not be seen as large, but if we are calculating for a household of five members, the increase is RM425 a month on food alone.

This is a large increase and with the financial crisis, it is not easy for the people, as their wages are not increasing together with the prices of food or goods in the country. They have to spend more on food that is getting more expensive day by day. This is due to the high cost of food production and high cost of food imports. If this situation continues, then one day wholesome food will be a luxury, having become too expensive for low-income people to buy nutritious food. Food will not be affordable for the poor and low-income groups.

This analysis proves that Malaysia is becoming vulnerable in the area of food security, where the prices of food are increasing and Malaysia is becoming more dependent on imported food as domestic production is not able meet the demand.

Analysis of The National Agriculture Policies

If we analyse further, this situation was caused by policies in the NAP1, NAP2 and NAP3, where step by step the agriculture sector was commercialised and market-driven. Moreover, self-sufficiency in food production was lowered on grounds that Malaysia does not have a comparative advantage for food production. Paddy production was targeted for an 80% self-sufficiency level when 90% was possible. This target was further lowered under NAP2 and NAP3 to a self-sufficiency of 65%.

Further, livestock, fisheries and vegetables were pushed towards export orientation and large-scale farming. This led to concentration on export based production, where we can see a large export of the commodities and a high value of imports in that sector for domestic consumption.

Moreover, research and development policies were based on commercial needs and market-driven under the three agriculture policies. Throughout the three agriculture

policies, private sector involvement increased to the extent that the private sector now plays an important role in the implementation of NAP3. Food production and the agriculture sector were commercialised and subsidies were gradually stopped for nearly all the food products. Malaysia has begun to globalise its agriculture sector and this meant its food sector as well, with the NAP3 giving encouragement to foreign investments in agriculture. Therefore, soon we can expect multinational companies producing food for the country as it is a lucrative business and there will always be a demand for it.

Situations like this already exist in many countries like United States, Philippines, India, Pakistan and Bangladesh, where transnational corporations and multinational companies control the production of food by controlling seeds, pesticides and also the prices of food. The nation will end up depending on corporations to feed its people.

Opening the agriculture sector to the globalised market is not going to benefit Third World countries, as this will further burden local farmers who are not competitive enough to compete with transnational or multinational corporations. This is because multinational companies are supposed to be much more efficient in food production as they are in commercial and large production.

Moreover, there is a need to protect the agriculture sector as it is important for food production in the country. Malaysia cannot be dependent on imported food or imported inputs to produce food. In the year 2000 budget, tax reduction and tax relief have been given to a certain number of imported foods, so that they will be cheaper to import. But then, the government has not considered the situation where we will be more dependent on imported foods as these will become much cheaper to import than to produce locally. This will increase dependency on imported food and also increase our import bill as you can get more products with the same amount of money spent earlier. The situation encourages imported foods and if this situation continues, it will make food security in Malaysia highly vulnerable. As we discussed earlier, food security is vital in ensuring national security.

Conclusion

The analysis in this paper confirms that:

- 1. Malaysia is not self-sufficient in food production**
- 2. Malaysia is dependent on food imports and also imported inputs for food produced locally**
- 3. The Malaysian agriculture sector has moved towards privatisation, commercialisation and is market-driven**
- 4. The Malaysian agriculture sector is moving towards globalisation and open economy**

Malaysia: Towards achieving Food Security

It is important for nation states to achieve food security and food sovereignty to ensure that every citizen in the country has access to safe and healthy food. Malaysia should take steps to move towards ensuring self-sufficiency in food production in the country and also push towards achieving food security in the ASEAN region.

The government should review the food policy in the Third National Agriculture Policy (NAP3) and move towards ensuring food security. Future food policies should aim to create greater stability in food production. They must also be geared towards establishing a more integrated food market, which can ensure better integration between supply and demand.

The government should also have a comprehensive programme, in line with developing food production, to develop the food industry. The Fund for Food should be more accessible and flexible to encourage farmers to produce food and develop the food production sector. Human resource development to generate a larger number of food technologists must also be pursued. The establishment of local food industries will not only provide income and employment generation opportunities but will also lead to a reduction in the country's food import bills and have a beneficial impact on the balance of payments. The government should also take over agriculture land that has been left idle and lease them out for food production. This will also increase food production, as more land will be used to produce food.

The government should also subsidise and give equal support and importance to the

food production sector as is given to the cash or commercial crops. Subsidies should be given to small farmers to enhance production in the food sector and other facilities should be given to youths and farmers to encourage more people to explore the agriculture sector for opportunities, especially the food production sector.

The government of Malaysia should also reject any new negotiations on the Agriculture sector in the Seattle Ministerial Meeting and push for an evaluation and impact analysis of the Agreement on Agriculture. This is to ensure no further liberalisation is done in the agriculture sector and food security is achieved. The United States of America had a 50-year relief period to liberalise its agriculture and textile markets. If a developed country needs 50 years to open up its agriculture market, how can a developing country like Malaysia liberalise its market in just 5 – 10 years? All this should be questioned at the Ministerial meeting and an evaluation should be done on the impacts of the Agreement on Agriculture on developing nations and on the small farmers.

The impact of the Agreement on Agriculture can be clearly seen in many developing nations. For instance, in the Philippines, liberalisation and the implementation of commitments under the Uruguay Round have had severe effects on both producers and consumers in the rice and corn sectors. Liberalisation of the rice trade in the Philippines through reductions in price subsidies and the reduction of stocks led in 1995 to the doubling of the local retail price of rice. In order to avoid civil unrest, the government was forced to import a large amount of rice for cheap distribution. The local sugar industry and the food security of its 400,000 workers suffered severely as a result of higher sugar imports resulting from liberalisation.

Another well-documented example is that of heavily subsidised beef from the European Union being dumped in West Africa at prices below production costs, forcing cattle farmers in Burkina Faso out of business. All these impacts should be evaluated and steps should be taken to set things right before further liberalisations in agriculture sector are negotiated.

Another very effective way to ensure food security in the country is to take steps towards regional food security through trade in food and food products among ASEAN member countries. Intra-regional trade will not only enable resources to be utilised more efficiently, based on the principles of comparative advantage and resource endowments, but will also bring about greater prosperity to the entire region.

To facilitate and also enhance intra-ASEAN food trade a number of major steps may be pursued:

1. Development of ASEAN Regional Food Balances Sheets. The purpose of this exercise would be to compile national food balance sheets that show supply-demand situations and also the level of self-sufficiency in the staples and major food items. This in turn will provide the starting point for identifying the surplus-deficit situation with regard to individual food production in each member country.
2. The next step is to develop regional food trade policies that can allow for an efficient exchange of food items between the member countries. This would entail the setting up of special committees under the Senior Officials Meeting of the ASEAN Ministers of Agriculture and Forestry (SOM-AMAF) Meeting, and also the AFTA working Group to design a policy framework that can lead to harmonised agriculture policies and instruments.
3. In addition, various other initiatives – institutional, financial and economic – may be undertaken to promote intra-ASEAN trade in food. These include strategic alliances among agricultural cooperatives in the region; the enhancement of ASEAN joint ventures in food production and the food industry, technology sharing and exchanges; offshore investments and Cupertino of shipping and other trade facilitation instruments.
4. The ASEAN Food Security and Reserve Board (AFSRB) should also endeavour to expand its scope of foods from the present three items – rice, sugar and maize – to include more main food items such as lentils and tapioca. The overall quantity of the stockpiles can also be increased in order to provide for sharp downturns in grain and other staple food harvests.²⁴

All these steps will form a strong foundation for the nation to move towards ensuring its food security and food sovereignty.

November 2000

²⁴ *Food, Agriculture and Food Security: developments In ASEAN-Prospects and Challenges* by Prof Abd. Aziz Abd.Rahman, Universiti Putra Malaysia

Appendix

EXPORT & IMPORT OF FOOD (RM MILLION)

<i>Year</i>	<i>Import</i>	<i>% Of Total Import</i>
1985	3,063.00	10
1990	4,581.80	5.8
1995	7,663.60	3.9
1996	9,056.20	*
1997	10,083.57	4.5
1998	10,515.51	4.6
Jun-99	5,200.21	4.5

<i>Year</i>	<i>Export</i>	<i>% Of Total Eksport</i>
1985	1,662.10	4.4
1990	3,454.20	4.3
1995	4,445.10	2.4
1996	4,693.30	*
1997	5,304.86	2.4
1998	6,199.67	2.1
Jun-99	2,971.60	2

Source: Ministry of Agriculture

PADDY

	<i>Production tonnes '000</i>	<i>%</i>	<i>Consumption tonnes '000</i>	<i>%</i>	<i>Supply- Demand Gap (tonnes000)</i>
1985	1,258	-	1,684	-	-426
1990	1,271	1.03%	1,630	-3.2%	-359
1995	1,373	8.03%	1,798	10.3%	-425
1996	1,426	3.87%	1,836	2.1%	-410
1997	1,482	3.90%	1,874	2.1%	-392
1998	1,539.50	3.90%	1,913.70	2.1%	-374.2

	<i>Import RM Million</i>	<i>%</i>	<i>Export RM Million</i>
1985	257.10	-	1.66
1990	270	4.9%	0.14
1995	356.1	32.0%	1.9
1996	537.52	50.9%	0.24
1997	701.31	30.5%	0.87
1998	910.52	29.8%	1.4
Jun-99	351.38	-159.1%	0.02

LAND USE

	<i>Hectares '000</i>		<i>Self Sufficiency Level %</i>
1985	655.0	1985	73.6
1990	680.6	1990	79.4
1995	670.0	1995	76.3
*1996	514.7	1996	71.0
*1997	503.9	1997	68.0
1998		1998	65

* Value for Peninsular Malaysia only

Estimate

PADDY FERTILIZER SUBSIDY

	<i>RM Million</i>
1996	118.6
1997	113.1
1998	125.1

Source: Ministry of Agriculture

VEGETABLES

<i>Year</i>	<i>Production tonnes '000</i>	<i>%</i>	<i>Consumption tonnes '000</i>	<i>%</i>	<i>Supply -Demand Gap</i>
1985	540.7	-	669.3	-	-128.6
1990	609.6	12.7%	810.3	21.1%	-200.7
1995	718.1	17.8%	1,003.20	23.8%	-285.10
1996	747.1	4.0%	1,041.40	3.8%	-294.30
1997	772.2	3.4%	1,081.10	3.8%	-308.90
1998	808.6	4.7%	1,122.20	3.8%	-313.60

<i>Year</i>	<i>Import RM Million</i>	<i>%</i>	<i>Export RM Million</i>
1985	276.0	-	39.1
1990	366.8	32.9%	125.4
1995	683.4	86.3%	160.5
1996	769.6	12.6%	160.0
1997	846.3	10.0%	177.0
1998	987.3	16.7%	206.1
Jun-99	467.7	-52.6%	81.5

LAND-USE

	<i>Hectares 000'</i>	<i>Self Sufficiency %</i>
1985	31.8	80.8
1990	35.2	75.2
1995	42.0	71.6
*1996	30.1	
*1997	32	

* value for Peninsular Malaysia only

Source: Ministry of Agriculture

LIVESTOCK

<i>Year</i>	<i>Production tonnes '000</i>	<i>%</i>	<i>Consumption tonnes '000</i>	<i>%</i>	<i>Supply -Demand Gap</i>
1985	643.1	-	1,204.40	-	-561.30
1990	962.7	49.7%	1,568.80	30.3%	-606.10
1995	1,400.10	45.4%	2,397.80	52.8%	-997.70
1996	1,443.20	3.1%	2,622.30	9.4%	-1,179.10
1997	1,495.40	3.6%	2,696.20	2.8%	-1,200.80
1998	1,555.50	4.0%	2,175.20	-19.3%	-619.70

<i>Year</i>	<i>Import RM Million</i>	<i>%</i>	<i>Export RM Million</i>
1985	465.0	-	116.2
1990	855.2	83.9%	587.1
1995	1473.2	72.3%	869.3
1996	1556.2	5.6%	970.7
1997	1704.7	(.5%	1023.3
1998	1673.3	-1.8%	1116.8
Jun-99	*		*

* not available

Livestock includes – beef, mutton, poultry, eggs, milk and dairy products

Source: Ministry of Agriculture

FISHERIES

<i>Year</i>	<i>Production tonnes '000</i>	<i>%</i>	<i>Consumption tonnes '000</i>	<i>%</i>	<i>Supply -Demand Gap</i>
1985	500.0	-	527.0	-	-27.0
1990	564.6	12.9%	619.9	17.6%	-55.3
1995	764.5	35.4%	809.3	30.6%	-44.8
1996	808.8	5.8%	866.8	7.1%	-58
1997	855.7	5.8%	928.3	7.1%	-138.5
1998	905.3	5.8%	994.2	7.1%	-88.9

<i>Year</i>	<i>Import RM Million</i>	<i>%</i>	<i>Export RM Million</i>
1985	237.2	-	245.9
1990	363.6	53.3%	606.1
1995	762.4	109.7%	807.4
1996	824.2	8.1%	778.3
1997	901.8	9.4%	901.1
1998	851.9	-6%	1,144.30
Jun-99	446.6		523.7

Source: Ministry of Agriculture

% OF AGRICULTURE IN GROSS DOMESTIC PRODUCE

	<i>%</i>
1985	20.8
1990	18.7
1995	13.5
1996	7.4
1997	7.1
1998	7.4

Source: Ministry of Agriculture

BUDGET ALLOCATION FOR THE AGRICULTURE SECTOR (RM MILLION)

<i>Year</i>	<i>Management</i>	<i>Development Expenditure</i>	<i>Total Expenditure</i>	<i>% of budget Allocation used for development</i>
1990	676.76	747.89	14242.65	52%
1995	876.36	1,068.84	1,945.20	55%
1996	1052.30			
1997	1,057.30	929.50	1,986.80	47%
1998	1,126.78	944.5	2,071.38	47%

Source: *Anggaran Belanjawan Prestasi & Program*

EMPLOYMENT IN THE AGRICULTURE SECTOR

	<i>Workers</i>	<i>% of Total Employment ('000)</i>
1985	1,853.20	30.4
1990	1,837.60	26.0
1995	1,524.00	20.0
1996	1,504.50	19.4
1997	1,494.50	17.3
1998	1,414.20	16.5

Source: *Human Resource Ministry*

COUNSUMER PRICE INDEX (CPI) FOR MAJOR FOOD ITEMS, 1990-1997 (1994=100)

	<i>CPI</i>	<i>FOOD</i>
1990	85.2	83.1
1995	103.4	104.9
1996	107.0	110.9
1997	109.0	115.5
1998	115.7	125.8
Jul-99	118.6	131.3

	<i>Cereals Rice, Bread</i>	<i>Fish</i>	<i>Fruits /Vegetables</i>	<i>Meat</i>	<i>Food Away From Home</i>
1990	96.2	65.8	72.7	86.6	88.4
1995	101.4	112.1	108.7	100.8	103.7
1996	108.9	125.2	112.0	105.5	109.1
1997	112.8	134.2	114.9	109.1	114.9
1998	120.6	146.4	131.1	117.9	124.5
Jul-99	125.5	160.5	137.3	118.7	128.6

Source: Statistics Department, Malaysia

LOANS APPROVED BY BANK PERTANIAN MALAYSIA FOR AGRICULTURE PROJECTS

	<i>Number of Applicants</i>	<i>Value \$000</i>
1986	54,195	188,096
1990	51,820	192,014
1995	52,501	586,647
1996	46,132	586,647
1997	34,693	110,889
1998	22,260	173,428

Source: Agriculture Bank of Malaysia

**LOANS GIVEN FOR FOOD PRODUCTION SECTOR
BY COMMERCIAL BANKS (RM '000)**

	<i>Paddy</i>	<i>Livestock</i>	<i>Fisheries</i>
1985	29.3	262.4	74.3
1990	34.4	327.3	123.8
1995	17.0	578.0	156.5
1996	60.6	745.3	117.8
1997	N.A	759.1	132.6

**LOANS GIVEN FOR FOOD PRODUCTION IN AGRICULTURE SECTOR
BY FINANCE COMPANIES (RM '000')**

	<i>Livestock & Fisheries</i>
1985	22.3
1990	58.3
1995	90.1
1996	102.7
1997	107.7

Source: Bank Negara, Malaysia

Sustainable Agriculture in Malaysia: An Assessment

By Chamhuri Siwar and Md Amzad Hossain
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I. Background

Until World War II, increases in agricultural production throughout the world, including Malaysia—primarily involved bringing more land into cultivation. However, during the last 50 years, the rate at which new land was brought into cultivation has declined sharply. New cropland worldwide expanded at only 0.3% per year in the 1970s compared with a rate of 1% in the 1950s (Hanrahan et al, 1984). Future increases in agricultural production will have to come primarily from increasing output per unit of land rather than increasing the area cultivated. Remarkable increases in agricultural productivity have occurred in many parts of the world, including Malaysia, during the last two to three decades. However, concerns are increasing as to whether these gains can be maintained in a sustainable manner.

The prevailing agricultural system, variously called “conventional farming”, “modern agriculture”, or “industrial farming”, has delivered tremendous gains in productivity and efficiency. Food production worldwide has risen in the past 50 years; the World Bank estimates that between 70% and 90% of the recent increases in food production is the result of conventional agriculture rather than greater acreage under cultivation.

Conventional farming systems vary from farm to farm and from country to country. However, they share many characteristics: rapid technological innovation; large capital investments in order to apply production and management technology; large-scale farms; single crops/row crops grown continuously over many seasons; uniform high-yield hybrid crops; extensive use of pesticides, fertilisers, and external energy inputs; high labour efficiency and dependency on agribusiness. In the case of livestock, most production comes from confined, concentrated systems.

Significant negative consequences have come with the bounty associated with industrial farming. Concerns about contemporary agriculture are presented below. While

considering these concerns, keep the following in mind:

- a) interactions between farming systems and soil, water, biota and atmosphere are complex – we have much to learn about their dynamics and long term impacts;
- b) most environmental problems are intertwined with economic, social, and political forces that are external to agriculture;
- c) some problems are global in scope while others are experienced only locally;
- d) many of these problems are being addressed through conventional, as well as alternative, agricultural channels;
- e) the list is not complete; and
- f) no order of importance is intended.

2. Concepts Of Sustainable Agriculture

Many definitions of sustainable agriculture have been proposed, but one of the first to be adopted in the United States was published by the American Society of Agronomy (1989:15):

“A sustainable agriculture is one that, over the long term, enhances environmental quality and the resource base on which agriculture depends; provides for basic human food and fibre needs; is economically viable; and enhances the quality of life for farmers and society as a whole.”

In the following year, the US Congress defined sustainable agriculture in the 1990 Farm Bill (US Government, 1990). Under that law, the term sustainable agriculture means an integrated system of plant and animal production practices having a site-specific application that over the long term will:

- Satisfy human food and fibre needs.
- Enhance environmental quality and the natural resource base upon which the agricultural economy depends.
- Make the most efficient use of non-renewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls.

- Sustain the economic viability of farm operations.
- Enhance the quality of life for farmers and society as a whole.

Thus, the definition has five parts, emphasising productivity, environmental quality, efficient use of non-renewable resources, economic viability and quality of life. Under this definition, a farm that emphasises short-run profit but sacrifices environmental quality would not be sustainable in the long run.

From the other end, pursuing environmental quality without ensuring viability of short-run returns would also be unsustainable. A farm that is very productive but uses large quantities of a non-renewable resource, such as fossil fuel or a non-rechargeable aquifer, to achieve and maintain that productivity would not be considered sustainable in the long run.

Agricultural sustainability consists of three components: ecological, economic and social/institutional (quality of life). In order to achieve these, they recognised three important “processes”: full use of the natural biological cycles, reducing as much as possible the use of purchased inputs, and reducing the frantic work schedules of many farm families (Norman et al, 1997).

2.1 Ecological Concerns

Agriculture affects many ecological systems. The negative effects of current practices include:

Decline in soil productivity can be due to wind and water erosion of exposed topsoil; soil compaction; loss of soil organic matter, water holding capacity and biological activity; and salinisation of soils and irrigation water in irrigated farming areas. Desertification due to overgrazing is a growing problem.

Agriculture is the largest single non-point source of water pollutants, including sediments, salts, fertilisers (nitrates and phosphorus), pesticides and manures. Pesticides from every chemical class have been detected in groundwater and are commonly found in groundwater beneath agricultural areas; they are widespread in Malaysia’s surface waters.

Eutrophication and “dead zones” due to nutrient run-off affect rivers, lakes, and oceans. Reduced water quality impacts agricultural production, drinking water

supplies, and fishery production. Water scarcity in many places is due to overuse of surface and ground water for irrigation with little concern for the natural cycle that maintains stable water availability. Other environmental ills include over 400 pests and 70 fungal pathogens that have become resistant to pesticides; stresses on pollinator and other beneficial species through pesticide use; loss of wetlands and wildlife habitat; and reduced genetic diversity due to reliance on genetic uniformity in most crops and livestock breeds.

Agriculture's link to global climate change is just beginning to be appreciated. Destruction of tropical forests and other native vegetation for agricultural production has a role in high levels of carbon dioxide and other greenhouse gases. Recent studies have found that soils may be sources or sinks for greenhouse gases.

2.2 Socio-economic Concerns

Economic and social problems associated with agriculture cannot be separated from external economic and social pressures. As barriers to a sustainable and equitable food supply system, however, the problems may be described in the following way:

Economically, the Malaysian agricultural sector has a history of large federal expenditures and corresponding government involvement in planting and investment decisions; widening disparity among farmer incomes; and increasing concentration of agribusiness-industries involved in manufacturing, processing and distribution of farm products – into fewer and fewer hands. Market competition is limited. Farmers have little control over farm prices and they continue to receive a smaller and smaller portion of consumer dollars spent on agricultural products.

Economically, it is very difficult for potential farmers to enter the business today. Productive farmland also has been pressured by the urban and suburban sprawl, since the 1970s.

2.3 Human Health Impacts

Potential health hazards are tied to sub-therapeutic use of antibiotics in animal production and pesticide and nitrate contamination of water and food. Farm workers are poisoned in fields, toxic residues are found in foods and certain human and animal diseases have developed resistance to frequently used antibiotics.

2.4 Philosophical Considerations

Historically, farming played an important role in our development and identity as a nation. From strongly agrarian roots, we have evolved into a culture with few farmers. Can sustainable and equitable food production be established when most consumers have so little connection to the natural processes that produce their food? What intrinsically Malaysian values have changed and will change with the decline of rural life and farmland ownership?

World population continues to grow. According to recent United Nations population projections, the world population will grow from 5.7 billion in 1995 to 9.4 billion in 2050, 10.4 billion in 2100, and 10.8 billion by 2150, and will stabilise at slightly under 11 billion around 2200. The rate of population increase is especially high in many developing countries. In these countries, the population factor, combined with rapid industrialisation, poverty, political instability, large food imports and debt burden make long-term food security especially urgent.

Finally, the challenge of defining and dealing with the problems associated with today's food production system is inherently laden with controversy and emotion. It is unfortunate, but true, that many in the agriculture community view sustainable agriculture as a personal criticism, or an attack, on conventional agriculture of which they are justifiably proud.

2.5 New Concepts of Sustainable Agriculture

Many in the agricultural community have adopted the sense of urgency and direction pointed to by the sustainable agriculture concept. Lack of sharp definition has not lessened its authenticity. Sustainability has become an integral component of many government, commercial, and non-profit agriculture research efforts, and it is beginning to be woven into agricultural policy. Increasing numbers of farmers and ranchers have embarked on their own paths to sustainability, incorporating integrated and innovative approaches into their own enterprises.

This just-do-it attitude is the real force carrying the issue of sustainability into the next century. "The best way to communicate the meaning of sustainable agriculture is through real-life stories of farmers who are developing sustainable farming systems on their own farms," says John Ikerd, describing the original 1,000 Ways to Sustainable Farming project funded by USDA's Sustainable Agriculture Research and Education (SARE) Program.

The project sought "to explore and refine the definition of sustainable agriculture by

profiling successful sustainable farmers”. SARE continued the project, renaming it The New American Farmer (David N et al., 1997). “In addition to describing successful farming practices, the features in The New American Farmer detail the effects of those practices on farm profitability, quality of life, rural communities and the environment.”

Critical discussion of the sustainable agriculture concept will and should continue. The understanding will deepen, and answers will continue to come. Ongoing dialogue is important for another reason: with more parties, each with its own agenda jumping onto the sustainable agriculture “tent”, only a continued focus on the real issues and goals will keep sustainable agriculture from becoming so all-encompassing as to become meaningless.

Although ultimately the decision as to whether or not to practice sustainable agriculture is to be made by the farmers and their families, the ease and practicality of doing so are dependent on a number of factors, some of which they can influence, but others are completely out of their control. Generally, progress towards sustainable agriculture is determined by what happens at five levels: international, national, community, farm and field. Another level cannot be fitted easily into the above classification – the watershed level, which may be at the field, farm, or community level or some combination of the three.

Thus, agricultural sustainability is not only a difficult concept to define but is also difficult to implement and monitor or measure. This complexity is illustrated in Table 1, which shows the expected interactions among the three components of sustainability and the five levels of influence. Although sustainability tends to be locational or site specific (at the field, farm, and community levels), it is very much influenced by:

Table 1: Interacting Components of Sustainability

Levels Influencing Sustainability	Components of Sustainability		
	Ecological	Economic	Social/Institutional
International	Secondary	Secondary	Secondary
National	Secondary	Secondary	Primary
Community	Secondary	Primary	Primary
Farm	Primary	Primary	Primary
Field	Primary	Secondary	Secondary

Note: The ‘primary’ cells represent where the component of sustainability is mainly expressed, and the ‘secondary’ cells represent other factors that can influence sustainability.

Source: David N et al., 1997

What happens at the higher levels? National policies will have a great influence on ecological and economic sustainability at the field/farm level. Other policies at that level related to social/institutional issues also can have major effects on the viability/welfare of communities and, hence, on quality of life. International markets and influences (particularly in smaller countries) are increasingly affecting what happens at the lower levels. Such influences tend to be relatively greater in Malaysia, where agricultural production is influenced heavily by the export market. Thus, it is necessary to understand the interaction between these levels, because “each level finds its explanations of mechanism in the levels below, and its significance in the levels above”.

Interactions among the sustainability components: In the focus group discussions referred to above, farmers in conventional agriculture were often on an economic treadmill (e.g. having to raise enough money to service debts) and hence had little time to consider ecological sustainability issues. They also had to make compromises concerning quality of life because of having to work very long hours. In fact, the prevailing attitude among the farmers was that all three components of sustainability (environmental, economic, and social) had to be pursued at the same time, if progress was to be achieved (Norman et al, 1997). The problem of doing this is short-run economic needs of survival are forcing them to sacrifice long-run ecological sustainability. In such a situation, ensuring ecological sustainability without solving the problems of poverty is impossible (World Bank, 1992).

3. Sustainable Agriculture in Malaysia: Review of Policy and Programmes

The Malaysian agricultural sector has undergone tremendous changes and challenges, along with the transformation of the economy to industrialisation. Despite the relative decline in terms of its contribution to GNP, employment and export, the agricultural sector still plays an important role, especially as a provider of food, as a source of raw materials for agro and resource-based industrialisation and also to deepen inter-linkages with the other sectors.

In the 1960s and 1970s, agricultural development was mainly based on land expansionary policies through land and regional development schemes incorporating export crops (rubber, cocoa and oil palm) and paddy double cropping through irrigation investment and increased crop intensification. When the New Economic Policy (NEP, 1971-1990) was implemented, agricultural development programmes formed the main component of the poverty alleviation strategy. Various agricultural modernisation programmes were implemented, mainly targeted at smallholders and fishermen,

through increased commercialisation and technological improvements, supported by price and income support measures, to create employment, enhance income and reduce poverty.

The 1980s saw the rapid transformation of the economy towards industrialisation, resulting in further relative decline in contribution from the agricultural sector. In 1984, the First National Agricultural Policy (NAP1) was implemented to arrest the decline in contribution from the agricultural sector and to maximise incomes from agriculture through productivity-driven growth, in-situ development, land development and consolidation of uneconomic holdings. The NAP1 recognised the need for the sector to be efficient in order to sustain agricultural growth in the long-run. In the forestry sub-sector, the interim National Forestry Policy (NFP) was formally adopted in 1978, providing guidelines for conserving and managing forestry resources on the principle of sustainable forest management (Malaysia, 1999).

In the face of changing global and domestic scenarios, the NAP1 was reviewed. The second NAP was introduced in 1992 (NAP2, 1992-2010), giving greater emphasis to productivity, efficiency and competitiveness in the context of sustainable development and linkages with other sectors.

Strategies for expanding food production, greater role for the private sector, marketing reform, accelerated agro-based industrialisation and further liberalisation of the agricultural sector were outlined. In this regard, the modernisation of the smallholders sub-sector was emphasised through the promotion of group farming activities as well as provision of support services. However, land development was also given priority, mainly by the state and regional agencies. In addition, the government provided support services and appropriate incentives, including land, to facilitate private sector participation in large-scale commercial farming, taking into consideration the environmental implications in large-scale farming, especially for food production as well as floriculture and aquaculture activities.

The modernisation of the agriculture sector was further accelerated through improvements in the delivery of agricultural support services. These services would encourage farmers to venture into commercial farming with intensive use of bio-fertilisers, adopt new technologies and increase productivity. These services included training and the extension of support services.

The NFP was also revised in 1992, giving greater emphasis to biodiversity, conservation and sustainable forest management.

In the 1990s, further structural changes in the economy led to further relative decline in the agricultural sector's contribution to the economy, increasing resource constraints for agricultural and forestry development, as well as the need to be competitive with trade liberalisation. The need to utilise and conserve natural resources on a more sustainable basis was further stressed amidst the growing concern for sustainable development and environmental conservation. In such a scenario, the NAP2 was revised.

In 1998, the Third National Agricultural Policy (NAP3, 1998-2010) was announced in the midst of the 1997-98 the financial crisis, giving agriculture a renewed role to meet the concerns of food security. The overriding objective of the NAP3 is the maximisation of income through optimal utilisation of resources.

Specifically, the objectives of the NAP3 are to:

- i) enhance food security,
- ii) increase productivity and competitiveness,
- iii) deepen linkages with other sectors,
- iv) create new sources of growth, and
- v) conserve and utilise natural resources on a sustainable basis.

The NAP3 employs strategic approaches to agricultural development, namely the agro-forestry and product-based approach.

The agro-forestry approach integrates agriculture and forestry development. In the face of increasingly scarce resources, especially land availability, this approach can bring about mutual benefits, provide a scope for joint development based on a larger productive base for agriculture and forestry, allow for wider agro-forestry-enterprise mix and enhance the income generating potential of agro-forestry investments, consonant with practices of sustainable agriculture development.

The product-based approach to commodity development is based on market demand, preferences and potential, which are then translated into strategies for upstream agricultural production to enhance the production and marketing of the agricultural produce. By this approach, market signals and consumer preferences at global and domestic levels would be transmitted upstream to the farm, facilitating the production of specialised, high value and high quality agriculture and forestry products. This approach would hopefully create and broaden business opportunities and linkages for agriculture and forestry development.

4. Assessment of Sustainable Agriculture in Malaysia

Evaluating the sustainability of Malaysian agriculture is no easy task. It requires the evaluation of the three components of sustainability: ecological, economics and social dimensions. Unavailability of data and time constraints limit the extent of this evaluation. While acknowledging that policies are in place to promote sustainable agriculture, especially since the 1990s, there exist unsustainable agricultural practices and development, which may be the effect of earlier policies and programmes. The issues of ecological, economic and social sustainability may be viewed through the following factors.

4.1 Population and Crop Land

Malaysia’s population increased from 8.8 million in 1970 to 13.1 million in 1980 and is expected to increase to 24.4 million in 2002. Population increase contributes to the shrinking of the natural resources availability and food production. This, coupled with rapid urbanisation and industrialisation, is expected to reduce arable land per capita from 0.49 hectares in 1960 to only 0.15 hectares by 2025 (Table 2). Per capita crop land has sharply decreased from 1960 to 1990 and is projected to drop more sharply up to the year 2025.

Malaysia is now experiencing the consequences of rapid economic and development growth that was founded on unsustainable exploitation of environmental resources. The changes in land use and cover in Malaysia coincided with the 1974-1996 period and its phenomenal economic growth. In Southeast Asia, deforestation is taking place at a rate of 3,690 hectares a year, while in Malaysia, it is at an average of 2,500 ha/yr. Agricultural land use area is increasing at an average rate of about 1,120 ha/yr in Malaysia, while urbanisation and industrialisation consumed about 2,170 ha/yr in Malaysia (T. B. Moya, 1998).

Table 2: Population and Crop Land in Malaysia, 1960-1990 and 2025 Projections

Country	Population			Per capita crop land		
	1960	1990	2025	1960	1990	2025
Malaysia	8,140	17,891	31,577	0.49	0.27	0.15

Source: Population Action International and UN projections, 2000

Malaysia's agricultural land use increased from 5.0 million hectares in 1985 to 5.8 million hectares in 1995. However, it is growing at a declining rate, from 2.3 percent in 1985-90, to 0.5 percent between 1990 and 1995, suggesting shrinking land use for agriculture. In terms of land use for agriculture, about 77 percent are planted with industrial crops (rubber, cocoa and oil palm), according to the NAP3. Rubber and cocoa areas showed declining trends, due to declining prices and economic viability. Oil palm showed increasing trend in land use, partly contributed by conversion from rubber land, attracted by higher prices and economic viability.

On the ecological front, it was asserted that oil palm and rubber created "negative impacts" on the capacity to conserve and regenerate biodiversity potentials. In addition, plantation crops require a lot of agriculture inputs, such as the use of chemical fertilisers and pesticides. Using chemical fertilisers and pesticides in large quantities over large areas like huge plantations and over a long duration does contribute to environmental pollution and degradation. (Singh, Indrani & Chan, undated).

Land use for food crops generally showed a declining trend. Except for fruits and vegetables, all other food crops (paddy, coconut, pepper and tobacco) showed declining or stabilising land use trends. Declining land use for food crops has implications for food self-sufficiency and security. However, there seems to be stagnation or leveling off in land use for food crops, which could affect Malaysia's capability to meet the food requirements of the population. This is also evidenced in the increasing food import bill. Furthermore, deforestation, degradation of coastal resources, pollution and destruction of wetland resources are some of the main causes of shrinking food supplies and increasing food prices (ERA Consumer Malaysia, 1999)

As for the forests, total area declined by 5.56 percent between 1987 and 1992. An empirical analysis suggests the inter-twined relationship between economic factors, land use changes and biodiversity in Malaysia (Jamal & Chamhuri, 1998). Forest land reduction was mainly due to the high demand for land for the increased cultivation of agricultural cash crops, population density as well as the intensity of industrial activities in given region. The higher the net reduction in forest areas, the greater the loss of biodiversity. In terms of agricultural land use, time series data shows that it has increased, mainly for the expansion of industrial crops, especially that of oil palm and largely in Sabah and Sarawak.

4.2 Irrigation

Although the potential of irrigation varies from country to country, it is viewed as an important input to agricultural production systems. It is because irrigation is a major factor in increasing agricultural productivity, facilitating multiple cropping, the use of high-yielding varieties and reducing crop loss to drought; there is little doubt that it will be pressed further to its economic limits.

Table 3 shows that there has only been a marginal increase in the irrigated proportion of arable and permanent cropland in Malaysia. The expansion of the irrigated area, however, may be approaching its limits, and there are growing problems due to the silting of dams and the loss of irrigated land caused by silting of valleys and changing hydrological regimes below deforested areas. Furthermore, the government's decision to restrict paddy production to the granary areas limits the expansion of irrigated areas, while the rising demands of cities and industries are increasingly in competition with agriculture. The holding back of water to provide urban supplies may also lead to inadequate dry-season flow into the sea, resulting in problems of salt-water intrusion.

Table 3: Growth in Irrigation in 1975-1995

Country	1975 (million ha)	1985 (million ha)	1995 (million ha)
Malaysia	0.31	0.44	0.45

Source: Population Action International and UN, 2000.

4.3 Fertiliser Consumption

The modernisation of agriculture has come about with increased fertiliser consumption. In Southeast Asia, fertiliser consumption increased 122 percent, due to the high consumption rates in countries like Vietnam, Thailand, and Malaysia (UNDP, 2001). Malaysia alone recorded a high growth rate of 324 percent (Table 4). In more recent years, fertiliser use has been tapering off in Malaysia as consumption may have already peaked. The general increase over a 29-year period is, nevertheless, a very notable feature. Together with the heavy use of herbicides and pesticides, this chemicalisation indicates both a major change in farming practices and a cause for serious concern because of the adverse environmental consequences.

Table 4: Fertiliser Consumption in kg per hectare, 1970-1998

Country	1970	1998
Malaysia	43.60	184.9

Source: UNDP, 2001

4.4 Forestry Situation

Nearly half of the Southeast Asian region is covered with tropical forests, accounting for about 6 percent of the forested area of the world. Therefore, this region's forests have global significance in terms of biological diversity and conservation. A total of 46.2 percent of the land in Southeast Asia is forested, deforestation growing at an annual rate of 1.3 percent or the loss of 274,800 hectares during the period 1990-1995. In Malaysia, more than 50 percent of the land was recorded as forest in 1985. Even on the basis of the FAO data, there have been steep reductions over the 15-year period in Malaysia, while other studies record much greater loss. A comparison of the forest covers of Peninsular Malaysia between 1973 (70 percent) and 1990 (56 percent) shows clearly the scale of transformation that has been taken place. The forested areas have been greatly reduced by large-scale land settlement schemes during this period, as well as by selective logging, which has extended over huge additional areas in that one decade, making deep inroads into the largest remaining block of rainforest.

Table 5: Area under Forest as Percentage of Total Land Area in 1973-1990

Country	1973	1985	1990
Malaysia	70	62	56

Source: Adapted from Harold. B and Yvonne. B, 1993

4.5 The Level of Food Security in Malaysia

The major foods are the crops (rice, fruits and vegetables), livestock (beef, mutton, poultry, pork, eggs and milk) and fish. Of them, apart from livestock (Table 6), all other food commodities recorded an increase in production between 1985 and 2000. Along with increasing total production, total demand also increased at a higher level, causing food deficit to increase over the same period. In the 15-year period, Malaysia's overall food deficit increased, but at a decreasing rate. As the factors of production of all these food commodities may be reaching their limits, therefore, Malaysia may be facing uncertainty in food security.

Table 6. Production and Demand of Major Food Commodities in 1985-2000 (000'tonnes)

Item	1985	1990	1995	2000	Average annual growth rate (%)			
					1985/90	1990/95	1995/00	2000/05
Crops	2367.9	2749.0	3110.6	3599.1	3.0	2.5	3.0	3.9
Livestock	643.1	962.7	1400.1	1706.3	8.4	7.8	4.0	3.0
Food Fish	500.0	564.6	764.51	1012.0	2.5	6.2	7.1	3.7
Total Production	3511.0	4276.3	5275.2	6317.4	4.0	4.3	3.7	3.7
Total Demand	4643.0	5386.8	7040.1	8359.3	3.0	5.5	3.5	3.2
Deficit	-1135.0	-1110.5	-1764.9	-2041.9	3.5	3.0	3.0	1.5

Source: *Third National Agricultural Policy, 1998-2010*

Table 7 shows the self-sufficiency level (SSL) for various food commodities, ranging from a low of 4 percent for milk to a high of 128 percent for poultry. Generally, the SSL are high for poultry, eggs, fish, pork, fruits, rice and vegetables, and low for beef, mutton and milk. Rice SSL has officially been kept at 65 percent due to the high cost of domestic production and because its cheaper to import. Pork's SSL has declined due to the closure of many pig farms as a result of the *Nipah* virus outbreak in 1998. The low SSL for beef, mutton and milk are related to their high cost, low acceptance of integration systems, unorganised production and marketing systems.

Table 7: Self Sufficiency level (SSL) in Food Commodities, 1995-2000

Commodity	1995	1998	2000
Rice	76	73	73
Fruits	99	98	99
Vegetables	71	73	75
Beef	19	20	21
Mutton	6	6	6
Poultry	111	116	128
Eggs	110	112	113
Pork	104	105	62
Milk	4	4	4
Fisheries	95	89	89

Source: Malaysia. 1996. Mid-term Review of the Seventh Malaysia Plan (1996-2000), Kuala Lumpur: Government Printers

The government's lack of enthusiasm for achieving higher SSL for some items is based on the argument that Malaysia is a high cost producer of many essential food items and it would be cheaper to import. This has led to the staggering increase in the food import bill, which stands at about RM10 billion annually. During hard times such as the recent financial crisis, depending on imports could have a high opportunity cost.

The NAP3 acknowledges the lessons from the financial crisis that it is not in the long-term interest of the country to be increasingly dependent on external sourcing for food, especially so in an uncertain long-term international supply environment. In this context, the NAP3 proposes a more aggressive policy to enhance food security through the expansion of domestic food production and strategic sourcing to ensure adequate supply and accessibility of food at affordable prices. With shrinking land area for cultivation, there is a need to set up permanent food zones and provide more incentives for the private sector to venture into the risky food production sub-sector.

5.0 Conclusion and Policy Implications

There are potential gaps between the current status of Malaysian agricultural development as a whole and established sustainability goals. These gaps reflect divergence between achievements and goals of sustainability.

To achieve ecological sustainability, agricultural development programmes need to be carried out in ways that modernise the sector and maximise the income of the farmers with a minimum negative environmental impact. Environmental concerns must be addressed and environment impact assessment need to be conducted, in addition to existing economic and social impact assessments. Mitigation measures need to be taken to offset anticipated environmental degradation. The stated NAP3 strategy of optimal or efficient resource utilisation needs to be evaluated and specific measures taken to realise the objectives. Detailed and specific measures are also needed to realise the objectives of the agro-forestry approach.

To achieve economic and social sustainability, the economic viability of agricultural development projects needs to be emphasised. Many projects are unsustainable economically, and fail to meet the stated economic and social objectives of income enhancement and poverty alleviation. The planning and implementation mechanism needs to be made more effective, with participation and inputs from communities and beneficiaries. Poverty alleviation needs to be central to any project development, and the delivery mechanism needs to correctly target the poor as beneficiaries of projects. Coordinated and integrated actions by key stakeholders are needed to enhance sustainability in Malaysian agricultural and rural developments.

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Strengthening The Role of Farmers Under Agenda 21

By P. Vijian, ERA Consumer Malaysia

Introduction

Raging poverty and environmental degradation became growing global and domestic concerns in the last two decades. The environment was at risk, as rapid urbanisation and industrial activities continued to threaten the ecology. Unbalanced economic development in many countries caused severe environmental destruction.

Global warming, land and sea pollution and shrinking forest reserves became pressing international issues. But development cannot be halted. The 1990s was an era of economic boom, mainly aided by the information technology or dotcom revolution. Many nations in all regions witnessed dramatic economic growths.

Malaysia was no exception. It chalked an impressive 8 percent growth for eight consecutive years in the 90s; and was on the fast track of industrialisation.

However, this also brought a fair share of problems for the nation, like elsewhere in the emerging economies. Expanding townships, population explosion and rapid urbanisation affatal the environment and upset the ecological balance. Forest reserves, mangroves, wildlife sanctuaries and marine habitats began to shrink.

This situation eventually led to environmental degradation. Flash floods, landslides, mudflows, soil erosion, siltation and sedimentation of rivers, unmanageable waste production and water shortages - all obvious signs of unbalanced development.

At the same time, population growth added pressure on the agriculture sector, which was forced to increase food supply.

However, Malaysia believed that high food productivity would be achieved through the Green Revolution that was propagated in the 70s – which unfortunately encouraged the use of potent pesticides, new technologies, heavy farm machineries and chemical fertilisers.

Traditional, sustainable farming methods were abandoned, leaving an adverse impact

on the ecology, health and economy. This brought another set of problems - soil erosion, water pollution and a drop in farm profits that gradually strained the farming community in rural areas.

The challenges of the 1990s for the local and global communities were therefore to promote balanced and sustainable development, one that would save the environment from further destruction.

This led concerned citizens, civil society and nations on the landmark road to the Earth Summit in Rio de Janeiro, Brazil, in June 1992. It was a historic meeting where Agenda 21 - a blue print for a comprehensive plan to make development economically, socially and environmentally sustainable – was endorsed.

Malaysia's commitment to preserve a healthy environment was epitomised by signing the Rio Declaration together with about 177 other countries. These nations agreed to the principles of sustainable management of forests to protect the environment.

Malaysia's stand was clear. As a country rich in biodiversity, natural resources and having once been an agriculture-based economy, Malaysia had more reasons to protect its environment.

Way back in 1974, the Environment Quality Act was enacted. Later in October 1989, the government endorsed the Commonwealth Langkawi Declaration on the Environment- all aimed at protecting aesthetic values such as green land, natural terrain and pristine ecosystems to enhance the quality of life and the health of its inhabitants.

Chapter 32 of Agenda 21 stresses “strengthening the role of farmers” as one method to promote sustainable agriculture in order to protect the environment. Farmers play a significant role in this aspect.

Sustainability is based on the principle that “we meet the needs of today, while protecting the ability of future generations to meet their own needs in the future.” It is imperative for a fast-developing Malaysia to protect, conserve and use its natural resources in a sustainable manner for the sake of future generations.

Policy makers are anxious to safeguard the remaining resources, such as forest reserves and marine habitats and to maintain the ecology and environmental balance of the country. This was clearly spelt out in a recent document, the Third National Agriculture Policy (NAP3, 1998- 2010), which is aimed at shaping the sector.

The government pursued Agenda 21 in several sectors like urban development and

agriculture. But implementation was slow and results were paltry, especially in the agriculture sector. A myriad of difficulties continued to hamper the adoption of the Agenda 21 proposals, mainly in the farming sector which had for years been bogged down with perennial weaknesses.

Current Status of the Agriculture Sector

Located just below the Equator, Malaysia's tropical climate and fertile land are ideal for farming activities. In addition, its geographical location protects it from natural disasters like typhoons, earthquakes and drought which hit some neighbouring countries. A strong rural community, on the other hand, provides the needed workforce to support the sector.

The agriculture sector expanded tremendously from the 1960s to 1970s because of the abundance of land, cheap labour and the government's expansionary policies to develop paddy and export crops like rubber, oil palm, cocoa and pepper. This was further aided by the government's heavy investments in infrastructure, land development policies and institutional building. The Malaysian economy was then agriculture driven. It created employment opportunities, reduced rural poverty and earned foreign exchange for the country. Its contribution to the Gross Domestic Product (GDP) in the 1970s was nearly 27 percent.

But this prosperity was short lived. In fact, Malaysia had its own national agenda - Vision 2020 – which was Prime Minister Datuk Seri Dr Mahathir Mohamad's ambition for the country to be fully industrialised by then. This pragmatic programme was launched in 1991.

Between 1985 and 1995, the Malaysian economy experienced a major transformation, taking a great leap towards industrialisation and stimulating the growth of the manufacturing, construction and service industries.

Meanwhile, the agriculture sector, which was once the pillar of the national economy, took a back seat as the Mahathir administration vigorously promoted industrialisation.

In the early 1980s, the agriculture sector was already plagued with its own problems - rising wages, labour shortages and land scarcity as urbanisation gobbled up arable land, while falling prices of commodities like pepper and cocoa in the world market affected the incomes of planters.

Meanwhile, competition for valuable resources like land, capital and labour started to

rise as the nation forged towards industrialisation and policies favourable to modernisation stifled the growth of agriculture.

Policies ranging from tax incentives, infrastructure development, immigration regulations in recruiting migrant workers and foreign direct investments were all skewed towards achieving Vision 2020. Consequently, the agriculture sector failed to compete with the buoyant manufacturing sector, losing investments and experiencing an outflow of agriculture resources.

The agriculture sector's contribution to the GDP declined gradually from 22.9 percent in 1980 to 13.6 percent in 1995, and rise marginally to 14 percent in 2001. It remained a "stepchild" of the Malaysian economy and some industry experts feared it would deteriorate into a sunset industry.

Despite the hiccups, the government has taken steps to ensure that the sector plays a significant role in the changing economy, especially in maintaining food security. Besides, the rural farming community had always been a stable vote bank for the ruling Barisan Nasional coalition.

The NAP3, doubling of annual budgets and the venture into biotechnology, the "miracle discovery" which is expected to revolutionise food production, are clear signs that Malaysia is keen on reviving the sector. In fact, the 1997 regional economic crisis had prodded the government to review its agriculture policy quickly because expensive food imports inflated the nation's budget. Therefore, there was an urgent need to strengthen the agriculture sector.

Farmers' Role in Modern Malaysia

Traditional farmers are the backbone of the agriculture sector, playing the crucial role of feeding the population. Rural farmers supply vegetables and fruits for daily consumption. Coastal fishermen provide fish and other seafood, while paddy farmers grow rice for over 22 million people in the country. Malaysian farmers produce nearly 1.3 million metric tonnes of rice to meet the domestic demand of 1.8 million metric tonnes. The balance is imported from regional producers.

Without these farmers, sustainable agriculture development cannot be achieved. There will be no food production and rural communities will cease to exist.

Malaysia is at the crossroads. While it ambitiously industrialised its agrarian-based

economy, the food sector was neglected. It focused on export commodities like palm oil and rubber, which generated hefty revenues for the country and provided raw materials for the booming manufacturing sector.

Malaysia has now become dependent on food imports. Food import bills soared to an average of RM10 billion annually in the mid-1990s, compared to only RM 4.5 billion in 1990.

Agriculture lost its comparative advantage because of the high cost of production. It is also not self-sufficient because of its reliance on imports such as pesticides, fertilisers and animal feed.

This is a dangerous situation. The global food market is volatile and any environmental disaster or political upheaval can quickly upset imports. This was clearly reflected in the Indonesian food crisis of 1998.

Besides providing food security, farmers play a key role in protecting the ecology. The country's rich biodiversity is slowly being threatened despite the Biodiversity Act 1998 passed to conserve the environment. The state of the marine ecosystem, depletion of fisheries resources due to over-fishing, destruction of coastal mangrove swamps and coral reefs due to land based activities is alarming.

In Sabah and Sarawak, excessive logging degraded the forest ecosystem, causing river siltation and damage to the land resources the indigenous people rely on. Agriculture helps to shape ecosystems and biodiversity can be improved or reduced by farming practices. A sustainable agriculture concept will help to preserve the nation's rich tropical forest, which is a home to a wealth of flora and fauna. Traditional farmers will be the mainstay, even in the modern economy, because they play a greater part in protecting the environment and feeding the nation.

However, their future remains uncertain. The farming population is dwindling because farming is no longer lucrative for the younger generation. In 1995, there were 1.4 million farmers in the country. This figure is expected to decline to 980,000 by 2010.

Gaps in Implementing Objectives of Agenda 21

The objective of the Agenda 21 is to create environmentally friendlier and sustainable agricultural practices. At the farm level, this means better farm management, with lower agriculture inputs like fertilisers and pesticides, adoption of environmentally-

friendly technologies and promoting education and farm advisory services. At the policy level, focus is in design and implementation of agricultural and environmental policies with the least economic distortions.

But policy makers are facing an uphill task in implementing the agenda in the agriculture sector, which has long been beset with problems. The new economic policies and the industrialisation programmes have stunted the growth of the agriculture sector and the farmers' progress.

Local farmers are not well informed about the concept of sustainable agriculture and how to manage natural resources like land and water efficiently. To many small-scale farmers, earning a daily income to support their families is far more important than safeguarding the environment. Thus they tend to neglect proper agronomic practices. In order to get high yields, an abundance of fertilisers is used, sometimes more than that recommended by the Ministry of Agriculture.

Due to the neglect of sustainable agricultural development over the years, local farmers and fishermen now face a crisis. With Malaysian paddy farmers and fishermen beginning to feel the brunt of unsustainable development and poor management of agriculture resources, many may be forced to abandon their trades for other lucrative jobs. Low incomes, poor output and lack of resources and rising production costs are threatening the farmers' livelihood.

Sustainable agriculture development as underlined by Agenda 21 has not been fully implemented in the country. Even after 10 years of signing the declaration, sustainable agriculture remains an alien term to many traditional farmers. This is evident from the perennial difficulties faced by some sectors within the agricultural sector.

A) Problem Areas:

- i) Decision making:** The practice is still a top-down process, where policies are formulated at the ministerial level. Empowerment of the grassroots to participate in decision-making is not the norm, even though there is some dialogue between farmers and local officials at the district level such as the Farmers' Organisation Authority and fishermen's associations. However, macro policy planning and research do not involve the target groups. This has its setback, like the mismatch between research and development. What the farmers produce and what the market demands may differ. For example, the exotica papaya that was developed by the Malaysian Agriculture Research

Development Institute (MARDI) was not popular among local farmers, although overseas demand was good. This is because the new variety fetches a lower profit compared with the larger - sized papayas commonly grown in the country.

- ii) **Women:** In many agriculture-based societies, women are considered important players, for they contribute to their country's GDP and household food security. Besides their routine household chores, women actively participate in farm work, from planting, weeding, and selection of seeds to harvesting and storing of crops and food processing. But their contribution to the sector and overall economic development is often undervalued. Similarly in Malaysia, women have largely been marginalised from the sector. There are few entrepreneurs. Many are only employed as farm hands or work in food production sectors, while others help husbands or family members in the farm. Traditional social norms and customary laws deprive women of equitable economic opportunities and access to vital resources like land.
- iii) **Paddy farmers:** The cost of paddy production has increased significantly and local farmers are finding it hard to compete with those in traditional rice growing nations like Thailand and Vietnam, who can produce at a lower cost. The ex-farm price per kilo of rice in these countries is less than 45 sen, compared with 70 sen in Malaysia. This is mainly due to the high cost of labour, land, water, fertilisers and pesticides. Poor farm practices and management over the years have created problems in the paddy fields. For example excessive use of chemicals have led to soil and water pollution, besides the poisoning of water resources. Farmers in general depend on the heavy usage of chemical fertilisers to sustain high yield production in paddy and fruit crops. The use of heavy machinery like tractors and harvesters has destroyed the clay-pen of the soil. Except direct seeding, which is done manually, 80% of the work in many paddy plantations is now mechanised, leading to land compaction. Local paddy farmers are yet to understand how to conserve and use agriculture resources on a sustainable basis.
- iv) **Fisheries:** Stocks along the Malaysian coastline are fast depleting. Rapid coastal development, over-fishing, marine pollution and the absence of a sustainable marine resources management have affected fish breeding. Three years ago, Malaysia's Exclusive Economic Zone - the 200 nautical miles surrounding its coasts, was estimated to support about two million metric tones of harvestable fish. However, stocks are thinning due to over-fishing and poor resource management. Local fishermen go to sea all year round, leaving little time for fish stocks to breed. While potential fishing grounds are shrinking, the number of fishermen has increased over the years. According to the Fisheries Department, 34,000 fishing licences were issued in 2000, about 2,000 more

compared with the previous year.

- v) **Poverty:** Low income is the main reason why it is difficult to promote sustainable farming among local farmers. Despite the government's increase in annual allocations and institutional efforts to lift the economic status of the farming community, many farmers and fishermen still use archaic methods, earn meagre incomes and live in poverty conditions. For instance, a paddy farmer earns about RM927 (inclusive of subsidies) per hectare per harvest, while coastal fishermen in the east coast of the peninsula earn a maximum of RM500 a month.
- vi) **Inadequate Policies:** There is no single national policy to promote sustainable development in the country. Legislations such as the Forestry Act and NAP3 to manage sustainable development are insufficient. Other factors which impede the implementation of Agenda 21 are weak coordination among the various authorities and lack of statutory instruments, resources, enforcement of existing legislations, institutional capabilities and trained personnel and environmental awareness among the general public. However, despite these structural weaknesses, the government has taken steps to develop agriculture strategies with the assistance of the Agriculture Ministry and other relevant agencies.

B) Government Actions:

- i) **Sustainable farming:** The government is gradually introducing different farming techniques which require minimum use of toxic chemicals, proper mechanisation and good farm management. The Integrated Pest Management (IPM), considered an effective method of controlling pests, is being promoted. The concept of "paddy mini estates" a project that encourages smallholders to become farmer-entrepreneurs by consolidating small-scale farms in rice production areas, is another step to improve the lot of the farming community. Farmers are also adopting natural pest control methods such as using barn owls to kill rats and cultivating predator mites or aphids in star fruit orchards to kill bugs and insects. In the fisheries sector, the Ministry has introduced artificial reefs to replenish coastal fish stocks.

Comments: These actions are carried out on a small-scale in selected areas by different government agencies. There is no concerted long-term plan to help or educate farmers. Despite the government's efforts, nothing much has changed on the ground. Paddy planters and vegetable growers continue to adopt old practices. The use of pesticides is still widespread, especially among the vegetable growers of Cameron Highlands, to the extent that neighbouring

countries have rejected Malaysian vegetable exports for failing to pass their residue tests.

Similarly, the authorities have done little to educate fishermen about sustainable fishing. Fishing should be on a rotational basis and not year-round. This will give the fish sufficient time to breed. This is not the case in Malaysia. Fishing is carried out throughout the year, except perhaps for the few weeks of monsoonal tides off the east coast of the peninsula. Such activities continue to deplete the coastal resources.

- ii) **National Policies:** The NAP3 is expected to be the major framework to enhance sustainable agriculture in the country through intensifying land use by integrated farming. Its main focus is agro-forestry, rehabilitation of marginal lands and proper soil and water conservation. Efforts are to be intensified to improve the fertility of the soil by promoting organic farming and use of organic matter, composting, conservation measures and production of organic fertilisers using the farm agricultural wastes

The Eighth Malaysia Plan (8MP – 2001-2005) emphasises environmentally sustainable development. The major thrust of the policy includes ensuring access to clean air and water, providing adequate food without excessive usage of chemicals, providing energy services without environmental degradation, developing healthy urban environments and conserving critical natural habitats and resources. Also, forest management is to be given priority to conserve biodiversity, protect watersheds and water catchment areas.

Comment: While the NAP3 seems to be the lifeline of the agriculture sector, little attention is given to how to make it a sustainable growth sector. Focus appears to be more on food production through commercial farming and promoting private sector participation. In sum, the aim of the policy is to transform the sector into an efficient “agribusiness” with high productivity and output. These may require extensive usage of technology, mechanisation and chemical inputs – and are certainly in conflict with Agenda 21, which stresses sustainable farming methods using traditional farmers.

Not more than four lines in certain chapters in NAP3 stress sustainable agricultural development. The NAP3 says “there is need to ensure agriculture and forestry development”, but falls short of explaining how the government plans to achieve this. This is a glaring flaw in the policy that seeks to serve as the guideline for the sector in the next 10 years. Although the government signed Agenda 21 six years before the revision of the policy in 1998, policy

makers failed to give serious attention to promoting sustainable farming, and the national focus still remains on industrial growth.

Plans are in the pipeline to promote Precision Farming (PF) in the country. The Malaysian Agriculture Development Authority (MARDI) is already conducting research on upland rice farms. This high-tech farming will displace traditional farmers and is unsuitable for Malaysia at this juncture. PF works by automated data collection, documentation and utilisation of information for strategic farming. It is a high cost farming technology, which uses the Global Positioning System, Geographic Information System and sophisticated computer software to capture and analyse data. It is not economical for small-scale farmers, who have limited knowledge in this field. Moreover, there has been little success with the PF method.

- iii) **Pesticide Reduction:** Excessive usage of pesticides in rice cultivation is prevalent among local rice and vegetable growers, and there is a growing concern about health hazards of farm workers. About 14.5 million metric tonnes of fertilisers valued at RM1.32 billion are imported for the sector (Statistic Department, 2001) As part of a crop protection strategy, the Integrated Pest Management (IPM), which encourages natural pest control and judicious use of chemical by farmers is widely promoted. This new technique is found to be effective in controlling certain pests such as leaf roller of rice and Diamondback moth of cabbage and also proved to be environmentally friendly. There is now a concerted effort to reduce the use of chemicals fertilisers and promote the use of organic fertilisers. These efforts have resulted in the recycling of organic waste and by-products for productive use. They have reduced indiscriminate disposal or burning of waste products which causes soil, water and air pollution.

Comment: The government's actions are inadequate and ineffective. For example, local farmers are quite reluctant to introduce integrated pest management for economical reasons. They are more familiar with using toxic pesticides that work immediately and fear that IPM may not protect their crops if there is an outbreak of disease. Crop failure means a disaster to their hand-to-mouth livelihood. The farmers are not confident and are not prepared to change their old habits and they certainly lack the knowledge of sustainable farm management.

- iv) **Mixed Farming:** In order to maximise land usage and help farmers to earn

extra income, the government introduced integrated farming in rubber, cocoa, coconut, oil palm and rubber plantations. Short- and medium- term crops, ruminants or poultry have been successfully introduced as mixed farming in many plantations. Crops like yellow sugarcane, banana and pineapple are planted in oil palm plantations and these yield good returns for farmers.

Comment: While mixed farming has benefited farmers, there are some hidden risks. Paddy fields and oil palm plantations are highly toxic because of the high usage of pesticides. This is not safe because the animals can eat the pesticide residues and eventually pose a health threat to people who consume their meat or milk. It is a major fear in integrated farming.

Another concern is that the livestock are sometimes confined to small space and this is unhealthy for the animals and farmers. Both are prone to poor health and injuries.

The government should instead consider integrated farming methods such as duck breeding in paddy fields or combining fish breeding with rice farming, for these practices have proven successful in neighbouring countries. In Vietnam for example, 30 million ducks are bred annually in rice fields in the early growth period of the crop or the post-harvest interval. The ducks also act as scavengers, helping to control insects and weed in rice fields. Fish breeding in certain granary areas of the country has been tried on small scales, allowing farmers to earn an extra RM60 to RM100 a month. Further, these farmers have been found to be more judicious in using pesticides or herbicides because they will kill the fish. Unless there is a serious insect attack, farmers tend to reduce chemical application.

- v) **Recycling Organic Wastes:** Organic wastes from oil palm plantations, such as fronds and empty fruit bunches, can be effectively recycled. Palm oil mill effluents can be used as organic fertilisers or used to enriched fertilisers used for other crops. The palm kernel can be used to produce palm kernel cake for animal feed. Chicken droppings are commonly used as organic fertilisers in vegetable farms. The wastes if not recycled will otherwise be harmful to the environment.

C) Recommendations

Problems such as poverty, shortage of land and labour, lack of private sector participation and the younger generation not keen in farming have been haunting local farmers for decades. Issues like poverty ought to be tackled first, especially among the rural based farming communities. About 70 percent of the world's poor are found in the rural areas.

Malaysia has been successful in poverty eradication nationwide – the rate of poverty was reduced from 49 percent in 1970 to 6.8 percent in 1999. Still, the hardcore poor make up about 1.6 percent of the total population. Several states still suffer high incidences of poverty, like Kelantan (19 percent), Terengganu (17 percent) and Sabah (16 percent). Most of these families rely on agriculture for their living. Without a strong political will and mobilisation of resources for rural development, the farming community will continue to grapple with poverty and environment damage will worsen. There will be no place for sustainable agriculture.

Therefore, a holistic approach is needed to address the structural weaknesses in the sector, so that farmers in the long run are in a better position to adopt the concept of sustainable development and manage agricultural resources successfully, to satisfy human needs and avoid environmental degradation at the same time.

Along with the current changes introduced by the government, the decision-makers can take following actions:

- i) Institutional Development:** Farmers cannot accomplish sustainable agriculture and rural development without the help of the governments and other support groups. Neither can other groups such as corporations replace farmers and feed the world. Government agencies like MARDI, Federal Agriculture Marketing Authority (FAMA), Federal Land Development Authority (FELDA) and Department of Fishery should work more closely with farmers at the grassroots level.

Institutions should create more awareness about sustainable farming and educate farmers of the importance of managing natural resources efficiently. For example, encouraging prudent use of water as farmers are likely to face water shortage because of demand from the industrial and domestic sectors. Farmers could also be advised to reduce pesticides and synthetic fertilisers and to maintain soil organic matter, protect ground water from contamination, practise

crop diversity and encourage wildlife maintenance.

There is gap between farmers, scientists and policy makers. In many countries neither farmers nor agriculture scientists determine what is sustainable, or what is needed in the market. Scientist carry out their research and development in far away laboratories based in universities and farmers' inputs are minimal. In most cases, they are not even consulted. A closer collaboration between these parties is important.

- ii) **Trained Farmers:** Young, trained farmers, who are able to understand concepts like sustainable agriculture and good farm management, should be encouraged to take up farming full-time and not as a temporary measure. This is important because agriculture and the environment are closely linked, and farmers play a crucial role in protecting the ecology. The over use of pesticides by local farmers, for instance, is due to ignorance. They are unaware of the serious implications to their own health and the environment. Many traditional farmers are still using pesticides instead of switching to IPM, which has proven effective.

Those interested in farming should undergo formal training before embarking on it. Programmes should be designed in a way that old and young farmers are able to work closely, so both can benefit in terms of farming knowledge. Older farmers can give traditional tips on subsistence farming, while young farmers can introduce new concepts. In the future, only educated and skilled farmers can compete with the highly efficient producers of the region, especially with the implementation of the Asean Free Trade Area in 2003. The ministry has already started the Green Certificate programme, where participants are given special incentives like land, financial aid and support services. More such programmes should be introduced among the rural youth, mainly among the farming communities as a long-term career and not a short-gap measure.

- iii) **Farm Accreditation:** The Agriculture Ministry launched an accreditation scheme where the department evaluates individual farms as to whether farmers follow “good agriculture practices” and “good handling practices”. The ministry should make the accreditation compulsory for all farmers, so that the government can monitor sustainable management of resources.

- iv) **Fair Trade Shops:** This concept is gaining popularity in Europe and Africa, where goods produced by farmers in the southern countries are sold directly to fair trade shops. Oxfam and the European World Shops are examples which help poor farmers to get a good deal in the foreign market. The principle of fair trade means farmers get a fair price and work in safe conditions, with respect for the environment. Since 1996, some 2,000 World Shops have mushroomed in Europe. Oxfam supplies coffee that comes directly from small producers in Africa and Latin America. Agencies like FAMA can promote such trade ideas for local farmers. In addition, farmers should be encouraged to form co-operatives which will further strengthen their bargaining power and enable farming communities to expand their activities on large scale, which will be more economical.
- v) **Support Programmes:** The government has introduced an “Exit Programme” for unproductive farmers and fishermen. They are encouraged to leave the sector and the government assists them to seek alternative employment. Exit programmes should be implemented carefully. The authorities must ensure that there is no exodus of traditional farmers and fishermen. Otherwise, it will be a great loss to the industry. Instead of exit programmes, the authorities can introduce support projects that can bring additional income to farmers and fishermen during off-peak periods.

Most farmers only work 30 hours a season and they are unemployed most of the time. Farmers can venture into cottage industries like food production, or in making and selling of handicraft. This can be turned into community enterprises, making the farmers self-reliant. It will not only help to reduce the poverty but will also protect the agriculture and marine resources from being exploited to the extent that harvests become uneconomical. Only certain agencies like the fishermen’s associations have such programmes. The authorities need to implement support programmes nationwide.

- vi) **Communal Farming:** There are 296,000 paddy farmers in the country, of whom 116,000 are full-time farmers. About 65 percent of them own farms that are less than one hectare and only 4 percent have plots more than three hectares. Hence, many are not of an economical size for large-scale farming or for mechanised farm activities. They suffer from high cost of production and low returns. These small farms should be consolidated to achieve economies of scale. In addition, farmers should be encouraged to market their own products, instead of leaving it to unscrupulous middlemen who reap hefty

profits by paying the farmers small sums but fixing high prices for the produce in the markets. This has been a perennial weakness in the sector. Farmers, through their own cooperatives and enterprises, can then fix reasonable prices and earn better incomes, rather than relying on middlemen who dominate the business.

- iv) **Poverty Eradication:** Unless efforts are taken to improve farmers' incomes and improve their quality of life, they will not care for the environment. The rural-urban poverty gap is widening and development policies must be designed to address the social disparities in society. Local farmers use plenty of highly toxic fertilisers to obtain better yields, and therefore higher returns. Such practices should be stopped, but this can only be achieved if farmers themselves are financially stable.

- v) **Private Sector Participation:** The government is aggressively encouraging the private sector to develop the agriculture industry. This must be done with caution. Extensive involvement of private players will lead to commercialisation of the agriculture sector because the private sector is always profit-driven. Privatisation means large-scale monocrop farming and food production. These practices are the direct opposite of sustainable farming which favours biodiversity. Traditional farmers will soon be displaced by mechanisation and the country will lose the vast farming knowledge accumulated over decades. The private sector should instead help to provide an enabling environment for farmers and limit their role to R & D and providing financial assistance. Farmers should still manage their own farms and form their own venture enterprises.

- vi) **Programmes For Women:** The Agriculture Ministry needs to design special programmes to encourage women to participate in the agriculture sector. For instance, in Bangladesh where women constitute 45 percent of the farming community, several development programmes have been designed for both men and women.

Similar steps can be taken to encourage greater participation of the local women in farming. Some ideas are:

- training field staff to be gender-sensitive and in participatory planning and programme implementation that are culturally acceptable;
- supporting women's work in the farm and homestead production instead of merely viewing them as wives of male farmers;

- strengthening the extension system to be gender-equitable to ensure its effectiveness;
- identifying and responding to women's agricultural and household needs for technology in close collaboration with researchers, implementing agencies and grassroots workers;
- supporting women in their home-based post-harvest production and marketing activities by providing local market information and linkages, improving transportation and storage facilities, improving processing and packaging techniques and enhancing credit facilities;
- launching adult literacy programmes and credit use capabilities with particular focus on women;
- establishing monitoring systems for these programmes;
- incorporating specific credit, seed production and nutrition education syllabi for training for NGOs/government agencies providing extension services;
- providing women with training in crop and horticulture production, post-harvest operation, poultry and small livestock rearing and fisheries production and processing, and;
- Encouraging the Women's Development Ministry to help women in the sector by providing credit for agriculture activities

viii) **Cultivating Biodiversity:** As part of sustainable development to achieve food security, the World Resources Institute released a text titled *Cultivating Diversity: Agro-biodiversity and Food Security*. This document highlights the key principles, policies and practices needed to maintain agro-biodiversity and to ensure that food security is safeguarded. These recommendations provide "win-win" solutions to the multiple challenges of achieving long-term food security, building economic productivity and maintaining healthy ecosystems. The recommendations include:

- Developing policies and institutional changes that support agro-biodiversity, ensure food security, protect farmers' rights and eliminate policies that promote uniform monoculture systems.
- Adapting agricultural practices and land use to local agro-ecological and socio-economic conditions that are adjusted to the diverse needs and aspirations of the farming communities and building upon local successful experiences.
- Empowering farmers and local communities to protect their rights to

resources, support their knowledge and cultural diversity and ensure their participation in decision-making and conservation.

- Supporting sustainable ecological agriculture that includes the goals of food security, social equity and health, economic productivity and ecological integrity as a framework for enhancing agro-biodiversity.
- Developing an ecosystems approach, using agro-ecology as a guiding scientific paradigm to support and validate the sustainable use and enhancement of agro-biodiversity.

ix) Improving National Policies: There is no specific national policy to promote sustainable agricultural development, nor a national food policy, both of which are vital for protecting the environment and food production. Although the NAP3 outlines the importance of food production and environmental protection, it does not specifically address the issues for a long-term, sustainable agriculture industry. The National Forestry Policy, on the other hand, only emphasises the importance of biological diversity, conservation and sustainable management of forest reserves. Concerted effort is needed and the government should formulate separate policies if successful sustainable development is to be achieved in the long-term for the benefit of the country.

D) Biotechnology - a Threat to Sustainable Farming

After globalisation, biotechnology is the latest mantra in many parts of the world. Proponents claim that it is the best scientific solution for countries to enhance food production to feed the growing world population, which continues to outstrip food output, thus leaving millions in Third World countries starving. This supposedly cutting-edge-technology can revolutionise food production, claim scientists, who are now able to use sophisticated tools to transfer genes from one organism to another for a specific trait. They argue it is “good science” and helps to create plants that are more drought-resistant, more tolerant to arid conditions, poor soil and resistant to pests without the use of pesticides.

This is touted as a boost to countries relying on the agriculture sector, because farmers could grow good crops with high yield in the future. This can increase their incomes significantly without disturbing the environment, say biotechnology advocates.

Malaysia, like many other countries does not want to miss good science. Thus, the government is promoting biotechnology as Malaysia’s next engine of growth. It is expected to bolster the ailing agriculture sector, enhance food production and create job opportunities for locals.

Malaysia is in a good position to do so because it is home to rich tropical biodiversity - rated as one of the 12 “mega biodiversity” nations in the world. It boasts over 150,000 species of invertebrates, 286 mammal , 736 birds and 15,000 flowers.

But there is a looming threat to this rich biodiversity, which has supported ecological balance for year and the farming community which relies extensively on the natural stock of wildlife, flora and fauna for their survival.

Malaysia’s rainforest is dwindling because of excessive logging, massive land clearing for development and forest fires. The advent of biotechnology could possibly cause more damage to this fragile ecosystem.

There are growing concerns as to whether the new science can deliver the goods with minimum damage to the environment, health and the rural communities. There are doubts whether biotechnology can protect sustainable agriculture – a core issue for many Third World farmers. Since biotechnology is still in its infancy, undergoing research in laboratories and farms, scientists have no ready answers for all the questions raised if farmers were to use this modern technology. And, neither is there adequate legislation to protect the communities.

Sufficient knowledge is not easily available to grassroots farmers. With the government continuing to slash funds for research and development for the agriculture sector, there are doubts how much farmers in developing countries like Malaysia will gain from the new technology.

While advocates of biotechnology push for the adoption of this new science, opponents loathe the idea, fearing it could be detrimental to the order of nature, natural pest control, biodiversity, to rural farming communities that thrive on traditional farming and threaten food security, both at household and national level.

Fundamental weaknesses in the technology are already surfacing and sustainable farming is being challenged in many places. Local farmers may face similar hardships suffered by several agriculture-based economies if the policy makers fail to take the necessary measures.

Some common flaws of biotechnology in the agriculture sector are:

- 1) **It undermines traditional farming:** The farming philosophy will change under the new regime and small-scale farmers may find it hard to grow diverse crops using old-style methods. The Green Revolution of the 1970s created immense social and economical problems for the farming community - high yielding varieties with abundance of chemical usage. It later displaced small-scale farmers, local crop varieties which were grown for decades disappeared, endangered biodiversity and promoted monoculture. Now, the gene revolution may create worse problems - marginalise and drive poor farmers into deep poverty, indigenous biodiversity created by decades of intensive farming may disappear and the extensive input of chemicals could destroy arable cropland.

In the future, farmers will not have access to seeds that were traditionally owned and grown by them for decades. Multinationals, through patents, will control seedlings, thus preventing farmers from planting in the next season. This will make farmers dependable on seed companies, another sensitive issue that is likely to stifle sustainable farming in Third World countries. Besides, the spiraling cost of farming due to expensive seeds and pesticides will eventually force traditional farmers out of business, or many will be trapped in huge debts with multinationals.

- 2) **Uneconomical farming:** Many farmers, especially from the under-developed countries, may not benefit because they are ill-equipped in terms of knowledge of what is happening abroad. Genetically modified (GM) foods may not find

lucrative markets, as better informed people and governments in Europe, Canada and Japan are beginning to reject them because of mounting pressure from health conscious consumers.

Local farmers forced to grow genetically modified crops may not have access to these markets and if the trend prevails, prices will eventually plunge. With the rising cost of pesticides, herbicides and poor income, individual or family owned farms may not survive for long. GM seeds and livestock give corporations increased control over family farms and farmers will be drawn further under corporate control. High costs will marginalise small farmers, and nations will be forced to accept GM foods grown in developed countries or with bio-engineered plant products, at the risk of their own natural food crops.

- 3) **Usage of herbicides:** The proponents of biotechnology claim that genetically engineered plants are herbicide resistant. But contrary to this, farmers continue to increase the use of herbicides in order to grow GM crops. This has been proven by studies in the soyabean fields of the United States, where farmers became totally dependent on herbicides. A study of more than 8,000 university-based field trials showed that farmers who plant Roundup-Ready (RR) soyabean used two to five times more herbicides compared with that for non-GM crops, where farmers use integrated weed control methods. Genetically-modified organisms are considered the biggest threat to sustainable agriculture.

There are vast differences between traditional and GM crops growers. The former rely on sustainable management practices, which emphasise on prevention of pest problems by optimising the effect of natural mortality factors (e.g. biological enemies and weather) to reduce pest populations. They depend on large amounts of ecological, biological, agronomic and climatic information. Farmers use a variety of cultural, biological and mechanical methods to prevent pest problems. Crop rotations, intercropping, cover crops, altered planting and tilling schedules, new tillage systems and natural bio-control agents are some of the many options available to growers adopting sustainable farming strategies, unlike in genetic technology where usage of chemicals is still widespread. Therefore, many experts feel the new technology is not environment friendly.

- 4) **Threat of monoculture:** When farmers plant GM seeds, all the seeds will have identical genetic make-up, which leads to monoculture. Crops will then be susceptible to diseases and virus and pest outbreaks. There can be major

crop failures, as experienced by Indonesian rice farmers in 1975, where they lost half a million acres of rice to leaf hoppers. In addition, the high input of fertilisers, water and pesticides and the use of heavy machinery in the farmlands to manage monoculture crops will have an adverse impact on the environment. GM crops have been proven to undermine natural biodiversity and the food security of rural communities who rely on indigenous crops. There are already signs that biotechnology could spell similar troubles again.

- 5) **Terminator seeds:** Dubbed as “traitor seeds or suicide seeds”, this new invention of biotechnology sterilises the seeds produced by pesticide companies after one generation. Farmers cannot grow them in the next season and they will be forced to rely on seed banks, which are largely controlled by the pesticide multinationals of the developed countries. The “terminator seed” technology has been widely condemned as an immoral practise that threatens global food security. If commercialised, this technology will prevent farmers from saving seeds from their harvest for planting in the following season. By creating terminator seeds, companies can sell farming packages to growers, which will include seeds, herbicides and other chemicals needed for farming activities. In, fact, they can now dictate what and when to produce and local farmers will have little say. Self-sustaining families in underdeveloped countries will be deprived of their basic livelihood and locked in abject poverty.

- 6) **Gene pollution:** Another growing concern is that genes from GM crops can move into neighbouring plants through pollens, either of the same species or a closely-related variety. Traditional crops can be polluted with genes from GM crops by insects, birds and wind. Genetic pollution is a serious problem in the southern countries, where many crop origins are found. In Thailand, the government barred field tests of Monsanto’s Bt cotton. (Bt cotton is named after *Bacillus thuringiensis*, a common soil bacterium that produces toxins lethal to caterpillars and certain insects but harmless to mammals, birds and fish), after farmers protested that its transgenes could flow into some of the 16 plants in the cotton family, which traditional healers use as medicines. Transgenic crops can create a lot of trouble for farmers: they can kill non-target organisms, including natural predators of pests, cross-pollinate other species and contribute to pesticide resistance.

Gene pollution has another danger. Pollution created by genetically engineered organisms, bacteria and viruses that are released into the environment is impossible to contain or clean up, unlike other chemical contamination. Scientists

warn of another threat – the growth of wild “super-weeds”, which would accept the resistant gene and become resistant to any pesticide.

- 7) **Threats to food security:** Traditional farmers cannot be replaced by technology. They will continue to produce basic foodstuff such as vegetables, rice, and poultry and feed the local population. Without them, the food production chain will be upset. Genetic engineering, which was lauded as miracle achievement for feeding the increasing world population and ending hunger, does not seem to protect this vital community. In fact, the reverse is happening. Farmers are now losing their grip on the agriculture sector, which they once dominated, and are forced to compete with large multinationals. How can one end starvation when farmers are not allowed to plant their own seeds but instead are forced to buy them? The “terminator technology” will surely undermine food security in the developing countries, where poverty and hunger is more acute. Traditional farmers, who depend on seeds saved from one planting season for the next, will now be unable to grow their own food but depend on multinationals for seed supplies.

Genetic engineering will undermine the nations’ capacities to be self-sufficient by destroying biodiversity, traditional knowledge and sustainable farming. GM crops may help food production in the South, only if the technologies are in the hands of the farmers. The answer to food security depends on sustainable agriculture and only traditional farmers can practise this, not GM crops growers.

- 8) **Harm to biodiversity:** The genes of living organisms are the basic raw materials needed for the growing biotechnology industries. Genes of plants, animals and other biological resources found in rich tropical countries, especially in the South, have been the target of gene hunters who hijack and patent them in the North. India’s popular brand of basmati rice was patented in the United States. Thailand’s Jasmine rice also suffered a similar dispute with US companies. Both actions attracted strong protests from the public and farming communities. Farmers and indigenous communities in the South have been mainly responsible in identifying many of these resources, which were used as medicines or food for centuries, and are freely available. But now, multinational companies by registering patents are claiming exclusive rights to produce and sell genetically engineered plants and animals, for which the people from the lesser-developed world have to pay a high price.

Conclusion

The debate over biotechnology still rages, with advocates claiming that genetic engineering is a safe and effective scientific solution to tackle hunger in many poor countries, without harming the environment. However, recent developments in the farms do not indicate this. The negative impact on societies and the ecology is far more worrying than the immediate results. Countries like India have taken a cautious stand in adopting GM crops, despite the pressing poverty of local farmers. In fact, after years of debate, the Indian government finally allowed farmers to grow Bt cotton – a GM crop – on a commercial scale, from March 2002.

Malaysian policy makers need to rethink their priorities. Malaysia too has strong farming traditions, which rural farmers still rely on. At the same time, it has to protect its rich biodiversity from gene hunters. Being a signatory to the Convention on Biological Diversity, Malaysia has an additional responsibility in protecting the environment and monitor GM crops and genetically engineered food. Biotechnology is not the only solution in addressing the shortcomings in the agriculture sector. Better approaches to pest control than chemical or genetically engineered products exist. For instance, pest management methods developed using sustainable agriculture practises. For the moment, biotechnology appears to be a quick fix, rather than a permanent component of sustainable farming.

Before creating the milk lakes and butter mountain, the government decided to jump-start its industrialisation programme, which eventually sidelined the agriculture sector. There was a chain reaction - rise in food imports, threat to food security, environmental degradation and at grassroots level, farmers were languishing in poverty.

It is almost a decade since the signing of the Rio declaration. Yet the government is finding it difficult to implement the concept of Agenda 21, mainly because the linkages between different players, the private sector, non-governmental groups, government agencies and the farming community appear to be weak.

Implementation was therefore sporadic. There was no concerted effort or nationwide campaign to achieve sustainable development, especially in the agriculture sector. Progress is visible in some areas, like in forestry, but more needs to be done in the farming sector. Prolonged neglect will only increase the economical and social costs. Agriculture is not just a sector of production, but a way of life for millions of people. And those in authority are responsible for ensuring a healthy green environment for the future generations.

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About ERA Consumer

The Education and Research Association for Consumers, Malaysia (ERA Consumer, Malaysia) is a voluntary, non-profit and non-political organisation that was founded in Ipoh, Perak in 1985. ERA Consumer is a registered membership organisation under the Malaysian Societies Act of 1966. It was set-up to undertake and promote the task of developing critical consciousness on public-related issues out of the larger socio-economic issues.

ERA Consumer is a dynamic institution that is constantly responding to and developing its services according to the needs and demands of the people. It aims to create awareness among the public on issues that are effecting their lives, through research and educational programmes by undertaking independent, authoritative, balanced research on public issues; carrying out public education projects; making policy recommendations to the government & international institutions; building solidarity and understanding among NGOs in Malaysia and society at large, and to increase South-South relations and North-South understanding. ERA Consumer's components and main programmes are consumer issues; human rights education; food, trade and economics.

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