Development of Malaysia's Agricultural Sector: Agriculture as an Engine of Growth?[1]

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INTRODUCTION

Development economists in general, and agricultural economists in particular, have long focused on how agriculture can best contribute to overall economic growth and modernization, premised on their in-grained believe that robust agricultural growth and productivity increases are crucial to sustained economic development, at least up till the mid 1980s. Since then, and despite this widely acknowledged role of agriculture in economic development, many policy makers, policy analysts and academics in developing countries, international agencies and donor communities appear to have lost interest in the sector, often relegating its role 'from engine of growth to sunset status' (Siamwalla, 1996) and Harron *et al* (2001) or arguing for its continuing relevance and importance because of its 'multi-functionality role' (Abd Rahman, 1992). However, after almost two decades of relative neglect, interest in agriculture is returning in a big and passionate way, as manifested in Malaysia where it is heralded as the next (third) engine of growth and promoted as 'New Agriculture' in Malaysia's latest 5-year development plan – the Ninth Malaysia Plan.

The purpose of this paper is two-fold. Firstly, I elect to explore the reasons why agriculture is firmly back on the policy agenda of Malaysia and other countries. In so doing, a major motivating factor for writing this paper and orientating it in this elected manner is my observation that despite the timeliness and relevance of this (re)emphasis on agriculture, given Malaysia's current stage of development and relative endowments, on the one hand, and the challenges and opportunities accompanying globalisation and rapid technological change (in biotechnology, information and communication technology (ICT) and nanotechnology and their impending convergence) on the other, there still appears to be a lack of understanding or appreciation of the underlying rationale and implications of this (re)emphasis.

Secondly, I note that amongst the major factors leading to this revival of interest in agriculture is the increasing relevance and impact of agriculture and food (agri-food) Supply Chain Management (SCM) and the inexorable rise of supermarkets at the global, regional and Malaysia levels. These, coupled with the advancements and applications of biotechnology, on the one hand, and that of ICT, on the other, and their impending convergence (bio-informatics and beyond) are expected to lead to a 'big bang' or major structural shift making it a worthy and exciting area of study. Events leading up to the 'big bang' and their ramifications will prove to be a boon to those who have anticipated or are prepared for it and a bane to those who are ill prepared along the entire agri-food supply chain. These are very strong and distinct trends that we ignore at our own peril.

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Consequently, this paper deviates from the normal approach of describing and quantifying Malaysia's past, present and future scenario of agriculture development (as adopted by Abd Rahman, 1992 and Harron *et al*, 2001) and instead presents some reflections from a pedestrian economist's perspective gained from jottings, anecdotal evidence, secondary sources including personal communication with stakeholders over more than a decade of establishing and managing supply chains and international production and trading networks in Malaysia and the region, coupled with a more recent fascination with the inexorable rise of supermarkets and biotechnology. Unfortunately, it is not sufficiently grounded empirically nor is it the result of rigorous analytics, as yet. This paper is also motivated by the urge to share some of my thoughts, aspirations and concerns.

The underlying theme of this paper is that it is imperative for policy makers, researchers, stakeholders and all involved at the various levels of the agri-food supply chain to understand, grasp, and appreciate the underlying rationale of this (re)emphasis on agriculture as well as the extent of interplay of developments in agric-food Supply Chain Management (SCM) and the rise of supermarkets and related transformation in food distributive trade in order to maximize the benefits of New Agriculture while minimizing or mitigating the negative impacts.

This paper is organized such that after this introduction, the next Section provides an overview of the role of agriculture and the reasons for this return of interest in agriculture and how it applies to Malaysia as well as the salient features of the 9th Malaysia Plan which underscores this (re)emphasis on agriculture to act as a backdrop. Section 3 examines the increasing relevance of Supply Chain Management with a Malaysian slant. Section 4 considers the rise of supermarkets in Asia with a Malaysian flavour by tracing its historical development, expansion path and factors fueling it. Section 5 takes a closer look at the cases of sweet corn and high value vegetables to gain some insights regarding the interplay or inter-relatedness of SCM with the rise of supermarkets. Section 6 considers the need for the Government, researchers, and stake-holders 'to get the balance right' in moving forward, before the conclusion in the final Section.

2. BACKDROP

Role of Agriculture in Economic Development

The role of agriculture in economic development is sometimes complicated and controversial despite a long historical literature examining the topic[3]. Part of the controversy stems from the structural transformation itself, which involves a multi-sectoral and general equilibrium process that is not easily understood from within the agricultural sector alone. By and large, agriculture's role seems to evolve through four basic stages: the early 'Mosher' stage when 'getting agriculture moving' is the main policy objective (Mosher, 1966); the 'Johnston-Mellor' stage when agriculture contributes to economic growth through a variety of linkages (Johnston and Mellor, 1961); the 'T.W. Schultz' stage when rising agricultural incomes fall behind those of a rapidly growing non-agricultural economy, inducing serious political tension (Schultz, 1978); and the 'D. Gale Johnson' stage where labour and financial markets fully integrate the agricultural economy into the rest of the economy (Johnson, 1997 and Gardner, 2002). Relatedly, Timmer (2005) contends that empirical evidence suggests that most Asian countries encounter difficulty in transitioning from the 'food security' to the 'farm income' and

[3] This section draws heavily from Timmer (2005)

on to the 'rural productivity' objective for public policy. Efforts to 'skip' the early stages and jump directly to a modern industrial economy have generally proven disastrous.

Strange as it may seem, especially in this part of the world, a country or region 'without agriculture' (where all food and agricultural products are sourced from international markets, and domestic agricultural sectors 'disappeared') was, up till recently, considered for many of the world's poorest countries, especially in Africa. This was even urged as the efficient path to development[4]. These macro economists, convinced of the power of rapid economic growth to lift populations out of poverty, see resources devoted to slow-growing agriculture as wasted, given ample food supplies in the international markets (some of it free as food aid) and increasingly open borders to trade. Given this scenario, what is the role of agriculture in poverty elevation or pro-poor growth, they ask?

Why Agriculture is back on the Agenda

After about two decades (since mid 1980s) of neglect or disinterest by academics, researchers, donor communities and some developing countries, interest in agriculture is resurging, largely fuelled by a new understanding that growth in the agricultural sector plays a major role in overall growth and poverty reduction through linkages to manufacturing and services in a supply chain and international trading network framework as well as in connecting the poor along the agri-supply chain to growth.

There are three basic drivers of this renewed interest in agriculture:

a. *Agro-Biotechnology Revolution* – Agro-Biotechnology (or 'green' biotechnology) Development in genetics (both GMOs and non-GMOs), microbiology and diagnostics, coupled with ICT and nanotechnology have revolutionalized and pushed out agric production/productivity and profit frontiers. The 21st Century is touted as the 'Biology Century' and there are great expectations that agro-biotechnology can contribute greatly to innovations, cost reductions, productivity improvements, new processes, and new products.
b. *The Rise of Supermarkets* – The supermarket revolution in Asia has transformed agri-food supply chains, especially food retail markets. There are new important opportunities for farmers to diversify into high-value crops with greater demand potential, and thus capture some of the value-added being generated by the supermarkets and increasingly sophisticated and stochastic supply chains and international networks. They also increasingly connect farmers and other stakeholders more directly to changing consumer preference and demand. Whether this is a boon or bane for farmers and stakeholders at different levels of the supply chain depends as much on public policies as the ability of the farmers and stakeholders to be proactive, adaptable and work together.
c. *Reducing Poverty and Preserving the Environment* – The recognition that as urbanization occurs at unprecedented rates, economic growth generated by agriculture (and the value adding along the supply chain) is the main vehicle for reducing poverty and preserving the environment in the rural areas

[4] Mark Rosenzweig, Director of Harvard's Center for International Development, asks, 'Should Africa do any agriculture at all?'(*Harvard Magazine*, 2004, p 57). Adrian Wood, Chief economist for DfID, envisions a 'hollowed out' Africa, with most of the population on the coasts where they could more effectively produce manufactured exports (Woods, 2002)

Taken together, all the above are compelling many researchers and governments to relook the role of agriculture in economic development, reassess and build on their relative strengths and endowments as well as better understand and track the drivers. As there is a separate paper on biotechnology at this conference, we will focus on agri-food supply chains and trading networks and the rise of supermarkets subsequent to providing a thumb nail sketch of the salient points or aspects of the 9MP.

Ninth Malaysia Plan(9MP)

In many important ways, agriculture was accorded a very different treatment in the 9MP, starting with the revitalizing of the sector as one of the key aims of the Plan, and the sector itself featured strongly in each of the five key thrusts of the National Mission. Following on from the restructuring and renaming the Ministry of Agriculture (MOA) as the Ministry of Agriculture and Agro-based Industry (MOAAI) in 2004, Chapter 3 of the Plan was entitled, 'Strengthening Agriculture and Agro-based Industry' and for the first time presented and discussed corresponding growth, export and employment figures for agriculture and agriculture plus agro-based industry combined. We also witnessed the introduction of the term New Agriculture as well as MOAAI's tag-line that 'Agriculture is Business'.

> *"During the Ninth Plan period, the agriculture sector will be revitalized to become the third engine of growth. The emphasis will be on* ***New Agriculture*** *which will involve large scale commercial farming, the wider application of modern technology, production of high quality and value-added products, unlocking the potential in biotechnology, increased convergence with information and communications technology (ICT), and the participation of entrepreneurial farmers and skilled workforce. The function of agricultural services will also be streamlined to enhance service delivery and efficiency." ..* [9MP, p81]

Interestingly, agriculture value-added grew at 3.0 per cent per annum over the 8th Plan period, higher than the target of 2.0,per cent[5] as shown in Table 1a. Agriculture and agro-based industry grew at 3.6 per cent. Over the 9MP period agriculture is expected to grow at 5 per cent per annum and agriculture and agro-based industry is expected to grow at 5.2 per cent. In 2005, agriculture value added RM21.6 billion (in 1987 constant prices) or 8.2 % of GDP while taken together with agro-based industry, value added in 2005 was RM38.5 billion or 14.7% of GDP. This is targeted to increase to RM49.7 billion or 14.2% of GDP in 2010.

Table 1b provides the corresponding data going back to 1990, computed from recently available national accounts statistics and hence providing a better indication of the relative changes in agriculture and agro-based industries as well as their individual components. The dominance of Oil Palm and Vegetable and Animal Oils &Fats is striking. To a lesser extent, all the food commodities and Other Food Processing, Beverages & Tobacco also stand out.

In terms of export earnings, (see Table 2), agriculture and agro-based exports are expected to grow from RM74.9 billion in 2005 (14% of total exports) to RM115.7 billion (14.5% of total exports) in 2010.

[5] It should be pointed out that this 2.0 per cent is in fact the revised target adopted in the Mid Term Review (MTR) of 8MP, revised down from the original target of 3.0 per cent. In retrospect, this acievement of 3 per cent annual growth is commendable recalling that in the 7MP, the original target for agriculture was 2.4 per cent, revised downwards to 1.9 per cent in MTR and the final achieved rate was 1.2 per cent.

In terms of employment (see Table 3), agriculture and agro-based industry employed 2.39 million workers (21.9% of total employment) in 2005, and this is expected to increase to 2.43 million workers (20.3% of total employment) in 2010. It is interesting to note that over the 2000 to 2010 period, the expected increase in employment in the agro-based industry is expected to more than off-set the continuing decline in the agricultural workforce, resulting in a net increase for agriculture and agro-based industry taken as a whole.

To complete the backdrop, Table 4 provides an indication of land use over the 2000 to 2010 period. Again the dominance of oil palm and other tree crops is more than obvious.

In retrospect, Malaysia has tremendous inherent strengths in agriculture, particularly in tree-crop agriculture and management of large scale production of industrial crops like oil palm and rubber as well as selected crops, livestock, and fisheries enterprises. We are also getting increasingly good at developing and managing the respective agri-food supply chains and international trading networks. In so doing, we have developed a comparative and competitive advantage in selected supply chain, leveraged on end-uses of these commodities. We have been operating at their respective production and profit frontiers, especially with respect to oil palm and palm oil as well as rubber. This has not only allowed us to stay ahead of the curve but also best positioned us to benefit from the potential and possibilities arising from the convergence of ICT, biotechnology and nano-technology.

Now, from another perspective, we note that developed countries' expertise in tree crops is invariably confined to timber, fruits, and nuts. Furthermore, the nerve-centers or nucleus of value-adding and R&D for oil palm and rubber are also in Malaysia. Consultancies and management expertise in the oil palm and rubber industry in ASEAN and further afield is dominated by Malaysians. Consequently, Malaysia must build on and exploit this comparative advantage.

It follows that this focus on agriculture and its role as an engine of growth means that it should not only drive the production of oil palm, rubber and the range of selected crops, livestock and fisheries, but also the economic activities in their entire supply chains, 'from seed to shelf' or from inputs to final consumer, be they local or in far away and more lucrative markets.

Now, in order to track the more holistic contribution from agriculture for purposes of monitoring and evaluation or otherwise, we should build on the crucial first step taken in the 9MP which incorporated the contribution from agro-based industries. Now, the computation of the contribution from agro-based services along the entire supply chain will be more challenging but not insuperable. For a start some coefficients can be computed to provide some estimates of the contribution from various types of services, using Input-Output (I-O) tables. These coefficients can be refined over time by conducting supply chain studies for the major commodities, starting with rubber and oil palm as well as the identified 'new areas of growth' (where the development strategy will obviously be a supply chain management approach rather than the hitherto more 'production-centric' one). Consequently, these contributions should be added to that from the agriculture sector (conventionally measured) to provide a more relevant indication of the real impact of this (re)emphasis on agriculture as the engine of growth. In this regard, it is heartening to note that the Third Industrial Master Plan (IMP3) supports and reinforces this shift in focus.

3. RELEVANCE OF SUPPLY CHAIN MANAGEMENT IN MALAYSIA

Overview

Supply Chain Management (SCM) has, in recent years, attracted the attention of a cross-section of academics, researchers and practitioners alike. It has spawned text books and even dedicated journals like '*Supply Chain Management*, *an International Journal'*. The development of the idea of supply chain owes much to the emergence from the middle of the last century of systems theory and the associated notion of holism. It has been contended (for example Boulding, 1956) that the behaviour of a complex system cannot be understood completely by the segregated analysis of its constituent parts. New (1997) has suggested that despite the undisputed importance of financial services, electronic communication and media industries, the economy still resolves around the production, processing, moving, buying and selling of 'stuff' and that SCM is about mechanisms and processes by which these activities are organized.

A central tenet of SCM is that in future, competition will no longer be between firms but rather be between supply chains, comprising groups of companies intricately linked through a series of partnership and alliances at the various levels of the supply chain. A cursory review of the literature indicates that SCM has been applied from the perspective of an individual firm; related to a particular product or item (such as the supply chain of rubber, or rice, or pork); and from the perspective of industry group or sector (such as grains and agri-food).

As all components along the supply chain need not belong to one company or group, varying degrees of strategic alliances can be observed at the operational level: from loose structures (JV 'at the door') to dedicated/designated suppliers (as in the case of supermarkets), through to cross investments. At the operational level, there is significant value-adding along the entire supply chain. Furthermore, supply chains can reduce asymmetry of information at interfaces with each subsequent level, thereby reducing transaction costs as well as increasing feedback and improving response rate to changes in consumer preferences and tastes, thus enabling the capturing of premiums. Of course, this sharing of information is greatly facilitated, enhanced and even revolutionised by recent advances in ICT.

Empirical evidence suggests that there can be amicable/sustainable sharing of margins along supply chains, including the transmission of prices back to farmers/producers. Consequently, an appealing strategy is to hook up (or integrate) small farmers/producers to increasingly sophisticated local supply chains (involving supermarkets) and more lucrative overseas markets, especially niche markets.

In Malaysia, supply chains can and will speedily exploit advances in biotechnology and its impending convergence with ICT as well as innovations. Similarly, there will be exponential growth, if and when interconnectivity of supply chains are exploited, as is already happening with telcos and multimedia superhighways.

From a policy and institutional standpoint, most government interventions and programmes in Malaysia are invariably overtly 'production-centric' so much so that the farming/production subsystem is not well linked or integrated (and often 'out-of-sync') with the post-harvest subsystem. As can be gleaned from the Big Picture of a generalized Agri-food Supply Chain depicted in Figure 1, the power of supply chains is the value-adding potential at each level of the chain when agriculture is viewed in its broader and more holistic, agribusiness perspective. This will offer the basis for agriculture to drive overall development by leveraging

on inherent advantages and potential of nations at the inputs, processing, wholesale and retail trade as well as international trade levels. In so doing, agriculture via its linkages in the supply chain, will also contribute to overall national economic growth from agro-based industries and value adding as well as agro-based services and consultancies at all levels of the supply chain.

This underlying rationale, to my mind, forms the cornerstone of the current Administration's (re)emphasis of agriculture as an engine of growth. A key challenge, however, is to ensure or facilitate the orderly and balanced development of supply chains, for as with all chains, it's strength (or competitiveness) is invariably determined by its weakest link. The potential economic activities and avenues for value adding along the entire agri-food supply chain, from 'seed to shelf' are depicted in Figure 1.

4. RISE OF SUPERMARKETS WITH A MALAYSIAN FLAVOUR

Historical Development:[6]

In a spatial perspective, Reardon and Timmer (2005) contend that there are three discernable 'waves' in the rise of supermarkets in Asia. The *First Wave* covered China (Taipei), Korea and Hong Kong followed by Thailand, Malaysia and the Philippines, with inflection or take-off points in the the early to mid 1990s. Their average share of supermarkets in national food retail currently accounts for 50-60%. To cast this spectacular growth in proper perspective, this group took one to one and a half decades to achieve the same rate of supermarket development witnessed in US and Europe in five decades. The *Second Wave* is typified by Indonesia where food retail share went from 5-10% in 1990s to 30% by the early 2000s. The *Third Wave* included Vietnam, China and India where supermarkets took off in the late 1990s or early 2000s and reached 10-20% of national food retail by 2004.

At this stage, a closer look at Malaysia would prove instructive. Supermarkets began in early 1990s with an inflection point in the mid 1990s, and by 2000, its share in national food retail (excluding wet markets, morning markets, night markets, and other non permanent retail facilities) rose meteorically to 40.2%, and then to 50.1% in 2002.(See Table 5).

In terms of food retailers sales by outlet types, supermarkets accounted for RM6.432 billion (33.7%) in 2003, while hypermarkets accounted for RM5.589 billion (29.3%). They are forecast to increase to RM8.57 billion (35.1%) and RM8.3 billion (34.0%) in 2008 See Table 6).

A flavour of the supermarket scenario is provided in Table 7 which presents the ranking of the major supermarket chains together with their retail format, ownership, number of stores, and net sales in 2004. The dominance of MNCs and regional supermarket chains is more than obvious.

[6] This section draws heavily from and builds upon Shamsudin and Selamat (2005), Arshad and Shamsudin (2006) and Wong (2006). It should be noted that while in Malaysia supermarkets are defined as self-service distribution stores with sales floor area of 2,000 m sq to less than 4,500 m sq retailing a wide variety of mainly consumer goods, comprising a mix of food and non-food products and hypermarkets refer to those with sales floor area of 5,000 m sq or more, we use the term supermarkets to refer to both unless specifically mentioned.

All these developments, of course, beg the question: what contributed to this rapid rise of supermarkets in Malaysia? The contributory factors include:

- Increasing Demand for supermarket services due to:
    - Urbanisation – There was an increase of 3.13 million people in urban areas in Malaysia between 1991 and 2000. This was accompanied by an increasing entry of women into the work force, especially in urban areas, fuelling demand for convenience shopping as well as easy-to-cook and ready-to-eat food
    - Rapid income growth coupled with increased ownership of refrigerators (nearly 90% of Malaysian households have refrigerators and some 15-20% having microwave ovens – Shamsudin and Selamat, 2005) as well as access to cars and public transport.
    - Relatedly, some even suggest that 'Today, going shopping is a way of life' as 'going to a shopping center/mall is the most affordable family and friends outing'. This is not surprising, since, given our tropical climate with average daytime temperature of 30 degrees Celsius and 80% Relative Humidity, the free climate controlled environment in shopping centers/malls/supermarkets[7] has its inherent appeal.
    - A relatively young (average age of Malaysian population is 25.8 years with a life expectancy of over 70 years) and increasingly affluent, more educated and traveled urban population, consumers are increasingly discerning and willing to pay for traceability, food safety and branding and a wider array of agri-food (including exotic and off-season ones) under one roof.
- Policy changes – especially the liberalization of FDI in retail business. In fact, Reardon and Timmer (2005) argue that FDI liberalization had as much impact, if not more, on food systems in Asia as trade liberalization.
- Increasing Supply of supermarket services: The inflection points of the three waves invariably coincided with FDI liberalization as alluded to above. These waves of FDI from Europe and US in Asia were largely 'pushed' by saturated markets back home and 'pulled' by growing markets and margins in Asia.
- Reinforcing the above factors are the new retail management practices, logistics and distribution systems, and advances in technology, particularly ICT which allows for seamless and almost real time sharing of information and tracking along the supply chain.

Expansion Paths of Supermarkets

At the regional level, there appears to have been a 'domino effect', with supermarkets expanding first and fastest in the richest and more developed countries (Taiwan, Korea, and Hong Kong). This involved both home grown as well as US (notably Wal-Mart) and European (notably Ahold, Tesco, Carrefour, Metro, Big C and Auchan) chains. Some home grown entities have developed into regional chains. For example, we witness Hong Kong, Taiwan, Japan and Korea chains spreading to China; Hong Kong and Japan chains spreading to Malaysia and Indonesia; and even Vietnamese chains spreading to Cambodia more recently.

At the national level, we witness the spread of supermarkets from large cities, then to intermediate and smaller cities.and subsequently to towns. Teo (undated) points out that there is at least one shopping center/mall in every small town of 100.000 people. At individual

[7] Unlike North America or Europe, supermarkets in Malaysia are not stand alone but are mainly anchors/majors in shopping complexes

city level, we witness the spread from rich neighbourhoods to middle class and then to poor neighbourhoods. At the same time, there is a discernable shift from processed and bulk staples to fresh or more perishable food, especially fresh fruits, vegetables, meat and fish.

There also appears to have been a rolling consolidation phase involving mergers and acquisitions, with global chains acquiring regional and national chains; regional chains acquiring national and localized chains; and national chains acquiring local supermarkets. In a related development, we observe various means being employed to check the unbridled growth of 'foreign' supermarket chains. In this respect, we recall the merger of Lianhua and Hua Lian, the two largest national chains in China, ostensibly as a rear-guard action to counter the relentless expansion and dominance of MNCs and foreign supermarket chains Similarly, it would be interesting to understand the reasons for and impact of the disposal of Carrefour and Wal-Mart chains in Korea to existing Korean chains.

5. THE CASES OF SWEET-CORN AND HIGH VALUE VEGETABLES

Sweet-Corn

A generalized sweet-corn supply chain is given in Figure 2, indicating the economic activities that can potentially be undertaken and the possible value adding activities. Interestingly, there are more than 100 end-use products in the market. As a recent entrant into the regional and international market, there has been some noteworthy developments. Over the last couple of years Nelson's, a Malaysian company, has introduced full kernel 'corn in a cup' to Malaysia, Middle East and further afield. They now operate a franchise system selling corn-in-a-cup, throughout Malaysia, the Middle East and other countries in the region. They source their sweet-corn through their own set of contract growers, in Peninsular as well as East Malaysia.

Daily Fresh, another Malaysian brand built on the corn-in-a-cup concept to include other innovative products like sweet-corn ice gelati, smoothie and exotic flavoured corn-in-a-cup and has a distribution network locally as well as the middle east. They are also operating in petrol stations shops and convenience stores. They also sell frozen full kernels. The firm also utilizes a system of contract farmers and dedicated wholesalers.

Thirdly, there is a local company selling branded, Marine Gold fresh sweet-corn cobs, which comes in cling-wrapped packs of two and five cobs and is sold by supermarket chains in Malaysia and Singapore. They also source their sweet corn via a system of strategic suppliers and contract farmers.

In addition, there is an on-going initiative by a Malaysian Government Linked Company (GLC) to move upstream into the local production of hybrid sweet-corn seeds so as to develop a complete 'seed to shelf' supply chain, inclusive of canning and processing factory, branding and exports to overseas market, as well as serving as a regional supplier to an international supermarket chain.

High Value Vegetables
Among the emerging players is Monoluxury Sdn Bhd which operates a hydroponics farm in Genting highlands and market its products under its own 'Genting Gardens' brand as well as 'First Choice', a house brand of the Cold Storage supermarket chain. They produce and market a whole range of temperate vegetables, especially lettuces and herbs as well as value-added salad packs through Malaysian and Singapore supermarkets. They also supply institutional buyers like hotels and up-market restaurants.

Sime Aerogreen Technologies Sdn Bhd, a subsidiary of Sime Darby, also grows temperate and sub-tropical high value vegetables, but near Seremban, in the lowlands, using aeroponics technology. Here, plants are grown in air and watered intermittently with chilled nutrient solution via nozzles in a closed system. Products are processed and value added in-house and sent to a various supermarket chains in Malaysia, and sold under the 'Sime-Fresh' brand. They also produce specialty and exotic products like habenaro (very hot) chillies for restaurants, and are working on a lettuce-based drink – Lettucino.

Grace Cup Sdn Bhd operates out of Cameron Highlands and uses compost farming and involves some contract farmers to produce Momotaro and cherry tomatoes, brinjals, cucumbers and lettuces on 'OEM' basis for Hong Kong and Japan companies. They are also marketed under their own 'Grace Cup' brand in Malaysia and Singapore.

The above examples are not exhaustive, but merely provide a flavour of recent developments, emerging trends and possibilities in some 'new areas of growth'. In these cases, supply chains are increasingly better managed, leveraged and orchestrated to exploit the opportunities provided by the rise of supermarkets while optimizing their inherent strengths and ability to seek out and link to new networks.

6. MOVING FORWARD

Governments and development practitioners are beginning to recognise the importance and relevance of agriculture as well as the changes in agri-food distributive trade/retailing highlighted above. Besides the opportunities to leverage on Malaysia's relative strengths and endowments (including increasingly strong network of supply chains, their interconnectivity, and our halal platform), the importance of supply chains and the need to address implications for small farmers and other small-scale stakeholders in the agri-food Supply Chain is underscored. The inherent challenge is how to balance the interests of the key players along the supply chain with that of the consumers and the nation, while gearing up for globalisation and addressing internal structural and institutional weaknesses.

It has been generally noted [e.g. Readon and Timmer (2005) and Chen et al (2005)] that with the rise of supermarkets, the procurement system invariably exerts more demanding requirements of processors and farmers, implying the need for increased investments and changes in practices. Empirical evidence seem to suggest that chains tend to select medium/large processors and wholesale firms wherever possible. Consequently, these changes would invariably pose threats and opportunities, leading to potential winners and losers.

Therefore, Governments would have to formulate policies, strategies and programmes that would enable farmers to meet investment requirements of new market channels as well as

develop appropriate and adequate human resources to develop and manage agri-food supply chains. This would include the development of the wholesale sector and stronger retail alternatives so as to minimize the marginalisation of small farmers and other stakeholders. The challenge is more focused/holistic government intervention to facilitate development and management of selected supply chains and international networks, on the one hand, and more coordinated policy oriented empirical studies on the other.

At the operational level, more concerted efforts should be made to encourage the evolving local agri-food supply chains to connect with global trading networks, including serving as regional suppliers for MNCs supermarket chains. In this regard, Malaysian can and should play the 'halal' card.

7. CONCLUSION

It is clear from the above that there are well founded reasons for Malaysia's (re)emphasis on agriculture. The medium-term course charted in the 9MP holds great promise. Within this development, there is also a continuing interplay between agri-food supply chain management (SCM) and the rise of supermarkets. Whether countries benefit or lose from these developments depends on the net benefits to consumers and producers arising from better prices, time costs, and food safety as well as access to markets, employment generated, skills and wage effects in the whole agri-food supply chain. Hence, it is critical to understand the dynamics of the interplay of key factors and to take a holistic perspective. Consequently, closer monitoring, more empirical study, and more rigorous policy analysis is vital.

Rather than being forced out altogether, stakeholders may find farming and related agribusiness or economic activities along the agri-food supply chain more profitable and sustainable than ever. A key challenge is to minimise their marginalisation and help them get plugged into and become players in supply chains and international trading networks. Another is to mount focused empirical studies to guide policy so that the inherent benefits from the inexorable rise of supermarkets can be harnessed in a balanced manner.

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Table 1a: VALUE ADDED OF AGRICULTURE AND AGRO-BASED INDUSTRY, 2000-2010

Commodity	*RM Million (in 1987 prices)*			*% of Total*			*Average Annual Growth Rate (%)*		
							8MP		*9MP Target*
	2000	*2005*	*2010*	*2000*	*2005*	*2010*	*Target*	*Achieved*	
Agriculture	**18,662**	**21,585**	**27,517**	**100.0**	**100.0**	**100.0**	**2.0**	**3.0**	**5.0**
Industrial Commodities	**11,033**	**13,278**	**15,521**	**59.1**	**60.6**	**56.4**	**0.7**	**3.8**	**3.2**
Oil Palm	5,860	7,915	10,068	31.4	36.7	36.6	3.4	6.2	4.9
Forestry and Logging	3,055	3,016	2,761	16.4	13.0	10.0	-5.6	-0.3	-1.7
Rubber	1,868	2,264	2,554	10.0	10.5	9.3	1.1	3.9	2.4
Cocoa	250	83	138	1.3	0.4	0.5	0.1	-19.8	10.8
Food Commodities	**7,629**	**8,308**	**11,996**	**40.9**	**39.4**	**43.6**	**4.0**	**1.7**	**7.6**
Fisheries	2,493	2,389	3,875	13.4	12.6	14.1	4.1	-0.9	10.2
Livestock	1,520	2,089	2,483	8.1	8.1	9.0	6.0	6.6	3.5
Padi	590	632	988	3.2	3.4	3.6	2.7	1.4	9.4
Other Agriculture[8]	3,026	3,198	4,650	16.2	15.2	16.9	3.2	1.1	7.8
Agro-Based Industry	**13,584**	**16,928**	**22,221**	**100.0**	**100.0**	**100.0**	**4.0**	**4.5**	**5.6**
Vegetable and Animal Oils & Fats	2,526	3,639	5,614	18.6	21.5	25.3	6.3	7.6	9.1
Other Food Processing, Beverages & Tobacco	4,010	4,790	6,333	29.5	28.3	28.5	2.0	3.6	5.7
Wood Products including Furniture	2,934	2,972	3,761	21.6	17.6	16.9	0.6	0.3	4.8
Paper & Paper Products, Printing & Publishing	2,293	2,640	3,275	16.9	15.6	14.7	3.4	2.9	4.4
Rubber Processing & Products	1,821	2,887	3,238	13.4	17.1	14.6	4.7	9.7	2.3
Total Agriculture and Agro-Based Industry	**32,246**	**38,513**	**49,738**				**2.7**	**3.6**	**5.2**
Gross Domestic Product at Purchaser's Prices	**210,558**	**262,029**	**351,297**					**4.5**	**6.0**

Source: Department of Statistics and Economic Planning Unit

Notes: [1] Includes coconut, vegetables, fruits, tobacco and pepper.

Table 1b: VALUE ADDED OF AGRICULTURE AND AGRO-BASED INDUSTRY, 1990-2010

Commodity	*RM Million (in 1987 prices)*				
	1990	*1995*	*2000*	*2005*	*2010*
Agriculture	**17,308**	**17,114**	**18,662**	**21,585**	**27,517**
	(16.33)	**(10.27)**	**(8.86)**	**(8.24)**	**(7.83)**
Industrial Commodities	**12,041**	**10,980**	**11,033**	**13,278**	**15,521**
Oil Palm	3,350	4,235	5,860	7,915	10,068
Forestry and Logging	5,194	4,139	3,055	3,016	2,761
Rubber	2,634	2,129	1,868	2,264	2,554
Cocoa	863	477	250	83	138
Food Commodities	**5,267**	**6,135**	**7,629**	**8,308**	**11,996**
Fisheries	1,534	1,964	2,493	2,389	3,875
Livestock	1,098	1,531	1,520	2,089	2,483
Other Agriculture[9]	2,635	2,640	3,616	3,830	5,638
Agro-Based Industry	**8,102**	**11,174**	**13,584**	**16,928**	**22,221**
	(7.64)	**(6.71)**	**(6.45)**	**(6.46)**	**(6.33)**
Vegetable and Animal Oils & Fats	1,036	1,203	2,526	3,639	5,614
Other Food Processing, Beverages & Tobacco	2,642	3,504	4,010	4,790	6,333
Wood Products including Furniture	1,776	3,030	2,934	2,972	3,761
Paper & Paper Products, Printing & Publishing	1,116	1,888	2,293	2,640	3,275
Rubber Processing & Products	1,532	1,549	1,821	2,887	3,238
Total Agriculture and Agro-Based Industry	**25,410**	**28,288**	**32,246**	**38,513**	**49,738**
	(23.97)	**(16.98)**	**(15.31)**	**(14.70)**	**(14.16)**
Gross Domestic Product at Purchaser's Prices	**105,977**	**166,625**	**210,558**	**262,029**	**351,297**

Source: Compiled from Department of Statistics, 2006 and Government of Malaysia, 2006

Notes: [1] Includes padi, coconut, vegetables, fruits, tobacco and pepper.
Figures within parenthesis refer to % contribution to GDP.

Table 2: AGRICULTURE AND AGRO-BASED MANUFACTURED EXPORT, 2000-2010

Commodity	*RM million*			*% of Total*			*Average Annual Growth Rate (%)*	
	2000	*2005*	*2010*	*2000*	*2005*	*2010*	*8MP Achieved*	*9MP Target*
Agriculture Exports	**22,892**	**37,421**	**54,992**	**48.1**	**50.0**	**47.5**	**10.3**	**8.0**
% to Total Exports	*6.1*	*7.0*	*6.8*					
Industrial Commodities	18,428	31,509	37,244	38.7	42.1	32.2	11.3	3.4
Palm Oil	9,948	19,036	26,735	20.9	25.4	23.1	13.9	7.0
Rubber	2,571	5,787	5,156	5.4	7.7	4.5	17.6	-2.3
Sawlogs	2,489	2,465	2,100	5.2	3.3	1.8	-0.2	-3.2
Sawntimber	3,020	4,051	2,995	6.3	5.4	2.6	6.0	-5.9
Cocoa	33	50	128	0.1	0.1	0.1	8.8	20.5
Pepper	367	120	130	0.8	0.2	0.1	-20.0	1.6
Food Commodities	4,464	5,913	17,748	9.4	7.9	15.3	5.8	24.6
Agro-Based Manufactured Exports	**24,686**	**37,442**	**60,660**	**51.9**	**50.0**	**52.5**	**8.7**	**10.0**
% to Total Exports	6.6	7.0	7.6					
Food	4,509	8,627	15,803	9.5	11.5	13.7	13.9	12.9
Beverages and Tobacco	1,207	1,755	2,446	2.5	2.3	2.1	7.8	6.9
Wood Product	6,801	9,665	13,909	14.3	12.9	12.0	7.3	7.6
Furniture and Parts	6,077	8,454	14,335	12.8	11.3	12.4	6.8	11.1
Paper and Paper Product	1,397	2,018	2,799	2.9	2.7	2.4	7.6	6.8
Rubber Product	4,695	6,923	11,368	9.9	9.3	9.8	8.1	10.4
Total Agriculture and Agro-Based Exports	**47,578**	**74,863**	**115,652**	**100.0**	**100.0**	**100.0**	**9.5**	**9.1**
% to Total Exports	*12.7*	*14.0*	*14.4*					
Total Exports	**373,270**	**533,790**	**803,163**				**7.4**	**8.5**

Source: Department of Statistics and Economic Planning Unit

Table 3: EMPLOYMENT AND VALUE ADDED PER WORKER IN AGRICULTURE AND AGRO-BASED INDUSTRY, 2000-2010

	RM million			*Average Annual Growth Rate (%)*		
				8MP		*9MP Target*
	2000	*2005*	*2010*	*Achieved*	*Target*	
Agriculture Employment						
Number ('000)	1,423.0	1,405.7	1,323.8	-1.4	-0.2	-1.2
% of Total Employment	*15.3*	*13.3*	*10.9*			
Value Added Per Worker (RM in 1987 prices)	13,115	15,752	21,299	4.5	3.7	6.2
Agro-Based Employment						
Number ('000)	844.0	981.9	1,110.2		3.1	2.5
% of Total Employment	*9.1*	*9.3*	*9.1*			
Value Added Per Worker (RM in 1987 prices)	16,107	17,002	19,688		1.1	3.0
Total Employment in Agriculture and Agro-Based Industry	**2,267.0**	**2,387.6**	**2,434.0**		**1.0**	**0.4**
% of Total Employment	*24.4*	*21.9*	*20.3*			

Source: Department of Statistics and Economic Planning Unit

Table 4: AGRICULTURE LAND USE, 2000-2010

Crop	*Hectares ('000)*			*Average Annual Growth Rate (%)*		
				8MP		*9MP Target*
	2000	*2005*	*2010*	*Target*	*Achieved*	
Oil Palm	3,377	4,049	4,555	3.2	3.7	2.4
Rubber	1,431	1,250	1,179	-2.7	-2.7	-1.2
Padi[10]	478	452	450	-0.5	-1.1	-0.1
Fruits	304	330	375	5.1	1.7	2.6
Coconut	159	180	180	-0.6	2.5	0.0
Cocoa	76	33	45	-2.4	-15.2	6.2
Vegetables	40	64	86	4.2	9.9	6.1
Tobacco	15	11	7	2.5	-6.0	-7.4
Pepper	13	13	14	2.1	0.0	0.6
Total [11]	**5,893**	**6,383**	**6,891**	**1.5**	**1.6**	**1.5**

Source: Ministry of Agriculture and Agro-Based Industry and Ministry of Plantation Industries and Commodities

Notes: [1] Based on padi parcel.
[2] Excludes areas for other crops like tea, coffee and herbs as well as aquaculture.

Table 7 : Major Retailers in Malaysia, 2004

No	Group Name	Ownership	Retail Formats	Store Names	Number of Stores	Net Sales (RM Million)	%	Sales per Store
1	Dairy Farm Giant Retail	Dairy Farm International Hong Kong	Hypermarkets (15), Supermarkets (46), Pharmacies (161)	Giant, Cold Storage, Guardian	222	2,458.6	30.2	11.1
2	Jaya Jusco	Jaya Jusco Stores Bhd, Aeon Group, Japan	Superstore Chain and Shopping Centre Operation	Jusco Selection	11	1,523.8	18.7	138.5
3	The Store Corporation	The Store Corp.	Department Stores cum Supermarkets (37), Hypermarkets (4)	The Store	38	1,162.8	14.3	30.6
4	Carrefour	Magnificent Diagraph, Carrefour, France	Hypermarket	Carrefour	8	999.4	12.3	124.9
5	Tesco	70:30 Joint Venture between Tesco, UK and Sime Darby Bhd Malaysia	Hypermarket	Tesco	6	573.8	7.0	95.6
6	Makro Cash & Carry Distribution	SHV, the Netherlands	Hypermarket	Aro, Q-Biz	8	775.2	9.5	96.9
7	Parkson Retail Group	Parkson Corporation, Retailing Arm of Lion Group, Malaysia Diversified	Department Stores (26), Hypermarkets (5)	Parkson, Xtra	31	414.2	5.1	13.4
8	Ngiu Kee Corporation	TKN Enterprise	Supermarket & Department Store	Pure Joy Laura, Sabrina, Mikoko	5	155.8	1.9	31.2
9	Ocean Capital	Ocean Capital Malaysia	Department Store, Supermarket	tm	17	79.8	1.0	4.7
Total					**346**	**8,143.4**	**100.0**	

* Source – http://www.pwc.com/gx/eng/about/ind/retail/growth/malaysia.pdf

NB : Other strong local supermarket groups include Bintang, Billion, EconSave and Mydin

Table 5 : Retail Sector Sales Share by Type of Business Entity, 2000 and 2002

Store Type	Sales (%)	
	2000	2002
Department stores, supermarkets and hypermarkets	20.0 (40.2) ***	28 (50.1)
Provision stores, grocery stores and alike	20.5 (41.2)	17 (30.4)
Convenience stores	9.3 (18.6)	11 (19.5)
Household, personal goods and other stores	50.2	44
Source : Ministry of Domestic Trade and Consumer Affairs		
* Exclude wet market, morning market, night market and other non-permanent retail facilities. They account for a large proportion of food sales. ** These establishment are not involved in the sale of food products. *** Figures in parentheses are normalized based on the first-three categories.		

Table 6 : Forecast Food Retailer Sales by Outlet Type, 2003 – 2008 (RM Million, constant 2003 prices)

No	Outlet Type	2003	2004	2005	2006	2007	2008
1	Supermarkets	6,432	6,900	7,365	7,700	8,100	8,570
2	Independent Grocery Stores	5,774	5,300	5,100	4,900	4,800	4,700
3	Hypermarkets	5,589	6,000	6,500	7,100	7,650	8,300
4	Convenience Stores	866	1,200	1,250	1,680	1,900	2,300
5	Food Specialists						
	- Bakers	223	225	232	245	265	280
	- Other Food Specialists	213	215	218	235	255	290
	Total	**19,097**	**19,840**	**20,665**	**21,860**	**22,970**	**24,440**
Source – Euromonitor							

Figure 1 : Agri-Food Supply Chain – From 'Seed to Shelf' : Potential Economic Activities

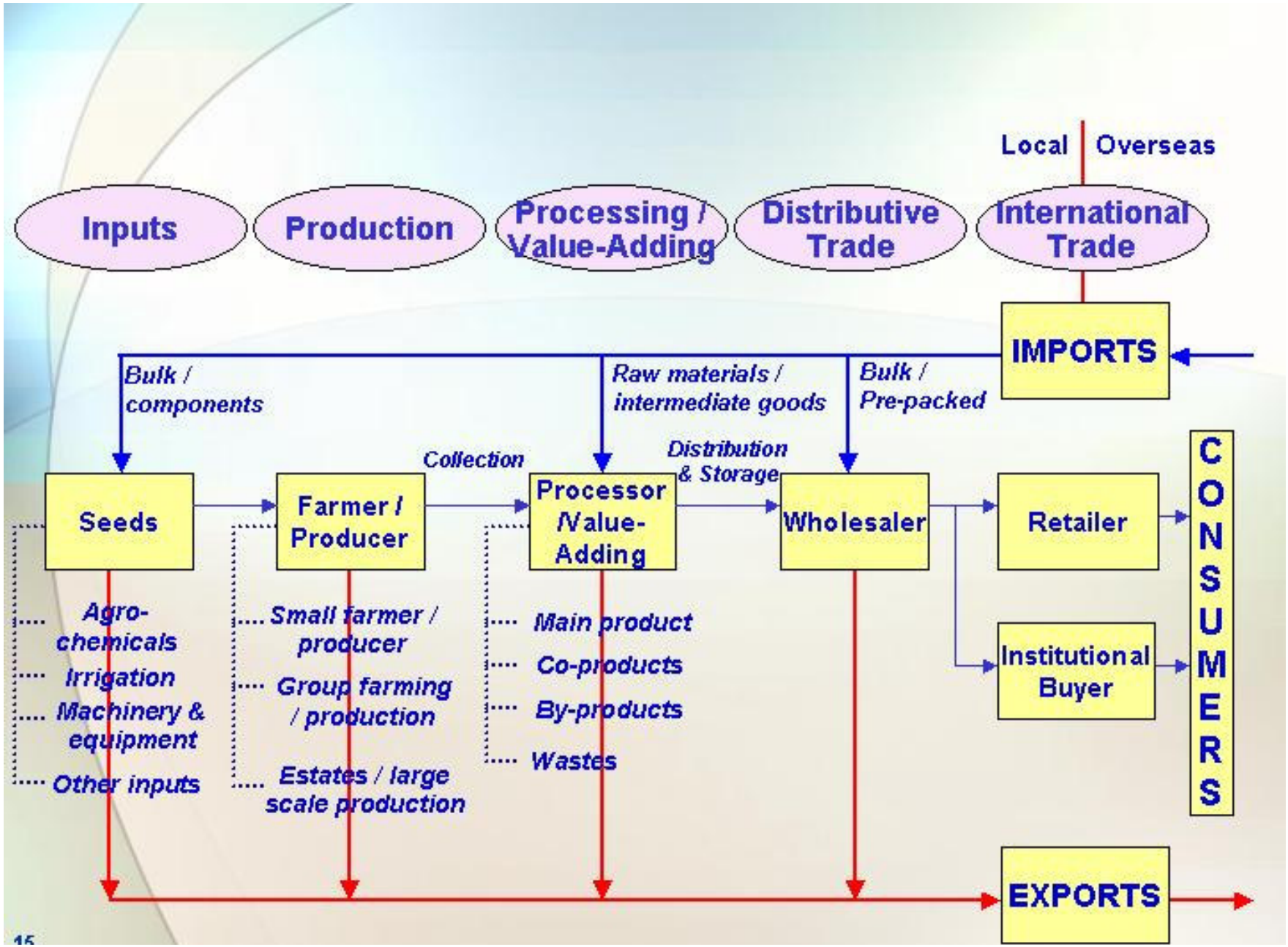

Figure 2 : Sweet Corn – Supply Chain