Globalization and Asian Agriculture: A Malaysian Perspective

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Abstract

This paper examines the major factors leading to the recent revival of interest in agriculture in many Asian countries, Malaysia included, after a lull of almost two decades. It underscores the increasing relevance and impact of the development and management of agri-food supply chains and international networks at the global, regional and Malaysian levels as well as the advancements and applications of agri-biotechnology. It also notes 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 rural areas.

It then examines two important emerging global trends, those of the inexorable rise of supermarkets and the frenzy over bio-fuels. Their likely interaction with agri-food supply chains and agri-biotechnology and the significant transformation that these developments are expected to bring to Asian agriculture sectors in general and Malaysian agriculture in particular is discussed.

In the wake of these developments, the paper emphasizes the pressing need to address the issue of how to balance the interests of the key players along the supply chain with that of national interest, and how to gear up for globalization while also strengthening internal structures and institutions. The challenge is to ensure the orderly and balanced development of supply chains. Specifically, governments need to launch focused and holistic interventions that would not only manage the supply chains and international networks, but also minimise the marginalization of small farmers and other stakeholders.

1. Introduction

In addressing globalization and agriculture transformation in Asia, it would be prudent to recall that development economists in general and agricultural economists in particular, have long focused on how agriculture can best contribute to overall economic growth and modernization. This focus has been premised on their in-grained believe that robust agricultural growth and productivity increases are crucial to sustained economic development; at least this was the case up to 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 one of "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 aggressive 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. First, I will explore why agriculture is firmly back on the policy agenda of Malaysia and other Asian countries. Second, I will point out that amongst the main factors leading to this revival of interest in agriculture is the increasing relevance and impact of agri-food Supply Chain Management (SCM) and the inexorable rise of supermarkets at the global, regional and Malaysia levels. These, coupled with the advances and applications of agri-biotechnology on the one hand, and that of ICT on the other, and their impending convergence (bio-informatics and beyond) as well as the recent frenzy related to bio-fuels are expected to lead to a "big bang" or a major structural shift or transformation. This all makes it a worthy and exciting area of study.

Events leading up to a "big bang" and their ramifications will prove to be a boon for those who have anticipated or are prepared for it, but be a bane to those along the entire agri-

food supply chain who are ill prepared. These are very strong and distinct trends that we ignore at our own peril.

Consequently, this paper presents some reflections from an economist's perspective gained from jottings, anecdotal evidence, secondary sources including personal communications with stakeholders over more than a decade of establishing and managing supply chains and international production and trading networks in Malaysia and the region. These I have coupled with a more recent fascination with the inexorable rise of supermarkets as well as the promises of agri-biotechnology and bio-fuels. Unfortunately, the exposition here is not sufficiently grounded empirically, nor is it yet the result of rigorous analytics. This paper is also motivated by the urge to share some of my thoughts, aspirations and concerns at this Forum.

The underlying theme of this paper is that it is imperative for policy makers, researchers, and stakeholders at all levels of the agri-food supply chain to understand, grasp, and appreciate the underlying rationale of this (re)emphasis on agriculture. It is also necessary to recognize the extent of the interplay of these trends and their implications to "get the balance right". It is crucial to get a proper balance between gearing up for globalization and putting ones own house in order; between the role of public and private sectors as well as balancing sectoral considerations and balancing the interests of the stake holders along the entire agri-food supply chain and that of the nation.

The rest of this paper is organized as follows. After this introduction, the next Section provides an overview of the role of agriculture, the reasons for this return of interest in agriculture and how it applies to Malaysia, A thumb-nail sketch of global and regional development is given as a backdrop. Section 3 examines the increasing relevance of agri-food Supply Chain Management and considers some of the promises of agri-biotechnology. Section 4 considers the rise of supermarkets in Asia and the recent frenzy over bio-fuels and considers some of their interplay and implications or impact on Asian agriculture. Section 5 considers the need for the Government, researchers, and stake-holders 'to get the balance right' in moving forward. The final Section presents conclusions.

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[1]. Part of the controversy stems from the structural transformation itself, which involves a multi-sectoral and general equilibrium process that is not easily understood when only viewed from within the agricultural sector.

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 labor 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 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 until recently, considered ideal for many of the world's poorest countries, especially in Africa. This was even urged as an efficient path to development[2]. These macro economists, convinced of the power of rapid economic growth to lift populations out of poverty, see resources devoted to slow-growing

[1] This section draws heavily from Timmer (2005).

[2] 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)

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 of neglect or disinterest by academics, researchers, donor communities and some developing countries, interest in agriculture is resurging. This is 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. *Agri-Biotechnology Revolution* – Agri-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 now new important opportunities for farmers to diversify into high-value crops with greater demand potential, and thus capture some of the added value being generated by supermarkets with increasingly sophisticated and stochastic supply chains and international networks. They also increasingly connect farmers and other stakeholders to changing consumer preferences and demands more directly. 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 to 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 rural areas.

Taken together, all the above are compelling both researchers and governments to relook at the role of agriculture in economic development, and to reassess and build on their relative strengths and endowments as well as to better understand and track the drivers.

Ninth Malaysia Plan (9MP) – 2006-2010

In many important ways, agriculture was accorded a very different treatment in the Ninth Malaysia Plan (9MP), starting with the revitalizing of the sector as one of the key aims of the Plan. The sector itself featured strongly in each of the five key thrusts of the National Mission. Following on from the restructuring and renaming of 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'*. For the first time it 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]

In reality Malaysia has tremendous inherent strengths in agriculture. Malaysia is particularly strong 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. Malaysia is also getting increasingly good at developing and managing the respective agri-food supply chains and international trading networks. In so doing, Malaysia has developed a comparative and competitive advantage in selected supply chain, leveraged on end-uses of these commodities. Such commodities and enterprises have been operating at their respective production and profit frontiers, especially with respect to oil palm, palm oil and rubber. This has not only allowed Malaysia to stay ahead of the curve but also has well positioned us to benefit from both the potential and the possibilities arising from the convergence of ICT, agri-biotechnology and nano-technology.

From another perspective, we can 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 be involved in the economic activities across 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.

Overview of Global and Regional Developments

Largely due to the stop-and-start nature of the progress of World Trade Organization (WTO) negotiations, especially the current Doha Round, and the rise of open regionalism and bilateral arrangements, regional free trade agreements (RFATs) and bilateral Trade Agreements (TAs) and Economic Partnership Agreements (EPAs) have proliferated over the last few years. These are often overlapping, as is apparent from Figure 1, giving rise to a 'spaghetti bowl' (or 'noodle bowl') effect (Urata 2004).

We are also witnessing the increasing interdependence in East Asia through trade and financial cooperation that has indeed heightened the need for greater regional cooperation and integration. This, no doubt, is also spurred by the impact and lessons learnt from the last regional financial crisis, coupled with the somewhat dubious value of Asia-Pacific Economic Cooperation (APEC) (Akhtar 2004).

At the ASEAN + 3 Summit in November 1999, there was a joint statement on East Asian cooperation covering trade, investment, technology transfer, e-commerce, agriculture, small- and medium-scale enterprises (SMEs), tourism, and the development of the Mekong River Basin. There has been an array of regional initiatives since then. For example, the recent Pan-Beibu Gulf Economic Cooperation ('One Axis, Two Wings') initiative encompassing the Nanning-Singapore Economic Corridor, Greater Mekong Sub-region, and Pan-Beibu Gulf Zone.

In relation to the East Asian regional cooperation, ASEAN is, in many important ways, the current 'hub', but this is largely by default. Many consider China as the key driver (given the hitherto unwillingness of Japan), because of its advantage of centralized decision-making, coupled by its declared 'peaceful development' or 'peaceful rising' strategy.

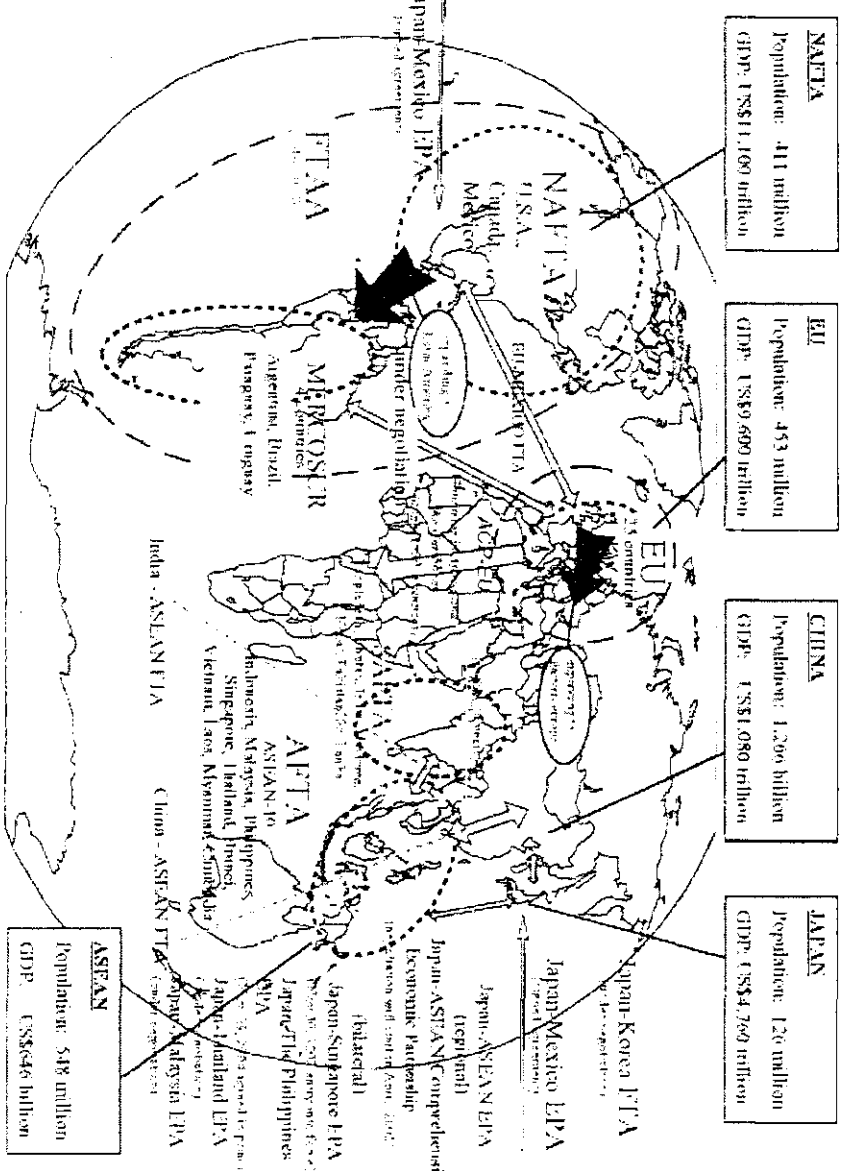


Figure 1 Main Regional Free Trade Agreement/Economic Partnership Agreement

Source: Urata (2005)

3. Increasing Relevance of Agri-Food Supply Chain Management & Promise of Agri-Biotechnology

Increasing Relevance of Agri-food Supply Chain Management

Supply Chain Management (SCM) has, in recent years, attracted the attention of a cross-section of academics, researchers and practitioners. It has spawned text books and even dedicated journals like *Supply Chain Management, an International Journal*. The development of the concept of the supply chain owes much to the emergence during the middle of the last century of systems theory and the associated notion of holism. It has been argued (in, for example Boulding 1956) that the behavior 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 revolves around the production, processing, moving, buying and selling of 'stuff' and that SCM is about the 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 an 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 revolutionized by recent advances in ICT.

Empirical evidence suggests that there can be amicable and sustainable sharing of margins along supply chains, including the transmission of prices back to the farmer producers. Consequently, an appealing strategy is to hook up (or integrate) small farmer 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 agri-biotechnology and its impending convergence with ICT, as well as innovations. Similarly, there will be exponential growth, if and when interconnectivity of supply chains is exploited, as is already happening with telephone companies 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 is 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 2a and 2b, 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, including consultancies, at all levels of the supply chain.

This underlying rationale, to my mind, forms the cornerstone of the current Malaysian Administration's (re)emphasis on agriculture as an engine of growth. A major challenge, however, is to ensure or facilitate the orderly and balanced development of supply chains, for as with all chains, its strength (or competitiveness) is invariably determined by its weakest link.

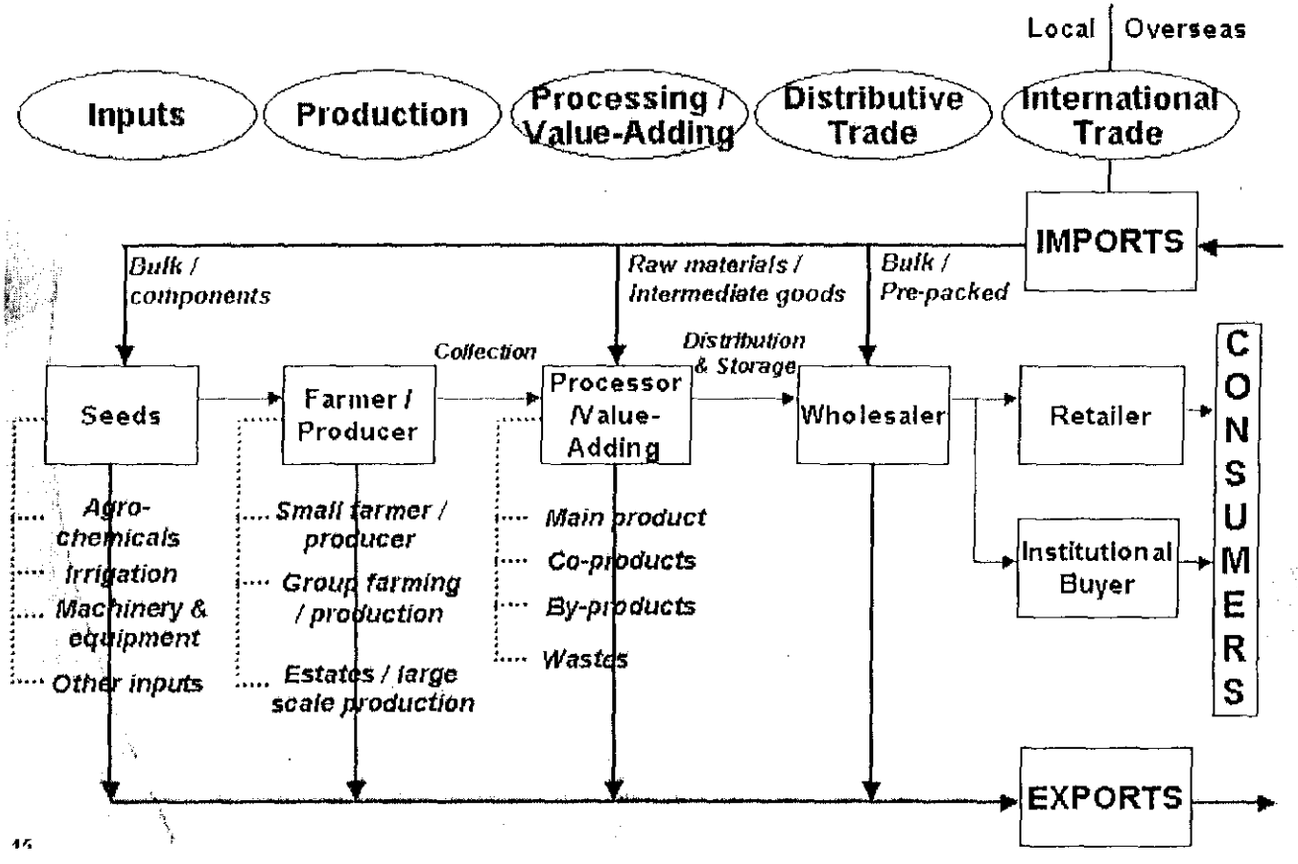


Figure 2. Agri-food Supply Chain-from "Seed to Shelf": Potential Economic Activities (Source: Wong (2007)

Promise of Agri-biotechnology

The advances made in agri-biotechnology are nothing short of staggering. There is much promise in the mapping of rice and other genomes and the spread of biotech crops. The 21st Century has been touted as the 'Biology Century' and agri-biotechnology is expected to lead to 'New Agriculture' where plants and animals are endowed with new value creation mechanisms. Consequently, we now have focused research and development in:

- Bio-Farming (biotech crops, bio-fertilizers, bio-pesticides);
- Bio-Pharming (bio-factories for insulin and vaccines);
- Bio-Fuels;
- Bio-Plastics; and
- Bio-Remediation.

Teng (2007) contends that the reported crop biotech to date is 'just the tip of the iceberg'. In the area of agronomic traits we note the progress in biotic stress (insect and disease resistance as well as weedicide tolerance; abiotic stress (drought, cold, heat and poor soils tolerance); desired or hedonic quality traits (taste, shelf-life, nutrients, seedless); novelty products (oils, nutraceuticals); and renewable resources (biomass conversing, bio-fuels or 'energy farming') [See Figure 3].

Consequently, there are high expectations that agri-biotechnology will contribute greatly to innovations, cost reductions, productivity increases, new processes and new products that will benefit mankind in general. However, as with all forms of technology in which they would tend to be embodied, these advances are likely to unequally benefit different stakeholders in the respective supply chains.

Figure 3. Crop biotech R & D to date – "Just the tip of the iceberg"

- Agronomic Traits
  - Biotic Stress
    - Insect Resistance
    - Disease Resistance Viral, Bacterial, Fungal, Nematode
    - Weed- herbicide tolerance
  - Abiotic Stress
    - Drought, Cold, Heat, Poor soils
  - Yield
    - Nitrogen Assimilation, Starch Biosynthesis, O2 Assimilation
- Quality Traits
  - Processing
  - Shelf-life
  - Reproduction: e.g seedlessness
  - Nutrients (Nutraceuticals)
    - Macro: Protein, Carbohydrates, Fats
    - Micro: vitamins, antioxydants, minerals, isoflavonoids, glucosinolates, phytoestrogens, lignins, condensed tannins
    - Anti-nutrients: Phytase, Allergen and Toxin reduction
  - Taste
  - Architecture
  - Fiber
  - Ornamentals: color, shelf-life, morphology, fragrance
- Novel Crop Products
  - Oils
  - Proteins: nutraceuticals, therapeutics, vaccines
  - Polymers
- Renewable resources: Biomass conversion, feedstocks, biofuels

Source: Teng (2007)

4. Rise of Supermarkets and the Frenzy Over Bio-fuels

Rise of Supermarkets

From a spatial perspective, Reardon and Timmer (2005) suggested that there were 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 early to mid 1990s. The average share of supermarkets in total national food retail currently accounts for 50–60 percent. To put this spectacular growth in a proper perspective, this group of countries took just one to one and a half decades to achieve the same rate of supermarket development witnessed in the US and Europe in five decades. The second wave was typified by Indonesia where the 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 total national food retail by 2004.

All these developments, of course, beg the question of what contributed to this rapid rise of supermarkets across Asia. The contributory factors include:

- Increasing demand for supermarket service because of: urbanization-which also saw a growing number of women entering the work force, thereby creating a bigger demand for convenience shopping as well as easy to cook and ready-to-eat food; reduction by supermarkets of the prices for processed food, often done in conjunction with large scale manufacturers; and rapid income growth, coupled with the increased ownership of refrigerators as well as access to cars and public transport.
- Policy changes-especially the liberalization of foreign direct investment (FDI) in retail businesses. To illustrate, this development occurred in China in 1992, Indonesia in 1998, and India in 2000, and coincides with the onset of the respective 'waves' referred to earlier. In fact, Reardon and Timmer (2005) argued that the liberalization of FDI had as much, if not more impact on food systems in Asia as did the liberalization of trade in goods.

- The increasing supply of supermarket services: the take-off or inflection points of the three waves invariably coincided with FDI liberalization as mentioned above. These waves 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 were new retail management practices, logistics and distribution systems, and advances in technology, particularly information and communication technology (ICT) which allowed for seamless and almost real-time sharing of information and tracking along supply chains.

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 chains from Hong Kong, Taiwan, Japan and Korea spreading to China; chains from Hong Kong and Japan spreading to Malaysia and Indonesia; and more recently even Vietnamese chains spreading to Cambodia.

At the national level, we have witnessed the spread of supermarkets from large cities, then to intermediate and smaller cities, and subsequently to towns. At the individual city level, we have witnessed the spread from rich neighborhoods to middle-class, and then to poor neighborhoods. At the same time, there has been 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 have observed 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.

Emerging Trends and Issues

In the midst of all these developments we note with some concern the following trends and issues:

- Supply chains and international trading networks are concurrently being developed by supermarket chains as well as strategic alliances between larger traditional growers, processors and traders (importer/exporter). There is a growing pool of anecdotal evidence that suggests that this vertical and horizontal integration is squeezing out smaller traditional players;
- Increasingly, the new export platforms developed by large supermarket chains, especially for pre-packed, ready for shelf agri-food provides a means of carving or hollowing out importing countries respective supply chains or economy (recall Figure 2);
- There is potentially an increasing rural/urban divide, as the beneficiaries of better and safer and cheaper agri-food in supermarkets are largely urban dwellers, while the potentially marginalized would tend to be mainly living in rural areas.

Be that as it may, all the trends noted above underscore the central tenet of Supply Chain Management that 'future competition would be between supply chains rather than between firms'.

Frenzy over Bio-fuels

In the wake of oil prices that have steadily risen since 2002 (exceeding US$75 per barrel in 2006) and escalating concerns over climate change, bio-fuels have emerged as an important alternative offering lower emissions and a higher degree of fuel security. Some commentators

have suggested that there are potential opportunities for rural and regional communities to benefit, as well as urban communities through improving air quality and hence improving health in cities. Consequently, we see bio-fuels being promoted as renewable green energy as well as energy farming, leveraging on methods and processes made available by advances in agri-biotechnology.

Ethanol production more than doubled from 17.6 billion liters in 2000 to 46.2 billion liters in 2005, but still merely accounted for less than two percent of global transportation fuel supplies. In 2005, biodiesel production reached 3.9 billion liters, less than ten percent of ethanol production.

Consequently, we have witnessed a frenzy of investments and a rush to plant crops in Asian countries to be processed into ethanol (notably China which has become the third largest producer, and Thailand and the Philippines) and biodiesel (especially in Malaysia and Indonesia). The availability of crops for biofuel production in selected countries is depicted in Table 1.

In many important ways, this frenzy has invariably been fueled by the conceptual benefits from the various levels of the economic and environmental value chain for bio-fuels, as illustrated in Figure 4. Hence, we note the spread of investors ranging from large scale producers integrating downstream on the one hand and the involvement of major oil companies on the other.

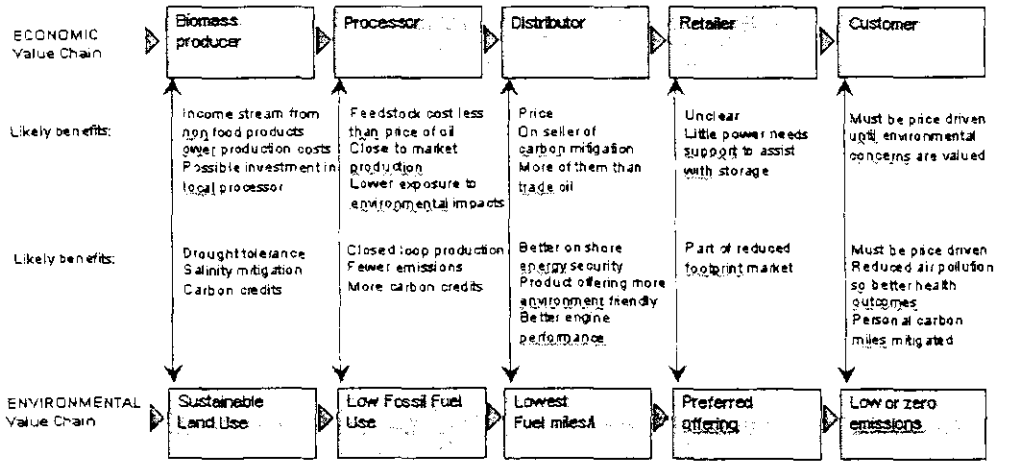
However, the escalating demand for the currently available alternative feedstock (which is hitherto used as food and animal feed) led to the doubling of US corn prices in 2006–7, accompanied by rising prices for beef, chicken, milk and eggs in the US as well as in China and most parts of Asia. Rape seed and palm also recorded unprecedented increases. Similarly, world sugar prices in 2006 were at a quarter century high. There is obviously a need to consider the ramifications of this frenzied move to capitalize on bio-fuels.

Table 1. Availability of Crops for Bio-fuel Production Based on Net Exports

Economy	Grain	Oilseeds	Vegetable Oil	Sugar	Cassava	Net exports of food and ag prods	Energy Consumption per capita 2003	Arable land per capita 2003	GDP per capita 2004
	Net exports (million tons)					Billion US	United State = 100		
Australia	19	1.3	-0.1	3.3	-	13.5	72	400	76
Canada	12.2	3.6	0.3	-1.2	-	4.2	105	240	79
China	2.5	-19.3	-5.5	-1.3	-10.6	-8	14	18	15
Indonesia	-7	-1.2	8.3	-1.2	0.2	2.9	10	17	9
Japan	-25.8	-7.5	-0.7	-1.5	-0.6	-35.7	52	5	74
Korea	-12.8	-1.7	-0.5	-1.3	-0.8	-7.9	55	5	52
Malaysia	-5.5	-1	11.6	-0.9	-0.5	4.5	30	12	26
Mexico	-12.9	-5.5	-0.7	-0.1	-	-3.6	20	40	25
Philippines	-3.9	-0.4	1	0.1	-0.2	-1	7	12	12
Thailand	8.1	-1.1	0.1	4.8	14.9	6.7	18	37	20
United States	78.7	28.8	-0.1	-1.4	-0.3	7.8	100	100	100
Vietnam	2.6	0.1	-	-	1.4	1	7	13	7
Brazil	-3.2	17.5	2.2	14.5	-0.1	18.1	14	55	21

Trade numbers are averages for 2002-04; a positive number = net exports; — = negligible, less than 50,000 tons
Source: Food and Agriculture Organization; World Bank, World Development Indicators, 2006.

Figure 4 : Potential benefits from economic and environmental value chains for biofuels



(Adapted from (from Single Vision (2007). Prospects for a viable grain based Australian Biofuels Industry – there is no single solution. Green Paper, February 2007. Single Vision, Grains Australia. Canberra.)

Emerging Trends and Issues

Therefore, in the midst of the euphoria accompanying this frenzy, we should note the following:

- the need to understand and rationalize the relationship between global, regional, and national objectives and local drivers;
- the importance of maintaining a balanced perspective between national Bio-fuels Policy with not only Agricultural Policy but also Climate Change and Energy Policies;
- the need to track and understand the impact of this frenzy on relative prices and their likely impact on all the players in the affected supply chains (direct and indirect); and
- the need to encourage the development of second and third generation bio-fuels or energy crops that can be grown on degraded land and not compete with other key agri-food crops, especially in cellulosic ethanol and bio-fuels from algae.

5. Moving Forward

Governments and development practitioners are beginning to recognize the importance and relevance of agriculture as well as the changes in agri-food distributive trade/retailing highlighted in the interplay of the various trends discussed above. Besides the opportunities to leverage on various Asian countries' relative strengths and endowments (including increasingly strong networks of supply chains and their interconnectivity), 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 main players along the supply chain with those of the consumers and the nation, while gearing up for globalization and addressing internal structural and institutional weaknesses.

It has been generally noted (in, for example, Readon and Timmer 2005 and Chen et al 2005) that with the rise of supermarkets, the procurement system invariably exerts more demanding requirements on processors and farmers, implying the need for increased

investments and changes in practices. Empirical evidence seems 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.

PECC (2006) also highlights the potential unequal distribution of benefits and costs along the supply chain of existing feedstock. Some have gone as far as calling it 'the great befoul fraud'.

Therefore, for 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, Governments would have to formulate suitable policies, strategies and programmes. These would include the development of the wholesale sector and stronger retail alternatives to minimize the marginalization 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.

6. Conclusion

It is clear from the above discussion that there are well founded reasons for Malaysia's and other Asian countries' (re)emphasis on agriculture. We also noted a continuing interplay between agri-food supply chain management (SCM), agri-biotechnology, bio-fuels and the rise of supermarkets. Whether countries benefit or lose from these developments and interplays depends on the net benefits to consumers and producers arising from better prices, time costs, and food safety as well as access to markets, and employment generation, skills and wage effects in the whole agri-food supply chain. Hence, it is critical to understand the