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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 then 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 agribiotechnology. 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 the rural areas.

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Globalisation and Asian Agriculture: A Malaysian Perspective¹

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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 then 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 the rural areas.

It then examines two key emerging global trends, that of the inexorable rise of supermarkets and the frenzy over biofuels, and 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.

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 the 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, the respective governments would need to launch focused and holistic interventions that would not only manage the supply chains and international networks, but also minimise the marginalisation of small farmers and other stakeholders.

INTRODUCTION

In addressing globalisation 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, 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

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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 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. Firstly, I elect to explore the reasons why agriculture is firmly back on the policy agenda of Malaysia and other Asian countries. Secondly, I note that amongst the major 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 advancements 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 on biofuels are expected to lead to a 'big bang' or major structural shift or transformation, thus 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.

Consequently, this paper presents some reflections from an 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 as well as the promises of agri-biotechnology and biofuels. 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 at this Forum.

The underlying theme of this paper is that it is imperative for policy makers, researchers, stakeholders at all 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 these trends and their implications so as to be able to 'get the balance right'. It is crucial to get a proper balance between gearing up for globalization and putting our own house in order, between the role of public and private sectors as well as balancing sectoral considerations and balancing the interests of the stakeholders along the entire agri-food supply chain and that of the nation.

This paper is organized such that 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, and a thumb-nail sketch of global and regional development in order to act 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 biofuels 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, 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 topic³. 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 viewed 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 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 development⁴. These macro economists, convinced of the power of rapid economic growth to lift populations out of poverty, see resources devoted

³ This section draws heavily from Timmer (2005).

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)

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 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 revolutionized 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

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.

Ninth Malaysia Plan (9MP) – 2006-2010

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’*. 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 retrospect, 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 and palm oil as well as rubber. This has not only allowed Malaysia to stay ahead of the curve but also best positioned us to benefit from the potential and possibilities arising from the convergence of ICT, agri-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.

Overview of Global and Regional Developments

Largely due to the stop-and-start nature of WTO progress, especially during the current Doha Round, and the rise of open regionalism and bilateral arrangements, Regional FTAs 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 the 'spaghetti bowl' (or 'noodle bowl') effect (Urata 2004).

We also witness the increasing interdependence in East Asia through trade and financial cooperation which has 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 the 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), owing to its advantage of centralized decision-making, coupled by its declared 'peaceful development' or 'peaceful rising' strategy.

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 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 argued (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

revolves 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 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 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 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 key 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.

Promise of Agri-biotechnology

The advances in agri-biotechnology is nothing short of staggering and promises much with 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 mechanism. Consequently, we now have focused research and development in:

- Bio-Farming (biotech crops, bio-fertilisers, bio-pesticides);
- Bio-Pharming (bio-factories for insulin and vaccines);
- BioFuels;
- BioPlastics; and
- BioRemediation.

Teng (2007) contends that the reported crop biotech R&D 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, biofuels or 'energy farming') [See Figure 3].

Consequently, there is great 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, to the extent that as in all forms of technology they would tend to be embodied, they are likely to benefit different stakeholders in the respective supply chains unequally.

4. RISE OF SUPERMARKETS & FRENZY OVER BIOFUELS

Rise of Supermarkets:

In 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. 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.

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

- Increasing demand for supermarket services due to:
 - o 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;
 - o The reduction of the prices of processed food, by supermarkets, often together with large scale manufacturers; and
 - o 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 business. 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 liberalization of trade in goods.
- 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 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 information and communication technology (ICT) which allowed 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. At the individual city level, we witness the spread from rich neighborhoods to middle-class, and then to poor neighborhoods. 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.

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 being concurrently 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 suggest 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); and
- Potentially an increasing rural-urban divide, as the beneficiaries of better/safer and cheaper agri-food in supermarkets are largely urban while the potentially marginalized would tend to be mainly rural.

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

Frenzy over Biofuels

In the wake of rising oil prices since 2002 (exceeding USD75 per barrel in 2006) and escalating concern over climate change, biofuels has emerged as a key alternative with lower emissions and a higher degree of fuel security. Some quarters 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 biofuels 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, which merely accounted for less than 2% of global transportation petrol supply. In 2005, biodiesel production reached 3.9 billion liters or less than 10% of ethanol production.

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

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

Now, the escalating demand for the currently available alternative feedstock (which is hitherto used as food and animal feed) has led to the doubling of US corn prices in 2006-7 accompanied by rising prices of beef, chicken, milk and eggs in the US as well as 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 ramification and implication of all this.

Emerging Trends and Issues:

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

- There is a 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 Biofuels Policy with not only Agricultural Policy but also Climate Change Policy and Energy Policy;
- The need to track and understand the impact of this frenzy on relative prices and their likely impact and implications on all the players in the affected supply chains (direct and indirect); and
- The need to encourage the development of second and third generation biofuels or energy crops that can be grown on degraded land and not compete with other key agri-food crops, especially in cellulosic ethanol and biofuels from algae.

5. 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 arising from the interplay of the various trends highlighted above. Besides the opportunities to leverage on the various Asian countries' relative strengths and endowments (including increasingly strong network 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 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 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 like Engdahl (2007) have gone as far as calling it 'the great biofuel fraud'.

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.

7. CONCLUSION

It is clear from the above that there are well founded reasons for Malaysia's and other Asian countries' (re)emphasis on agriculture. We also note a continuing interplay between agri-food supply chain management (SCM), agri-biotechnology, biofuels and the rise of supermarkets. Whether countries benefit or lose from these developments and interplay 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 are required.

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 and frenzy over biofuels can be harnessed in a balanced manner.

REFERENCES:

- Abd Rahman, A. 1992. Agricultural Development in Malaysia: Retrospect and Prospects. *Journal of Economic Cooperation Among Islamic Countries*, 13:3-4: pp 51-86.
- Akhtar, S. 2004. Economic Integration in East Asia: Trends, Challenges and Opportunities. Paper presented at the Symposium on *The Challenges and Opportunities of Economic Integration in East Asia*, held 27 October 2004 at the Royal Society, London.
- Chen, K., A.W. Shepherd, and C. da Silva. 2005. Changes in Food Retailing in Asia. *FAO Agricultural Management, Marketing and Finance Occasional Paper No. 8*, Rome.
- Gardner, B.L. 2002. *American Agriculture in the Twentieth Century: How it Flourished and What it Cost*. Harvard University Press, Cambridge, MA.
- Government of Malaysia. 2006. *Ninth Malaysia Plan*. Percetakan Nasional Malaysia Berhad, March 2006
- Harron, M., Shamsuddin, M.N. and Abd Latif, I. 2001. Challenges for Agribusiness: A Case for Malaysia. Paper presented at International Symposium in Agribusiness Management towards Strengthening Agricultural Development and Trade, Chaingmai University, Thailand
- Johnson, D.G. 1997. Agriculture and the Wealth of Nations (Ely Lecture). *American Economic Review*, Vol. 87, no.2, pp. 1-12
- Johnston, B.F. and J.W. Mellor. 1961. The Role of Agriculture in Economic Development. *American Economic Review*, Vol. 51, no.4. pp. 566-93
- Morhead, A. 2005. Africa's Engine of Growth. 1st May article in New Agriculturalists On-line (Reporting Agriculture for the 21st Century)
- Mosher, A.T. 1966. *Getting Agriculture Moving: Essentials for Development and Modernization*. New York: Praeger.
- New, S.J. 1997. The Scope of Supply Chain Management Research. *Supply Chain Management: An International Journal*. Volume 2 Issue 1. pp 15-22
- Pacific Economic Cooperation Council (PECC). 2006. *Pacific Food System Outlook 2006-2007: The Future Role of Biofuels*. PECC
- Pingali, P. 2006. Agricultural Growth and Economic Development: A View through the Globalisation Lens. Presidential Address to the 26th International Conference of Agricultural Economists, Gold Coast, Australia, 12-18th August 2006.
- Reardon, T. and P. Timmer. 2005. 'he Supermarket Revolution with Asian Characteristics,. Paper presented at SEARCA International Conference *Agricultural and Rural*

development in Asia: Ideas, Paradigms, and Policies Three Decades After. 10-11 Nov, 2005, Makati City, Philippines.

Schultz, T.W. 1978. *Distortions of Agricultural Incentives*. Bloomington: Indiana University Press.

Siamwalla, A. 1996. Thai Agriculture: From Engine of Growth to Sunset Status. *TDR/Quarterly Review*, 11:4 pp3-10

Teng, P.S. 2007. Development of Malaysia's Biotechnology Sector. Paper presented at the ISEAS Conference on *The Malaysian Economy: Development and Challenges*. January 2007, Singapore.

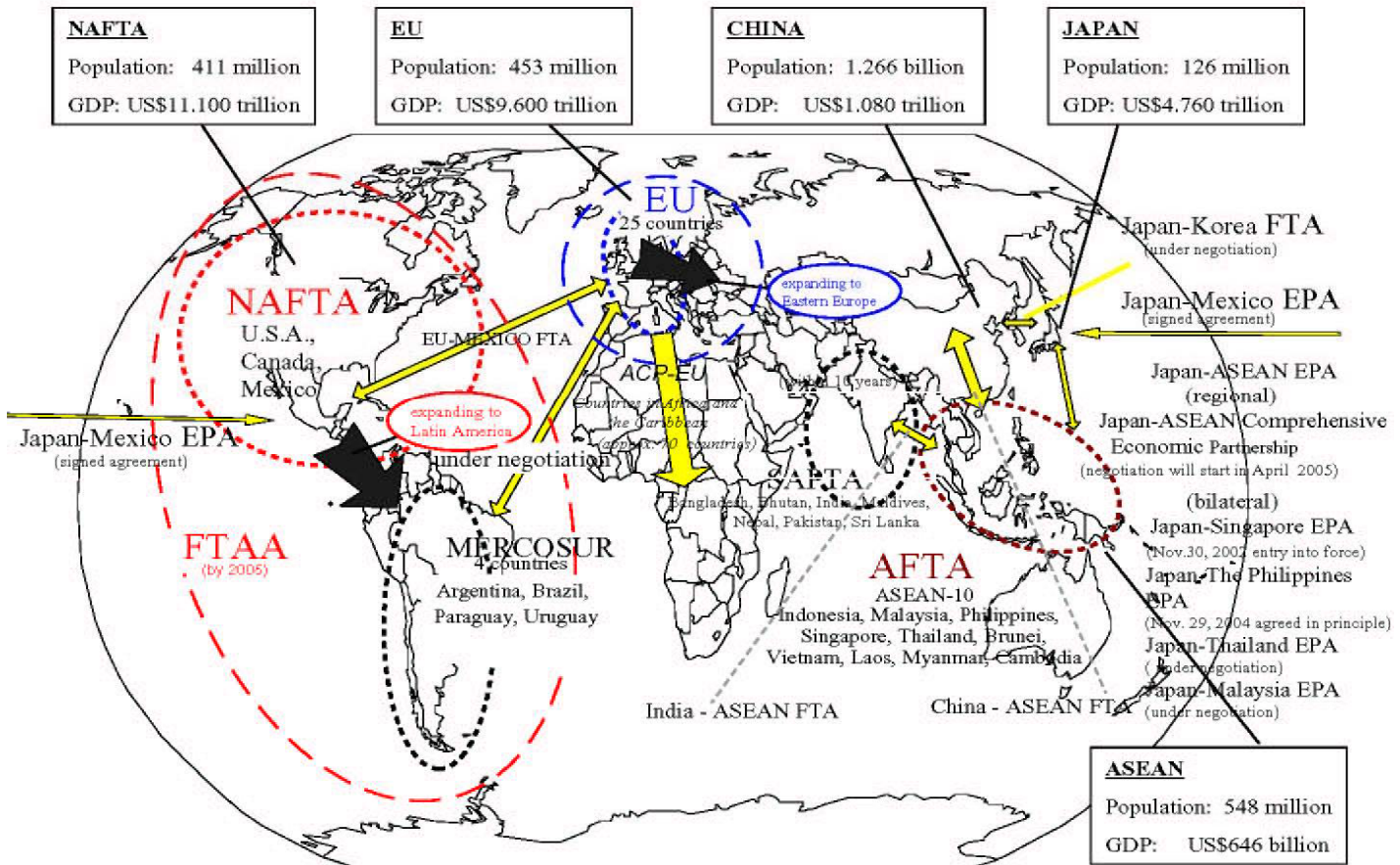
Timmer, C.P. 2005. Agriculture and Pro-poor Growth: An Asian Perspective. Center for Global Development, Working Paper No.63, July, 2005

Wong, L. C. Y. 2006. Implications of Regional and Global Developments on Agriculture and Its Competitiveness in CLMV: Increasing Importance of Supply Chains and International Trading Networks. Paper presented at SEARCA Policy Round Table on *Shoring and Sharing Capabilities to Improve Agriculture and its Competitiveness in Transition Southeast Asia*, Siem Reap, Cambodia, 24-25 April, 2006

Wong, L. C. Y. 2007. Development of Malaysia's Agricultural Sector: Agriculture as an Engine of Growth?. Paper presented at the ISEAS Conference on *Malaysian economy: Development and Challenges*. January 2007, Singapore.

Urata, S. 2005. Proliferation of FTAs in East Asia. Waseda University and REITI (Mimeographed).

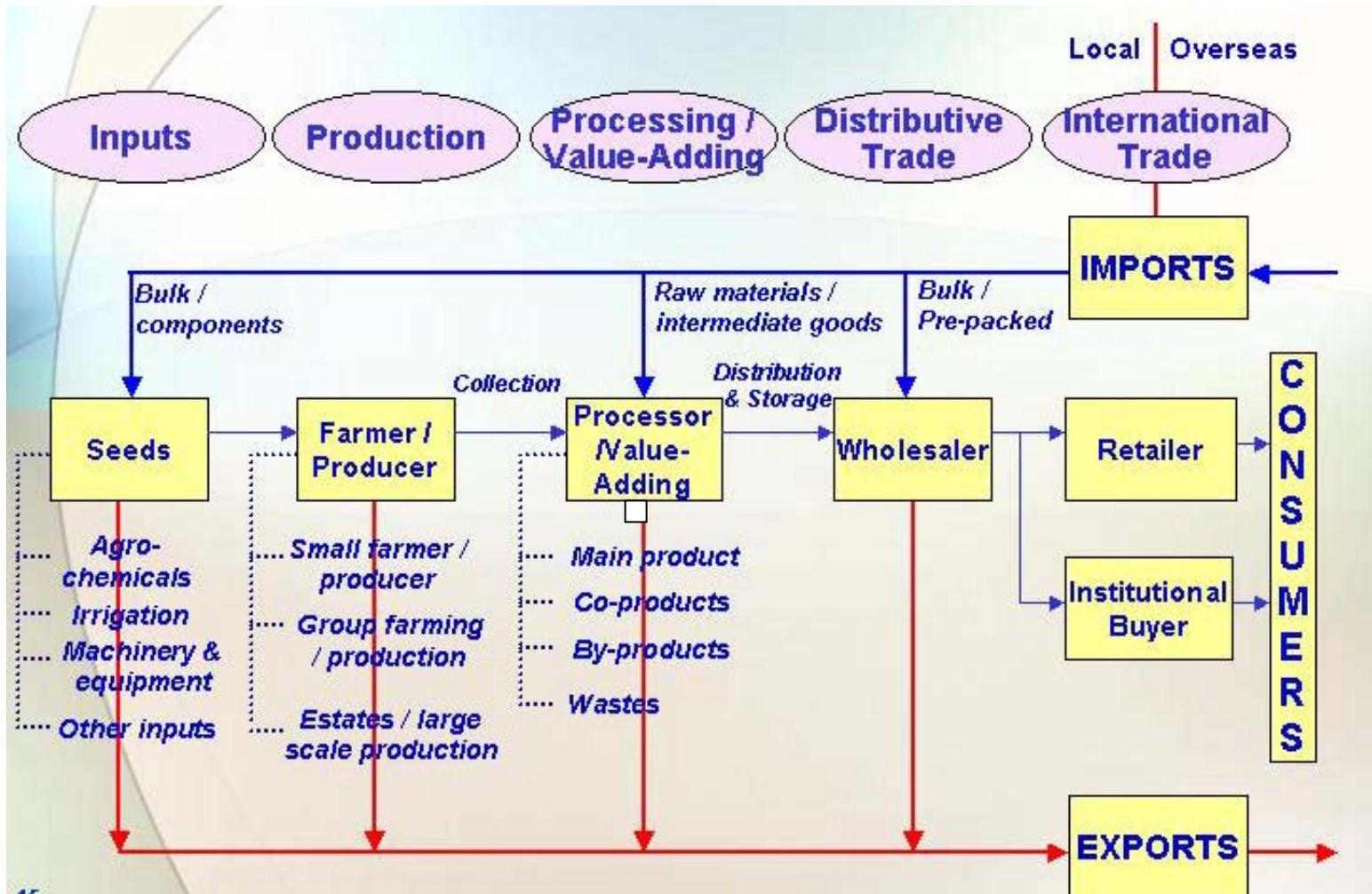
Main Regional FTAs/EPAs



Source: Urata (2005)

Figure 1. Main Regional Free Trade Agreements/Economic Partnership Agreements

**Figure 2 : Agri-Food Supply Chain – From ‘Seed to Shelf’ :
Potential Economic Activities**



Source: Wong (2007)

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, antioxidants, minerals, isoflavonoids, glucosinolates, phytoestrogens, lignins, condensed tannins
- Anti-nutrients: Phytase, Allergen and Toxin reduction

🌱 Taste

🌱 Architecture

🌱 Fiber

🌱 Ornaments: color, shelf-life, morphology, fragrance

🌾 Novel Crop Products

🌱 Oils

🌱 Proteins: nutraceuticals, therapeutics, vaccines

🌱 Polymers

🌾 Renewable resources: Biomass conversion, feedstocks, biofuels

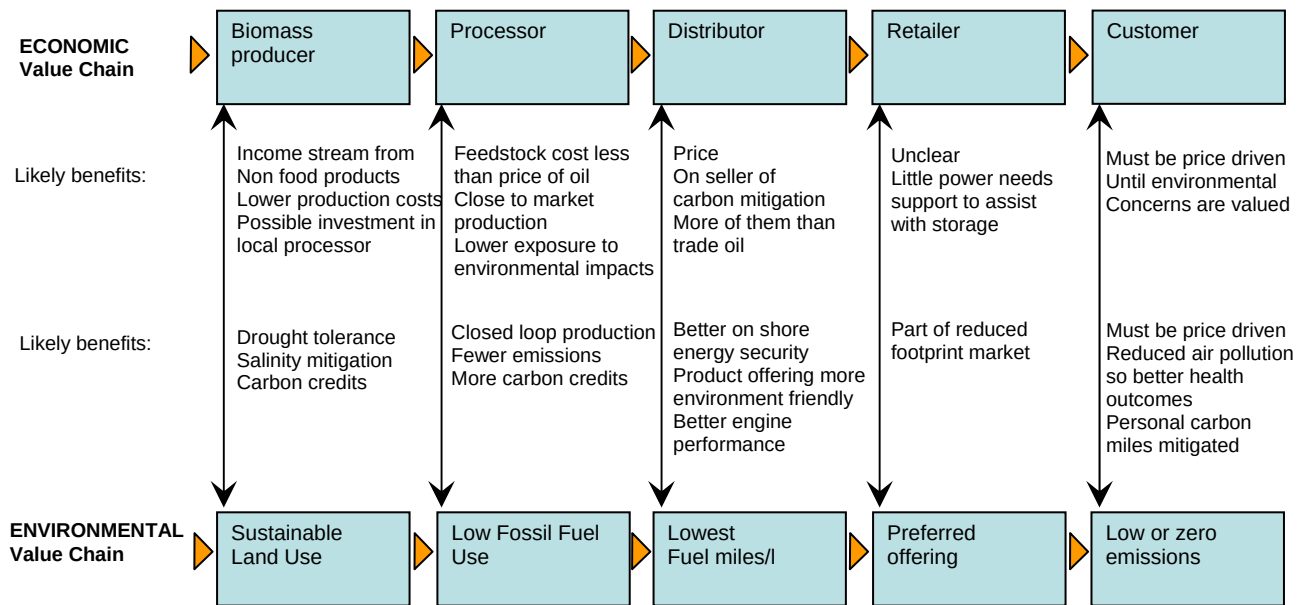
Source: Teng (2007)

Table 1 : Availability of Crops for Biofuel 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	19.0	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	-8.0	14	18	15
Indonesia	-7.0	-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	-1.0	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	0.1	-0.2	-1.0	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	1.0	7	13	7
Brazil	-3.20	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.)