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**From the Megalopolis-Centered System to the Rural-Urban
Balanced System for the Sustainability of Developing Economies***

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Abstract

Current surge of globalization on developing economies has been associated with growing concentration of economic activities in megalopolis side by side with rapid expansion in industrial production. The result has been formidable urban congestion/pollution and serious rural-urban income disparity endangering the sustainability of developing economies.. However, such an outcome is not an inevitable consequence of globalization characterized by freer movements of goods and services across national borders. The experiences of industrialization in Meiji Japan (1868-1912) and in Taiwan, China, after the Second World War suggest the possibility to achieve rural-urban balanced growth under globalization. A condition for this possibility to realize is the development of a domestic trade network appropriately linking rural producers with international markets. This paper aims to illustrate the nature of the trade network needed to support agricultural and industrial production in the hinterlands of developing economies in response to rising global demands and, then, discuss ways and means to develop it, especially with its relationship with the clean development mechanism of the Kyoto Protocol that aimed to combat against global warming through international cooperation.

* This paper draws heavily on Hayami (2000; 2004) and Hayami and Godo(2005, ch.9).

1. Introduction.

Economic growth under the current wave of globalization has been characterized, among others, by a strong bent toward urbanization. The concentration of economic activities in the urban sector is even stronger in developing than in developed economies. Typically it takes the form of what may be called “megapolis-centered system”. In this system economic, political and cultural activities and resources are disproportionately concentrated in primate cities and their surroundings that constitute megapolis. Such a megapolis complex, typically one in one economy (such as Bangkok in Thailand and Manila in the Philippines) or one in one major region of a large economy (such as Shanghai in the Lower Yangtze of China) dominates the economy to such an extent as to occupy in the order of 10 to 20 percent of total population and 20 to 40 percent of total GDP.

The price paid for the benefit of agglomeration economies resulting from such extreme urban concentration has been formidable congestion and pollution. Unlike in rural areas with relatively easy access to renewable resources, such as natural water streams, winds and biomass, human living and economic activities in cities rely almost exclusively on non-renewable resources. In an apartment in a mega-city where cool breezes brown over forests and meadows are not available, it is difficult to bear hot summer without electric air-conditioning based on fossil fuels. The emission of residues from concentrated economic activities in cities has been excessive relative to the recycling capacity of the nature, resulting in the serious deterioration of air and water.

Furthermore, income inequality has increased, as rural to urban labor migration tends to lag behind the concentration of economic activities in cities and, also, as migrants who typically find employment in the urban informal sector receive much lower wages than those of workers employed in the formal sector guarded by labor codes and unions. Worsening environments and widening income disparities have been a major source of social/political instability as epitomized by increased crimes and riots. Thus, the problems of environmental pollution and income disparity that emanate from economic growth based on the megapolis-centered system have now been emerging as two major threats to the sustainability of developing economies.

The situation is especially serious in the so-called “high-performing economies” in East Asia that are achieving rapid catching-up with advanced economies through successful industrial technology borrowing in a process commonly called “East Asian Economic Miracle (World Bank 1993). Among others, China is known to be facing the especially serious threats of environmental pollution in such forms of increasing

incidence of acid rain as well as inter-regional income disparity, especially between the rapidly developing coastal areas and the Western hinterlands, which are feared to reach such a level as to fatally disrupt the Chinese economic miracle.

Considering the threats being created from the megalopolis-centered system, this paper tries to search a system which can achieve a rural-urban balanced growth with greater environmental and social sustainability in developing economies. A popular perception prevails to identify the concentration of economic activities in megalopolis as an inevitable consequence of developing economies' integration with the world economy. However, globalization characterized by freer movements of goods and services across national borders does not necessarily cause urban concentration and rural marginalization. The integration of domestic with international markets has been stimulating the growth of industrial activities in developing economies under the current wave of globalization unlike the earlier globalization under colonialism that resulted in their de-industrialization. However, many industrial activities, especially labor-intensive manufactures such as cloth, garments and standard electric/electronic parts, which are characterized weak scale economies and modest transportation costs, need not be located in megalopolis. For these activities to be located in the hinterlands, however, there must be a domestic trade network appropriately linking between foreign demands and rural producers.

In the absence of such a network, emerging demands for labor-intensive manufactures in developing economies, for example, tend to be met exclusively by factories located in metropolis, to which labor is migrated from the hinterlands, without stimulating cottage industries in rural areas even if their manufacturing costs could be lower. This perspective is clearly supported by the experience of rural-based industrialization in Meiji Japan (1868-1912) and the striking success of balanced rural-urban growth in Taiwan, China, after the Second World War.

This paper tries to illustrate this critical role of the domestic trade network in supporting agricultural and industrial production in developing the hinterlands of developing economies in response to rising global demands and, then, discuss ways and means to promote it. Following this introduction, Section 2 tries to identify the unique nature of urbanization and industrialization in developing economies under the current wave of industrialization through a review of histories and theories. The critical importance of developing the community-based trade network for linking rural producers with global markets is illustrated in Section 3 with respect to industrial commodities and in Section 4 with respect to agricultural commodities. In section 5, policies to support such trade network are discussed, identifying the provision of public

infrastructure in transportation, communication and power supply for rural areas, as critically important. Finally in Section 6, the possibility shall be emphasized that such infrastructure can be built in an eco-friendly manner with the maximum use of local renewable resources, if rural development projects are appropriately linked with the clean development mechanism under the Kyoto Protocol that aimed to counteract against global warming.

2. The Megalopolis-Centered System: Theory and History

First, we examine theory and history on the emergence of the megalopolis-centered system in developing economies as observed today so as to understand this system is not an inevitable consequence of globalization.

Colonial legacy

The widespread belief to identify globalization as a major force underlying the megalopolis-centered system through urban concentration and rural marginalization appears to be significantly influenced by the neo-Marxian dependency theory perspective to identify global capitalism to marginalize Third World economies for the profit of advanced capitalist economies (Furtado 1963; Frank 1967; Baran 1975). In this perspective free trade and foreign direct investment destroy indigenous industries forcing rural people to specialize in primary commodity production at a mere subsistence level of living, while primate cities prosper as commercial and financial centers for supporting business of shipping out primary commodities to advanced economies and distributing industrial commodities imported from advanced economies; in this way the integration of developing economies gives rise to the dominance of primate cities in their economic systems.

This explanation on the effect of globalization to create the megalopolis-centered system fits well to developing economies under colonialism from the late 19th to the early 20th century. As colonial powers imposed the free trade system on tropical economies, they were forced to specialize in the production of primary commodities (Bairlock 1975). Competition from industrial commodities imported from the West that had had already completed the Industrial Revolution typically destroyed indigenous manufacturing by farm households and cottage industries for local consumption of so-called “Z-goods” (Hymer and Resnick 1969; Resnick 1970). Rural labor sought alternative employment in plantations and mines geared for exports to

industrialized economies. Colonial governments took various measures to enhance this process. They allocated available virgin lands exclusively to colonial planters, often allowing to enclose native communities' commons into plantations. Public-funded agricultural research concentrated on cash crops grown in plantations, to the neglect of subsistence food crops. Investments in infrastructure such as ports, roads and railways were directed to facilitate the transport of cash crops and minerals for export. Native peasants shouldered a significant share of the cost of building infrastructure through various taxes and levies such as land and poll taxes. This taxation forced cashless peasants to seek wage employment, with the effect to expand labor supply to colonial enclaves. All these policies increased the comparative advantage of cash crops and minerals over subsistence crops and domestically manufactured commodities (Myint 1965; Lewis 1970).

This process produced large port cities, typically one in each colony, linking domestic economies with international markets, not only for trade but also for financial and other services. Such a city was usually the site of colonial administration. Strong agglomeration economies worked among all the private and public services, including close connections between private firms and government offices. Consisting of colonial government officials, traders, shippers, and financiers, plus a large number of native employees and a swarm of coolies, the colonial primate city grew to a size incomparably larger than pre-colonial towns in dominating each of colonial economies. As such, the the megalopolis-centered system is a legacy of colonialism. A similar history applied also to non-colonized Asian economies such as China and Thailand, who were forced to enter the free trade regime under unequal treaties with deprivation of tariff autonomy and imposition of extraterritoriality.

The impact of import-substitution industrialization

After the Second World War, newly independent nations almost unanimously made industrialization a top priority. Reflecting on the de-industrialization effect of free trade under colonialism, so-called import-substitution industrialization (ISI) strategy was commonly adopted. ISI advocated for the use of tariffs and quota to reduce competition of imports upon large-scale modern industries. While the tariffs and quotas raised the domestic prices of commodities produced by these industries, they were given import quotas of capital and intermediate goods, whose prices were lowered by the overvaluation of domestic currency under the government control of foreign exchange. The victims of this strategy were not only consumers but also unprotected industries as they were forced to sell products at lowered prices and buy inputs at elevated costs.

Agriculture and small/medium-scale industries especially suffered (Little et al. 1970). For example, when large-scale synthetic fiber industries were protected, resulting high yarn prices damaged downstream textile-processing industries usually run by small and medium enterprises using labor-intensive technology. Note that weaving and garment making are among the most suitable industries for rural households and cottage industries. Protection of chemical fertilizer industries had the same negative effect on farmers. Thus, the scope for rural-based developments was narrowed further under ISI with industries concentrated among large urban-based factories. Ironically, the strategy intended to break the colonial economic system strengthened it instead.

The nature of the second globalization wave

The first wave of globalization in the 19th century under colonialism set a stage for the megalopolis-centered system to emerge through the de-industrialization of developing economies. Yet, this system was not counteracted but strengthened through their industrialization under the anti-globalization, autarky-oriented ISI regime. In terms of this history, globalization may appear to contain a factor to promote megalopolis-centered urbanization, but curbing globalization alone is unlikely to be effective in stopping urban concentration. For finding right policies for promoting more balanced equitable growth between rural and urban sectors, it is critically important to understand the different nature of current globalization as compared with that of earlier globalization.

According to Robert Baldwin and Paul Martin (1999), the “first globalization wave” in the 19th century was generated by the rise of industrial power in western nations, which resulted in the de-industrialization of the Third World under the dictate of comparative advantage. In contrast, the “second wave” currently in progress has been characterized by the shift of comparative advantage in advanced economies from the industrial production of standardized commodities to the production of services, especially new knowledge and information. Under the present structure of comparative advantage, the integration of domestic with international markets stimulates the growth of manufacturing activities in developing economies unlike the case of the first globalization wave. In fact, East Asia is the region that has been best exploiting the industrialization opportunity created by the second wave.

However, the success of industrialization could be the factor to promote the megalopolis-centered system. Through the application of the strategic trade theory to economic geography, Paul Krugman (1991) predicted concentration of industrial activities in an urban center under the assumption of strong increasing returns in

industrial production and significant transportation costs, whereas rural areas are supposed to specialize in agricultural production as it is characterized by constant returns. This prediction is flawed to the extent that his dichotomy between agriculture and industry with respect to scale economies lacks empirical validity.

Indeed, strong evidence does exist for the absence of scale economies in agriculture in developing economies, though agriculture in developed economies is generally characterized by increasing returns (Hayami, 1996; Hayami and Rutttan, 1985). However, there are many industrial commodities, especially among labor-intensive manufactures such as cloth, garments and standard electric/electronic parts, which are characterized by narrow ranges of increasing returns and modest transportation costs. Moreover, the share of commodities with weak scale economies has been rising as global demands have been shifting from standardized to differentiated products with shorter product cycles (Piore and Sabel 1984; Feenstra 1998). Indeed, the enormous expansion in the production of industrial commodities of this nature as a major link in the “global value chain” or “commodity chain” has been considered to underlie the “East Asian economic miracle” (Gereffi 1999; Tewari 2005). There is no reason to doubt the possibility of hinterlands to be able to produce such industrial commodities at lower costs than in megalopolis, to the extent of rural-urban differentials in labor and land costs.

Even, for the commodities characterized by strong increasing returns and high transportation costs such as automobile, the greater integration with external markets may induce industrial entrepreneurs to shift their production base to rural areas closer to export markets, such as to the border with USA in the case of Mexico corresponding to the formation of NAFTA, as Krugman himself recognizes (Krugman and Elizondo, 1966). The tendency of trade liberalization to reduce urban concentration is also suggested by a cross-country study by Alberto Ades and Edward Glaeser (1995).

However, the liberalization of trade and foreign direct investment alone can hardly be sufficient to prevent the progress of urban concentration. Even if the integration of domestic with international markets stimulates the growth of industrial activities, for a significant share of these activities to be located in hinterlands far away from the trade entrepot, there must be a domestic trade network appropriately linking between foreign demands and rural producers. In the absence of such a network, emerging demands for labor-intensive manufactures in developing economies, for example, tend to be met exclusively by factories located in metropolis, to which labor is migrated from the hinterlands, without stimulating cottage industries in rural areas even if their manufacturing costs may potentially be lower. Such a trade network is also

vitaly important to mobilize a large number of peasant producers for production of labor-intensive, high-value agricultural commodities such as fresh fruits, vegetables and flowers, for which international demands have been rising sharply.

3. The Community-Based Trade Network for Rural Industrialization

Although trade liberalization coupled with domestic deregulation has greatly facilitated the effective use of abundant labor in developing economies in response to rising demand for labor-intensive commodities from high-income countries, these manufactures have been located disproportionately within major cities and their outskirts, such as Bangkok, Jakarta and Manila. This situation is different from the experience of Japan during the Meiji era (1868-1912) and in Taiwan, China, after the Second World War, which developed rural towns and villages as the production sites of labor-intensive industrial and agricultural commodities (Ho 1982; Ranis and Stewart 1993). It was the domestic trade network consisted of a large number of small traders and processors tied by community relationships that enabled effective mobilization of labor in hinterlands for rural-based production geared for international markets. Because of space limitation, my explanation in this section is largely based on the experience of Japan. However, the Taiwan experience does not seem to imply a different conclusion on the issue focused in this paper, despite its greatly different political-economy environments (Caldwell 1976; Amsden 1991; Gereffi and Pan 1994; Lane 1998)

In Meiji Japan, if an urban trader received a large order of silk cloth for export, for example, he usually made contracts with local collectors in rural areas to assemble the needed amount from many small weavers living in their native places. In order to meet the export demand, a large bulk of commodities to meet a certain quality standard specified by a foreign buyer must be collected by a specified delivery date. If his collectors violated the contracts by mistake or opportunism, the export trader may have had to pay high penalty in cash and/or through the loss of reputation among foreign customers. Thus, he normally endeavored to establish a mutual trust relationship with collectors through repeated transactions over time as well as interlinking commodity trades with credit and other transactions so as to avoid the prisoners' dilemma game situation.

The same applied for local collectors in relation with cottage weavers operating in rural villages and towns. Typically, a local collector developed putting-out contracts with weavers by advancing yarn and collecting cloth at a prescribed piece rate.

Long-term, repeated contracts were applied to suppress opportunistic behaviors such as embezzlement of yarn by means of weaving cloth at lower density than agreed upon. Personal connections such as relatives, friends and neighbors were preferred in the selection of contracting partners. Opportunism was strongly suppressed by the expectation that possible contract violation would be punished socially through bad reputation and ostracism in the small rural community. Once community sanction reduced opportunism, small-scale, family-based rural enterprises became more efficient than large factories under hierarchical management because of family firms' advantage in monitoring labor at a lower cost in the case of labor-intensive industries characterized by weak scale economies. It was on the basis of such community-based trade network that industrial activities spread out widely over rural areas in Meiji Japan (Smith 1988; Itoh and Tanimoto 1998; Tanimoto 1998).

Unlike the assumption of Krugman (1991), it is not the physical cost of transportation that makes it advantageous to locate industries near to the urban center but the transaction costs of enforcing contracts at various stages of domestic trading from urban exporters to rural producers. It is not practical of contract enforcement to rely on legal procedures, since judicial costs involved in formal court procedures often exceed the expected gains from dispute settlement on small transactions typical of rural entrepreneurs. Thus, rural-based industrialization in Japan is considered to have critically depended on the successful use of community mechanism for correcting the agency problem stemming from information asymmetry. Indeed, wide dispersion of industrial activities over rural areas through the community-based trade network has already been progressing in developing Asia, but so far it has not extended much beyond the outskirts of metropolis unlike the case of Meiji Japan (Hayami 1998).

It may be questioned if decentralized production systems such as the putting-out system could only be effective in controlling industrial production in a primitive stage but may not be adequate in advanced stages. Indeed, a popular presumption based on the historical experience in Europe is that the putting-out system is a pre-modern form of industrial organization and that, though it was effective in promoting 'proto-industrialization' before the Industrial Revolution, it was bound to demise in the modern era as it was replaced by the modern factory system based on the team of hired wage laborers working together under the supervision of managers and foremen (Landes 1969; Pollard 1965). The advantage of the factory system over the putting-out system has been identified as the advantage of the former in mass-producing standardized goods with the effective use of large-scale machinery for meeting demands from wide national and international markets.

In Japan, however, there is an evidence to indicate that the putting-out system became more common after the beginning of modern economic growth with the nation's opening to international trade in the late nineteenth century. A case study from Saitama Prefecture shows that, before the Meiji Restoration (1868), farmers used to weave cloth from yarn spun from their own cotton harvests and sell their products in cash to guild merchants in towns. The opening of international trade and subsequent national unification brought large increases in demand for striped cotton cloth produced in this area from wider markets and, also, major declines in the price of cotton yarn imported from abroad. This opportunity was exploited by rural-based traders outside the guild, who organized the putting-out contract in leasing looms and advancing yarn for weaving by women in farm households (Kandachi1975; Tanimoto1987, ch.2). The enforcement of their contracts, not only with these cottage weavers but also with large wholesalers who engage in transshipment of collected cloth to distant markets, critically depended on strong community ties characteristic of rural Japan (Itoh and Tanimoto 1998). This example seems to indicate that the putting-out system can be an efficient mechanism for meeting dynamic demand expansion by mobilizing low opportunity-cost labor at a minimum labor-monitoring cost where community relationships can be relied upon as the basis of contract enforcement. Indeed, this system served as a major instrument in organizing industrial production in Japan in its early stage of modern economic growth. Without the effective use of this mechanism, the wide diffusion of industrial activities over rural areas through subcontract arrangements would have not been possible in Taiwan also (Amsden 1991; Gereffi and Pan 1994).

An important point to be recognized is that the traditional putting-out system organized by local traders has later been transformed into the modern subcontracting system in support of industrial strength in Japan. Although the agents of the contract became larger in the scale of their establishments and household production gave way to factory production, similar to the Taiwan case (Ho, 1982), the putting-out system in its original form is still commonly practiced in textile industries in Japan. Today, it is used by large chemical fiber manufacturers and large trading houses based in metropolis as an instrument to organize small and medium-scale enterprises in local industrial clusters for meeting national and international demands. The large chemical companies prefer the contracting-out of weaving, dying and garment making activities to the vertical integration of these downstream activities with fiber production, not so much for seeking cheap labor but more for such advantages as low labor-monitoring costs, strong work incentives for management, and flexibility in employment and

staffing (Itoh and Urata, 1994).

In Japan today, the putting-out system for processing chemical textiles as explained above is only one of many variations of the subcontracting system practiced by high-technology industries. Well known is the relationship between automobile assemblers and parts suppliers. Their transactions are not only long-term but also multi-stranded including technical guidance and credit guarantee. The subcontractors try to observe product quality and delivery date requirements. The assembler also tries to guarantee appropriate treatment of subcontractors to maintain assured supply. Because mutual trust thus created eliminates the danger of “hold-up”, the sub-contractors do not hesitate to invest heavily in the formation of specific skills and equipment consistent with their principal’s demands. Such artificial creation of a community relationship is said to underlie the competitive strength of the Japanese automobile industry (Asanuma 1985; Abegglen and Stalk 1985; Fujimoto 1999).

It is interesting to know that Kiichiro Toyota, the founder of the Toyota Motor Company, intended to build a “pastoral factory” in Koromo City (today’s Toyota City) — a typical rural town with few industrial activities when he began automobile production in the 1930s . Kiichiro’s idea was not only to locate the factory in a pastoral environment with cheap land and labor but also to surround it with trustworthy parts suppliers connected by community spirit. Toyota tried to contract with manufacturers receptive to Toyota’s guidance, even if they had no previous experience in precise, sophisticated metal processing works (Wada 1998). It appears that Kiichiro’s idea originated from his experience as a supplier of automatic looms for rural-based weavers. His idea bears fruit today as Toyota’s highly efficient modern subcontracting system known as the just-in-time system (*kanban*).

It is important to recognize that the community-based contract enforcement mechanism used in subcontracting system in Japan today as well as in the putting-out system in the Meiji era is not a mere remnant of pre-modern agrarian society. Instead, it is an institutional innovation created by entrepreneurs in response to modern needs. They have installed community relationships in their business organizations to make them consistent with social norms ingrained in the mind of people, thereby lowering the cost of contract enforcement. From this experience, entrepreneurs in high-performing East Asia today may learn a lesson on the possibility of improving their production and trade organizations through exploitation of their own cultural endowments.

4. For Mobilizing Farm Producers for Global Markets

The previous chapter concentrated on the question of how to link labor intensive industrial activities in rural areas with international markets. Another question of equal importance for promoting rural-urban balanced growth under globalization should be how to forge an adequate link between emerging international demands for agricultural products and farmers in hinterlands.

The traditional marketing system for peasants' crops such as rice and corn is characterized by a relatively loose network of traders across various levels. Typically, the system consists of a large number of self-employed agents constituting a hierarchy of small traders who specialize in the collection of small marketable surpluses from peasants in villages (maybe called "village collectors") and larger traders in towns who engage in both local retailing and transshipment to other areas (maybe called "town traders"); town traders gradually accumulate surpluses of commodities supplied from village collectors beyond use for local retailing into a sufficiently large bulk adequate for shipment to urban markets.. The cargos received by urban wholesalers are distributed to retailers or transshipped further to other markets either domestic or abroad. This system is characterized by relatively loose connections among traders. Community ties do exist at the local level commonly involving repeated transactions; short-term trade credits in the length of a few days to a few weeks frequently flow in such forms as advanced and delayed payments, while longer-term credits for production and consumption purposes are also practiced though much less commonly. Despite the practices to inter-link between trade and credit transactions, buying and selling in traditional peasant marketing are largely spot transactions (Chowdhury and Haggblade 2001; Crow 2001; Dewey 1962; Davis 1973; Hayami 1999; Hayami and Kawagoe 1993).

Such a system works relatively efficiently for traditional peasant crops such as cereals and pulses, which are storable and of which product quality can easily be verified so that information asymmetry is insignificant. However, it does not appear that the system can serve as an appropriate channel to connect small family farms with wide national and international markets with respect to new high-value commodities. The new agricultural commodities of rising global demand, such as vegetables, fruits and flowers, are mostly perishable, of which fast delivery from producers to consumers or processing plants is critically important. Yet, it is not easy to assemble a sufficiently large bulk of standardized commodities adequate for marketing and processing to meet large urban or foreign demands. Quality standardization of these commodities is also difficult, especially for the assurance of "organic cultivation" with low use of chemicals due to severe information asymmetry For this purpose, farm-level production from

planting to harvesting must be much more closely coordinated with the needs of marketing and processing than is the case of the prototype peasant marketing system, in which production plans including the choice of crop varieties and cultivation methods are left to decentralized decisions by individual farm producers.

A traditional approach to achieving sufficient coordination between farm production and marketing/processing for delivering tropical agricultural products to international markets is the vertical integration across farm-level production, processing and marketing in the form of large-scale agribusiness plantations (Hayami,1996; 2002). A typical example is the case of black tea. The manufacturing of black tea at a standardized quality for export requires a modern fermentation plant into which fresh leaves must be fed within a few hours after plucking. The need for close coordination between farm production and large-scale processing underlies the traditional use of the plantation system for black tea manufacture. Unfermented green tea, in contrast, remains predominantly the product of family farms in China and Japan. Another example is bananas for export. In this case, harvested fruits must be packed, sent to the wharf, and loaded on a refrigerated boat within a day. A boatful of bananas that can meet the quality standards of foreign buyers must be collected within a few days. Therefore, the whole production process from planting to harvesting must be precisely controlled so as to meet the shipment schedule. Thus, the plantation system has a decisive advantage for bananas for export, but not for bananas for domestic consumption so that they are usually produced in family farms.

A large plantation based on hired wage laborers under centralized management was a necessary and efficient organization for opening new lands for export crop production, because of its ability to build necessary infrastructure such as road and harbor. However, after the land-opening stage was over and infrastructure was built, the plantation system became increasingly more inefficient relative to the peasant system, because of high costs to supervising hired wage laborers unlike the case of peasants who rely on family labor requiring no supervision. Because of high costs to monitor hired labor in spatially dispersed and ecologically diverse farm operations, plantations usually practice monoculture. Complicated inter-cropping and crop rotation are difficult to manage by the command system, implying that both labor input and income per hectare are lower in plantations. The strong bent of plantation management toward mechanization further reduces the labor-holding capacity of hinterlands.

The approach that has recently been advocated as a substitute for the plantation system is the so-called “contract farming” or “core-satellite” system in which an agribusiness enterprise or a co-operative manages processing/marketing and

contracts with small growers on the assured supply of farm-produced raw materials (Goldsmith 1985). The contract may include stipulations not only on the time and quantity of material supply but also on prices, credit and technical extension services. In this way, the advantage of agribusiness in large-scale marketing/processing and the advantage of the peasant system in farm-level production can be combined. As a system to coordinate activities across various economic agents, contract farming is a variation of sub-contracting systems. In fact, if contract farming includes a stipulation for a principal organizer to advance inputs such as fertilizer to farmer-agents as credit in kind, it has exactly the same structure as the putting-out system.

Contract farming has recorded several significant successes, notably in pineapples for processing by multinational agribusiness in Thailand, with which Thailand rose to the world-top exporter of pineapple products, surpassing the Philippines based on the plantation system. However, many failures have also been reported (Siamwalla 1992; Jaffe and Morton 1995). The failure usually stemmed from the difficulty of agribusiness or co-op management to enforce contracts with a large number of smallholders concerning the quantity, quality and time of their product delivery to processing plants and/or marketing centers. Moral hazards in the side of farmer-agents often correspond to exercises of opportunism such as hold-ups by agribusiness-principals, e.g., a principal initially offers a high price for inducing agents to specialize in the production of a crop under contract and later breaches it upon completion of agents' specialization (Glover 1987; Singh 2002).

Therefore, similar to the case of subcontracting systems in manufacturing, the success of contract farming critically depends on whether mutual trust can be established between agents and principals, possibly by exploiting community relationships prevailing in rural villages.

5. Toward Balanced Rural-Urban Growth

This paper has identified the development of community-based domestic trade network linking between rural producers and international markets as one of critical conditions to counteract against megalopolis-centered urbanization underlying formidable congestion and inequality problems in developing economies, which has been especially serious among high performing economies in East Asia. What policies might be effective to support the move away from this system to an urban-rural balanced system with environmental and social sustainability?

The provision of public goods

Needless to say, investments in transportation and communication infrastructure, such as roads, railways, and telecommunication networks, are indispensable for the development of internal trade. It is obvious that the reduction of marketing costs resulting from the development of such infrastructure should benefit both rural producers by raising the prices they receive and urban consumers by lowering the prices they pay, thereby contributing to the expansion of rural-urban trades. Moreover, the reduced transportation and communication costs have the power of integrating hitherto segmented small markets in remote hinterlands into a larger regional market in which traders, each used to have monopolistic power in an isolated market, have to compete each other, and this competition will continue to be strengthened as entry barriers to traders from other areas will be lowered with improved marketing infrastructure (Ahmed and Rustagi 1984; Baulch 1997).

The formation of industrial clusters should contribute to the creation of agglomeration economies outside metropolis, which can be facilitated by setting up industrial parks and export-processing zones (Sonobe and Otsuka 2006). Holding industrial fairs is effective in giving rural entrepreneurs access to urban and foreign markets. Above all, research and development on industrial and agricultural technology geared for rural production as well as education, training and extension of rural producers are vital for the support of rural-based development. Without such efforts to upgrade rural producers' capability, out-sourcing to rural producers from urban manufacturers/traders attracted by low wages and abundant natural resources in hinterlands is unlikely to be sustainable, or it could well work as a mechanism to lock in workers in developing economies to simple low-wage tasks at the bottom node of the global value chain (Gereffi 1999; Humphrey and Schmitz 2002; Tewari 2005).

Technological opportunities for developing economies

The budget necessary for providing enough local public goods to achieve rural-urban balanced growth would be very large. Indeed, it will be extremely difficult for low-income economies with low population density such as in Sub-Saharan Africa to mobilize enough public resources to support numerous small farmers, manufacturers and traders scattered around their vast hinterlands. However, one great advantage in developing economies today is the availability of advanced electronic communication technology. The use of personal computers backed by satellite systems can enable small rural producers to integrate their activities with and international markets with

relatively modest investments. Emails and cellular phones can facilitate formation of relational contracts linking between rural manufacturers and urban traders. For rural producers, the new communication technology can thus substitute for urban agglomeration economies on intense information flows.

Technological advance can also help other infrastructure. Local power generation based on solar, wind and biomass energies can greatly facilitate rural electrification as a vital support for rural-based manufactures. Such locally generated electricity based on renewable resources could eliminate the need for large-scale, high-cost systems for transmitting power generated from fossil fuels at the centralized grid. The combined effect of advances in communication and power generation technologies may place developing economies today in a situation similar to Meiji Japan which benefited from the development of small electric motors and hydro-based electrification. Small rural workshops in Japan relying on those technologies were able to offset the scale-economies achieved by producers using steam engines, thereby strengthening their competitive position vis-a-vis large-scale urban factories (Minami 1987).

Keeping the market competitive and contestable

While governments at both national and municipal levels must make maximum efforts for the provision of such public goods, they should refrain from distorting incentives of market agents. If markets are competitive, profit-seeking private entrepreneurs in rural areas will try to make the best use of community relationships for reducing transaction costs in order to win the competition. Resulting efficiency improvements in marketing will benefit both consumers and producers including poor peasants and cottage manufactures under competitive market environments. On the other hand, if government as well as international development assistance agencies would give special favors to apparently non-profit-seeking organizations, such as cooperatives and self-help associations, by granting some monopoly rights or exclusive access to subsidized credits and inputs, benefits therefrom tend to be captured by political elite in communities controlling these organizations; this will motivate the elite to allocate their efforts to rent-seeking activities rather than to activities to reduce costs and improve services in their business for winning competition in the market.

Certainly, non-profit organizations, such as agricultural cooperatives and village associations, have important roles to play. Governments and NGOs may give

them major supports through such activities as research, development and extension as well as education and training for upgrading their technological and managerial capability rather than granting special privileges in finance and trade. It is important to recognize that, in the absence of contestable markets, community relationships will turn to become the mechanism for the rich and powerful to exploit the poor. If the government colluded with political elite to suppress contestable markets, the failure of community will loom large and the scope of rural-based development would be narrowed..

6. The Opportunity from the Clean Development Mechanism of the Kyoto Protocol

It appears possible that the exploitation of technological opportunities available to the rural sector of developing economies today will be greatly facilitated by the application of the Clean Development Mechanism prescribed in the Kyoto Protocol as one of major means to reduce the emission of greenhouse gases for counteracting against global warming. According to this mechanism, the developed countries that pledged to reduce the emission of greenhouse gases are allowed to meet a part of their obligation by contributing to emission reductions in developing economies through the projects with the effects of increasing the production of energy based on the renewable resources that can replace for the use of fossil fuels, such as electric generation from hydro, wind and solar energies as well as conversion of biomass into bio ethanol and diesel or of sequestering the gases from the air by such means as forestation.

In order to facilitate financing such projects, markets have been developed for the transactions of projects with the effects of gas emission reduction. So-called “carbon funds” have been established and managed by international organizations such as World Bank and Asian Development Bank as a mechanism to advance finance for such projects and through mediating their sales to firms and governments in developed economies demanding for the acquisition of emission reduction credits. Transactions in this market are made in terms of “certified emission reductions” measured by tons of carbon dioxide equivalent. Among these carbon funds, the Community Development Carbon Fund of the World Bank is specifically targeted to small projects at the rural community level. From the development of such a market for emission reductions, a win-win situation can be expected to emerge. The rural sector in developing economies can expect a large inflow of funds from developed economies who aim to fulfill the emission reduction obligations by buying emission-reducing projects in developing economies at lower costs than undertaking the projects of equivalent effects at home.

The projects undertaken under this mechanism will create significant employment and income-earning opportunities in poverty-stricken hinterlands in developing economies, while strengthening the infrastructure critically needed for rural-based development and, at the same time, contributing to the prevention of environmental crisis from occurring at both national and global levels.

How significant will be the power of the Clean Development Mechanism to promote rural-based development in developing economies as well as to counteract the global warming trend in the future will depend on whether regulations on the emission of greenhouse gases will be strengthened through post-Kyoto negotiations. The larger the emission reduction obligations shall be imposed on developed economies, the larger will be the demands for clean development projects. To that extent the fund flows to developing economies will increase, resulting in greater benefits to developing economies. Therefore, it should be the advantage of developing economies to participate the negotiations more positively by proposing to share modest burdens of emission reductions in exchange for greater reductions in the side of developed economies. Considering low energy efficiency in developing economies, there is a good scope for them to over-fulfill the modest reduction obligations, so that they can earn significant incomes through emission trading and strengthen the basis for rural-urban balanced growth with the aide of the Clean Development Mechanism, while mitigating environmental pollution in their own territories.

Developed economies must persuade developing economies by showing the package of technical assistance that such a win-win situation is not a dream but the genuine possibility, among which assistance to promote technological opportunities available for the rural-based development of developing economies today as pointed out in the previous section appears to be critically important. For this purpose, however, the transfer of technology already existing in developed economies is not sufficient. For example, the production of bio ethanol and diesel from plants grown in rural areas appears to be most suitable for achieving the dual goals of environmental conservation and rural poverty reduction. Yet, the current use of foodstuff such as corn, rape seeds and coconuts as feedstock for the production of fuels is unlikely to be sustainable as it results in the increased cost of living for poor people through food price increases. Therefore, the developments of engineering technology to convert cellulose in crop residues such as rice straws and wild grasses into carbohydrate or oil and of agricultural technology to breed suitable plants for the production of bio fuels, which can be grown in infertile lands where food crops can not be grown, are vitally needed. It is important to recognize that financial and technical assistance to promote the clean

development mechanism in developing economies can not be sustained unless being supported by top-level scientific and engineering research.

Such technological innovations must be supported by institutional innovations at the community level. For the efficient operation of a bio-ethanol plant, for example, a large amount of feedstock at a standard quality must be delivered to the factory at a steady pace over a long period. How to ensure the credible supply of plant materials for processing from a large number of small farm producers scattered around a wide area will pose a major problem for the development of the bio ethanol project. The community-based trade net works discussed in the paper as a necessary organization for the promotion of rural-urban balanced growth, especially in the form of contract farming, seems to be applicable to the support of development of bio-fuel industries in the hinterlands of developing economies.

Thus, the present momentum for sustainable rural-based development of developing economies, that has emerged from the international cooperation framework for combating against global warming, can best be promoted by the appropriate combination of the efforts to advance agricultural and industrial technologies through scientific research and development and the efforts to promote the efficiency of market and community organizations.

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