



Infrastructure and Regional Cooperation

Haruhiko Kuroda

President

Asian Development Bank

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As late as 1800, Asia was one of the most open regions of the world and occupied an important position in the global economy through not only population and production, but also in productivity, trade, competitiveness, and capital formation (Sakakibara and Yamakawa 2003). Data show that during the 15th–17th centuries, Asia played a key role in ensuring global division of labor. Intra-Asian trade was well developed long before Europeans arrived in the region and such trade involved exclusively Asian ships, Asian merchants, and Asian goods. Several Japanese historians claim that the economic growth of Asian countries was led by intra-Asian trade (Akita 1999). Sugihara (1990) argues that the economic success of Japan in the late 20th century, as well as that of the newly industrialized economies (NIEs), originated in this intra-Asian trade where they developed capabilities to adapt the western cultural elements to suit Asian domestic markets, such as making things smaller and cheaper or neater and cleaner.

The focus of most of the analytic work on regional cooperation has been on trade and investment, including issues such as tariff and nontariff barriers and foreign direct investment. With the emergence of global and regional production networks, transport and logistics aspects have become important. This paper focuses on the role of cross-border infrastructure in the process of regional integration in Asia. In this paper, cross-border infrastructure is defined as any cooperation initiative between two or more countries to strengthen physical connectivity.

Section I sets the context: it presents Asia's phenomenal growth in trade and investment in the last two and half decades. It describes how Asia is becoming a dominant part of international production networks and supply chains. So far, barring a few examples from the Greater Mekong Subregion, efforts to improve the region's connectivity have mostly been made

through national infrastructure projects and national policy actions. This approach has so far worked but is likely to be inadequate given the future prospects of rapid growth in Asian trade. The paper argues that the needs for reducing transport and logistics costs, developing economic agglomeration and connecting production clusters and markets will be a key driver of demand for cross-border infrastructure in Asia in the next few decades. Addressing the region's logistics challenges will hence require attention to cross-border infrastructure.

A review of four case studies of cross-border infrastructure around the Asian region in section II, reveals that most cross-border infrastructure projects and programs are very complex, and that there is a need for a comprehensive framework to deal with inherent challenges facing cross-border infrastructure.

In section III, a conceptual framework to address political, economic and financial, and institutional challenges is suggested for cross-border infrastructure development. It emphasizes that the software component is inseparable from the hardware component. The last section identifies key actions that need to be taken by various stakeholders—such as the Asian governments, the private sector, civil society organizations, and multilateral institutions like the Asian Development Bank (ADB)—in connecting Asia.

I. The Context

Asia's Trade, Investment, and Production Networks

Asia's economic performance in the last few decades has been impressive. As a group, the region has grown at an average rate of 7% since 1980. It has achieved rapid poverty reduction: there were 300 million fewer people living in poverty in 2003 compared with 1990

(ADB, 2005). Strong export growth and high foreign direct investments have been two important drivers of most Asian economies.

Trade, investment, and regional integration. Over the last 20+ years, Asia's exports to the world have grown at the rate of 11% per annum or from a level of \$162 billion in 1980 to \$1.9 trillion in 2004. Asia now accounts for a quarter of world exports. This strong export growth in recent years has been marked by a rapid increase in the absolute and relative significance of intraregional trade. East Asia reported an annual average growth of over 20% during 1980–2004 whereas South Asia, 10%. Asia as a whole has reported an average growth of nearly 17% per annum for regional exports. Data for imports show similar trends. The degree of integration measured through intraregional trade in East Asia has been rising fast: from 35% in 1980 to 55% in 2004, if Japan is included, and from 22 to 44% if Japan is excluded. This share is higher than the North American Free Trade Agreement (NAFTA) although it remains somewhat lower compared with the European Union (Table 1).

Table 1. Trends in Intraregional Trade (%) *

Regions	1980	1985	1990	1995	2000	2001	2002	2003	2004
Emerging East Asia +Japan ^a	34.6	37.1	43.1	52.0	52.2	51.7	53.7	54.7	55.2
Emerging East Asia	22.1	27.5	32.9	39.2	40.7	40.9	43.2	43.9	44.2
NIEs	6.4	6.5	11.9	15.5	15.5	14.9	15.5	15.0	14.4
ASEAN ^b	18.0	20.3	18.9	24.1	24.7	24.1	24.4	23.9	23.9
NAFTA	33.8	38.7	37.9	43.2	48.8	49.1	48.4	47.3	46.4
European Union—15	60.7	59.8	66.2	64.2	62.3	62.2	62.5	63.0	62.1

ASEAN= Association of Southeast Asian Nations (Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam); NIEs= newly industrialized economies (Hong Kong, China; Republic of Korea; Singapore; and Taipei, China); NAFTA= North American Free Trade Association

^a Emerging East Asia includes 14 economies including 4 Asian NIEs, 9 ASEAN members (excluding Singapore), and the People's Republic of China.

^b ASEAN includes all 10 members.

* Source: Kawai, 2006.

Initial growth sparked off by high-flying economies—the NIEs (Hong Kong, China; Republic of Korea; Singapore; and Taipei, China)—and middle-income Association of Southeast Asian (ASEAN) countries has continued with the People's Republic of China (PRC) emerging as an important destination for regional exports in addition to being an important source of imports. The PRC now accounts for 30% of regional trade as a result of its robust trade growth. More recently, there is a surge from other exporters such as India (\$24 billion) and Viet Nam (\$20 billion).

Much of this is due to rapid trade liberalization in these economies in the 1990s and beyond. Several economies in the region reduced tariff barriers significantly: for example, overall tariff rates were reduced by 50% in the PRC, Malaysia, Philippines, and Thailand, whereas South Asian countries such as Bangladesh and India reduced average import tariffs by two thirds. In most countries, tariff reductions were also accompanied by removal of nontariff barriers and simplification of customs rules and regulations (Dollar and Kraay 2001).

The expansion in trade in East Asia has been accompanied by a rapid rise in foreign direct investment (FDI) during this period: though the United States and the European Union are all important, Japan is the largest developed country investor in ASEAN—excluding Singapore. In the case of the PRC, Hong Kong, China is the largest investor. FDI inflows rose more than 28 times in 24 years during 1980–2004. FDI in Asia peaked in 1994 at 25% of total global FDI.

In 2004, the East and Southeast Asian economies accounted for over 59% of all FDI inflows in developing economies (United Nations Conference on Trade and Development [UNCTAD] 2005b). Today, one of the most important destinations of FDI remains the PRC: from a level of \$57 million in 1980, the PRC was able to attract over \$60 billion in FDI in 2004. Most FDIs in Asia were in new, greenfield investments concentrated in manufacturing, though

there was also a significant increase in cross-border mergers and acquisitions, largely in service sectors (Table 2).

Table 2. Foreign Direct Investments Stocks as % of Gross Domestic Product

Economy		1980	1985	1990	1995	2000	2004
Japan	Inward	0.3	0.3	0.3	0.6	1.1	2.1
	Outward	1.8	3.2	6.6	4.5	5.8	7.9
Korea, Republic of	Inward	2.1	2.3	2.1	1.9	8.1	8.1
	Outward	0.2		0.9		5.8	5.8
China, People's Rep. of	Inward	0.5	2.0	5.8	14.4	17.9	14.9
	Outward	—	0.3	1.3	2.5	2.6	2.4
Hong Kong, China	Inward	74.3	76.3	60.3	50.1	275.4	277.6
	Outward	0.5	6.7	15.9	55.6	234.9	246.5
Taipei, China	Inward	5.8	4.7	6.1	5.9	5.7	12.8
	Outward	31.4	21.4	19.0	16.1	21.5	29.9
Singapore	Inward	52.9	73.6	83.1	78.2	123.1	150.2
	Outward	31.7	24.8	21.3	41.8	62.1	94.5
Malaysia	Inward	20.7	23.3	23.4	32.3	58.6	39.3
	Outward	0.8	4.3	6.1	12.4	23.6	11.7
Thailand	Inward	3.0	5.1	9.7	10.5	24.4	29.7
Philippines	Inward	3.9	8.5	7.4	8.2	16.9	14.9
Indonesia	Inward	6.0	6.6	7.7	10.2	16.5	4.4
Viet Nam	Inward	32.9	24.8	25.5	34.5	65.7	66.3
Cambodia	Inward	2.4	2.0	3.4	10.8	46.9	47.2
Lao PDR	Inward	0.3	0.0	1.5	11.8	32.1	26.6

Source: United Nations Conference on Trade and Development [UNCTAD] 2005b.

In the last two-and-a-half decades, Japan and four NIEs have emerged as important sources of FDI in Asia as production costs in these areas increased over time. The PRC has benefited through this process and now investments are also going to countries such as Viet Nam and Cambodia. Regional production networks and well-functioning supply chains emerged from this process. A key contributor to industrial upgrading in Asia has been the participation of local enterprises in regional networks set up by multinational firms. Through their roles as suppliers of parts and products and as purchasers of specialized process equipment, these local firms gain access to important product and process know-how. East Asia has thus been able to create a virtuous cycle of regional trade and investment through the medium of production networks.

*Regional economic integration through production networks.*¹ Several studies on regional economic integration across Europe and Asia conclude that there is no unique or one right way to integrate economies because the speed and the primary drivers of integration vary across different regions. The early architects of the European Union saw economic interdependence, rather than military coordination, as the most important factor for political cooperation. The member countries of the European Union sought to create a single market by policy-driven convergence of market rules. Strong regional institutions were created and granted powers in fields such as education, health, taxes, labor, employment, and transportation. Private sector activities—trade and investment—helped, but it was really the governments and their economic policies that drove the integration process in Europe. Creation of supranational institutions deepened the integration process further.

East Asia's integration also started with the formation of regional institutions: ASEAN being one of the most important ones. The organization has, however, remained relatively weak: the political will that was so important in the European integration was not present in the support provided to ASEAN by its member states because of their inherent preference for national sovereignty. Compared with Europe, Asian economies had very different levels of economic development in terms of per capita incomes, industrial structures, market infrastructure, institutional capacities, and governance. As a result, Asia did not have strong regional institutions driving the integration process. East Asian integration has largely been private sector-driven, created by strong market forces of trade and investment. Such integration was strengthened by multinational corporations in the form of regional production networks and supply chains, without much direct institutional support from regional governments.

¹ This discussion draws on Carruthers, Bajpai, and Hummels (2003), Fujita and Hisa (2004), and Kawai (2005).

Japan took a lead in establishing such production networks and it was soon followed by the Asian NIEs and then by Malaysia, Thailand, Philippines, and Indonesia, and now by the PRC and Viet Nam. All are currently at different stages of industrial development. Today, the PRC dominates as a global manufacturing center with its competitive labor costs, capital accumulation, and its open market policies.

Regional production and trade expansion in Asia have been accompanied by the region's participation in global value chains in line with its comparative advantage. East Asian exporters have made broad-based gains in competitiveness in local markets against all major nonregional suppliers (ADB 2003).

Such market-driven integration has led to new demands on the distribution structures requiring complex logistics services. Increasing reliance on logistics is changing the conventional perspective of comparative advantage, implying that transportation is more closely integrated to supply chains than previously accounted. What seems evident from the East Asian experience is that not only a combination of abundant skilled labor, capital investment, and advanced technology but also transportation and logistics support determine the sustainability of such decentralized production systems. Most East Asian economies invested significant amounts in physical infrastructure to improve cross-border connectivity that such decentralized production systems demanded. These responses were largely focused on improving national connectivity to serve the needs for outward-oriented industrialization.

Logistics, Infrastructure, and Software

Logistics costs as barriers to trade. Several complex factors determine overall transport and logistics costs. In the United States, during 1950–1980, average transit time fell from 40

days to about 10 days and this was one of the important factors leading to the decline in logistics cost. Table 3 presents global trends in logistic costs: technological advances have reduced overall logistics costs for the United States, but this is not the case for the developing countries where land transport costs remain quite high due to inadequate transport and communications infrastructure, uncompetitive transport and logistics sectors, and high fuel costs. The developing countries have yet to create efficient multimodal transportation networks² and significantly improve the efficiency of existing road or rail networks.

Table 3. Trends in Logistics Costs

Economy	1997		2000		2002	
	\$ Billion	% of GDP	\$ Billion	% of GDP	\$ Billion	% of GDP
North America	1035	11.0%	1240	10.6%	1203	9.9%
Europe	884	12.2%	1100	12.8%	1229	13.3%
China, People's Rep. of	718	16.9%	975	17.7%	1052	17.9%
India	236	15.4%	433	17.0%	487	17.4%

Source: Rodrigues, Bowersox, and Calantone 2005.

High logistics costs in many Asian countries stem from various factors—including the low quality of infrastructure and market-unfriendly legal and regulatory frameworks for the transport sector. For example, in the landlocked Central Asian republics, the cost and availability of transport permits and visas for vehicle operators to travel cross-border are a major barrier: it can cost as much as \$400 for non-CIS countries to enter Uzbekistan in addition to various other charges such as road taxes, axel load charges, insurance, and visa charges for vehicle operators and drivers. Actual transport costs and time are much higher than the “ideal world” costs (United

² In efficient multimodal transportation networks, the goods move from one mode of transport to another seamlessly, without storage or human handling in between.

Nations Development Programme [UNDP] 2005),³ hampering regional connectivity. For example, there are no direct commercial flights connecting Dushanbe and Tashkent. Travel from Bishkek to Ashgabat requires flying through Istanbul. The deficiencies of Central Asian transport networks, high costs, and low quality of transport and logistics services have meant that 16–19% of the total value of exports and imports is absorbed by transport costs.⁴ A recent analysis shows that a 20% reduction in logistics costs would increase the trade to gross domestic product (GDP) ratio by more than 10% in Cambodia, Lao People’s Democratic Republic (Lao PDR), and the PRC; by more than 15% in Mongolia; and by more than 20% in Papua New Guinea.

So far, these costs have not affected the overall competitiveness of Asian products because some production clusters are at locations concentrated near ports and in coastal areas. This will become a major challenge in years to come when manufacturing firms need to move inland due to congestion and other factors. It is estimated that in the PRC, inland provinces such as Shaanxi would have to incur additional land transportation costs of over \$1,500 per 20-foot equivalent unit (TEU) of electronic goods to Qingdao port for exports. Similar costs are also reported for other regions. Though no comprehensive databases are available on the land transport costs of traded goods, several studies provide location-specific information. Almost 63% of the cost of transporting goods from Chongqing in the PRC to the west coast of the United States is incurred before arriving at the port of export.

³ The “ideal world” condition is based on balanced transport flows, competitive markets for transport services, smooth border crossings, low transit fees, and no visa problems or unofficial payments.

⁴ A recent study (ADB 2006c) on the effects of regional cooperation in trade, transport, and customs transit in the Kyrgyz Republic indicated a potential cumulative gain for the period 2006–2015 amounting to \$2.1 billion at 2002 prices.

Asia's needs for cross-border infrastructure. Given these logistics challenges, there is a potential for improving regionally cross-border infrastructure to support regional production and trade activities. Initial production networks were supported by national governments that invested in building infrastructure with appropriate port linkages. When labor costs increased in the Republic of Korea, some manufacturing bases were shifted to the PRC, while the Republic of Korea still kept value-added activities locally. This led to phenomenal growth in regional freight flows between the Republic of Korea and the PRC. National governments supported investment projects in necessary infrastructure and some Yellow Sea ports have become important links in these supply chains.

The East Asian economies—the NIEs, middle-income ASEAN countries, and more recently the PRC and Viet Nam—have invested significant capital resources, building necessary national infrastructure to support these production networks. These networks have enjoyed their initial comparative advantage, but this is not guaranteed as the efficiency of East Asia's logistics is falling behind. Overall quality and quantity of infrastructure in the Philippines, Indonesia, Thailand, and to some extent Malaysia may already be inadequate compared with what is needed to remain competitive. With differing factor prices, technology levels, capabilities of workforce, and logistics costs, most global investors will have much wider choices regarding location of future production clusters or expanding existing ones. Against this background, it is possible to reinforce the region's comparative advantage through regional cooperation because East Asian economies are still at different stages of development. Arndt (2001) states, "The basic idea is to think of the region rather than the nation as the production base and to spread component production around the region in accordance with comparative advantage." Regional connectivity

through cross-border infrastructure will be crucial in such a case because it supports complementarity in production across the entire region, looking beyond national boundaries.

Other parts of Asia—South Asia, Central Asia, and the Pacific—all lack national and cross-border infrastructure. The needs for reducing transport and logistics costs, connecting production clusters in different countries, and linking these clusters with markets will be a major challenge for many developing countries in Asia in the next few decades to come.

Key role of software. It is not enough to focus only on hard infrastructure facilities. Several surveys and benchmarking studies indicate that the lack of infrastructure connectivity is only a part of overall trade costs: a lot of other impediments related to policies, regulations, procedures and standards also need to be addressed to promote movements of people, services, and goods. An analysis of trade facilitation measures involving 75 developed and developing countries around the world concludes that if countries currently below the group average in relevant indicators individually cut their deficits to the mean by only 50%, total trade among the 75 would expand by 9.7%, i.e., by \$377 billion (Wilson et al. 2004). Initiatives involving customs and trade facilitation can remove procedural barriers to the cross-border movement of people and goods, thereby increasing efficiency, reducing costs, and maximizing the economic benefits of improved cross-border physical connectivity. The software component is inseparable from the hardware component.

II. Lessons from Major Cross-Border Infrastructure in Asia

Political boundaries of nations often impede cross-border trade, investment, and economic integration. Even in the most open economies, domestic trade is much larger than international trade. Several regional initiatives are at various stages of implementation in Asia to

promote regional cooperation and greater connectivity. In some sense, the 1997–1998 financial crisis was a turning point for regional cooperation among the East Asian economies. Before the crisis, the institutional base and policy initiatives were limited to removal of trade and investment barriers while the actual integration process was largely driven by the private sector. The growing support for regionalism⁵ was due to several factors: a need to reduce financial vulnerabilities at the regional level; a need for greater cooperation with the PRC given the country’s emerging dominance in the world and regional markets; and the merit of harmonizing policies to enhance the region’s competitiveness. Thus, after the crisis, the market-led integration process was supplemented by policy-driven cooperation efforts in money and finance, trade and investment, and provision of regional public goods. In this context, robust transport and communications links are considered to be important building blocks—connecting national markets and supporting production, trade, and investment.

ADB has supported regional and subregional economic cooperation programs covering both physical infrastructure and software aspects for trade and transit facilitation, policy and regulatory harmonization, as well as capacity building. In this section, we review four case studies of cross-border infrastructure: Greater Mekong Subregion (GMS) Northern Economic Corridor and Trade and Transit Harmonization, Nam Theun2 Hydropower, Regional Cooperation for Pacific Aviation and Information Communications Technology (ICT) Application, and Indonesia–Singapore Gas Transmission.

⁵ Here regionalism is meant to include formal economic cooperation and economic integration arrangements covering trade and investment liberalization, and facilitation.

GMS Northern Economic Corridor and Trade and Transit Harmonization

Northern Economic Corridor. ADB, through the Greater Mekong Subregion (GMS) program, has supported regional cooperation for strengthening cross-border physical connectivity. Key activities of the GMS include development of economic corridors, focusing on road investments to improve access; institutional and policy changes for trade facilitation; and transit policy harmonization to reduce logistics costs across the subregion. Five economic corridors (two North-South, one East-West, and two Southern) have been identified and several road investments are under way in these corridors while feasibility studies are addressing prospective railway improvements. In addition to hard infrastructure facilities, ADB has also focused on software cooperation through trade and transit harmonization.

The Northern Economic Corridor project (ADB 2002), which will link Thailand and the PRC through a 228-kilometer short road link via northern and remote parts of landlocked Lao PDR, was designed to open up economic opportunities. The trade and transit corridor was estimated to cost \$90 million not only for physical investments in building road links but also to cover components that will benefit local communities along the road. A social action plan with provisions for community roads, small water and sanitation schemes, education, HIV/AIDS awareness programs, and local capacity-building programs for environmental management was an integral part of the project design. These components were planned in a participatory process involving large numbers of ethnic minority groups.

The project was funded through financial and other resources from two primary beneficiaries, the PRC and Thailand and, in partnership with ADB. The multilateral role was multifaceted to ensure success of this project. First, ADB helped mobilize financial resources.

Second, ADB assisted in project design to ensure not only greater regional connectivity, but also inclusion of isolated regions of the northern Lao PDR in the process of regional integration. Third, ADB assisted the Lao PDR in negotiations to promote pricing policies that would maintain newly created assets without undue fiscal burden on itself as a transit country. Fourth, special care was taken to ensure that distribution of costs and benefits across the three countries was fair: since most immediate benefits were expected to accrue to the PRC and Thailand, both countries shared two thirds of project investments and provided the Lao PDR concessional resources. Finally, the project adopted a social and environmental management plan and worked with contracting arrangements that aligned incentives of the construction firms to mitigate these risks. Similar projects that seek to coordinate regional infrastructure are under way in the region.

Trade and transit harmonization. For hard infrastructure facilities to work, well-designed software to reduce policy- and procedure-related impediments needs to be developed. . Although international conventions exist that address these regulatory and procedural barriers to the cross-border movement of people and goods, most GMS members are unable to fully accede to these conventions. ADB, through its capacity-building efforts, has been working toward the freer movement of people and goods across the subregion and in a consistent manner.

The three economic corridors in the GMS—North-South, East-West, and Southern—are expected to form a highly efficient transportation system. However, roads no matter how good are of little use if traffic is held up at the borders. Recognizing this, the countries implemented an agreement on the cross-border movement of services and goods. These changes allow people and goods to travel around the GMS with minimum impediment, cost, or delays thereby ensuring that the basic framework is in place to support the economic competitiveness of the GMS as an integrated area of production, consumption, and distribution.

The GMS Cross-Border Transport Agreement (CBTA) is a multilateral instrument designed to facilitate cross-border transport of people and goods in the subregion and was entered into force with its ratification by all six GMS member countries in December 2003. It incorporates the principles of bilateral or multilateral action, and flexibility in recognizing differences in procedures in each GMS country. The agreement includes references to existing international conventions that have demonstrated their usefulness in a broad range of countries. It also takes into account, and is consistent with, similar initiatives of the ASEAN. The CBTA includes a preamble, with 10 parts and 20 annexes and protocols, that applies to selected and mutually agreed upon routes and points of entry and exit in the signatory countries along the East-West, North-South, and Southern Economic Corridors to provide (i) single-stop inspection; (ii) cross-border movement of persons (i.e., visas for persons engaged in transport operations); (iii) transit traffic regimes, including exemptions from physical customs inspection; (iv) bond deposit, escort, and agriculture and veterinary inspection; (v) requirements that road vehicles will have to meet to be eligible for cross-border traffic; (vi) exchange of commercial traffic rights; and (vii) infrastructure, including road and bridge design standards, road signs, and signals.

Nam Theun Power Project

Nam Theun 2 (NT2) is a 1,070-megawatt hydropower project being implemented in the Lao PDR and will export most of its power to Thailand (ADB 2004). The \$1.2 billion project is a private sector undertaking with multilateral and bilateral financial and other support. For the Lao PDR, the NT2 is enormous. It has been under preparation for decades since the mid-1980s. The project has very strong supporters as well as several groups opposing the project. It is the largest private power project not only for the Lao PDR but also the world's largest private sector

hydroelectric cross-border project. Most of the power produced by the project will be exported to Thailand.

The Lao PDR government is the major beneficiary of NT2 and would receive about \$1.9 billion over the 25-year operation period from dividend income, royalties, and taxes. The main costs, however, are carried by the local communities and the environment in the project area, arising from the construction of the dam, the flooding of the Nakai Plateau, and downstream effects associated with the interbasin transfer of water from the Nam Theun to the Xe Bang Fai river. Over 70,000 local people (and a part of these ethnic minorities) would face varying degrees of impacts. One of the major issues was how to ensure a fair system for distributing costs and benefits with appropriate compensation to protect those most affected by the project. A total of \$90 million has been designated as capital and operating expenditures for environmental and social mitigation and compensation. These obligations are integrated in the concession agreement, which the government and private sector concessionaires signed. Mechanisms have been developed to address weak accountability arrangements in the public finance management system, in particular, to facilitate more effective and transparent targeting of NT2 revenues toward poverty reduction, including improved education, health, and sustainable livelihood.

An adequate system of monitoring and capacity-building support to the government, provided through multilateral and bilateral institutions, are in place to ensure that the project is not only a success in terms of power trade but also helps the Lao PDR further its development agenda of poverty reduction and targeted interventions for health and education. The key will be to make certain that the proposed fair distribution of costs and benefits between different stakeholders groups remains on track.

Regional Cooperation in the Pacific for Aviation and ICT

Regional cooperation has a different dimension for the island economies of the Pacific, which are characterized by small size, fragmented markets, and physical isolation. Physical connectivity is a major challenge but the scope for cross-border infrastructure is limited due to the geography. Nonetheless, a strong rationale exists for regional cooperation on the software aspects to improve connectivity and to create efficient regional aviation, shipping, and communications.

Aviation. Aviation in the Pacific is fragmented, with 43 air transport operators, 266 aircrafts, and nearly 4,000 licensed personnel. As a result, capacity for safety and security regulation and oversight is difficult to sustain given the small individual market in each country. Noncompliance with international safety and other regulations makes air travel in the Pacific less safe and secure, affecting overall connectivity. Air travel is vital for the Pacific economies given the importance of tourism in employment and its major share in their GDPs.

Given the need to operate in a strict, rule-based international regulatory environment, a regional agency, the Pacific Aviation Safety Office, was formally established. A regional agency is expected to help reduce overall cost of oversight and still meet international standards because it will avoid duplication, create economies of scale, harmonize regulatory systems, and make available scarce technical expertise as and when needed. An investment program will support the continuing institutional development of the Pacific Aviation Safety Office to improve aviation safety and security. The program has four components: (i) harmonize the regulatory environment; (ii) ensure compliance to international standards; (iii) establish regional inspection and surveillance system; and (iv) refurbish the organizational headquarters. The project includes extensive capacity-building efforts, formulation of regulatory and legal frameworks, and

adoption of necessary systems of documentation. The project is expected to become self-sustaining in 5 years as revenue from service will match the expected costs. It is likewise expected to serve as a model for intergovernmental regional cooperation in the field of regulation services necessary for developing an adequate regional transportation infrastructure.

Information and communication technology. While in many developed countries information and communication technology (ICT) provides additional information services over an already well-established communications infrastructure, in the Pacific, cross-border ICT application through use of VSAT (very small aperture terminal satellite communications system) has the potential to drastically reduce the negative effects of two fundamental challenges: distance and small market size. ICT cooperation can aggregate production so that cooperatives (e.g., in fishing and agriculture) can access larger markets, and can bring even very small enterprises (e.g., micro-tourism resorts or agro-tourism) to the attention of a global audience.

The technology solutions, such as the use of multiple-access VSAT technology, could allow internet data to be beamed down to a multitude of places under the footprint of a given satellite. Users could be located anywhere in the Pacific and use this technology for anything from e-mail communication to local administration exchanges with the central government, to tourism and other applications. Once this or a similar wide-area system is established, it is easier to see how the Pacific could capitalize on its vast human and natural resources more effectively.

Strong communication capacity provides a cluster of countries in a given area many more chances to become an integrated region and to thrive on economies of scale, something that the Pacific has not yet been able to do. In trade, this is important for procurement, exports, or aggregation of national production; whereas in governance, such a system could improve local administration communication, human resource deployment, budgeting information, and much

more. A wide-area communication network can also positively improve hospital procurement, disaster management, health alerts, school research, trade, and other activities. In short, effective and inexpensive ICT cooperation across island nations opens vast opportunities.

Indonesia–Singapore Gas Transmission

Although a large number of Asian countries have gas resources, the region has yet to develop an integrated cross-border gas network. The Indonesia–Singapore gas pipeline started as a domestic pipeline with ADB funding from various multilateral and bilateral sources. The original project was to construct onshore and offshore pipelines to increase domestic use of gas as a substitute for petroleum and to improve energy efficiency. The project included a set of policies to create an enabling environment for private sector participation in the gas sector and establish a regulatory framework and supporting institutions for transmission and distribution networks. An important policy covenant under the ADB loan was that the Perusahaan Gas Negara would undertake a partial divestment of equity in the project to a suitable strategic investor to spread the economic risks and introduce world-class operations, maintenance, and financing to the Indonesian gas sector.

The 1997–1998 financial crisis brought considerable uncertainty with respect to the domestic gas market and, at the same time, slowed overall progress to secure a strategic investor. In partnership with ADB, the government formed Transmisi Gas Indonesia in 2002 and through open competitive bid, 40% of equity of this newly formed company was divested to Transasia consortium made up of four investors: Petronas, Gulf Indonesia, Singapore Petroleum, and Talisman Energy. Transasia paid \$187.6 million for the 40% equity that included about \$58 million toward cost of extending the Grissik–Battam pipeline to Gissik–Battam–Singapore. In

some sense, this particular cross-border project has begun the critical step of restructuring the Indonesian gas sector and the wider development of the proposed Trans-ASEAN gas pipeline project.

Lessons

Although most lessons drawn from the case studies are specific to the context and circumstances of individual projects, a few general lessons can be summarized below.

- The governments involved need to play an increasingly important role in cross-border infrastructure, even if the projects are in the private sector. Such a role can be multifaceted and, in most cases, context-specific—from sharing risks, to creating credible policy regimes, to providing direct or indirect financial support.
- In the absence of a single overarching sovereign jurisdiction, aligning differing interests of two or more sovereign parties would require formal or informal institutional arrangements to lower transactions costs and/or reduce the risk of conflict—like the European Commission or the GMS.⁶
- The presence of multiple constituencies involved in cross-border infrastructure requires capacities and mechanisms to identify the magnitude and distribution of benefits and costs of cooperation efforts. When costs and benefits between different groups vary dramatically, a fair system of distribution of benefits and costs needs to be introduced and the issue of incentive compatibility needs to be addressed and internalized at the planning

⁶ International arbitration offers a solution to this problem, but recourse to such arbitration must be agreed to and adhered to *a priori*.

and design stage. Sufficient incentives have to be provided to the transit country to ensure project success.

- When factors such as high fixed costs, long life of assets, and space specificity expose cross-border infrastructure to risks arising from high “sunk costs,” governments need to establish credible policy regimes that are supportive of private investors.
- As cross-border infrastructure is subject to negative externalities such as spread of HIV/AIDS, transborder pollution, erosion of social values and cultural identities, and trafficking of vulnerable groups, appropriate mitigation plans and adequate financial and technical resources are needed to address such negative externalities. By bridging a shared history, cultural values, or norms, and creating cohesiveness based on ethnic identity, cross-border infrastructure projects can help build trust that is important for any regional cooperation.⁷
- Finally, in almost all cases, planning and preparation costs are evidently high. Some projects needed up-front external financial and other support to be successful.

III. A Framework for Cross-Border Infrastructure

In Asia, given the rapid growth of regional economic activities, trade, and investment, cross-border infrastructure has become an important building block of regional economic integration and globalization. Many cross-border infrastructure initiatives are specifically directed at facilitating cross-border trade through reduction in overall transport and logistics

⁷ In the GMS program, cross-border infrastructure was found to be a crucial building block in developing cultural capital to reap peace dividend, expand markets, and exploit economic opportunities in transborder regions and provided a means for the smaller nations to be relevant in the process of globalization.

costs. There are also many examples where cross-border infrastructure has helped improve connectivity in a country or have changed the market structure of domestic sectors. The overall impact of improved physical connectivity has been examined and a recent empirical study has found that in the GMS, cross-border infrastructure had positive effects on trade in major goods (Edmunds and Fujimura 2006).

Except for the European Union, which has well-defined market integration rules to support cross-border infrastructure, most cross-border infrastructure projects are planned and designed individually. In some cases, such individual project negotiations have worked well. For example, Scandinavian countries have interchanged as much as 7% of total subregional power generation based solely on a “gentlemen’s agreement.” Though in theory, project-to-project cooperation between governments for mutual benefit does not demand a formalized institutional or legal framework, in reality such an approach involves high transactions costs, high failure rates, or long lead time. A project-to-project approach does not follow any single, integrated framework for planning and designing of such projects. In this section, we propose an effective framework for planning and designing cross-border infrastructure in three dimensions: political, economic and financial, and institutional. Most of these dimensions need to be addressed to ensure successful cross-border infrastructure outcomes.

Political

Infrastructure is very political and cross-border infrastructure even more so because it invariably raises geopolitical issues. More often than not, a cross-border infrastructure project, policy, or program is used to promote or hinder the foreign policy goals of governments. Political economy issues are at the forefront of any cross-border infrastructure.

There is a need for sufficient mutual trust and goodwill between governments involved in the project. This can be done either through formal institutions (such as the European Union) or, as is the case in many Asian groups, through informal political consensus to create such collaborative groups. Strong political leadership for cross-border infrastructure also reduces overall external risks arising from increased dependence on other countries. Hence, governments involved need to ensure that the underlying policy environment is supportive. Transparent and predictable governance structures would reduce the overall risks and enhance feasibility.

Economic and Financial

Economic and financial feasibility needs to be studied and well-established. More often than not, political leaders announce cross-border infrastructure projects without undertaking the necessary economic and financial analyses.

First, economic and financial analyses are important for any infrastructure, but more so for cross-border infrastructure given the capital intensities, complex structures of costs and benefits, regional public goods attributes, and long-term, indirect impacts. As cross-border infrastructure investment is usually subject to market and/or government failures, institutional mechanisms are needed to address such failures. Second, the presence of two or more governments for cross-border infrastructure can reduce serious financial risks the projects often encounter. The involvement of more than one country can make it difficult for an individual government to unilaterally renege on the terms of agreements under which infrastructure is supplied, when the other parties would also have an interest in enforcing the agreement. Third, given the asymmetric distribution of costs and benefits between different groups for any cross-border infrastructure, a detailed distribution analysis would be necessary to ensure a fair system

of distribution in place. Such an assurance is crucial to obtain support from less powerful countries, regions, or groups within a country.

Institutional and Software

Institutional and software factors are as important in cross-border infrastructure as hard physical connectivity. Institutional and software agenda for cross-border infrastructure can be complex because it is often multifaceted and involves multiple stakeholder groups.

First, successful cross-border infrastructure requires institutional arrangements, formal or informal, that will help reach an optimum outcome arising from cooperation as opposed to independently chosen suboptimal outcomes. Technocratic cooperation is the most critical element. Institutional requirements for coordination vary depending on the complexity of sectors: for example, technical complexity of a cross-border road project is relatively low (primarily agreement on design standards and road signage at the construction stage) as compared with electricity (for which agreement on the technical standards is essential both for construction and operation). Sector-specific institutions will be needed for detailed planning and coordination activities in any cross-border infrastructure.

Second, if institutional and technocratic coordination and negotiations are to be done each time a new set of opportunities arises, transactions costs become very high making such collaborations unfeasible. Hence, a systematic, comprehensive, institutionalized approach is essential for success.

Third, resources are clearly required not only for identification of projects or programs but also for the needed software aspects such as strengthening local capacity and building consensus.

Finally, it is important to design institutions in a way to provide incentives for long-term success. Harmonizing regulatory, procedural, and technical standards, environmental and other safety requirements all help reduce risks and lower transactions costs.

IV. Conclusion: The Future of Cross-Border Infrastructure in Asia

The future of the Asian region—its overall performance in terms of economic growth and poverty reduction—is closely tied to its ability to reap benefits from regional economic integration. Though logistics have not as yet become a serious constraint, we have seen that action will be required to enhance both the quality and quantity of infrastructure to improve overall efficiency. Growing cross-border economic activities in Asia have important implications for the demand for infrastructure development in the region. Infrastructure needs for feeder seaports, logistics services, etc. will continue to increase rapidly.

With the emergence of the PRC and India as important destinations for exports and sources of imports, physical connectivity to different regions of the PRC and India features prominently in Asia's infrastructure development plans. For their neighboring economies in Southeast Asia, South Asia, and Central Asia, export-related transport and logistics will be particularly important, especially those geared toward serving the PRC and/or Indian markets. For poorer countries and poorer areas within a country where infrastructure is a major constraint on economic opportunities, improved access to larger regional markets will be key to economic success. The efficiency of cross-border infrastructure connectivity will be an important determinant of a country's prospects for economic growth, employment creation, poverty reduction, and social improvements.

Through greater investment in logistics and infrastructure, Asia can further strengthen overall productivity and competitiveness. As Asia's existing physical linkages are inadequate, the region can gain more from improved cross-border connectivity—such as cross-border transport corridors on land and a series of feeder ports and regional hubs—for promoting exports and imports. This can be achieved by improving overall efficiency: new construction; rehabilitation, upgrading, and modernization of infrastructure services, equipment, and facilities; capacity building for asset maintenance; and coordination of cross-border services, harmonization of regulations, procedures and standards; and trade and customs facilitation.

Various stakeholders need to work together to ensure success in this difficult area. The following section outlines an agenda for moving forward for the Asian governments, the private sector, civil society groups, and multilateral institutions such as ADB.

Asian Governments

One of the first and foremost tasks is to recognize the enormous need for coordination and planning for cross-border infrastructure. Asian governments can take several actions.

First, candidate projects and programs for cross-border infrastructure have been identified to enhance the region's trade and integration agenda. There is a need for political leadership to support such cross-border infrastructure arising from a vision of regional cooperation based on improvements in transport and logistics efficiency and market expansion for the entire region. Asian governments need to reorient existing partnerships to deliver greater regional connectivity. Second, Asian governments could integrate some cross-border projects and programs into their countries' own development plans to demonstrate their willingness and credibility to support such initiatives. Finally, Asian governments should establish a framework

for sharing risks that are inevitable in such projects and programs. It is important for governments to develop a reliable and dependable partnership for such programs.

Private Sector

Though the role of the private sector in cross-border infrastructure has been somewhat opportunistic, the sector has brought real “additionality.” Several successful cross-border infrastructure projects demonstrate that where relationships are governed purely by commercial considerations, differences are more easily resolved. Given the public sector’s resource constraints, the private sector will have to play an increasingly important role in cross-border infrastructure. There are substantial financial rewards to be derived from regional and/or subregional cooperation in the energy and transport sectors. The private sector is expected to play a critical role in this process.

First, the private sector can bring additional financial and technical resources for cross-border infrastructure. Together with the government and other development partners, it can commercially viably structure cross-border infrastructure investment with an acceptable risk profile. Second, the private sector can provide the enormous resources needed for improving physical connectivity, through national and cross-border infrastructure investment projects. To dispel the past perception that these partnerships are often somewhat opportunistic and not based on mutual trust, the private sector is encouraged to act as a reliable and dependable partner. It needs to develop a long-term view of the return and rewards as infrastructure projects and concessions are long-term business ventures. Finally, there is no better strategy for risk sharing than to reduce the overall risk for the project; hence, due market and financial diligence remains fundamental to a successful cross-border infrastructure.

Civil Society Organizations

Most cross-border infrastructure projects and programs are high-profile investments, and often civil society organizations are opposed to them. There are several reasons for this. First, they often share serious concerns regarding environmental and social costs associated with such projects or programs. Second, the asymmetric distribution of costs and benefits between groups of stakeholders can make them pay greater attention to those groups of affected people who bear the costs in terms of loss of land, property, and livelihood, rather than the majority of people who benefit. Third, unlike national projects or programs, cross-border projects involve no single jurisdiction and hence are hard to ensure a fair system of compensation and processes. In our view, civil society groups have an important and constructive role to play in enhancing the overall outcome.

Civil society organizations can provide a rigorous system of screening and monitoring cross-border infrastructure to ensure that transparent processes are put in place for project planning and design, for project implementation, and for a fair distribution of costs and benefits between different groups of stakeholders. In this way, civil society can make a significant difference by giving an effective voice to stakeholders who have not been fairly compensated.

Multilateral Institutions

Within the European Union financial instruments are available for identification and design of cross-border projects, so as to develop a large internal market and strengthen regional competitiveness. The European Community Budget finances part of costs using “structural funds” at below market rates—hence involving some form of subsidy to promote cross-border infrastructure—and the European Investment Bank plays a significant role in funding such

projects. In the GMS, ADB has provided sponsorship support in financial resources and capacity building through its technical assistance program. Multilateral institutions like ADB can play a special role in ensuring that cross-border infrastructure complements the work being done by local and regional governments in all areas identified in the framework and actually help in the process of integration, regionally and as part of the larger globalization process. Thus the role of multilaterals such as ADB in cross-border infrastructure is multifaceted.

First, multilaterals can be a catalyst in regional integration and play a role of honest broker, bringing countries together impartially. They can facilitate the process of dialogue and discussion where countries can reach political convergence to promote regional integration. Second, multilaterals can be a technical adviser and a knowledge partner by providing expert advice, sharing lessons learned globally, and tailoring its knowledge to the specific needs and conditions in the countries. Third, as a financier, multilaterals can provide loans, technical assistance, and other risk mitigation instruments such as guarantees. Financial and technical appraisals would be important inputs, but so are environmental and social appraisals to ensure that negative impacts are mitigated and there is fair distribution of costs and benefits between different groups of stakeholders, addressing the asymmetric distribution of costs and benefits between different stakeholder groups in the project design.

Finally, multilaterals, as a coordinator, often help in facilitating resource transfers: not only their own resources but also from other development partners. Many regions have benefited from specialized funds to support the identification, design, planning, and even financing of such projects. The success of the GMS program can be attributed, in large measure, to ADB sponsorship of financial and other technical resources that supported the collective processes.

References

- ADB (Asian Development Bank). 2006a. *Asian Development Outlook 2006*. Manila: ADB.
- . 2006b. “Regional Cooperation and Integration in Asia.” Background Paper for the Asia 2015 Conference. ADB. Manila.
- . 2006c. “Central Asia: Increasing Gains from Trade through Regional Cooperation in Trade Policy, Transport, and Customs Transit.” Manila: ADB.
- . 2005. *Key Indicators of Developing Asian and Pacific Countries 2005*. Manila: ADB.
- . 2004. “Summary Environmental and Social Impact Assessment of the Proposed Nam Theun 2 Hydroelectric Project.” ADB. Manila.
- . 2003. *Asian Development Outlook 2003*. Manila: ADB.
- . 2002. “Greater Mekong Subregion Northern Economic Corridor Project. Report and Recommendation of the President to the Board of Directors.” ADB. Manila.
- Akita, Shigeru. 1999. “British Informal Empire in East Asia, 1880–1939: A Japanese Perspective.” In Raymond Dumett, ed., *Gentlemanly Capitalism and British Imperialism: The New Debate on Empire*. New York: Addison Wesley Longman.
- Arndt, Sven W. 2001. “Production Networks in an Economically Integrated Region.” *ASEAN Economic Bulletin* 18(1): 24–34.
- Carruthers, Robin, Jitendra N. Bajpai, and David Hummels. 2003. “Trade and Logistics: An East Asian Perspective.” In Kathie Krumm and Homi Kharas, eds., *East Asia Integrates: A Trade Policy Agenda for Shared Growth*. Washington, DC: World Bank.
- Das, Dilip K. 2005. “Market-Driven Regionalization in Asia.” *Global Economy Journal*, Volume 5, No. 3, Article 2. Available at <http://www.bepress.com/gej/vol5/iss3/2>.
- Dollar, David, and Aart Kraay. 2001. “Trade, Growth, and Poverty.” Paper presented at the Asia and Pacific Forum on Poverty: Reforming Policies and Institutions for Poverty Reduction. ADB. Manila.
- Fujimura, Manabu, and Christopher Edmonds. 2006. “Impact of Cross-Border Transport Infrastructure on Trade and Investment in the GMS.” Asian Development Bank Institute (ADBI) Discussion Paper No. 48. ADBI. Tokyo.
- Fujita, Yasuo, and Shoichi Hisa. 2004. “Shifting Trade Patterns—How Will They Impact Infrastructure Needs in the East Asia and Pacific Region?” Background Paper Prepared for the *Connecting East Asia: A New Framework for Infrastructure*. Joint Publication of the Asian Development Bank, Japan Bank for International Cooperation, and World Bank. Washington, DC: World Bank.
- Kawai, Masahiro. 2005. “Trade and Investment Integration and Cooperation in East Asia: Empirical Evidence and Issues.” In ADB, *Asian Economic Cooperation and Integration: Progress, Prospects, and Challenges*. Manila: ADB.

———. 2006. “East Asian Economic Regionalism: Progress and Challenges.” An updated version of the paper with the same title that appeared in: *Journal of Asian Economics* 16:1 (February 2005), 29-55.

Rodrigues, Alexandre M., Donald J. Bowersox, and Roger J. Calantone. 2005. “Estimation of Global and National Logistic Expenditures: 2002 Data Update.” *Journal of Business Logistics* 26 (2).

Sakakibara, Eisuke, and Sharon Yamakawa. 2003a. *Regional Integration in East Asia: Challenges and Opportunities—Part 1: History and Institutions*. Policy Research Working Paper Series 3078. World Bank, Washington, D.C.

———. 2003b. *Regional Integration in East Asia: Challenges and Opportunities—Part 2: Trade, Finance and Integration*. Policy Research Working Paper Series 3079. Washington, DC: World Bank.

Sugihara, Kaoru. 1990. "Japan as an Engine of Asian International Economy, c. 1880–1936." *Japan Forum* 2:1, 127–45.

United Nations Conference on Trade and Development (UNCTAD). 2005a. *Trade and Development Report, 2005*. UNCTAD. Geneva.

———. 2005b. *World Investment Report 2005: Transnational Corporations and the Internationalization of R&D*. Geneva: UNCTAD.

United Nations Development Programme (UNDP) Regional Bureau for Europe and the Commonwealth of Independent States (CIS). 2005. "Chapter 3: Regional Cooperation to Promote Trade and Investment." In *Central Asia Human Development Report 2005: Bringing down Barriers: Regional Cooperation for Human Development and Human Security*. Bratislava: UNDP Regional Bureau for Europe and CIS.

Wilson, John S., Catherine L. Mann, and Tsunehiro Otsuki. 2004. “Assessing the Potential Benefit of Trade Facilitation: A Global Perspective.” Policy Research Working Paper No. 3224. Washington, DC: World Bank.