2

Inclusive Development

What is inclusive development?

Inclusive development is about improving the incomes and lives of all members of society, particularly the poor. It depends on generating economic growth, sharing its benefits with the poor, and enhancing their access to basic services.

As we shall see, infrastructure is essential to generating growth; to including communities, workers, firms and regions in that growth process; and to bringing services to those who need them most.

Development, inclusiveness, and infrastructure

As we saw in Chapter 1, economic development in East Asia has typically been inclusive, benefiting the poor, as well as the nonpoor. Integration among and within countries has fostered high economic growth overall, and the fruits have generally been shared. Inclusive development has brought political cohesion and social stability through mutual interdependence. Infrastructure has underpinned that interdependence, and has played an essential role in making development inclusive.

But there is no assurance that this will continue into the future. Significant income disparities have developed in East Asia: between low- and high-income countries in the region, and within countries. The structure of growth in many Asian countries has been changing. The divide between rural and urban areas is growing. Within rural areas there are some pockets of deep poverty, often with an ethnic minority dimension.

Coastal areas are prospering and are well-connected to global markets; remote and landlocked regions are lagging behind. Peri-urban areas are becoming a volatile halfway house for migrants, urban environments are under population pressure, and congestion is choking broad-based growth.

This chapter is about how infrastructure can reinforce inclusive development in East Asia. It is about what we can expect infrastructure to do for growth and poverty reduction in the region. And it's about what makes "good" infrastructure. As we shall see these are complex issues, and so we will have to address them in a number of ways.

This chapter has four sections. The first looks at what's so different about infrastructure—at what infrastructure is—and how this relates to the principal themes of this study. This has important implications for how we get infrastructure to serve the goals of inclusive development, and—as we see in Chapter 4—for accountability.

In the second section, we shift our emphasis. From looking at what infrastructure is, we consider what it does. Infrastructure connects. We look first at how infrastructure connects conceptually—linking growth and poverty reduction into a mutually reinforcing relationship. In the third section, we look at the role of infrastructure in connecting East Asia to the global economy and fostering regional integration. Finally, in the last section, we take our analysis to the country level and look at how inclusive development has played out in the case of Vietnam.

Box 2.1 Inclusive development with Chinese characteristics

When China's economic reforms began in the late 1970s, Deng Xiaoping coined the phrase *xiaokang* (or "well-off society"). Initially, *xiaokang* was defined solely by GDP per capita targets.

But in recent years, *xiaokang* has taken on a broader meaning. In 2002, the Sixteenth National Congress of the Communist Party of China established the objective of building an "all-inclusive" *xiaokang* society over the next two decades, in which prosperity is both created and shared. This concept also underpins Premier Wen Jinbao's statement that China's development strategy should be in accordance with "five balanced aspects": balancing urban and rural development, balancing development among regions, balancing economic and social development, balancing man and nature, and balancing domestic development and opening to the world (Wen 2004). Infrastructure has a central role to play in the balancing act to create the *xiaokang* society.

What is so different about infrastructure anyway?

Infrastructure is not like shoe factories, schools, or supermarkets—all of which can potentially contribute to inclusive development in different ways. Infrastructure, and the services it provides, have some rather peculiar features that shape its contribution: features that require specialized mechanisms to facilitate coordination, both vertical and horizontal (chapter 3); that give rise to a number of common risks; and tend to entail a particular set of institutions in the structuring of accountability relationships among the various actors involved in infrastructure (chapter 4). What are those peculiarities?

Infrastructure services tend to be capital intensive and exhibit economies of scale

The provision of large-scale electricity or transport services, for example, generally requires higher capital intensity than the provision of large-scale education or health services. Such infrastructure services can therefore suffer high risk, long gestation, and long payback periods—but enjoy substantial economies of scale. Including more users can greatly enhance the viability and affordability of the service (although this raises coordination and accountability challenges). In some cases, the inclusion of more users can even enhance the value of the service to each individual user (for example, I want as many other people as possible to be on my phone network, or as many locations as possible to be on my rail network). Indeed, it is often the network nature of infrastructure that brings the economies of scale.

Conversely, providing infrastructure services on a small scale can be expensive. But small can also be beautiful, because it may involve low risk, limited need for coordination, or a positive environmental impact—these factors can be worth the extra unit costs.

Infrastructure is usually lumpy rather than incremental

Infrastructure tends to come in lumps, and those lumps tend to form networks. To be useful, roads connecting population centers do actually need to go all the way and join other roads. A power plant with only 10 percent of a turbine is not a power plant, and a power plant without a

transmission and distribution grid doesn't provide many people power. An urban water supply system can't function with only half a treatment plant, and a whole treatment plant needs an extensive water distribution system to be justified.

Of course, some infrastructure can be incremental—for example, a wind turbine, a borehole, a household boiler, a septic tank, or a feeder road. Such infrastructure can be crucial in particular circumstances, such as in rural or peri-urban areas, to realize environmental benefits, or to overcome financing and risk constraints. Or incremental approaches may facilitate community participation in governance (lumpy infrastructure has a strong association with top-down institutions). Incremental infrastructure can certainly be the best available option for a particular community of end users. But with current technology, lumpy infrastructure will usually be the cheapest way of providing for large-scale general use.

Infrastructure is long-lasting

After you've built it, it's probably going to be there a long time, even if inattention to maintenance reduces its useful life. A port, a street system, a sewerage network, mass transit, or a hydropower dam can last for decades. Once built, it can define for many years how and where people live and work. It can define which areas prosper and which stagnate, who accumulates wealth and who does not, who exercises power and who has little voice. In short, who is included in development and who is not.

Periods of rapid urbanization present massive opportunities and challenges, and can shape economies and societies profoundly. For some sectors, periods of rapid technological change can radically change what previously made sense.[1]

So risks are high, and infrastructure mistakes can haunt you for a very long time. Missing windows of opportunity can cost dearly, and so can locking in the wrong solutions. Long-term vision matters enormously.

Infrastructure is space-specific and use-specific

Shoe factories, schools, and supermarkets can change locations, or the space can easily be used for a different purpose. Some harbors have become leisure centers and power plants museums, but most infrastructure can't go anywhere else or do something new (and its scrap value can be low).

Infrastructure therefore makes a good hostage. With high sunk costs, revenues can be driven way down and operation will continue (as long as variable costs are covered, it's worse to stop than to carry on). At the same time, those sunk costs and space-specificity mean monopoly power is quite likely. A hostage with monopoly power can attract predators, particularly when the services it provides are politically sensitive. Consequently, infrastructure faces considerable political risk (and this is not just a private sector problem; public infrastructure can also be kidnapped by rent-seekers).

And space-specificity can bring local social and environmental impacts: Dams displace people living nearby, vehicles kill people where roads are located, airports bring noise to host communities, power plants emit noxious chemicals locally, and untreated sewage presents a health hazard for neighbors.

Infrastructure is complicated: It provides inputs for multiple purposes simultaneously—and does so along with multiple noninfrastructure inputs

Infrastructure is intertwined with the fabric of our economic and social lives, and connects us to one another. For example, water reticulation can simultaneously be the energy source for electricity, the provider of drinking water and sanitation to households, the source of fertility for food production, the source of steam for chemicals production, the carrier of heat for homes, and a medium of transport for people and goods. But that water helps produce chemicals, for example, only if there are skilled and healthy workers available, capital to fund the business, and a host of other services to help it operate and sell its products. Infrastructure is useless in isolation.

The fact that so much of our lives depends so intricately on infrastructure services makes their provision very important both economically and politically—but also intrinsically hard to value. A disruption to water or energy supply, or a breakdown in transport or telecommunication services, can have incalculable economic, environmental, and social reverberations. These disruptions can be very expensive to prevent. Correspondingly, reliable provision of those services can have benefits well beyond the revenues accruing to the provider of those services; but do we know what those benefits are worth?

Knowing that infrastructure per se is important is very easy; measuring the precise importance of a particular piece of infrastructure is very difficult. Our world would be unimaginable without electricity, but that doesn't mean it's the highest priority for every village. Choices are all the more complex when programs of infrastructure are involved. Infrastructure priorities are hard to measure and choices hard to make. But choices do need to be made about infrastructure, so we need to understand what impacts it has, how the impacts are channeled, and what they depend on.

Connecting growth, poverty reduction, and investment through infrastructure

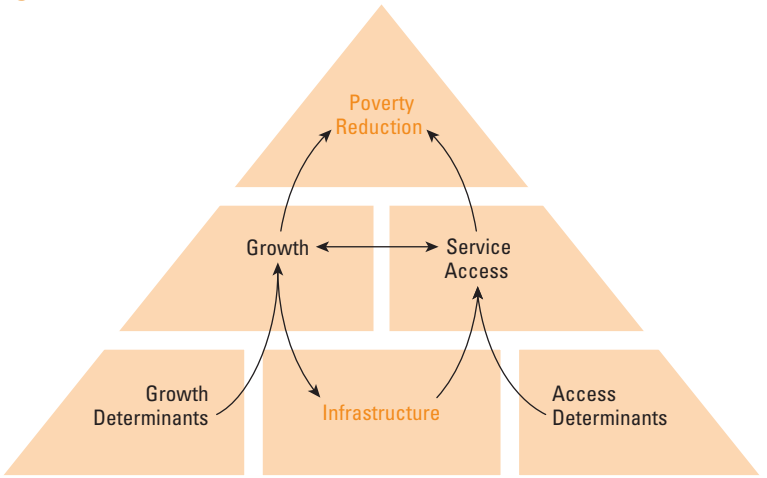
This study is about the connecting role of infrastructure. We can think of this in a number of ways. Here we start with the connecting role that infrastructure plays in a series of mutually reinforcing relationships that link growth and poverty reduction—a subject on which the development world has come to broad consensus.[2]

In the first place, infrastructure provides people with services they need and want. Water and sanitation; power for heat, cooking, and light; telephones and computer access; and transport all make immeasurable differences in people's lives. The absence of some of the most basic infrastructure services is an important dimension of what we often mean when we talk about poverty.

Infrastructure also has an impact on the activities through which people earn their livings. It contributes to the health and education that people need to fill jobs, or create them. But infrastructure is also an intermediate input into production. Without power and water, all but the most basic production processes would grind to a halt. Infrastructure raises the productivity of factors of production—by generating the power that allows factories to mechanize, by allowing workers to get to work quicker, or by providing the networks through which information can pass electronically. Infrastructure connects goods to markets, workers to industry, people to services, the poor in rural areas to urban growth poles. Infrastructure lowers costs, enlarges markets, and facilitates trade.

In sum, infrastructure impacts on poverty in two ways: First, it supports the processes of growth on which much poverty reduction depends; and second it helps the poor access basic services that can improve their lives and income opportunities. And at its best,

Figure 2.1 Links among infrastructure, poverty reduction, and growth



infrastructure can draw poverty reduction, service provision, and growth into a reinforcing cycle: More growth enables providers to expand services, while enabling users to afford these services. Further service provision encourages more growth. And stronger growth and better access to services both lead to greater impacts on poverty reduction (Figure 2.1).

What of the empirical literature on the impacts of infrastructure on both growth and poverty reduction? Of 102 studies conducted over the last 15 years into the impact of infrastructure on growth and productivity, a majority find positive impacts. In the case of developing countries, all studies show positive impacts (See Table 2.1, and Briceno, Estache and Shafik (2004) for more details). Using cross-country data, a number of studies have confirmed the significant impact on output of telecommunications and roads in particular (for example, Röller and Waverman 2001; Demetriades and Mamuneas 2000; Canning 1999 and Fernald 1999). Using a related approach, one analysis (Canning and Bennathan 2000) found that, in developing countries, rates of return to infrastructure are higher than for overall capital investment, while in industrial countries returns equalized. This implies that developing countries have underinvested in infrastructure (particularly in roads in middle-income countries and electricity in poor countries).[3]

Table 2.1 Distribution of study findings on impact of infrastructure investment on productivity or growth

Area studied	Number of studies	Percentage showing a positive effect	Percentage showing no significant effect	Percentage showing a negative effect
Multiple countries	30	40	50	10
United States	41	41	54	5
Spain	19	74	26	0
Developing countries	12	100	0	0
Total/average	102	53	42	5

Source: de la Fuente and Estache 2004.

Other studies found that public expenditure on transport and communications significantly raises economic growth (for example, Easterly and Rebelo 1993; Miller and Tsoukis 2001), although one study found a negative relationship between the share of infrastructure spending in total public expenditure and economic growth (Devarajan, Swaroop, and Zhou 1996).

The specific impact of infrastructure on welfare, especially of the poor, has been studied in a number of ways, and departs from how one defines poverty. The narrowest poverty definitions focus on incomes and livelihoods, measured, for instance, by the "dollar a day" poverty line. In terms of this approach, the impact of infrastructure on poverty is measured through the degree to which infrastructure increases the real incomes of the poor (for instance, by reducing the costs faced by the poor for services they use); the degree to which infrastructure opens up employment opportunities; and the degree to which infrastructure enhances the productive assets on which the poor depend (for instance, when access roads increase the value of land owned by the poor).

But poverty can be defined more broadly, reflecting some of the key dimensions identified in the MDGs (See Box 2.2). Here, research into the impact of infrastructure on poverty has examined the extent to which infrastructure improves access to education and health services (transport, communications, and power infrastructure are likely to play roles here) as well as the impact of improved water and sanitation services on health.

And perhaps the widest definition of poverty focuses on enhancing social inclusion, human capabilities, and freedoms. Such approaches might focus on the impact that transport and communications infrastructure have in improving people's ability to engage in collective

Box 2.2 Infrastructure and the Millennium Development Goals

The Millennium Development Goals (MDGs)—the international community's agreement on the goals for reducing poverty—include eight objectives to be achieved by 2015. The goals are as follows:

1. **To eradicate extreme poverty and hunger—**

   Halve the proportion of people living on less than $1 a day.

   Halve the proportion of people who suffer from hunger.

2. **To achieve universal primary education—**

   Ensure that boys and girls alike complete primary schooling.

3. **To promote gender equality and empower women—**

   Eliminate gender disparity at all levels of education.

4. **To reduce child mortality—**

   Reduce by two-thirds the under-five mortality rate.

5. **To improve maternal health—**

   Reduce by three-quarters the maternal mortality ratio.

6. **To combat HIV/AIDS, malaria, and other diseases—**

   Reverse the spread of HIV/AIDS.

7. **To ensure environmental sustainability—**

   Integrate sustainable development into country policies and reverse loss of environmental resources.

   Halve the proportion of people without access to portable water.

   Significantly improve the lives of at least 100 million slum dwellers.

8. **To develop a global partnership for development—**

   Raise official development assistance.

   Expand market access.

How does infrastructure relate to the MDGs, and how is this relationship addressed in this study?

Poverty and infrastructure are at the core of the concept of inclusive development around which this report is written. In this chapter we look at poverty from three angles, and consider how infrastructure in each of the sectors makes an impact. We look not only at income poverty (MDG 1), but also the impacts of infrastructure on education, health, and the environment (with impacts on MDGs 2, 4, 5, 6 and 7).

Some of the channels through which impacts are felt are not as obvious as might be expected. It may seem intuitive that the ability of people to earn a living is increased when transport, information, power, and water are readily available. But infrastructure has some less obvious impacts—one study we

(Continued on the next page)

Box 2.2 (Continued)

refer to, for instance, examines the impact of transport and electricity on education. The impact of health services may be similarly affected by the ability of the poor to access facilities. A road, or a telephone call, can make an enormous difference.

Poor access to water and sanitation is an important part of the discussion about poverty, and this is addressed in the seventh MDG (environmental sustainability). But the role of infrastructure in the environment is much wider than this. In Chapter 1, we focus on the challenges of mainstreaming environmental issues, although the environmental theme cuts across this study.

Finally, the role of infrastructure in creating livable cities and providing service to slum dwellers is a theme of Chapter 1 and is included in our discussion of urban management in Chapter 3.

activities, access wider sources of information and opportunity, or make time for both economic and noneconomic purposes (particularly for women in cases where they bear principal responsibility for water and energy provision for the household).

Empirical analysis sheds some light on the magnitude of infrastructure impacts on welfare, defined in these ways. Some studies show that water and sanitation access explains a substantial portion of the difference in infant and child mortality rates experienced by rich and poor, that better transportation increases school attendance, and that electricity access allows more study time (see Leipziger, Fay, Wodon and Yepes 2003). Another study (Calderon and Serven 2004) found that infrastructure quantity and quality—particularly water and sanitation—have a strong positive impact on income equality, as well as on economic growth. And a further study showed that enhanced access to roads and sanitation has been an important determinant in reducing disparities between the poorer and richer regions of Argentina and Brazil (Estache and Fay 1995). Studies of rural roads have shown they raise the productivity and value of land for poor farmers (for example, Jacoby 2000).

Rural roads have been found to have a substantial positive impact on overall poverty reduction in a number of other studies, but there are some interesting nuances. One found that rural roads were the form of public expenditure that reduced poverty most effectively in India (Fan 2003). For China, the same study found that they were the most effective form of public expenditure on infrastructure, but that expenditure on education and agricultural research and development was a more effective means of

reducing poverty. A study of rural roads in the Philippines (Balisacan and Pernia 2002) found access to these roads is important for poverty reduction, and that the impact is increased if the roads are coupled with education expenditure. By contrast, this study found that the very poorest households lacked the minimal income and complementary facilities necessary to benefit from access to electricity.

Table 2.2 spells out some of the impact of infrastructure on poverty in more detail. Although precisely how any set of infrastructure undertakings would affect poverty depends very much on country context (Box 2.3). Most important the literature emphasizes that infrastructure is effective only when combined with other interventions.

None of this implies, however, that everyone benefits from investments in infrastructure, nor even that they benefit equally. While broad-based impacts on poverty may often be positive, the local socioeconomic

Table 2.2 Potential positive impacts of infrastructure services on the poor

Sector	Direct impact on poor	Indirect impacts on poor
Electricity	Mainly for lighting, TV, radio at low levels of income.	Reduced energy costs for enterprises encouraging employment creation across wide range of activities
	Heating, cooking, appliances for self-employment at higher levels of income	Improved health and other services (refrigeration, lighting, and so on)
		Improves ICT access
Piped Gas	Limited impact at low-income levels	Reduced energy costs for enterprises encouraging employment creation (limited range of activities)
	Heating, cooking at higher levels of income	
Roads	Access to employment and markets	Reduced transport costs and improved market access for enterprises and service providers, lowering costs of serving remote communities
	Access to services (health, education)	
Railways	Limited	Reduced costs and improved market access for enterprises
Urban Mass Transit	Access to employment opportunities	Employment creation from more efficient labor markets
Ports	Limited	Reduced transport costs for enterprises encouraging employment creation (for example, bulk commodities like agriculture)
Airports	Limited	Reduced transport costs for enterprises encouraging employment creation (high-value, low-bulk commodities and services)
Information and Communications Technology (ICT)	Better communication access, aiding migration, information on opportunities, access to knowledge, and potential engagement in wider communities	Employment creation through improved knowledge of markets, reduced management supervision costs, access to wider knowledge base
Water Supply	Improved health outcomes; time savings; lower costs	Limited
Sanitation	Improved health outcomes	Improved health outcomes (for example, reduced pollution by nonpoor households and others)

Source: Jones 2004a.

Box 2.3 The importance of infrastructure in particular poverty reduction programs varies

While infrastructure has an important part to play in addressing poverty, the nature of its role may vary depending on the nature of poverty in a particular setting.

Where there is mass poverty, affecting large proportions of the population throughout a country, infrastructure investment may be an important part of a broader strategy for poverty reduction and economic growth, although precise priorities will vary depending on the context.

Where poverty is highly location-specific (for instance, in remote highland areas) and clearly linked to geographic remoteness or poor access to key services (for instance, water supply and sanitation in urban slums), a targeted strategy of improving infrastructure provision to areas of high poverty concentration may be the single most important element of a poverty reduction strategy.

In some cases, however, countries may choose to place significantly less emphasis on infrastructure investment in pursuing poverty reduction. This may be the case, for instance, when poverty affects a relatively limited proportion of the population and depends on factors other than those directly related to geographic remoteness—for example, factors like caste, histories of discrimination against particular ethnic groups, and cultural or other factors that present limited education attainment or employment opportunities for certain groups.

Source: Jones 2004a.

impacts from infrastructure development can sometimes be negative, unless deliberately mitigated. For example, hydropower might provide inexpensive electricity to large numbers of consumers, yet displace people living and working in the vicinity of the hydropower dam, or negatively affect their agricultural land or fishing grounds.[4]

At the same time, there may be genuine choices to be made among infrastructure investments that affect aggregate growth and poverty reduction unequally: between investment with strong poverty-related impacts, but limited implications for short-run aggregate growth—for instance, rural water supply—and investments with strong growth focus, but limited poverty reduction impacts.

Institutions often need to make choices covering the trade-offs between the interests of different groups of poor and nonpoor, so that the two groups may share the benefits of infrastructure equitably. Participation of affected groups in decision making is one measure that can help—a theme we pick up in Chapter 4, on accountability and risk management.

Making the links: Infrastructure, trade, and logistics[5]

We can look at how these inclusive development issues play out both regionally, and within a particular country. As we saw in Chapter 1, trade and regional integration have helped distribute the benefits of growth. The role of infrastructure in sustaining this process, in particular that of logistics, is the subject of this section. In our next section, we'll trace some of the links among infrastructure, growth, and poverty reduction through a case study of Vietnam.

Getting the goods to market has been the key to East Asia's prosperity. Trade has been a crucial ingredient in the rapid growth of much of the region, and it is likely to remain so. Sharing in the region's growth, particularly for the poorest in the region, will depend heavily on countries' ability to carry out infrastructure investments and improve the efficiency of delivery of infrastructure services, in support of regional trade opportunities.

For some countries of East Asia—in particular, land-locked Lao PDR and Mongolia—effective regional infrastructure cooperation will be crucial. Box 2.4 sets out how the participation of Lao PDR in the GMS has enabled it to take advantage of its geographic location to pursue its development objectives through greater regional integration.

The case for regional infrastructure coordination is broader than just trade alone. Regional infrastructure coordination can play an important role in lowering infrastructure costs. It has been estimated, for example, that a full-trade energy scenario within the GMS would save the member states more than $10 billion over a 20-year period when compared with the other extreme of individual national self-sufficiency (Crousillat 1998). Interconnection could also significantly reduce future project-related environmental impacts throughout the subregion.

Superior logistics and low transport costs have been an important aspect of East Asia's outward-oriented growth. This is particularly so in the region's most impressive long-term performers—Hong Kong (China), Japan, Korea, Singapore and Taiwan (China)—but also in a number of developing countries—China, Malaysia, the Philippines, and Thailand (Figure 2.2).

Until recently, East Asia has been largely competitive (although performance varies across countries—see Box 2.5). Right now, however,

Box 2.4 Inclusive development on a regional scale: Opportunities for landlocked Lao PDR

Lao PDR is a land-locked country bordered by Thailand, Cambodia, Vietnam, China, and Myanmar. It is one of the poorest and least developed countries in the region, with per capita income estimated at US$320 in 1998. Despite growth achieved in the last decade, the social indicators of Lao PDR are among the worst in the region. There are few economic opportunities in Lao PDR with its sparse population to address development challenges.

The membership of Lao PDR in the GMS—which brings together five other neighboring partners (Cambodia, Myanmar, Thailand, Vietnam, and China's Yunnan Province)—has enabled it to take advantage of its geographic location to pursue its development objectives through greater regional integration.

Over the 12 years of its existence, the GMS has steadily evolved from a disparate collection of wary neighbors into a highly effective but informal collaboration that can now point to numerous successful cross-border infrastructure investments.

GMS members have identified nine priority sectors: transport, telecommunications, energy, tourism, human resources development, environment, agriculture, trade, and investment.

To focus on regional integration through infrastructure, individual subregional forums have been established for electric power, telecommunications, and transport.

One of the concepts favored by the GMS is that of the development of economic corridors, focusing on road investments to improve access, institutional and policy changes for trade facilitation, and transit policies to reduce logistic costs.

Traversing the subregion and reflecting primary transport routings, five economic corridors (two north-south, one east-west, and two southern) have been identified; several road investments are under way within these corridors, while feasibility studies are addressing prospective railway improvements. Plans for regional power interconnections and a telecommunications backbone have also been drawn.

These investments promote inclusive development for large remote areas of land-locked countries, such as Lao PDR and parts of China.

Among these undertakings is the Northern Economic Corridor project, which links Thailand and China through a short road link via northern and remote parts of Lao PDR.

In addition to hard infrastructure investments required to create a trade and transit corridor, the project included components that will benefit local communities along the road. A social action plan comprising community roads, small water and sanitation schemes, education and HIV/AIDS awareness programs, and local capacity building programs were integral parts of the project design. These components were planned in a participatory process involving large numbers of ethnic minority groups.

The project was funded through resources from two primary beneficiaries (Thailand and China) with catalytic support from multilaterals.

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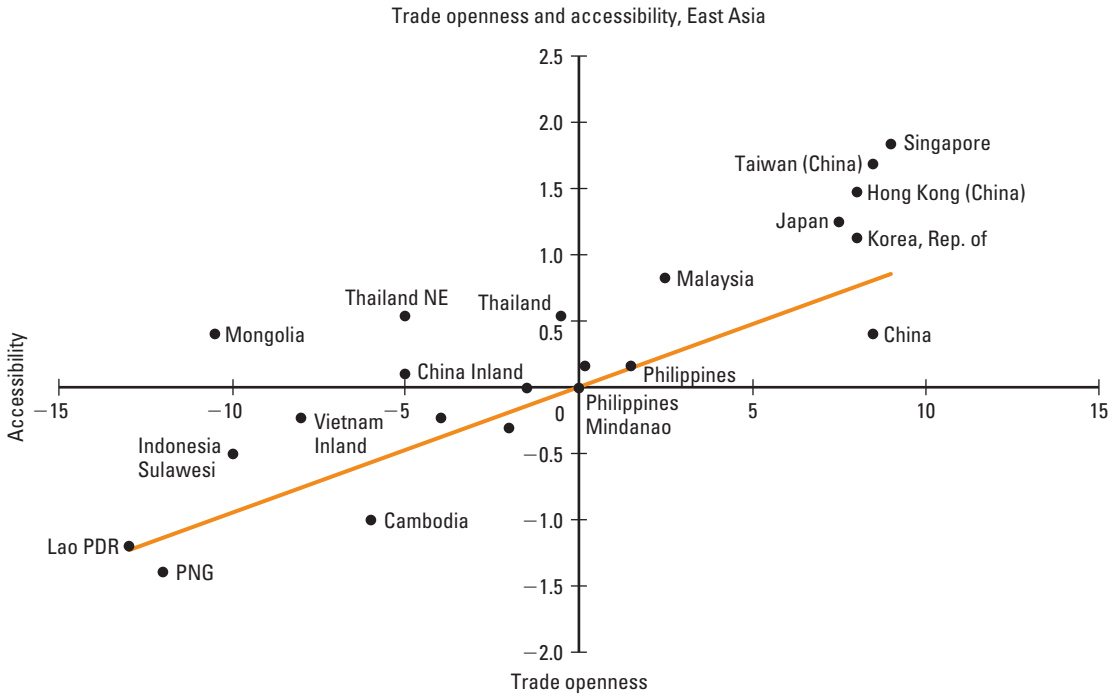
Box 2.4 (Continued)

The multilateral role was three-fold: First, to help mobilize resources; second, to assist in project design to ensure not only greater regional connectivity, but also that isolated regions like Lao PDR would be included; and third, to promote pricing policies that would maintain newly created assets without undue fiscal burden on participating countries.

A number of similar projects that seek to coordinate regional infrastructure are under way in the region. The development challenge is to ensure that they're able to replicate, and scale up, some of the features that are proving so important to Lao PDR. The challenge, in short, is to design infrastructure that truly promotes inclusive development on a regional scale.

Source: ADB 2002.

Figure 2.2 In the most open economies of the region, logistics costs are typically much lower



Source: Carruthers, Bajpai, and Hummels 2003.
Note: The measures of trade openness are based on those indicated in the *Global Competitiveness Report*, 2001–02 (World Economic Forum 2002). Values for countries not included in the *Global Competitiveness Report* have been added using World Bank assessment, in keeping with those of the World Economic Forum. All values have been normalized for the countries of East Asia. The measure of accessibility are based on the cost of transporting a standard TEU (twenty foot equivalent units) from the metropolitan region of the largest port to Hamburg. For inland regions, the land transport cost to the metropolitan region has been added. PNG = Papua New Guinea.

Box 2.5 East Asia's logistics challenge—country differences

East Asian countries differ in their logistics capabilities and their logistics challenges. One logistics study attempts to classify them into four groups.

Group 1 includes those that are outward orientated and highly accessible, that is, have low transportation costs and superior logistics. These include Singapore, Hong Kong (China), Korea, and Taiwan (China).

And then we have the developing countries that approach the Group 1 model to varying degrees.

Group 2 includes those countries that have open trade but face serious logistics challenges to inclusive development (Thailand, the Philippines, Malaysia, China, and Indonesia). In these countries, policies and institutions to encourage multimodal transport are at an early stage of development. Transport inefficiencies persist in some parts of these countries, particularly in rural areas. Penetration of third-party suppliers of logistics services (3PL) is generally low.

Group 3 includes the less open but accessible countries (Cambodia and Vietnam), while *Group 4* includes the land-locked and island countries (for example, Mongolia, Lao PDR, and Pacific island states).

The countries in Group 3 and Group 4 are either former socialist economies or are small island states dependent on a small number of commodities and tourism. History or geography largely explain the small role of international trade in their economies, although for some the situation is changing rapidly (for example, Vietnam).

In Group 3 and 4, countries lack adequate transport infrastructure. Roads are frequently closed or impose high vehicle operating costs, customs clearance is slow, border delays can be long, ports are often expensive and inefficient, and intermodal transport is generally poorly integrated. Government transport policies lack consistency and predictability, and policy coordination among different agencies and tiers of government is generally poor. Logistics services are rudimentary.

Source: Carruthers, Bajpai, and Hummels 2003.

the efficiency of East Asia's logistics is falling behind, with costs of transportation representing a high proportion of the final price of goods.

Higher logistics costs in East Asia stem from a number of factors: inadequate transport infrastructure, underdeveloped logistics and transport services, and bureaucratic (and sometimes corrupt) import and export procedures. Much of the problem is behind the border, and indeed beyond the port. The cost of internal access to ports is greater than the costs associated with the ports themselves or with maritime transport.[6] This has limited the spread of the benefits of trade-induced growth to areas beyond those adjacent to ports and has created congestion near the ports.[7] Reducing logistics costs is therefore crucial to inclusive development.

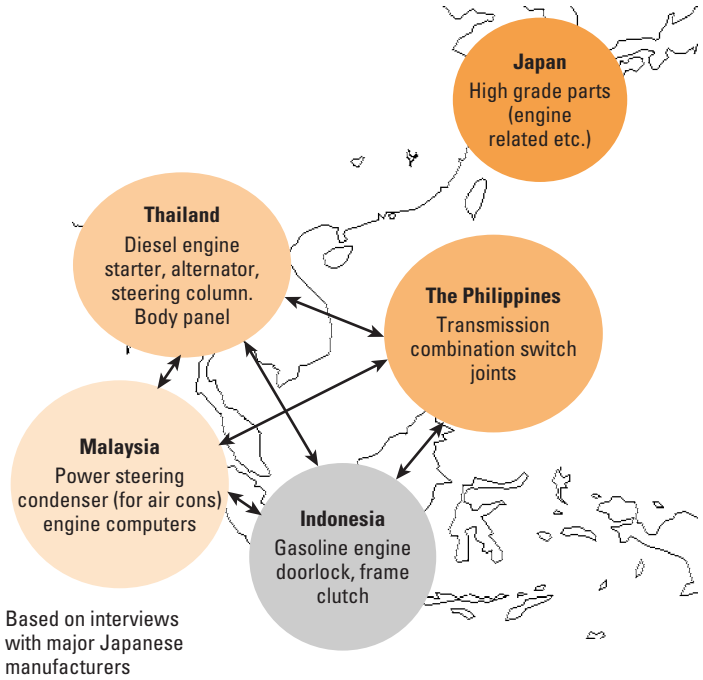
Significant benefits are likely to arise from improved logistics. Imported goods would become cheaper to inland consumers, raising real disposable income. A greater variety of goods would become competitive, raising living standards through increasing choice. Expanded input variety in manufacturing can also increase productivity. For exports, ex-factory or ex-farm prices would increase, as will the associated land values and wages. Exports of a wider range of products to a wider range of markets would become possible.[8] Increasingly larger areas of inland East Asia would be connected to international markets (and coastal domestic markets also).

Improvements in logistics would also reduce a number of risks to individuals, firms, and the economy as a whole, in a number of ways. For example, the product diversification just mentioned protects incomes against volatile prices for specific commodities. Similar arguments apply to market diversification. So too, in the case of agricultural commodities, efficient logistics allows surplus regions to sell to deficit regions, dampening price and income fluctuations. This is particularly important in countries where agriculture constitutes a large share of GDP and rural poverty is high (for example, Lao PDR, Cambodia, and Vietnam). Finally, improved logistics can also reduce uncertainty about delivery schedules, thus allowing producers and retailers to lower inventory levels, which they hold as insurance against late delivery. This, in turn, could lead to lower production costs.[9]

And countries that have good logistics are more able to participate in global production chains. In East Asia, this is particularly important for the electronics and automotive industries (see Figure 2.3 on Japanese auto manufacturing), in which the production process can include a number of countries. Participation in global production chains can help enhance the value of exports—an especially important development for those countries in which manufacturers are low skilled and low wage.

East Asia therefore faces a number of logistics challenges. As countries move progressively into more complex and higher-value manufacturing, and greater integration into global production chains, logistics requirements become more sophisticated. A greater premium is placed on short transit times, certainty of delivery schedules, careful handling of goods, certification, and standardization of product quality, and security from theft. The quality of freight-forwarding, warehousing, storage, packaging, and trucking services becomes more important, as does e-business use and the associated telecommunications infrastructure. Logistics

Figure 2.3 Interdependence of auto manufacturing within ASEAN



Source: Nomura Research Institute, Ltd. 2004. Reprinted with permission from JBIC.

software issues are often as important as transport infrastructure hardware.

Rapid growth in containerized shipping represents a revolutionary technological change, but presents perhaps the major logistics challenge in East Asia. Regional ports are increasing their efficiency in container handling, but they are running out of berth space. Between 1980 and 2000, the capacity of the container fleet on East Asian routes increased by 20 percent a year, but the capacity of container berths increased by only 8 percent a year. However, expanding capacity requires greater land use, and municipalities are finding it increasingly difficult to accommodate the additional space requirements and the associated congestion in adjacent areas.

The solutions are multiple. In some cases, new ports can be built, or feeder ports currently serving hub ports can expand their direct services

instead. In other cases, nonmaritime port activities (mostly value-added production and packaging services) can be moved closer to the industries they serve, and rail links can be built from those industries to the port to avoid road congestion.

In East Asia, containers are often used only for maritime transport, and are stuffed and unstuffed in the ports. But encouraging door to door movement of containers using multimodal transport could spread trade benefits across even larger areas. Here, remedial measures include adapting the rail and road vehicle fleet to carry loaded containers; contracting out logistics to 3PL,[10] regulatory reform to allow single trade documentation for all transport modes and clearance of containers away from port locations; effective communications systems for freight forwarders; and improved coordination among agencies responsible for different modes of transport.

Issues of coordination—the subject of our next chapter—feature prominently in the broader measures required to address East Asia's logistics challenge, in particular, coordination across national boundaries and in urban management.

Cross-border facilitation would yield major efficiency gains in East Asia (although less so for countries that are already both highly accessible and highly open—see Box 2.6). This requires coordination among countries and could be achieved through harmonization and simplification of customs procedures, information-sharing, customs modernization, establishment of transparent transit rules, and postentry compliance audit.[11] For all countries, streamlining and coordinating security procedures in the post-9/11 environment would enhance trade facilitation.

Additionally, urban governments need to implement land use policies for the location of logistics infrastructure and ports that internalize externalities.[12] This is not easy. Firms cluster together because it is to their mutual advantage. The positive productivity externalities they experience include the stimulus to innovation, information exchange, access to inputs, and specialized skills—the agglomeration economies. These become more important as production moves up the value-added chain, and they are a significant part of the high-growth story in East Asia. But, of course, firms do not take into account the effect their own move has on overall congestion and pollution—the negative externalities—that can ultimately choke growth and the urban environment. And so the urban management policy challenge is to trade off the positive and

Box 2.6 Integration of ports and land transport networks in Korea

Korea has one of East Asia's most developed land access networks to its ports, making use of road and rail links to the ports of Pusan and Kwangyang, the latter alongside a major steel mill and industrial complex and now in its second stage of development with a potential capacity of 2.4 million TEU (twenty foot equivalent unit, size of a standard container). Both Pusan and Kwangyang have been planned in conjunction with major road and rail links to Korea's major manufacturing regions. Pusan in particular has adopted a strategy of encouraging people to live and work in the city and, for this reason, has developed a new port area away from the downtown area to allow the original port area to be redeveloped for residential and commercial use. This has reduced traffic congestion and air pollution, and improved logistics efficiency has made the new port easier to reach from the city's industrial areas and the rest of Korea.

The Yangsan inland container terminal has been constructed to relieve port-generated traffic congestion and environmental problems resulting from the massive transport movements the port generates. Another inland container terminal (ICD) is under development in the center of the Korean peninsula to serve the growing industrial zones on the west coast and in the central region of the country. Together with the ports, the ICDs are part of a logistics system based on an advanced electronic data interchange (EDI) and information service. In this way, Korea will be able to maintain the competitiveness of its industrial base, while moving its manufacturing away from the existing congested urban areas and spreading its benefits more widely throughout the country.

Source: Carruthers, Bajpai, and Hummels 2003.

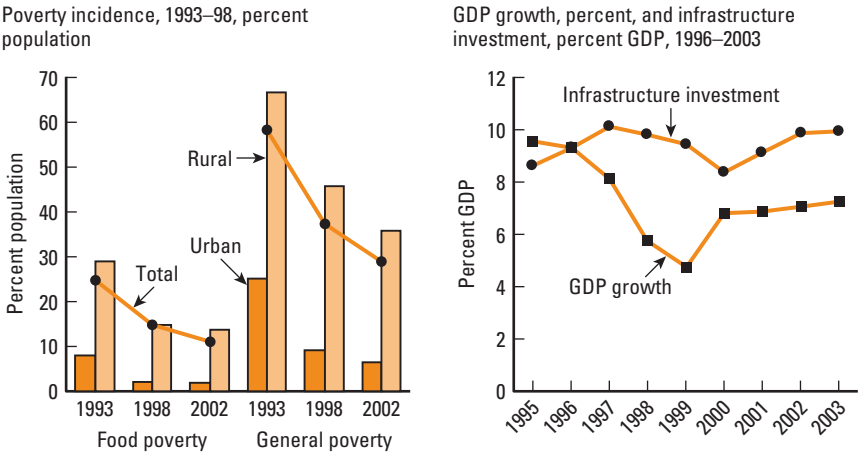
negative externalities for urban areas, and to do so in coordination with national or regional strategies for inclusiveness.

Focus on Vietnam: Infrastructure and inclusive development

In the last section, we looked at the connecting role that infrastructure plays across the region, enlarging markets and facilitating trade. In this section, we drill down a little further into the role of infrastructure in fostering inclusive development in one of the region's best performers: Vietnam.

Over the last decade, Vietnam has grown at an annual average rate of 7.6 percent, placing it among the fastest growing countries in the world. Economic development has also been remarkably pro-poor, lifting

Figure 2.4 Vietnam: Poverty, growth, and infrastructure



Sources: Vietnam Development Report, 2004; General Statistical Office of Vietnam (1996, 1998, 1999, 2000, 2001, 2003); World Bank calculations.
Note: Infrastructure investment includes the following infrastructure categories: transportation, telecom, water, gas, and electricity.

around 20 million people out of poverty in less than a decade.[13] In fact, Vietnam is one of the best performers in East Asia in terms of elasticity of poverty to growth (4 out of 23 in an analysis of middle- and low-income countries), with one extra percentage point of GDP growth leading to a decline in the poverty rate by slightly more than 1 percent.[14]

Infrastructure and investment have been an important part of this story, complementing the country's many targeted poverty reduction initiatives.[15] Approximately one-third of GDP has been directed into capital investment (44 percent of government investment has been in infrastructure, both national and local). Infrastructure investment has risen as a percentage of GDP, to 10 percent in 2003, as GDP itself continued to rise significantly (Figure 2.4).

Since 1993, continuous economic growth, fueled in part by infrastructure investment, has been the main engine for poverty reduction, complemented by targeted poverty reduction programs. The mutually reinforcing relationships set out in Figure 2.1 are deeply embedded in the processes of inclusive development that characterize Vietnam's recent development experience. Let's look at some of the evidence.

Infrastructure has affected poverty in Vietnam through large-scale investments and through smaller-scale rural infrastructure. On the large

scale, trunk infrastructure has played a critical role in creating links among growth centers and their surrounding rural areas. It has connected remote areas with power grids, trunk roads with feeder roads, and, in the process, generated opportunities for business and promoted income diversification and off-farm employment.[16]

One systematic exercise to assess the impact of large infrastructure investment on poverty reduction in Vietnam finds that investments in water and sanitation and transport, in particular, have a large positive impact on poverty reduction at the provincial level. It suggests that public investments in transport and in water and sanitation are highly progressive, lifting more people out of poverty in Vietnam's poorest provinces (Larsen, Lan, and Rama 2004)

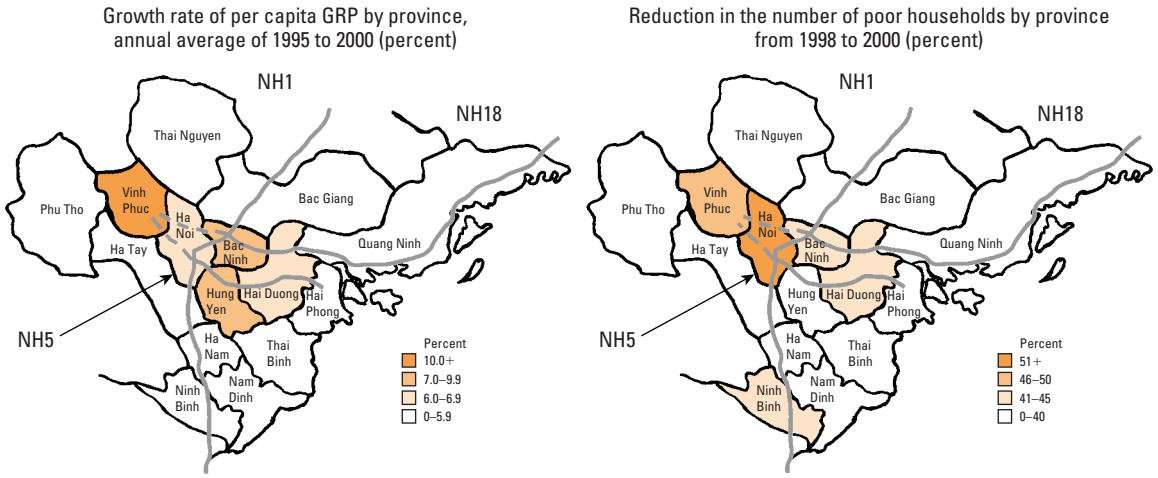
Among the country's most important large-scale infrastructure undertakings is the improvement of National Highway No. 5, which links Ha Noi, the national capital, and Hai Phong in the Red River Delta Region. Together, these two cities comprise northern Vietnam's major growth center. With the improvement of National Highway No. 5 and the expansion of Hai Phong Port, the transport corridor has enhanced the access of Ha Noi to global markets by improving land and sea transport. Foreign direct investment (FDI) to major industrial zones has increased significantly, particularly since 2000, driving industrial and export growth in the north.

An interview survey with more than 70 FDI firm managers suggests that nearly 90 percent of new investments would not have been realized without the improvement of National Highway No. 5 and the Hai Phong port. The survey indicates that managers were attracted by cost reduction in transporting imported inputs, time savings in the delivery of raw materials and final products, and improved coordination of production and sales schedules.

Most of the provinces in the Ha Noi-Hai Phong corridor achieved faster growth in per capita income and reduction in the number of poor households compared with the average for the Red River Delta and the whole country (Map 2.1).

And growth has now spread to neighboring areas, particularly Hung Yen and Hai Duong provinces (located between the two economic hubs), with similar transformation of the rural economy. Rural households have diversified their agricultural production (from rice to fishery and poultry) and have been increasingly engaged in new business opportunities. More convenient transportation has also spurred demand for tourism in

Map 2.1 Comparison of the growth rate and poverty reduction rate of each province in the Red River Delta region



Source: JBIC/IDCJ 2003. Poverty data are based on Statistics of Agriculture and Rural Development 1991–2001. Reprinted with permission from JBIC.
Note: NH=National Highway.

Ha Long Bay, in effect, extending the corridor into a Ha Noi-Hai Phong-Ha Long development triangle.

But Vietnam has also concentrated on the small scale. Enormous investments have been made in rural roads—reducing the number of communes lacking all-season road access to district centers by more than 50 percent—with significant effects on poverty (World Bank estimates).

One study into these rural road investments suggests that the establishment of a new road in a village raised the per capita income of households by 30 percent between 1993 and 1998, after controlling for other factors, such as household size and education (Deolalikar 2001). Moreover, the spatial location of roads increased the household probability of moving out of poverty by 68 percent over the same period of time. It showed that rural roads expanded school enrollment of children at all levels and improved the utilization of public health services. And the spatial and economic benefits of rural roads were significantly larger in poorer provinces than in the richer ones.

Another study of the marginal returns in agricultural growth and poverty reduction to various kinds of government spending suggests that

Box 2.7 Inclusive development: Transport access for the disabled

Including individuals with disabilities is an important factor to consider during the planning and design phase of infrastructure projects. Equally important is rectifying existing infrastructure deficiencies, which may hamper the quality of life of disabled persons by denying them the ability to effectively use their surrounding environment.

One important means of inclusiveness is to address public transport design to enhance access and safety. Four major disability groups should be considered:

- Orthopedic: ambulant and nonambulant (wheelchair users)
- Sensory: visually impaired and hearing impaired
- Cognitive: mental, developmental, and learning disabilities
- Multiple: combination of any or all of the above

Individuals with orthopedic disabilities are generally those with locomotive disabilities that affect mobility. Wheelchair users face a particular challenge in developing countries—the spatial need of wheelchair users often exceeds that of people with other types of disabilities, and the need for provision of ramps, curb-cuts, and elevators is critical. Individuals with sensory impairments need visual signs and tactile clues, such as route finders, and adequate signage must be provided to increase directional clarity for the hearing impaired. Disabled individuals who are cognitively challenged and those with multiple disabilities need a combination of these provisions.

Some mass transit systems developed recently in the East Asia region do include full accessibility features—sometimes as the result of campaigns by disability advocacy groups during the project planning stage. The new Bangkok underground system, Malaysia's PUTRA mass transit system, and Beijing's new subway and light rail system under development include barrier-free components in their design.

Manila is betting on the bus rapid transport (BRT) system to dramatically improve the accessibility of persons with disabilities. The BRT uses buses linked by threes or fours with dedicated corridors running along a 22-mile highway that surrounds the city. These buses have low floors for ease of entry and exit, tend to move at a uniform speed, and stop only at designated stations. BRT systems are currently operating in various Asian cities, including Jakarta and Shijiazhuang, with a system under construction in Beijing, and in the planning stage in Shanghai, Bangkok, Chengdu, and Chongqing.

Whenever new infrastructure is constructed or new vehicles are bought, access features that serve most passengers who are considered disabled can be incorporated at relatively low cost. For example, elevator installation at 18 stations of the Bangkok underground system cost approximately 46 million baht (about $1.1 million)—out of a total of 105 billion baht (about $2.6 billion) in construction costs for the whole system—or roughly 0.0004 percent of total costs. However, retrofitting an existing system is much more expensive. The cost of installing just one elevator in an existing New York City subway station is approximately $2 million.

(Continued on the next page)

Box 2.7 (Continued)

Consequently, city planners need to incorporate access provisions in their planning at the earliest stages. Development banks can be helpful by adopting policies for universal and inclusive design for built environments and public transport in infrastructure projects they finance. These institutions can also provide specialist expertise.

Finally, one critical consideration concerning disability issues and infrastructure in East Asia is the emergence of an aging society. Disabilities—or degrees of impairment—increase with age, even in seemingly healthy individuals. Infrastructure planners have time now to plan for this demographic shift and to adequately provide enabling environments for all members of society.

Source: Takamine 2004.

the payoff of investment in roads is second only to that of investment in agricultural research. Returns to road investment proved even higher than those in education (Fan, Huong, and Long 2004).[17]

But as important as these achievements have been, Vietnam is in no position to rest on its laurels. Access to basic infrastructure services has not been equal, and the degree of this inequality is increasing. The percentage of the population in the lowest-income quintile with access to clean water is 22.7 percent, less than half the national average. It is also striking that only 2 percent of the population in the lowest-income quintile has access to hygienic latrines, compared with 70 percent for the top quintile of the population (Vietnam Development Report 2004).

Increasing inequality, particularly between urban and rural areas, raises new infrastructure challenges.[18] On the one hand, infrastructure can be used to continue to reach into those isolated regions whose inhabitants are cut off from services and economic participation. But rapid urbanization is also placing a significant strain on urban infrastructure and the capacity of urban managers to keep up with demand. New pockets of poverty are emerging in peri-urban settlements.

As the complexities of the infrastructure challenges multiply, and the scale of the risks increases, Vietnam will be increasingly unable to sustain the inefficiencies that characterize its coordination and delivery of infrastructure and infrastructure services.