

## **INFRASTRUCTURE POLICY IN ASIAN DEVELOPING COUNTRIES**

Peter McCawley (\*)

### *Abstract*

**The urgent need for very large increases in investment in infrastructure in most developing countries in Asia is very clear. This paper surveys the challenges facing policymakers in the region. Nearly all of the main concerns for policy-makers in Asia in addressing the global infrastructure imbalance are on the supply side. In particular, there are seven related supply-side issues that are of high priority for policy-makers: selection and preparation of appropriate projects; finance; pricing; access; governance and management; policy and regulatory policies; and climate change. Governments and utilities need to improve their policies and performance to build confidence amongst stakeholders. Access to infrastructure services needs to be improved so that consumers will support realistic pricing policies and investors will be encouraged to provide finance for infrastructure sectors.**

### **The need for infrastructure**

Infrastructure policy has attracted increased interest across developing countries in Asia in recent years. There has been rising awareness of the costs of the neglect of infrastructure

(Rogoff 2006); and moves by regional governments to stimulate aggregate demand in the wake of the global financial crisis have encouraged planners to consider how to promote new infrastructure projects. In China, for example, well over half of the stimulus package, amounting to over US\$850 billion, announced in late 2008 was expected to be devoted to infrastructure. In addition, governments in India, Thailand, Indonesia, and other regional developing countries announced plans to boost spending on major infrastructure projects in 2008 and early 2009.

At the broadest level, the urgent need for very large increases in investments in infrastructure in most developing countries in Asia is very clear. Neither is there any shortage of ambitious proposals. Priorities for project selection vary by country and by sector but, at the overall level, the very wide differences in access to basic infrastructure between the developed and developing world—a global infrastructure imbalance—are very large indeed (see Table 1).

Similarly, data from selected Asian developing countries illustrates the urgent need to expand the supply of infrastructure to meet the basic needs of millions of people across the region (see Table 2, ADB, JBIC and World Bank 2005, ADB 2009c).

(\* Visiting Fellow, Arndt-Corden Division of Economics, Research School of Pacific Studies,  
Australian National University, Canberra.

**Table 1: Infrastructure Indicators, 2006**

Countries/country groupings	Electricity (kWh per capita)	Sanitation (% urban)	Water (% access)	Internet access (per 100 popn.)	Mobile phones (per 100 popn.)
<u>Country groupings</u>					
High income	9,650	100	100	62	93
Upper middle income	2,957	89	94	22	70
Middle income	1,549	75	88	12	37
Lower middle income	1,186	69	86	9	28
Low income	316	52	67	3	10
LDCs (UN classification)	129	49	62	1	9
<u>Selected countries</u>					
Singapore	8,520	100	100	59	109
Malaysia	3,388	95	99	52	75
Tajikistan a	2,245	95	67	7*	32
China	2,041	74	88	11	35
Thailand	1,984	95	98	17	61
Viet Nam	598	88	92	17	18
Philippines	572	81	93	6	50
Indonesia	530	67	80	9	29
India	503	52	89	7	15
Pakistan	480	90	90	8	22
Sri Lanka	400	89	82	3	27
Lao PDR	n.a.	87	60	1	17
Bangladesh	146	48	80	0	12
Cambodia	88	62	65	0	12
Timor Leste	n.a.	64	62	n.a.	n.a.
PNG	n.a.	67	40	2	2

a Internet data is for 2007.

**Notes:** Electricity is electric power consumption, kWh per capita. Sanitation is for improved urban sanitation facilities, % of urban population with access. Water is for improved water sources, % of population with access. Internet is for internet users, per 100 people. Mobile phones are for mobile cellular subscriptions, per 100 people. LDCs = less developed countries.

**Source:** World Bank, World Development Indicators, accessed 16 November 2009.

**Table 2: Examples of infrastructure needs in Asia**

Country	Sector	Comment
ADB DMCs overall (2005)	Electricity Roads Telephone	36% of households have no electricity connection 23% of rural population have no access to all-season roads 73% of population have no telephone connection
Global	Water	<b>40% of people worldwide have no access to a latrine; 20% lack access to clean drinking water; only 50% of world population has piped water in their homes; and 30-40% of piped water is lost to leakages (2005)</b>
China and India	Electricity	In China and India about 800 million do not have access to electricity. In Indonesia, the figure is above 30% of the population.
Bangladesh	Electricity	Around 40% of the population of 140 million has access to electricity.
Cambodia	Electricity	Nationwide, less than 17% of the population was estimated to have access to electricity in 2004. Consumption per capita was 55 kWh p.a.
Philippines	Water & sanitation	In eastern Manila, where 5 million people live, in 2005 only 8% were estimated to have access to a central sewerage system
India	Water	Delhi's residents lack basic amenities and the city faces an 'unparalleled water crisis'. Nearly one-quarter of Delhi's houses had no access to water in 2001. Twenty-seven per cent of households receive water for less than 3 hours a day and 55% for 3 to 6 hours. (Indian Human Development Report, 2006.)
Indonesia	Water	Bername (Malaysia) reported that more than 100 million Indonesians did not have access to clean water, with 70% consuming contaminated water, leaving them vulnerable to water-borne diseases. (24 Apr. 2006)
Indonesia	Water, electricity, phones, and sewerage	'only 1.7% of people have access to network sewerage; only 16% have access to piped water at the household level' (World Bank, Feb. 2003). 'there are still about 50 million people without access to treated water, 90 million without electricity, and close to 200 million without direct access to a phone or sewerage network' (ADB, Oct. 2006).
South Asia	Sanitation	'76% of the population in rural South Asia do not have access to hygienic toilets and in urban areas the figure is 34%. The practice of open defecation is widespread; and this contributes to a world where diarrhoea alone is responsible for the deaths of 1.8 million children under five each year.'
India	Telecoms	10% of the population has access to a telephone. 3% has access to the internet.

*Note: DMC = Developing member country of the ADB.*

*Sources: Various World Bank, ADB, and Asian regional press reports.*

More detailed information (Table 3) is suggestive of wide variation in the quality of infrastructure by country, which is, not surprisingly, roughly correlated with income per capita. Nevertheless, there are some notable aspects of the overall picture. One is that for all countries shown in the table, the quality of infrastructure in the airline sector was judged by respondents to be above the average quality of infrastructure for the country as a whole. Hypotheses that might explain this, assuming that the data are to some degree reflective of reality, include the ‘technology hypothesis’ (Tendler 1968) that technology in some sectors (such as airlines) is less forgiving of failure than in other sectors (such as rail); the ‘political hypothesis’ that there is stronger political pressure on governments across the region to guarantee the quality of elite goods (such as airline travel) than mass-based infrastructure goods such as road and rail services; and the ‘globalisation hypothesis’ (arguably a variant of the political hypothesis) that the international community puts more pressure on developing countries to improve the quality of tradable goods (which consumers in rich countries are concerned about) than nontradables.

A second notable aspect of the data is that the quality of service in certain sectors in certain countries appears to lag markedly below the average for that country. The rail sector in the Philippines and Cambodia, and the electric power sector in Pakistan, appear to have suffered marked neglect. In this respect, the data accord with anecdotal reports of standards in these sectors.

## Challenges are on the supply side

The needs on the demand side of the infrastructure sector are very clear. This means that nearly all of the main issues for policy-makers in Asia in addressing the global infrastructure imbalance are on the supply side. In particular, there are seven related supply-side issues that are now of high priority for policy-makers in developing countries across the Asia-Pacific region.

- Selection and preparation of appropriate projects
- Finance
- Pricing
- Access
- Governance and management
- Policy and regulatory policies
- Climate change

**Table 3: Comparison of Asian infrastructure quality with the world, 2008**  
**Selected countries**

Region/country	Road	Rail	Ports	Air	Electric power	Overall
<u>Country groupings</u>						
World	3.8	3.0	4.0	4.7	4.6	3.8
G7	5.7	5.4	5.4	5.8	6.4	5.7
Asia	3.7	3.6	3.9	4.6	4.1	3.8
<u>Asian regional averages</u>						
East Asia	4.7	4.8	4.8	5.1	5.3	4.6
Southeast Asia	4.2	3.2	4.3	5.1	4.7	4.2
Central Asia	3.1	3.6	3.2	4.2	3.6	3.5
South Asia	3.1	2.8	3.4	4.2	2.8	2.9
<u>Selected countries</u>						
Singapore	6.6	5.6	6.8	6.9	6.7	6.7
Hong Kong	6.4	6.2	6.6	6.7	6.7	6.3
Malaysia	5.7	5.0	5.7	6.0	5.8	5.6
Korea	5.8	5.8	5.2	5.9	6.2	5.6
Taipei, China	5.6	5.7	5.5	5.7	5.9	5.5
Thailand	5.0	3.1	4.4	5.8	5.5	4.8
Brunei Darussalam	5.1	n.a.	5.0	5.6	5.4	4.7
China	4.1	4.1	4.3	4.4	4.7	3.9
Azerbaijan	3.7	4.0	4.2	5.2	3.9	3.9
Kazakhstan	2.5	3.6	3.2	3.7	4.3	3.5
Georgia	3.5	3.5	3.9	4.2	4.4	3.2
Tajikistan	2.6	3.3	1.6	3.5	1.7	3.2
Pakistan	3.5	3.0	3.7	4.2	2.5	3.1
Cambodia	3.1	1.6	3.4	4.2	4.2	3.1
India	2.9	4.4	3.3	4.7	3.2	2.9
Philippines	2.8	1.8	3.2	4.1	4.2	2.9
Indonesia	2.5	2.8	3.0	4.4	3.9	2.8
Viet Nam	2.6	2.4	2.8	3.9	3.2	2.7
Bangladesh	2.8	2.3	2.6	3.4	1.9	2.2
Nepal	1.9	1.3	2.9	3.5	1.7	1.9
Mongolia	1.4	2.1	2.4	2.7	2.9	1.7

n.a. = not available.

Scores: 1 = underdeveloped; 7 = extensive and efficient by international standards.

Source: ADB and ADBI. 2009.



## Selection and preparation of projects

The first set of issues that decision-makers need to consider when preparing investment plans for the infrastructure sector are:

- what is the optimal level of investment in infrastructure?
- which projects should be given priority? and
- how might appropriate projects be prepared?

It has not proved easy to develop techniques that provide reliable guidance as to the optimal level of infrastructure in any particular country at any given time. A recent Asian Development Bank (ADB) study on Infrastructure for a Seamless Asia (ADB and ADBI 2009) noted that ‘marshaling empirical evidence on the impacts of cross-border infrastructure projects is difficult’ because data is often inadequate or unavailable. Estache and Fey (2007) provide a useful survey of studies but are obliged to conclude that the best that can be done is provide rough benchmarks for different country types. Bearing in mind that total expenditure plans for infrastructure should allow for maintenance as well as new expenditure, they draw on Fey and Yepes (2003) to suggest that as a rule of thumb, total investment needs appear to vary from well over 7 per cent of gross domestic product (GDP) in low-income countries to around 3.1 per cent of GDP in upper-middle-income countries (Table 4).

Table 4: Infrastructure: Investment and Maintenance Needs  
 (Average 2005 - 2015)

Country group	Investment	Maintenance	Total
	(% of GDP)	(% of GDP)	(% of GDP)
Low income	4.2	3.3	7.5
Lower middle income	3.8	2.5	6.3
Upper middle income	1.7	1.4	3.1
Total developing	3.2	2.3	6.5

Source: Estache and Fey (2007)

Apart from noting the broad guidelines in Table 4, it is probably not useful for policy-makers to announce ‘top down’ targets for investment levels in infrastructure. Rather, better policy outcomes are more likely to be achieved if the focus of policy is on the ‘bottom-up’ approach of ensuring that only individual projects (and especially large showcase projects seen as having national or regional importance) that meet rigorous economic, social, and environmental criteria are approved.

This conclusion highlights the need, which now seems increasingly pressing in a number of developing countries in the region, to consider the practical question of how appropriate

projects might be prepared. Until the impact of the global financial crisis began to be felt across the region in 2008, it was common to hear project financiers say that ‘money is not the problem’ holding back investments in the infrastructure sector in developing countries in Asia. Rather, the main bottlenecks were said to be the result of a shortage of high-quality bankable projects. According to this view, political leaders, administrators, and engineers were failing both to encourage the preparation of realistic project documentation and also to facilitate the myriad of approvals that most large infrastructure projects need. Failure to acquire land clearances, as well as obtain environmental approvals and to ensure local social support for a project, was frequently cited as a major non-financial obstacle to investment in the infrastructure sector.

The traditional approach to project preparation in infrastructure in developing countries in Asia, widely adopted from the 1970s through to the 1990s, was to rely significantly on sectoral planning strategies drawn up by national planning agencies (such as BAPPENAS in Indonesia, NEDA in the Philippines, and the NESDB in Thailand). These planning agencies, in turn, worked closely with national infrastructure utilities and departments, as well as with the World Bank, the ADB, and major donor organisations such as the Japan Bank for International Cooperation (JBIC). But for a combination of reasons, including the wide-ranging impact of the regional economic crisis in 1997-98, the traditional approach has not worked so well during the past decade. Therefore, an important question for policy-makers in the region now is whether the traditional approach to infrastructure planning needs to be strengthened or whether other institutions, such as ministries of finance or economic

coordinating teams might do the job better? In Indonesia, for example, following the re-election of President Susilo Bambang Yudhoyono in 2009, a high-level team was established to try to overcome the various bottlenecks hampering investment in the infrastructure sector in Indonesia. It remains to be seen how successful high-level approaches of this kind will be.

Barriers to investment such as difficulties in acquiring land and obtaining regulatory clearances were formidable enough before the global financial crisis led to dramatic changes in global debt markets during 2008. Inevitably, difficulties multiplied quickly as international financial conditions deteriorated markedly into late 2008. By early 2009, it was clear that not only was the shortage of bankable projects a major constraint on investment in developing countries in the region, but so was finance. Therefore, the next sections take up the issue of finance for investment across the region.

Finance: where will the money come from?

As noted in Table 4, in broad terms a useful benchmark for a sustained level of investment in the infrastructure sector in many low- or middle-income developing Asian countries is 6-7 per cent of GDP. Of this, around 4 per cent might be mobilised for new investment, while 2-3 per cent might be allocated to maintenance. The appropriate levels will vary according to sector and country. This total amount of 6-7 per cent of GDP, in turn, is around one-quarter of the minimum desirable total investment-to-GDP (I/GDP) ratio for Asian economies as a whole of

20-25 per cent. In practice, for various reasons, investment in infrastructure in developing Asian countries has fallen away markedly during the past decade (World Bank 2005). In some, the current infrastructure investment ratio is as low as 2-3 per cent of GDP. This low investment ratio is generally inadequate to cover on-going maintenance needs. It is certainly insufficient to allow for expected increases in the stock of national infrastructure investments.

The reasons for the fall in investment in infrastructure vary from country to country. In some countries such as Indonesia, public sector investment in infrastructure was severely squeezed following the 1997-98 economic crisis (World Bank 2004). In other countries such as the Philippines, a combination of particular local circumstances appears to have been important (Llanto 2007). In yet other countries, support for infrastructure investments from the multilateral development banks fell markedly for some years after the 1997-98 crisis, partly as a result of donor pressure to provide increased funding for activities in other sectors such as governance, gender, and the environment.

Looking to the future, estimates of needs vary widely. Indeed, in one (rather unhelpful) sense, the sky is the limit because the needs for infrastructure in developing countries across the region are vast. One recent report from the UN Economic and Social Commission for Asia and the Pacific (ESCAP 2006) estimated that on a region-wide basis, at least US\$228 billion per annum would be needed for infrastructure investments during the five-year period 2006-2010. Other surveys of investment needs have arrived at somewhat different estimates but most forecasts are in the vicinity of at least US\$200 billion per annum and some much more

(ADB, JBIC and World Bank 2005). Indeed, the ADB-ADBI report on Infrastructure for a Seamless Asia identified total infrastructure investment needs that are very much higher again, at around US\$750 billion per annum during the 2010-20 period. Whichever of these levels one chooses to focus on, as the ESCAP report noted, realised levels of investment in infrastructure in regional developing countries have been much lower than any of the amounts mentioned. The average level of infrastructure finance provided from the private sector in the period 2000-2003 was around US\$20 billion per annum, with perhaps another US\$27 billion per annum provided from the public sector (including aid flows). Thus, overall, assuming a business-as-usual approach, ESCAP noted that there could be expected to be a very large investment gap—as large as US\$180 billion per annum over the 2006-10 period—unless significant increases in funding could be mobilized (Table 5). And the prospects for mobilising international funding have fallen away sharply as a result of the current global financial crisis.

Table 5: Possible infrastructure financing gap, 2006-2010

	US\$ bn per annum
	228
Estimated need	
Estimated supply	48
Of which:	
Public sector financing	28 (a)
Private sector financing	20
Apparent gap	180

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Source: ESCAP, 2006.

(a) Includes expected assistance from World Bank, ADB, and JBIC.

In response to these challenges, during the past year or so many governments in the Asia-Pacific region have announced plans to promote investment in the infrastructure sector. On one hand, it is recognized that economic growth rates in the Asia-Pacific region following the global financial crisis are likely, for some years, to be lower than previously forecast. These more modest growth rates, in turn, are likely to lead to lower growth rates in output (and therefore planned investment) in infrastructure sectors (ADB, 2009a). On the other hand, even allowing for lower overall economic growth rates, the infrastructure bottlenecks reported across the region are acute. But many of the official announcements of increased investment programs lack detail, appear ambitious, and often vaguely suggest that 'the private sector must fill the gaps' in the official financing programs.

Against this daunting situation, what can be said about the longer-term prospects for mobilising funds? In the recent past, the main options for governments in the developing Asia region have been the following:

- Official budget financing—supplied either directly from subsidies provided through national (or sometimes regional) budgets or with support from foreign donors.
- Private sector financing—usually provided by foreign partners who may raise funds directly themselves, perhaps by issuing debt, or may seek support from foreign export credit agencies.
- Encouraging domestic utilities themselves to raise investment funds—through, for example, semi-official borrowings underpinned by reliable income flows from consumer revenues.

It is useful to consider each of these sources of funding in more detail.

## Official budget financing

The first of these options, official budget financing, has traditionally been a major source of funds for new investments in infrastructure by utilities and other suppliers in many Asian developing countries. In some sectors such as electric power, it has been common for 80 per cent or more of new investments to be funded from government budgets and foreign donors, either through loans or grants. In the water sector, in some countries in recent decades the public sector has financed as much as 90 per cent of all water projects. Thus, in practice, support from the private sector has been modest.

The disadvantage of this traditional approach is that in many countries across the region it has become very difficult to sustain. For various reasons—the precise factors vary from country to country—governments now find it very hard to continue with the financial support that they have provided in recent decades. For one thing, following the 1997-98 Asian crisis, debt service levels have risen, thus squeezing fiscal budgets. For another, beginning in the early 1990s and continuing on into the current decade, international donor support for infrastructure projects from bilateral aid agencies as well as the international development banks fell away because donors shifted attention to other sectors such as education, health, and governance (ADB, JBIC and World Bank 2005).



In the meantime, there has been much discussion amongst Asian policy-makers about the phenomenon of Asian savings ‘flowing uphill’ out of the region into long-term debt assets in rich countries, particularly the US. There has been considerable debate about what might be done to use these resources more effectively within the region, including for investment in infrastructure (Kawai and Stone 2008.). The debate has been a lively one because it seems clear that the flow of capital out of the region is a complex phenomenon that has been influenced by a range of factors (Petri 2008).

The global financial crisis that began in late 2007 has also encouraged a reexamination of policy on the part of Asian policy-makers. To the extent that any new consensus has emerged across the region, there is now increased agreement that the development of regional debt markets to mobilise and allocate regional savings is a priority, and that more needs to be done to channel the savings into infrastructure sectors (Kim 2005). The recent ADB-ADBI study (2009), for example, argued that: ‘The region's vast domestic savings will be the main source of financing for Asia's massive infrastructure investment requirements. . . the public sector will necessarily continue to play a dominant role . . .’

In principle, suggestions of this kind serve to encourage regional policy-makers to consider what reforms are needed to use Asian savings more effectively within Asia. But reforms will take time to introduce. In the meantime, there is much pressure on policy makers to look to other sources of finance for support for new infrastructure projects.

Is private sector funding the answer?

Largely because of the difficulties of relying on limited official budget financing, in recent years in developing countries in Asia there has been much hopeful talk about the possibility of attracting private investment into the infrastructure sector. Some government programs have suggested that perhaps as much as 80 per cent of new infrastructure investment in the coming years might be funded by the private sector.

Attractive though this possibility may appear, the track record is not encouraging. For one thing, in recent years it has proved difficult for most developing countries in Asia to tap into private sector funding to support large infrastructure projects (ADB, JBIC and World Bank 2005: Box 1.7). The telecommunications sector stands out as an exception; but, as a general rule, in other sectors—electric power, water, roads and transport—both international and domestic private sector investors have been reluctant to support large projects unless reliable guarantees of generous support from governments have been forthcoming.

Two significant factors underpinning the reluctance of private sector firms to invest in infrastructure have been regulatory uncertainty and price suppression. Infrastructure policy in many countries of the region is fraught with political uncertainty. Regulatory policies are often unclear and changeable, depending on the political and social pressures of the day. Under these circumstances, foreign investors, particularly, are reluctant to commit to the long-term

investments of perhaps 20 years or more that infrastructure projects typically call for. In addition, persistent and widespread price suppression has discouraged investment because of the very considerable uncertainty about financial flows that price controls cause. The impact of price suppression is considered in more detail below.

Another reason the track record is not encouraging is that the most recent modest boom in private sector funding in infrastructure in developing Asia—which occurred in the early and mid-1990s (World Bank 1996)—brought unexpected consequences. Experiences during the early and mid-1990s left both governments and private investors in countries such as the Philippines and Indonesia unhappy with the arrangements that had been entered into (McIntosh 2003, Llanto 2007). One problem for governments was that it sometimes turned out that there were unexpectedly high costs involved in the provision of facilities (such as waivers of import duties, land concessions, or other agreements) provided to private investors in infrastructure (ADB 2000). A second difficulty was that in the wake of the Asian economic crisis of 1997-98, it became very difficult for local Asian utilities and other suppliers to meet their contractual obligations to foreign investors. Many of the contracts were subsequently renegotiated. However, the experience of undertaking lengthy and often acrimonious renegotiations left a nasty taste in the mouths of both debtors and creditors.

Indonesia's experience during the early and mid 1990s in attempting to promote private investment in the power sector is a case study of these difficulties. In a survey of the experience between 1990 and 1997 in which Indonesia's state-owned electricity company,

Perusahaan Listrik Negara, signed 26 agreements worth over US\$13 billion with private investors, mostly foreign-led consortia, Wells (2007) emphasised how difficult, indeed unsatisfactory, the process was. Serious problems quickly arose following the Asian currency crisis in 1997-98 when agreements that Indonesia had negotiated for private electric power only a few years earlier collapsed. Wells notes that:

The ensuing struggle with investors created bad publicity and cost the country several hundred million dollars. . .

There were:

. . . accusations that Indonesia did not honour its contracts, expropriated foreign investment, kidnapped an arbitrator, and was unwilling to pay a legitimate international arbitration award. One dispute lingered into 2007 . . .

**In retrospect, it is clear that the negotiations leading up to the 26 agreements were accompanied by numerous legal, political, administrative, attitudinal, and regulatory policy problems. Wells concludes that there are many lessons to be learned from the experience but,**

**If Indonesia can do no better in new arrangements, privatization is simply too costly. Borrowed funds and state ownership, with all their own problems, would be preferable.**

Considering these and other relevant factors, it would seem optimistic for government planners in most developing countries in Asia to hope to attract significant amounts of private sector funding into infrastructure investments in the foreseeable future (OECD 2006). In particular, major reforms in the policy environment—including, for example, more reliable policies and regulatory arrangements, better tariff policies, and improved contract enforcement procedures—are likely to be needed before private investors will be prepared to risk large investments in infrastructure in developing Asia (OECD 2006: 30, ADB, JBIC and World Bank 2005).

### Self-funding as an option

The third main option open to developing country governments in Asia is to encourage domestic utilities themselves to raise investment funds. This can be done, for example, by

- Permitting utilities and other infrastructure suppliers to retain earnings and, where possible, use the retained earnings for investments in new capacity, or
- Encouraging utilities and agencies to raise investment funds by entering into borrowings in local or international capital markets.

In both cases, however, revenues from tariffs need to be sufficient to both cover all costs and provide a reasonable cash surplus. In the latter case, important issues of central government control over public debt arise. The key issue of the pricing of infrastructure services underpins these options.

## Prices for infrastructure

A key problem of infrastructure policy in many developing countries in the Asian region is that price suppression has been common for many years (McCawley 1970, World Bank 1994).<sup>1</sup> The political and other factors that lead policy makers to suppress prices are easy to understand, yet the consequences are very serious. A brief consideration of both the reasons for price suppression in infrastructure sectors and the consequences is therefore useful.

At the broadest level, it is easy to understand that increases in prices of basic services such as water, electric power, and transport are unpopular. Nobody likes paying higher prices. In addition, in many developing countries in Asia the populist idea that it is the responsibility of the government to provide certain basic services at low prices is part of the conventional wisdom (Lohani 2005). At a more detailed level, depending on the circumstances, a rather wide range of arguments are often put forward in opposition to price increases. Amongst other things it is argued that price increases:

- Will have damaging macroeconomic impacts (by directly causing inflation or by triggering other inflationary pressures such as wage increases);
- Are not fair and will increase inequality because the poor cannot afford price increases;
- Fail to deal with the problem of excessive costs, inefficiency, and corruption in infrastructure sectors; and
- Fail to allow time for alternatives to price increases (such as alternative sources of supply) to be explored properly.

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<sup>1</sup> Price suppression is here defined as setting average prices, i.e., tariffs, below the full costs of supply.

This mixture of arguments is often taken up by a kaleidoscope of influential interest groups. The result is that, as is the case elsewhere across the world, debates about price increases for basic infrastructure goods and services often become highly emotional and politicised. Some of these arguments are sometimes half-right, but mostly they are wrong. For one thing, nearly all of the objectives implied by these arguments can be more effectively achieved using other policy tools. For another, the high economic, financial, and social costs of price suppression need to be borne in mind. The undesirable consequences of the subsidies that price suppression give rise to often include the following:

- Macroeconomic costs through the impact on national fiscal policy—in some countries, large and hidden budgetary subsidies to infrastructure have risen to close to 5 per cent of GDP, requiring governments to either cut expenditures in other priority sectors to finance the costs or increase government borrowings to pay for the subsidies.
- Inequality in the use of government monies—the subsidies frequently favour urban middle class consumers rather than lower-income groups (McIntosh 2003); this occurs because lower-income groups (such as poorer urban consumers or people in rural areas) often have either limited or no access to the infrastructure goods that are being subsidised.
- Restricting investment and growth prospects in basic infrastructure sectors—limits on the opportunities for infrastructure suppliers to develop sustainable cash flows prevent these firms from funding adequate levels of maintenance or preparing timing programs to mobilise funds for new capital investments.
- Misallocation in the use of resources—price suppression encourages over-consumption and waste by consumers and discourages suppliers from providing expanded services (ADB 2000).

Despite these consequences, it has generally proved very difficult for governments in many Asian developing countries to set realistic infrastructure tariffs. This issue is as topical now as it was 30 to 40 years ago. As just one example, the matter of subsidies for infrastructure, especially electric power, has been a key subject of public policy debate in Indonesia recently (Ashcroft and Cavanough 2008.). Until there is a more widespread appreciation of the costs of

price suppression by policy-makers and others, an essential source of finance for expansion of infrastructure in developing Asia will remain severely limited.

### Access

Lack of effective access appears to be an important factor contributing to the reluctance of consumers in developing countries in Asia to pay prices that cover costs for infrastructure services. Understandably, when access to infrastructure services is either poor or non-existent, consumers are often unwilling to accept price increases. Thus, the guaranteed provision of access to infrastructure services to all who want them needs to go hand in hand with efforts to set realistic prices.

Unfortunately, in many developing countries in Asia, infrastructure suppliers are caught in a vicious circle: poor quality services mean that consumers resist price increases and low prices in turn mean that revenue flows are not sufficient to cover maintenance and new capital spending, so utilities find it very difficult to improve services. There is no easy way out of this vicious circle. However, at the end of the day, consumers in any industry tend to get the services they pay for. Ultimately, all infrastructure is paid for by users through tariffs or by taxpayers through subsidies (ADB, JBIC and World Bank 2005). Suppliers of infrastructure services, and governments in the region, must therefore work to break the vicious circle by



setting tariffs to cover costs wherever possible and, at the same time, improving access so that consumers are prepared to pay for effective services.

Access: what do consumers want?

What, then, are the aspects of access that are important? This issue needs close attention because the indications are that in many infrastructure sectors in developing Asia, utilities and other providers (many of which are state-owned and unresponsive to market signals) are failing to meet the effective demand of consumers. Bearing in mind that the great bulk of actual and potential consumers of infrastructure services in the region are in lower-income groups, the two most important aspects of access are (a) physical access, and (b) the minimum amount that consumers must pay to gain access. If either physical access is difficult or if the price of the minimum package of services provided is too high, then low-income consumers will find it difficult to access infrastructure services.

There are many examples of infrastructure services provided by the main government-owned utilities in developing Asia where physical access is difficult or where the costs to consumers of gaining access is too high (ADB 2006). Often, an appropriate market-responsive approach would be to redesign the infrastructure product—often downsizing or simplifying the goods supplied—so that both physical and financial access could be improved. But rather than adopt this approach, it is more usual for governments to ration the supply of basic infrastructure

goods in the formal sector so that, it is argued, fairer access can be provided. However, numerous studies in recent decades in many developing countries in Asia have shown that rationing is often counterproductive (ADB 1994). In the water, sector, for example, examples of unsatisfactory physical access abound. Across Asia, hundreds of millions of poor consumers in urban areas in developing countries must rely on unauthorised (and often illegal) water deliveries provided by private retailers operating in the informal markets, which flourish because the formal markets fail to supply the products needed. Examples of high prices for the minimum units of a service are found, for example, in the electricity sector where the minimum levels of service provided by public utilities (for example, a minimum capacity supply of 100 watts) are too expensive for consumers who would be glad to pay for 25 watts of supply if such a package were available.

The consequence of the failure of government-owned utilities in the formal sector to provide simple and appropriate levels of service suitable for the mass market is that many millions of consumers turn to the informal sector to purchase infrastructure services. Paradoxically, the prices per unit of services traded in the informal markets are often much higher than prices per unit in the formal sector. Studies of the price of water sold by illegal suppliers in informal markets in Manila, for example, indicate that the price of water per litre in informal markets is often five times greater than the price per litre in formal markets where wealthy customers purchase supplies. Indeed, the price of water per unit in informal markets in Manila can rise to 20 or even 30 times (or more) the fixed price in formal markets during periods of acute water shortage in the dry season (McIntosh. 2003). There are similar stories in other developing

countries in Asia. ADB (1994) noted that: ‘Vendors supplying water for the poor in Karachi, Dhaka, Surabaya, and Istanbul charge about 12 times the cost of the city’s piped water supply’. These differences arise because prices in the formal sector are government-controlled (and subsidised, because prices are below costs) while prices in the informal sector are largely market-driven and thus fluctuate markedly in response to the prevailing demand and supply conditions.

Access: responding to needs of customers

In principle, the solution to this problem is relatively straight-forward. Market structures need to be designed to ensure that utilities and other suppliers in the formal sector face market pressures to find ways to downsize and tailor their products to meet the genuine, often simple, needs of the mass consumption market. In recent years in Europe and the Americas, policies to promote greater competition in the supply of infrastructure services *have generally been effective in encouraging suppliers to adopt more consumer-oriented* programs. The one sector that has adopted this approach in developing Asia, telecommunications, has witnessed very rapid growth in demand during the past decade despite generally setting prices to cover costs. An example of an outstandingly successful approach of this kind—of the provision of a simple product that responds to genuine consumer demand—is the way that national telecommunications suppliers have facilitated the dramatic expansion in the use of SMS services in the Philippines during the past decade.

One important implication of adopting this approach needs to be noted: an excessive emphasis by infrastructure suppliers in the formal sector on the provision of high quality and sophisticated infrastructure services can become a barrier to access for lower-income consumers. High quality goods and services are usually costly to provide. Unless large subsidies are provided, high quality services provided in the formal sector will generally be too expensive for low-income groups. Because of this, it is often the infrastructure suppliers in the informal sector in developing Asia who best meet the needs of the majority of the people by supplying simple products rather than sophisticated ones. Paradoxically, sometimes in the infrastructure sector in developing Asia the best can be the enemy of the good!

This approach of providing cheap and simple products that meet the needs of lower-income groups is very common in other sectors in developing Asia. Microfinance has proved an effective tool for meeting key financial needs of lower-income groups. Many daily consumer items, such as cooking oil, soap, kerosene, and even sugar and salt, are packaged into very small quantities for retail sale in local markets in cities and villages across Asia. In the infrastructure sector, in accessing transport services such as road, rail and sea, millions of lower-income consumers every day choose to use lower-quality informal but cheap services, rather than more comfortable but more expensive modes of transport (De Launey 2006). The same general approach of adopting a strongly consumer-oriented approach is needed across all infrastructure sectors in developing Asia.

What is holding back the development of the lower-end segment of infrastructure markets in Asia? Why are the larger public utilities and other suppliers in the formal sectors of the economy reluctant to develop products that would meet the requirements of the bottom 30 or 40 per cent of the market? After all, it is clearly possible to devise products that supply services to the lower-end of the market, because informal markets often do so. Apparently there are barriers that discourage larger, formal sector suppliers from entering this segment of the mass-based market.

The barriers appear to be of at least three kinds: regulatory, technical, and institutional. First, various types of regulatory requirements set minimum standards (technical, safety, financial, and workplace-related) that firms in the formal sector are expected to observe. Buses and trucks are expected to observe load standards and pass regular safety checks, water supplies are tested for quality, and the fluctuations in the voltages of electricity supplies in the generation, transmission, and distribution sectors are expected to be contained within closely-measured limits. However, standards such as these are routinely ignored, and sometimes breached in quite extreme ways, especially in the informal sector but also in the formal sector. In the transport sector, extreme overloading of buses, trucks and trains is very common. In Indonesia, in the shipping sector attention to the monitoring of safety 'is minimal and enforcement is almost non-existent' (Dick 2008). In some Asian countries in the electricity sector, voltages of electricity provided by informal providers in rural areas at a nominal voltage of 110 volts can fall as low as 70 volts during the local peak evening load.

A second type of barrier arises from a self-imposed preference within the formal utility sector, sometimes on the part of technical staff, for the use of modern technology and standards. Examples include the tendency of utilities in the electricity sector to advertise their readiness to provide adequate supplies of household electricity for high consumption consumer goods such as large refrigerators and air conditioning, and for utilities in the water sector to offer plentiful supplies of hot water for household and industrial use. The supply of infrastructure services for these purposes, by the very nature of the services offered, is directed to an elite market and is thus well beyond the reach of the mass market.

Third, there appear to be a range of institutional barriers within formal sector utilities to tackling the challenging task of supplying simple, mass-based, infrastructure products. For one thing, performance indicators in infrastructure sectors tend to focus on the provision of high-profile new capacity in projects rather than on indicators that emphasize other aspects of performance. Thus, the opening of a new airport or large power plant is usually given more prominence than the provision of new distribution lines to a village. For another thing, improving the supply of simple, mass-based, infrastructure goods requires a focus on the retail end of the business of infrastructure provision. However, the retail end of the supply of infrastructure is often seen as the most unrewarding and low-status area of operations. In the airlines sector, pilots are accorded higher status and more likely to be promoted to managerial positions than cabin crew. In the electric power industry, engineers from the generation sector who have experience with large engineering projects and who tend to be in senior positions within the industry prefer 'to build things' rather than worry about the retail end of the

business, which is sometimes considered ‘almost undignified because of its details and routine’ (Tendler, 1968: 183).

The lesson from the way that informal markets in infrastructure work in much of developing Asia is that physical access is generally more important for consumers than the unit price. Even though prices per unit purchased in informal markets are often much higher than in formal markets, consumers still turn to informal markets when formal markets fail to provide the services they need. The twin challenges for state-owned utilities in the formal sector are to find ways of becoming more inclusive in the products they provide and to earn enough revenue to cover costs while doing so.

### Governance and management

Across developing Asia, many infrastructure services—especially in the formal sector in such industries as electric power, transport, water, and even telecommunications—are provided by state-owned enterprises (SOEs). While SOEs are often perceived to have advantages such as national ownership and responsiveness to non-economic community goals such as equity, it is also true that in recent years SOEs have increasingly been criticized. Some of the problems that SOEs are said to suffer from *include the following (Schiavo-Campo and Sundaram, 2000)*:

- *Excessive political and social influence*

- *Protected from market disciplines and therefore often both inefficient (reflected in high costs) and not responsive to consumers*
- *Excessive reliance on government subsidies*
- *Politicisation of management appointments with consequent loss of professional managerial skills at the higher levels of the organisation*
- *Lack of transparency and accountability in their operations, and*
- *Inclined to be protective of their often-dominant positions in national markets and resistant to proposals for competition.*

*As a result of these and related concerns, the current consensus in an increasing number of countries is that whatever the precise ownership arrangements, there is much to be gained from encouraging greater competition in infrastructure sectors (ADB et al. 2005). Further, as part of the trend towards encouraging competition there is a growing awareness that to promote reform in infrastructure, governments need to both set out clear policy directions for the main infrastructure sectors as well as establish reliable regulatory structures to oversee performance.*

## Policy and regulation

Governments across Asia play a key role in setting the rules of the economic game in infrastructure policy (Schiavo-Campo and Sundaram. 2000) When policies are unclear and when regulatory arrangements are ineffective, orderly expansion in infrastructure becomes difficult (ADB et al. 2005). Producers become uncertain of their rights and duties; investors become reluctant to provide funding for new projects; and consumers lose confidence in the capacity of government agencies to protect their rights and ensure that acceptable levels of



service are provided (ADB 2000). For all of these reasons, good policies and effective regulatory structures are vital to the expansion of efficient infrastructure in developing countries in Asia (Greenwood 2006, Kirkpatrick and Parker 2005). As just one example, commenting on constraints to development in the infrastructure sector in Indonesia, the World Bank (2004) recently observed that: ‘A key impediment is the lack of an overall government strategy for infrastructure and predictable policies in . . . critical infrastructure sectors.’

Governments need to spell out their policies towards infrastructure sectors in detail, and preferably updated on a regular basis. Clear policy statements will both provide a broad view of the way that government expects each of the infrastructure sectors to expand as well as respond to the main issues attracting the attention of stakeholders.

Regulatory arrangements as just as important. Regulatory arrangements are to overall policy as judges and police are to the written letter of the law. Indeed, regulators are often the de facto economic police in an industry sector, working to ensure that economic laws and policies are properly enforced and that actors in the industry abide by the rules. Thus, while statements of policy in any particular sector help define the broad rules of the economic game, the day-to-day implementation of regulatory arrangements has a major impact on the operations of infrastructure sectors (Singh 2006). In well-regulated industries, the main aspects of industry policy that regulators are usually expected to pay attention to include the following:

- Structure of the industry
- Broad aspects of competition policy
- Compliance with investment rules
- Pricing
- Anti-competitive behaviour in the sector
- Disclosure of information, transparency
- Compliance with all appropriate social and labour requirements, and
- Service to consumers

In order to fulfill these duties, it is desirable that regulatory agencies are properly resourced with adequate budgets and staffing and have appropriate legal powers. However, the reality is that many governments in developing countries in Asia find it close to impossible to provide adequate resources to regulatory agencies. Under these circumstances, a best second-best approach would appear to be the following:

- Aim to establish minimalist regulatory regimes. Under minimalist regimes, regulatory authorities would concentrate on the highest-priority regulatory tasks. Lower-priority matters might be either outsourced to the private sector through formal concession arrangements (ADB et al. 2005) or deliberately left unregulated for the time being, making it clear to all players that they must bear ‘consulting adult’ risks of operating in an unregulated environment.
- Raise at least part of the cost of regulatory activities from the regulated sectors. One way of doing this would be through the imposition of a transparent, ear-marked levy on the main suppliers.
- *Involve the media and other civil society actors. These agencies might be encouraged to take an interest in the implementation of infrastructure policy and to discuss issues of public concern (Muzzini 2005).*
- *Invite the main multilateral development banks (World Bank and Asian Development Bank) to give renewed attention to issues concerning infrastructure policy and regulation. These institutions have particularly strong expertise in issues relating to infrastructure programs in developing countries, so it would be useful to draw on their experience in relevant sectors.*

Climate change

During the past few years, issues surrounding the implications of global climate change have quickly moved towards the top of the international development agenda. Reflecting the changed international priorities, planners in infrastructure sectors in developing countries in the Asia-Pacific region have been expected to incorporate responses to global climate change issues in their investment plans (ADB 2009b). But so far, this has not been easy. It is currently quite uncertain how infrastructure investment programs in developing Asia are likely to be influenced by the need to respond to global climate change concerns. A full discussion of the various implications of the international climate change debate on infrastructure planning for developing countries in Asia is beyond the scope of this article. But one major challenge is the expected continuing reliance on coal for power generation in the period to 2030 (Symon 2007, ADB 2009a). A second issue that has attracted considerable comment is the additional cost to infrastructure budgets in developing countries to allow for both mitigation and climate change adaptation measures in infrastructure projects. These cost pressures will clearly complicate the job of designing *appropriate projects in infrastructure sectors in developing Asian countries during the coming decade*.

## Conclusion

The needs on the demand side of the infrastructure sector in developing countries in the Asia-Pacific region are very clear. This means that nearly all of the main issues for policy makers in Asia are on the supply side. In particular, there are seven inter-related supply-side issues that are now of high priority for policy-makers:

- Selection and preparation of projects
- Finance
- Pricing
- Access
- Governance and management
- Policy and regulatory policies, and
- Climate change.

*Governments and utilities need to improve their policies and performance to build confidence amongst stakeholders. Access to infrastructure services needs to be improved so that consumers will support realistic pricing policies and investors will be encouraged to provide finance for infrastructure sectors.*

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