

Private Solutions for Infrastructure in Cambodia



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Private Solutions for Infrastructure in Cambodia

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A Country Framework Report

The Public-Private Infrastructure Advisory Facility
and the World Bank Group

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Acronyms and Abbreviations

ACLEDA	Association of Cambodian Local Economic Development Agencies	MOWRAM	Ministry of Water Resources and Meteorology
ADB	Asian Development Bank	MPTC	Ministry of Post and Telecommunications
ASEAN	Association of Southeast Asian Nations	MPWT	Ministry of Public Works and Transport
BOO	Build-own-operate	MRD	Ministry of Rural Development
BOT	Build-own-transfer	MLMUC	Ministry of Land Management, Urbanization, and Construction
CDC	Council for the Development of Cambodia	MW	Megawatt
CFR	Country Framework Report	NAA	National Audit Authority
EAC	Electricity Authority of Cambodia	NGO	Nongovernmental organization
EDC	Électricité du Cambodge	PIP	Public Investment Program
GDP	Gross domestic product	PPA	Power purchase agreement
GNP	Gross national product	PPI	Private participation in infrastructure
GSM	Global system for mobiles technology	PPIAF	Public-Private Infrastructure Advisory Facility
IPP	Independent power producer	PPWSA	Phnom Penh Water Supply Authority
JV	Joint Venture	RRC	Royal Railways of Cambodia
km	Kilometers	SCA	Société Concessionnaire de l'Aéroport
kVA	Kilovolt ampere	SSCA	State Secretariat for Civil Aviation
kW	Kilowatt	VDC	Village development committee
kWh	Kilowatt hour	WTO	World Trade Organization
Lao PDR	Lao People's Democratic Republic		
MEF	Ministry of Economy and Finance		
MIME	Ministry of Industry, Mines, and Energy		

Introduction and Acknowledgments

This Country Framework Report (CFR) for Cambodia is one of a series of country reviews aimed at improving the environment for private sector involvement in infrastructure. Prepared at the request of the government concerned, CFRs have the following three main objectives:

- To describe and assess the current status and performance of key infrastructure sectors
- To describe and assess the policy, regulatory, and institutional environment for involving the private sector in those sectors
- To help policymakers frame future reform and development strategies and to help potential private sector investors assess investment opportunities.

This report has been prepared at the request of the Royal Government of Cambodia in recognition of the key role private participation in infrastructure can play in improving living standards for its people. The Ministry of Economy and Finance (MEF) has served as the primary counterpart to this project. Government officials from every agency involved with infrastructure development contributed invaluable data, comments, and feedback throughout the CFR process. This report does not, however, necessarily reflect the views of the Royal Government of Cambodia or of any particular official involved with the project.

The report preparation process for all CFRs is intended to facilitate dialogue among key stakeholders on the priorities for government reform and the concerns of investors, policymakers, and consumers of infrastructure services. Thus an important part of the

process is the establishment of an advisory group. The Advisory Group of the Cambodia CFR comprised representatives from the Japan Bank for International Cooperation, the Asian Development Bank (ADB), the U.K. Department for International Development, France's Ministry of Foreign Affairs, the International Business Club of Cambodia, Keidanren (the Japanese Federation of Economic Organizations), and the U.S.-Association of Southeast Asian Nations (ASEAN) Business Council.

This report is being published jointly by the Public-Private Infrastructure Advisory Facility (PPIAF) and the World Bank. The PPIAF is a multidonor technical assistance facility aimed at helping developing countries improve the quality of their infrastructure through private sector involvement (for more information about the facility go to <http://www.ppiaf.org>).

Jordan Z. Schwartz of the World Bank's Private Sector Advisory Services Department supervised the CFR project on behalf of the PPIAF and the World Bank. The core project team included Warrick P. Smith, manager of the Private Provision of Public Services Unit; Chiaki Yamamoto, private sector development specialist; and a team of consultants including Frontier Economics of London, Sarin & Associates of Phnom Penh, Gibb, Ltd. of London, and Lucy Wang & Associates of Hanoi. The report also drew on inputs from various staff of the World Bank, the ADB, and other development institutions, as well as on discussions with representatives of the private sector, non-governmental organizations (NGOs), and government

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Executive Summary

Infrastructure has a vital role to play in supporting Cambodia's growth and development and in directly addressing poverty. Improving access to efficient and affordable water, electricity, transport, and telecommunications services can have major impacts on the living standards of individual households. Efficient infrastructure is also essential to sustain broader economic growth and industrial competitiveness, thereby creating jobs and expanding the country's tax base.

Cambodia's low income, low population density, and history of conflict are reflected in the poor coverage, quality, and efficiency of much of its infrastructure. The services that exist are mainly concentrated in urban areas, and the substantial rural population suffers from lack of access to markets, from unsafe and unreliable water supplies, and from dependence on traditional biomass forms of energy or high-cost alternatives. The Royal Government of Cambodia recognizes that public resources alone are insufficient to provide adequate infrastructure services for the citizens of Cambodia.

Private sector participation offers two main advantages:

- *Augmenting budget resources.* The private sector can undertake to finance projects or services that would otherwise not be funded at all or would be funded at the expense of other public expenditures. Private sector participation can thus free up budget resources for other activities.
- *Improving efficiency.* When structured appropriately, private participation can improve incentives for efficiency. This is most clearly the case when private

sector participation is accompanied by pro-competitive reforms; however, experience shows that private firms can also improve the efficiency of even monopolistic activities when operating under an appropriate regulatory framework. The benefits of improved efficiency can be substantial, and can result in expanded services being provided at lower cost.

Current role of the private sector

Unlike most countries at a similar level of economic development, Cambodia already has significant experience in private sector participation in infrastructure, ranging from major projects involving foreign investors in the airports and telecommunications sectors to small-scale local entrepreneurs who are active in the water and power sectors. When considering Cambodian experience against the backdrop of international practice, several points stand out as follows:

- With the exception of transport, where the main fuel terminal, some highways, and the primary aviation infrastructure have been turned over to the private sector, the emphasis has been on using private sector participation to provide new services to complement those of the state-owned supplier rather than to expand or improve the efficiency of existing assets.
- In the telecommunications sector, Cambodia has chosen joint venture arrangements rather than the more common approach of privatizing the main operator and allowing liberal entry for mobile operators and international services.

- Small-scale private providers operating under liberal entry regimes play an important role in sectors such as electricity and water.

In seeking to capture the potential benefits of private participation in infrastructure, Cambodia faces several broad challenges, namely, balancing cost-covering tariffs and affordability concerns; facilitating competition, transparency, and incentives for efficiency; allocating and mitigating risks; mobilizing local finance; and managing the private participation in infrastructure (PPI) process.

Sectoral overview and opportunities

Power

Cambodia's power sector is only now recovering from the effects of conflict. The country has one of the lowest electrification rates outside Sub-Saharan Africa and some of the highest energy costs in the world. Yet despite the significant challenges, Cambodia's electricity sector has seen major changes and achievements in recent years. The private sector has emerged as an important provider through independent power producers providing generation to state-run utilities, through small-scale provision in rural areas, and through autogeneration for individual domestic and business consumers. In addition, the policy environment has evolved, most recently with the approval of the Electricity Law in 2001 that creates, along with other reforms, an independent regulator for the sector.

There are major opportunities for the private sector in meeting the demand for electricity. These range from large and small independent power producers, to isolated systems supplying the needs of rural consumers, to private sector participation in *Électricité du Cambodge* itself. PPI offers both new funds for investment in needed capacity as well as expertise to increase the efficiency of current operations.

Water

The structure of Cambodia's water sector can be characterized as one in which isolated, vertically integrated systems provide water supply services to communities without providing sewerage services. Most systems are publicly owned and operated, but a handful of private providers also offer treated, piped water delivery to parts of provincial and district communities. Despite

this plethora of ownership arrangements, the government estimates that only 70 percent of residents in Phnom Penh, 13 percent of residents in other urban areas, and 23 percent of rural residents have access to safe water. As the population of Cambodia is largely rural, these data signify that only about 32 percent of the total population has access to piped water.

The short-term opportunities for investment in water supply lie in provincial towns and peri-urban areas not served by piped distribution systems. In the medium term the existing utilities may provide opportunities for investment, lease, or concession arrangements.

Telecommunications

The telecommunications sector has witnessed more private sector involvement than any other infrastructure industry in Cambodia. To date, the Ministry of Post and Telecommunications (MPTC) has issued five mobile licenses and one international gateway license to private companies and recently completed a 10-year cooperation agreement with another private company for the operation of the primary international gateway. Each of these agreements is in the form of a joint venture between the operator and the MPTC.

Despite the involvement of the private sector in almost all aspects of operations, telecommunications can also be described as the area of Cambodian infrastructure with the greatest degree of centralized control. A single central government agency, the MPTC, shares in the ownership of all mobile services, the fixed line network, and the international gateways. It also sets telecommunications policy and acts as the regulatory agency. The telecommunications sector faces a number of challenges, including a lack of transparency in the process for awarding licenses; the forced large-scale revenue sharing between private operators and the MPTC; the government's conflicting responsibilities of ownership, policymaking, and regulation; and the low-use, high-cost performance of the fixed line networks.

The Council of Ministers is currently working to adopt strategy recommendations that include separating the MPTC's policy functions from its operational role of providing post and telecommunications services. The network is small and relatively new as a result of significant donor-funded investment during the past few years, and is therefore likely to be an attractive investment target for the private sector.

Transport

While the government and several donors have committed significant resources to transport over the last 10 years, the network elements of the sector—roads, rail, and waterways—are still struggling with insufficient maintenance, degradation from floods, and lack of investment funds, all in the face of increasing demand. The government has already begun to allow private sector investment and operations in transport. The degree of private sector activity and the form of involvement varies across modes, with the railroad remaining entirely public at one extreme and both major airports concessioned to the private sector at the other extreme.

The main opportunities for private sector participation in the roads sector will focus on maintenance or rehabilitation funded from tolls and/or from government remuneration, possibly through the use of shadow tolls. The roads with the greatest potential for tolling and longer-term contracting to the private sector will be those that link Cambodia to Vietnam and Thailand and that improve the connections between Phnom Penh and the primary tourism zone of Siem Reap.

Currently there is almost no private sector activity in Cambodia's railway, only private sector financing of the repair of tanker wagons used to transport oil. Opportunities for private sector involvement may exist in either the southern or northern lines or in re-establishing the rail link between Cambodia and Thailand.

The private sector operates two dry ports around Phnom Penh and the main fuel terminal at Sihanoukville. The Sihanoukville port also operates a 19-hectare dry port on the outskirts of Phnom Penh in a joint venture with the Singapore Port Authority. Eventually, the expansion of the main general cargo and container facilities at Sihanoukville could be turned over to private terminal operators.

Cross-sectoral issues

Many of the opportunities for and constraints on expanding private sector participation in infrastructure can be assessed at a sector-specific level; however, a number of important issues are substantially common across infrastructure, and in some cases across the economy as a whole. They include the following:

- *Legal environment.* Cambodia's legal system remains at an early stage in its evolution, and the courts sys-

tem has not yet established a reputation for independence, competence, or efficiency. This is a significant source of concern for investors. In addition, while the current Law on Investment offers significant guarantees and incentives for foreign investors, it still has several critical limitations, such as a prohibition of the transfer of investment incentives and restrictions on land sales and the employment of foreign nationals.

- *Government organization and decisionmaking.* The incomplete nature of the legal system, coupled with an unclear allocation of responsibilities between levels of government and among agencies at the same level of government, creates costs and uncertainty for investors. While Subdecree 70 of July 2001 provides the Council for the Development of Cambodia with specific responsibility for approving PPI projects and conducting bidding processes, the precise terms of reference will require further elaboration to ensure the council's role in relation to ministries and agencies is clearly defined.
- *PPI approval and transaction processes.* Over the last several years the government has entered into build-operate-transfer agreements, licenses, and sale contracts with private sector investors and operators for some of the country's most important infrastructure services. None of these transactions has benefited from published performance requirements, a competitive bidding process, or established procurement procedures, and none of the agreements has been subjected to public scrutiny. Cambodia may benefit from establishing a legal framework that will clarify and confirm the acceptability of a range of modalities of PPI, establish clear and effective rules governing the transparent procurement of private infrastructure projects, and confirm that international arbitration is available to resolve disputes arising from private infrastructure projects. Enforcement of procurement requirements as applied to PPI projects may eventually be aided by the National Audit Authority once that agency is fully operational.
- *Regulatory approaches.* While regulatory frameworks need to be tailored to the circumstances in each sector, there are cross-cutting issues that are vital to the effective performance of all infrastructure services. First, the issue of exclusivity should be considered with extra caution. Second, care should be

taken to ensure that regulatory systems are adapted to Cambodia's particular circumstances, for example, the financial and human resource requirements of the selected institutional arrangement should match their availability. Finally, structural issues of the regulatory agencies should be considered, such as regulatory independence and the choice between single sector and multisectoral regulation.

- *Land acquisitions and resettlement.* While Cambodia enacted a new Land Law in 2001, no clear legal process exists whereby either investors or the government can acquire land for infrastructure projects. The government has been working to create a formal framework outlining the process for land expropriation and has created the Resettlement Committee to deal with this issue; however, the new procedure only applies to public projects. Resettlement issues continue to impede infrastructure projects, as the government has yet to decide whether it is willing to use its authority to help private companies gain access to land.
- *Financing environment.* Cambodian financial markets are small. The local debt market is limited, both in terms of liquidity and maturity on loans. As regards infrastructure, the financial markets are unable to

contribute significantly to anything other than small-scale projects for limited terms. Consequently, in addition to entrepreneurs' own funds, private infrastructure projects tend to be supported through microfinance schemes. To date foreign capital markets have not been accessed for local infrastructure projects. To increase confidence in the banking system, the National Bank is re-licensing each of the commercial banks. Other measures aimed at increasing confidence in the sector—such as technical and financial support from international donors—will be required in the years to come.

- *Subsidy schemes.* In rural projects or those with a disproportionate number of low-income consumers, some degree of public subsidy may be justified for infrastructure services. Designing a subsidy scheme for infrastructure services involves making choices from among many design variables including objectives, targeted beneficiaries, funding sources, delivery mechanism, subsidy costs, and administrative costs.
- *Output-based aid.* For countries like Cambodia, where scarce public resources limit the opportunities for leveraging public sources through private financing, an output-based approach to publicly financed subsidies may provide some benefits.

2

Country Context and the Role of Private Participation in Infrastructure

Economic setting

Cambodia is a small, predominantly rural, nation of 12 million people bordering the Lao People's Democratic Republic (PDR), Thailand, and Vietnam. With annual per capita income of US\$290, Cambodia is among the poorest countries in the world. More than a third of Cambodians live below the poverty line, and 90 percent of the poor inhabit rural areas.

Cambodia has only recently emerged from many decades of war and internal conflict that shattered many of the foundations for growth and development—physical, social, human, and economic. Since the 1993 elections, the Royal Government of Cambodia has been engaged in building the basic institutions and processes of a democratic, market-oriented economy, including an effective legal system and other governance arrangements. Progress is being made, but much remains to be done. Partly because of this legacy, foreign investors perceive Cambodia to be a relatively high-risk market.

Agriculture dominates the economy, accounting for about 40 percent of gross domestic product (GDP) and about 80 percent of the labor force. Industry accounts for about 20 percent of GDP, with the remainder derived from services. Recent economic performance has been encouraging. In 2000 real GDP grew at 4 percent, compared with 1 percent in 1998, with an annual average of 4.4 percent during 1989–99. Inflation fell to –1 percent in 2000, down from more than 15 percent in 1998.

In addition to its export-oriented forestry and garment sectors, Cambodia hopes to capitalize on its substantial tourism assets, which include an attractive mix of coastline, old-growth forests, and ancient cultural heritage sites. Estimates indicate that in 2000 tourism accounted for inflows of more than US\$87 million. In particular, the government is focused on developing the triangular area defined by Siem Reap, Sihanoukville, and Phnom Penh. This requires improvements in all areas of infrastructure, especially transport. To spread the benefits of tourist revenues across the country, the government is committed to broadening its focus to encompass other areas later. This may include increasing investment in roads and inland waterways for passenger transport, further developing airport infrastructure at Siem Reap and Phnom Penh and possibly rehabilitating the airport at Sihanoukville, and rehabilitating the water and sanitation and power systems in the towns.

Cambodia has a flourishing private sector, particularly in Phnom Penh, and private consumption accounts for nearly 90 percent of GDP. However, growth is constrained by limited and high-cost infrastructure, uncertain land and property rights, limited access to credit, and a weak and underdeveloped regulatory framework.

Cambodia's infrastructure challenge

Infrastructure has a vital role to play in supporting Cambodia's growth and development, as well as in di-

Table 2.1 Access and coverage indicators, selected countries, most recent years

Country	GDP/capita	Roads (100 km road/km ² surface area)	Electrical grid (percentage of households with connection) ^a	Telephone (connections/1,000 population) ^b	Piped water network (percentage of households with connection) ^b
Cambodia	260	5.9	10	8	23
Tanzania	240	9.3	—	5	51
Lao PDR	280	9.2	20	7	39
Tajikistan	290	9.6	—	37	47
Uganda	320	4.0	5	4	34
Vietnam	370	7.1	51	28	36
Thailand	1,960	12.3	87	116	89

— Not available.

Km = Kilometer.

a. Excludes small-scale private providers, which provide only a small proportion of network connections.

b. Includes both mobile and fixed line.

Sources: CIA (2001); ITU (2001); World Bank (2001); Frontier Economics data.

rectly addressing poverty. Improving access to efficient and affordable water, electricity, transport, and telecommunications services could have major impacts on households' living standards. Efficient infrastructure is also essential to sustain broader economic growth and industrial competitiveness, thereby creating jobs and expanding the tax base.

Cambodia's low incomes, low population density, and decades of conflict are reflected in the coverage, quality, and efficiency of its infrastructure. The following discussion benchmarks Cambodia's infrastructure according to access, quality, and efficiency measures against its neighbors and countries with a similar GDP per capita.

Access

As table 2.1 indicates, access to infrastructure in Cambodia is relatively poor compared with its neighbors

and countries at similar income levels. Those services that exist are mainly concentrated in urban areas, and the rural population suffers from lack of access to markets, from unsafe and unreliable water supplies, and from dependence on traditional biomass forms of energy or high-cost alternatives.

Service quality

Service quality has many dimensions. According to published data on some common indicators, however, the quality of the available services in Cambodia is broadly in line with comparators (table 2.2).¹

Efficiency

Labor productivity, one measure of efficiency, reveals that performance varies considerably over the different services. The evidence indicates that the power sector is extremely inefficient, with almost 3 employees per 100

Table 2.2 Selected infrastructure quality indicators, selected countries, most recent years

Country	GDP/capita (US\$2,000)	Electricity losses (%) ^a	Water losses (%) ^b	Telephone faults (per 100 mainlines per year)
Cambodia	260	17 ^c	27	35.1
Tanzania	240	14	—	17.5
Tajikistan	290	12	—	99.3
Vietnam	370	18	34	—
Thailand	1,960	9	38	25.9

— Not available.

a. All figures combine technical and nontechnical losses for network supplies.

b. Water losses are represented by Phnom Penh, Vietnam's by Ho Chi Minh City, and Thailand's by Chonburi.

c. Cambodia power losses are represented by Électricité du Cambodge, which does not operate a transmission line.

Sources: CIA (2002); ITU (2001); World Bank (2001); ADB electric utilities database.

connections compared with about 1 employee in the Lao PDR and 0.6 in Thailand. However, telecommunications is more in line with all the comparators except Thailand and Vietnam, having about 3 to 4 employees per 100 fixed line connections, perhaps reflecting the greater degree of private participation in that sector's activities in Cambodia.²

In seeking to improve its infrastructure, Cambodia will need to look for opportunities both to expand coverage through new investments and to improve the quality and efficiency of existing assets.

Scope for public sector financing for infrastructure

Improving the coverage and quality of Cambodia's infrastructure will require substantial investment. This section looks at the role—and limits—of public sector financing for Cambodia's infrastructure.

Inadequate domestic revenue mobilization and skewed public expenditure allocations have kept Cambodia heavily dependent on foreign aid for financing the provision of basic goods and services.³ Of the government's total budgeted expenditures for 2001, US\$356 million was allocated to current expenditure and US\$262 million was allocated to capital expenditure (table 2.3).

As table 2.3 shows, roughly 7 percent of current expenditure is allocated to four infrastructure-related ministries, namely, the State Secretariat for Civil Aviation

(SSCA); the Ministry of Industry, Mines, and Energy (MIME); the Ministry of Post and Telecommunications (MPTC); and the Ministry of Public Works and Transport (MPWT).⁴ However, the Ministry of Planning estimates that 40 percent of all planned investments will be in the areas of power, water, telecommunications, and transport (table 2.4). The government estimates that total investment needs in the infrastructure sectors will be between US\$660 and US\$888 million over the next three years (tables 2.4 and 2.5). Infrastructure sector investments will account for more than the combined investments in health, education, and the environment.

The government recognizes that public resources alone are insufficient to provide adequate infrastructure services. A breakdown of the Public Investment Program (PIP)—which is prepared by the Ministry of Planning and is based on the Five-Year Socioeconomic Development Plan—based on the programmed projects in each infrastructure sector, provides an indication of the gap between the demand for and the availability of investment capital.

The figures in the first three columns of table 2.5 are derived from the sum total of projects that each ministry has presented to the Ministry of Planning to demonstrate its sectoral priorities. These figures are thus not the same as the amount of capital available from public sources. Nonetheless, the gap between the cost of the required investments and the resources at hand is remarkable: 66 percent of the costs of all infra-

Table 2.3 Budgeted public expenditures, 1999–2001 (US\$ millions)

Category	1999 (actual)	2000 (actual)	2001 (Financial Law)
Total general expenditure	458	530	19
Total current expenditure	274	304	356
<i>Of which</i>			
State Secretariat of Civil Aviation	1	1	1
Ministry of Industry, Mines, and Energy	1	1	2
Ministry of Post and Telecommunications	9	7	11
Ministry of Public Works and Transport	2	5	6
Capital expenditure	184	226	262
<i>Of which</i>			
Investment on locally financed	56	76	81
Externally financed	126	148	175
Debt amortization	3	2	6

Note: CR 4,004 = US\$1.

Source: Ministry of Economy and Finance data.

Table 2.4 Public investment program, 2001–03

Sector	Amount		Share (%)
	US\$ millions	CR millions	
Infrastructure	664	2,657,855	40
Transport	356	1,427,026	22
Water	181	724,724	11
Telecommunications	70	281,081	4
Energy	56	225,025	3
Other	986	3,948,745	60
Health	326	1,303,702	20
Agriculture	210	841,641	13
Education	197	788,788	12
Administration	93	373,974	6
Environment and conservation	60	239,439	4
Social and community services	48	190,991	3
Trade and industry	22	88,088	1
Special programs	17	66,466	1
Religion and culture	12	6,446	1
Tourism	2	9,209	0
Total	1,650	6,606,600	100

Note: The water sector includes water resource management, flood control, and drainage as well as water supply and sanitation. Exchange rate: CR 4,004 = US\$1.

Sources: Government of Cambodia (2001b); Ministry of Planning (2001).

Table 2.5 Sources of funds for infrastructure investments, 2001–03 (US\$ millions)

Sector	Year				Source		
	2001	2002	2003	Total	Government	External	Unfunded
Power	27.8	17.1	11.3	56.2	0	16.0	40.2
Rural electricity	1.5	2.8	2.23	6.6	—	—	—
Water supply and sewerage	25.1	13.6	3.9	42.4	7.9	17.1	17.5
Telecommunications	15.8	9.6	19.1	44.5	0	0	44.5
Transport	242.8	266.8	229.1	738.7	48.5	216.9	474
Roads	189.4	170.5	167.6	527.5	45.9	168.3	313.3
Rail	20.4	42.9	45.1	108.5	0	0	108.5
Ports and waterways	22.8	40.6	12.3	75.7	0	40.8	34.9
Aviation	10.2	12.8	4.1	27.1	2.6	7.8	16.7
Total infrastructure	311.5	307.1	263.4	888.2	56.4	250	582.0
Allocation (%)	35	35	30	100	6	28	66

— Not available.

Note: In addition, the Ministry of Rural Development will require an estimated US\$32.3 million between 2001 and 2005 to implement the Rural Water Supply Development Plan (Government of Cambodia 2001b, p. 218). Sector-specific table for rural development estimates, however; about US\$28 million to be allocated to “water resources” (Government of Cambodia 2001b, p. 120). Ports and waterways include a US\$9.2 million reallocation of funds for the Chong Kheas River Port rehabilitation originally found in the Public Investment Program for roads. Rail and road figures are higher than the total allocation presented in table 2.5, and the sources, which contain both sets of figures, do not explain the discrepancy. Note that numbers may not add up because of rounding.

Source: Ministry of Planning (2001).

structure projects to be undertaken over the next three years have no identified source of funding.

Although budget resources are complemented by user fees generated by ministries and state-owned enterprises, in many cases user fees are not feasible (for example, for rural roads) or, if feasible, do not fully cover costs. In these cases, public funds must be allocated to the capital costs or service provision, or the infrastructure will

not be provided or maintained. In a few cases, the sectors are not merely self-financing, but also act as a significant source of net revenue for the government, with the public entities acting as de facto taxation authorities.

As table 2.6 illustrates, the MEF estimates that 38 percent of all nontax revenues, or 11 percent of all government revenues, will come from telecommunications, civil aviation, and port transfers to the budget in

Table 2.6 Sources of budget revenue, 2001

Category	2001 (Financial Law) (US\$ millions)	Percentage of total
Total domestic revenue	412	100
Capital revenue	6	1
Current revenue	406	99
Tax revenue	296	72
Nontax revenue	110	38
<i>Of which</i>		Percentage of nontax revenue
Civil aviation	6	5
Post and telecommunications	36	33
Ports	2	2

Note: exchange rate CR 4,004 = US\$1.
Source: Ministry of Economy and Finance data.

2001. The sector-specific chapters discuss some of the weaknesses of using these approaches to generate government revenue.

Public financing is also complemented by NGOs, which play an active role in providing basic services in rural and peri-urban areas. Some 800 NGOs work in Cambodia, and in 1998 provided about US\$56 million in assistance, primarily in health, rural development, and education. NGOs have played a significant role in providing rural water supplies, and some are also becoming involved in developing rural electricity networks.

Promise of private participation in infrastructure

The last decade or so has seen a dramatic shift in favor of private sector financing of infrastructure worldwide. Between 1990 and 2000 private infrastructure projects in developing countries attracted more than US\$682 billion in investment, with the East Asia region accounting for nearly 30 percent of the total. Telecommunications and power have dominated investment flows, but there have also been significant flows to all modes of transport and to water and sanitation.

Private sector participation offers the following two main advantages to Cambodia:

- *Augmenting budget resources.* The private sector can undertake to finance projects or services that would otherwise not be funded at all or would be funded at the expense of other public expenditures. Private sector participation can thus free up budget resources for other activities.

- *Improving efficiency.* When structured appropriately, private participation can provide improved incentives for efficiency. This is most clearly the case when private sector participation is accompanied by reforms that promote competition. Experience shows, however, that private firms can also improve the efficiency of even monopolistic activities when operating under an appropriate regulatory framework. The benefits of improved efficiency can be substantial, and can result in expanded services at lower cost.

Cambodia already has significant experience in private sector participation in infrastructure, ranging from major projects involving foreign investors in the airports and telecommunications sectors to small-scale local entrepreneurs who are active in the water and power sectors. Table 2.7 provides an overview of Cambodia's experience in private participation in infrastructure (PPI) by form of private sector participation and sector. The table highlights the progress Cambodia has made to date, but also the potential for expanding and deepening private sector participation. When considering Cambodian experience against the backdrop of international practice, several points stand out, namely:

- With the exception of transport infrastructure, the emphasis has been on using private sector participation to provide new services to complement those of the state-owned supplier rather than to expand or improve the efficiency of existing assets.
- In the telecommunications sector, Cambodia has chosen joint venture arrangements rather than the more common approach of privatizing the main operator and allowing liberal entry for mobile operators and international services.
- Small-scale private providers operating under liberal entry regimes play an important role in the electricity and water sectors.

Realizing the potential of PPI

In seeking to capture the potential benefits of PPI, Cambodia faces five broad challenges as discussed in the following paragraphs (and also dealt with in later chapters).

Dealing with cost-covering tariffs and affordability concerns
Private sector participation can take many forms, including service and management contracts, leases,

Table 2.7 Examples of PPI by sector and form

Sector	Divestiture of existing assets	Concession of existing assets	Public-private joint ventures for existing or new assets	Greenfield BOO/BOT projects	Liberal entry
Electricity	—	—	—	Independent power producer in Phnom Penh and provincial centers	Numerous small-scale providers in distribution
Water	—	—	—	—	Numerous small-scale providers
Telecommunications	—	—	<ul style="list-style-type: none"> • Camintel (second national fixed wire) • Four mobile operators • Second international gateway 	—	—
Roads	—	Highway 4	—	Two toll roads in Phnom Penh	—
Rail	—	—	—	—	—
Airports	—	<ul style="list-style-type: none"> • Phnom Penh and Siem Reap airports • Air traffic control services 	—	—	—
Ports	Fuel terminal at Sihanoukville	—	Dry port at Phnom Penh	—	—

—, No examples available.

BOO = Build-own-operate.

BOT = Build-own-transfer.

Source: Government of Cambodia.

concessions, and divestitures. While each form offers some benefits, the greatest benefits flow from options whereby the private sector finances the delivery of services. This usually means that user fees need to be set at levels that cover the full costs of supply, which does not necessarily imply price increases. Much depends on the adequacy of current tariffs and the potential for private providers to reap further efficiency gains that in some cases might even provide opportunities for lowering tariffs. This phenomenon has been observed in water concessions in Buenos Aires and Manila, for example.

In most infrastructure sectors Cambodia has already managed the transition to full cost-covering tariffs. In some sectors, however, imposing user fees is more difficult because of collection difficulties, for instance, for the use of rural roads, or affordability constraints may be a concern, particularly for the poorest members of society. In these cases the challenge becomes one of designing a subsidy scheme that might allow user fees to be complemented by donors or other sources of public financing in a way that is compatible both with private sector participation and with incentives for efficiency.

In some cases the manner in which the government goes about engaging private sector participation can also have a significant impact on the costs investors face, and hence ultimately the level of required tariffs. For example, unclear project approval processes and difficulties in obtaining rights of way can significantly increase investors' development costs, which can be a significant part of total costs. This may have a particularly severe effect on smaller-scale projects of the kind that might be well suited to serving Cambodia's dispersed population.

Promoting competition and incentives for efficiency

The greatest benefits of private participation come from approaches that create strong incentives for efficiency. In most sectors of the economy the best approach for achieving this is through competition, which spurs lower costs and encourages greater responsiveness to consumers as well as innovation.

While many infrastructure activities were once considered to be natural monopolies, advances in technology and in economic thinking show that competi-

tion is not only feasible, but is also highly desirable in a growing range of infrastructure activities. For example, traditional head-to-head competition is possible in most telecommunications services as well as in many port services. Competition between distinct but potentially substitute services, such as between rail and road, is also possible. Competition of this kind not only provides improved incentives for efficiency, but also reduces demands on regulatory oversight, which can be an important advantage in Cambodia, given its still underdeveloped legal and regulatory capacity and the risks regulation creates for investors.

When traditional forms of competition are not feasible, some of the benefits might be realized by creating competition for the market. This involves using competitive processes for awarding monopoly or restricted rights, and in some cases re-bidding the rights at the end of the concession period. International experience confirms the advantages of competitive award of concessions and similar rights. Such approaches are the most reliable way of ensuring that Cambodia gets the best deal possible. Transparent competitive processes also give assurances to prospective investors, and by reducing concerns about possible corruption or other improper influences, can help to reinforce the legitimacy of private sector participation in monopolistic activities. To date, the concessioning and licensing of rights to provide infrastructure services in Cambodia have been tendered without the benefits of competition or transparency, raising doubts about the service providers' qualifications and the potential economic benefits of the agreements.

Allocating and mitigating risks

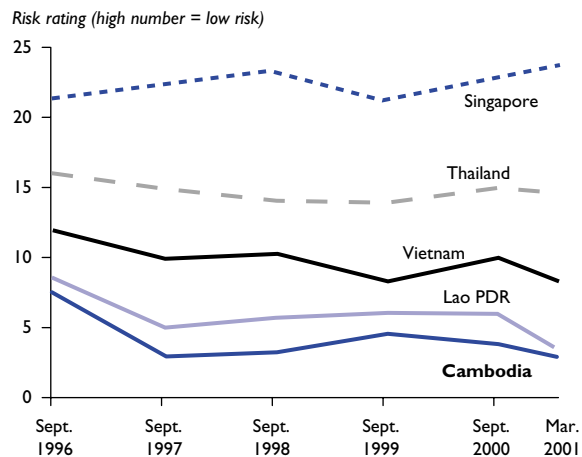
Private infrastructure projects must deal with the allocation and mitigation of various kinds of risks. Many risks are of a commercial nature and are best handled by the private sector. Indeed, having the government bear risks over which it has no control and no comparative advantage in managing creates unnecessary liabilities for taxpayers. Recognition of this fact has been a major force driving efforts to privatize enterprises operating in competitive market segments.

The government does have control over or a comparative advantage in mitigating some risks of a non-commercial nature, and trying to transfer these risks to the private sector would be inefficient. The most obvi-

ous cases include acts such as expropriation or the imposition of controls on the transfer of foreign currency. In these cases the best approach is usually to reduce the risk by adopting sound policies, and then to provide investors with credible assurances of fair compensation should such an event occur. The guarantee of compensation in the event of expropriation contained in Cambodia's Constitution provides an example.

An important source of noncommercial risk investors face, especially in infrastructure projects, can be uncertainties about the application or interpretation of regulatory controls or contractual commitments governing matters such as tariffs and quality standards. Risks of this kind increase investors' cost of capital, and thus result in reduced investment and higher prices. Investors are likely to be particularly sensitive to these risks

Figure 2.1 Perceptions of political risk by investors



Note: Maximum score (no risk) is 25.

Source: Euromoney (various issues).

in Cambodia, given that the legal and regulatory framework is at an early stage of development and key judicial and other institutions remain untested.

As figure 2.1 shows, perceptions of political risk are higher in Cambodia than in any of its neighbors.

Mobilizing local finance

Infrastructure investments are often capital intensive and may require mobilizing significant resources. Debt financing is important to facilitate new entry into the market, and long-term debt will be important to re-

duce the required tariffs for long-lived assets. Matching the currency of the project's revenue streams with the currency of the debt service obligation is also an important strategy for minimizing exchange rate risks. This means that there will be advantages in mobilizing local currency financing for projects that receive tariffs denominated in local currency, which will be the case for most private infrastructure projects.

Cambodia's financial sector is still small and at an early stage in its evolution. The local debt market is extremely limited, both in terms of liquidity and maturity on loans.

Financing considerations, coupled with foreign investors' perceptions of relatively high political risks in Cambodia, will have implications for the strategy for approaching PPI. Unless an activity has access to significant foreign currency earnings (like telecommunications, ports, and airports), it will usually be easier to attract private participation in existing assets, where investors have immediate access to cash flows that they can use to service debt or finance expansion, or in smaller greenfield projects with robust economics.

Managing the PPI process

Private infrastructure arrangements vary in size and complexity. Large projects involving key segments of

the economy often rank among the most complex and sensitive transactions any government will undertake. However, even smaller projects or reforms intended to support private sector participation can involve a large number of engineering, economic, financial, legal, and other issues, and effective coordination across several ministries and other agencies may be required. While the benefits of such arrangements can be substantial and long-lived, the costs of mistakes can also be significant and enduring.

The administrative hurdles prospective investors face can also deter interest and add to project costs. This can be an issue for smaller projects in particular, where transaction-related costs can account for a significant share of total project costs. Thus how a government organizes itself to deal with private infrastructure matters can be crucial to success. This will be especially so in Cambodia, where expertise in most of these issues is in short supply and administrative structures remain weak.

Notes

1. Note that official data often underestimate the extent of losses. For a fuller discussion of the situation in individual sectors see the sector-specific chapters of this report.
2. Although additional factors should also be taken into account, such as the high cost of telephone services in Cambodia.
3. According to the Financial Law, in 2001 about US\$175 million (or 67 percent) of total capital expenditure was expected to be financed externally and US\$81 million locally.
4. There are only minor discrepancies between the 2000 Financial Law and actual expenditure, therefore the estimated actual expenditure for 2001 was expected to be reasonably close to what was set out in the Financial Law.

3

Power

Sector overview and market structure

Cambodia's power sector is only now recovering from the effects of conflict. Cambodia has one of the lowest electrification rates outside Sub-Saharan Africa and some of the highest energy costs in the world. Yet despite the significant challenges, Cambodia's electricity sector has witnessed some major changes and achievements in the last seven years. The private sector has emerged as an important provider through independent power producers (IPPs) providing generation to state-run utilities, through small-scale provision in rural areas, and through autogeneration for individual domestic and business consumers. In addition, the policy environment has evolved, most recently with the approval of the Electricity Law in 2001, which along with other reforms creates an independent regulator for the sector.

Aside from the thousands of autogenerators throughout Cambodia that complement connections to local grids and provide individual households and businesses with electricity where no other option is available, Cambodia has three largely unconnected sources of electricity, namely:

- *Électricité du Cambodge's (EDC's) Phnom Penh operations.* The government-owned national company, EDC, provides electricity from its own generators and several privately owned producers to customers in Phnom Penh.
- *EDC's provincial operations.* EDC supplies customers in the capital towns of the provinces from independent stand-alone facilities.

- *Private rural operations.* Hundreds of private providers spread across the country offer services ranging from battery recharging sites to fully metered electricity provision for entire communities.

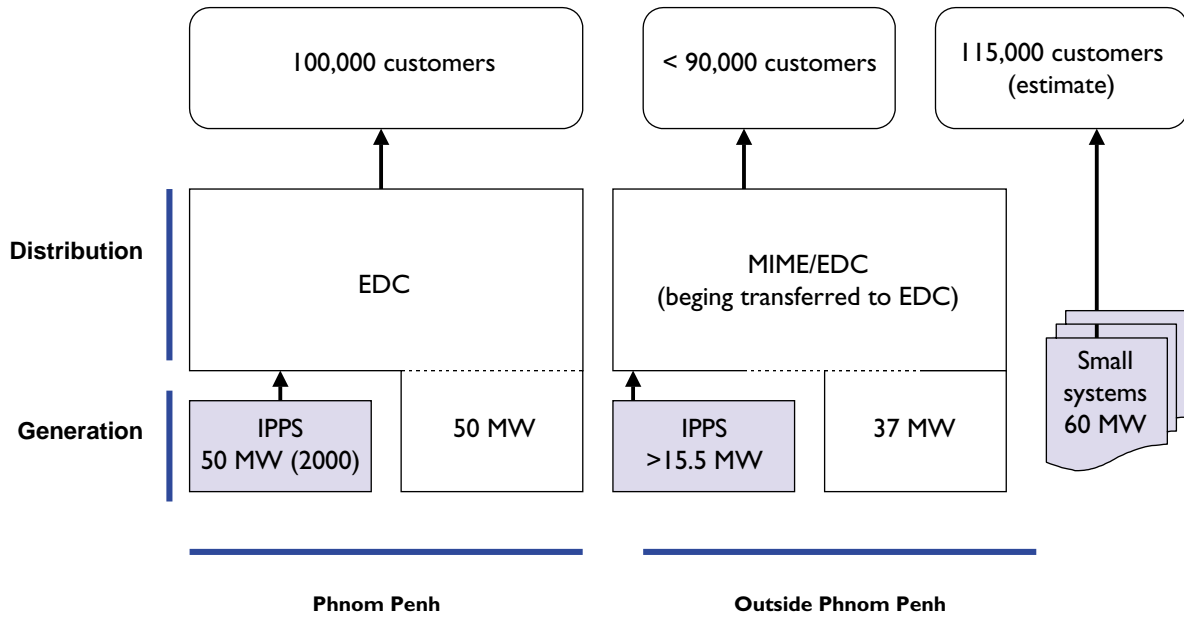
The current market structure for electricity supply can thus be characterized as bifurcated. On the one hand, EDC's operations represent integrated public utilities that are isolated from each other, but are centrally owned by one public enterprise. On the other hand, some of EDC's generating capacity is owned by private power producers who have signed power purchase agreements with EDC. These agreements typically incorporate take-or-pay provisions, which guarantee private generators' dispatch to EDC. While EDC does not have exclusivity or monopoly rights, it faces little competition within its service areas.

Most rural communities and small towns remain unserved by EDC, and in these locales a large degree of open access is allowed. Where EDC does not operate, hundreds of small-scale providers have sprung up. Most of these providers receive licenses from provincial authorities and all provide integrated service. Figure 3.1 summarizes the market structure for electricity.

Demand for electricity

The average electricity consumption rate in Cambodia is still relatively low compared with neighboring countries, although the rate is comparable to countries with a similar per capita GDP (table 3.1). As in parts of Sub-Saharan Africa, this is largely a reflection of the low level of connections in Cambodia.

Figure 3.1 Structure of the electricity sector



MW = Megawatt.

Note: The estimate of the number of rural electricity customers is very uncertain. The number in the figure is the lower end of the estimates. Other estimates put total rural households served at about 260,000. The shaded boxes represent private ownership of assets.

Sources: EDC (1999); Enterprise Development Cambodia (2001).

Table 3.1 Average electricity consumption, selected countries, most recent years (kWh/capita/year)

Country	Consumption
Cambodia	50
Lao PDR	93
Tanzania	54
Thailand	1,388
Uganda	34
Vietnam	262

Source: CIA (2000); Frontier Economics data.

As only 15 to 20 percent of Cambodia’s population is connected to EDC or a local private system, the consumption figures reflect demonstrated demand. Suppressed demand, or the level of consumption at current income levels and industrial activity, would be much greater. Unlocking this potential demand for power requires two conditions: first, increasing connections to the unserved majority; and second, improving service to current customers through extended hours, greater reliability, and lower prices.

The process for increasing connections, improving service, and lowering prices is different where an

incumbent provider exists and where private providers are allowed to enter the market and compete for customers.

Électricité du Cambodge

EDC operates 22 isolated systems that serve Phnom Penh and the capital towns of the provinces. EDC supplies only about 10 percent of all households, with most of those served (about 100,000 households) located in Phnom Penh. The power system in Phnom Penh has about 100 megawatts (MW) total capacity, of which 50 MW are supplied by two privately owned IPPs. Peak demand is currently about 100 MW. Total installed capacity owned by EDC outside Phnom Penh is estimated at about 37 MW (EDC 1999). These data indicate that access to power is still extremely low compared with other countries. Although it serves only 10 percent of the population, EDC is the dominant entity in Cambodia’s power sector. Until March 1996 it operated as a government department under the direction of the Minister of Industry, Mines, and Energy. Under the 1996 Royal Decree Establishing the Electricity Company of Cambodia, Ltd., EDC was converted into a wholly state-owned limited liability

Table 3.2 Summary of EDC's financial results, 1998–2000

Category	1998	1999	2000 (unaudited)	
	(CR billions)	(CR billions)	CR billions	US\$ millions
Revenues	104	146	198	52
Operating expenses	151	146	232	61
Operating income (losses)	-47	0	-34	-9
Net income (losses)	-51	-4	-49	-13
Total fixed assets	365	378	515	136
Current assets	43	76	63	17
Total equity	189	186	336	88
Long-term liabilities	147	172	126	33
Current liabilities	64	88	115	30
Total liabilities and equity	408	454	578	152

Note: Exchange rate CR 3,800 = US\$1.

Sources: EDC consolidated financial statements; World Bank projections.

corporation in accordance with the Law of Public Enterprises. It has a seven-member board, three of whom are drawn from the private sector.

Table 3.2 summarizes EDC's financial results and table 3.3 presents other operating statistics. The large increase in turnover from 1998 to 1999 was due to a large increase in legal connections in Phnom Penh, partly a result of the rehabilitation of the distribution system and training provided by *Électricité de France*.

The 1996 decree extended EDC's coverage, granting it nonexclusive rights to generate, transmit, and distribute electricity throughout Cambodia. Since 1996 EDC has been gradually taking over responsibility for electricity supply from existing service providers outside Phnom Penh. This process is likely to continue under an ADB-financed project to rehabilitate and extend electricity supply in eight provincial towns.¹

EDC relies on private generators to meet much of its demand in order to avoid large costs associated with constructing and operating its own generating facilities.² Box 3.1 summarizes the status of these private generators.

Private independent electricity suppliers

Outside the main cities, responsibility for electricity service depends upon about 600 private providers. These companies provide a wide range of services ranging from recharging batteries to distributing electricity directly to houses, serving, on average, about 192 customers with generating capacity of 105 kilowatts (kW). However, significant variation exists between the largest, which provide wired services to about 750 cus-

tomers plus battery recharging to another 2,000, to the smallest, which have fewer than 20 customers. Appendix 1 contains a Cambodia PPI power map that illustrates the distribution of registered electricity providers. Estimates indicate that Cambodia has about another 400 unregistered suppliers.

Sector performance

Électricité du Cambodge

The difficult political, social, and economic circumstances under which EDC has operated have affected its performance. High tariffs and poor reliability have led to large-scale self-generation among many consumers within EDC's own service areas.³ Despite this, capacity growth has not kept pace with rapid increases in demand in recent years: EDC's sales volumes rose by an annual average of 41 percent between 1995 and 1998.

Under existing plans EDC's longer-term ability to meet demand across the country will rely on significant imports from both Thailand and Vietnam, although neither interconnection agreement has yet been finalized. Also the demand forecasts that have been used to provide justification for the investments appear to assume substantial customer switching. Whether this actually took place would depend on EDC offering tariffs that compete with the variable cost of operating existing autogenerators, currently about CR 264/kilowatt hour (kWh) (US\$6.6), compared with the lowest tariff for these customers of about CR 500/kWh (US\$12.5).⁴

Unlike many countries at similar stages of development, capacity shortfalls on EDC's system appear to be

Table 3.3 Selected EDC operating statistics, 1998–2000

Category	Amount
<i>Energy sales (gWh)</i>	
1998	266
1999	264
2000	337
<i>Sales growth (%)</i>	
1998	22
1999	–1
2000	19
<i>Average revenue (per kWh)</i>	
1998 (CR billions)	371
1999 (CR billions)	504
2000 (CR billions)	577
2000 (US cents)	15
<i>Average tariff increase (%)</i>	
1998	5
1999	36
2000	14
<i>Gross margin (%)^a</i>	
1998	45
1999	0
2000	–17
<i>Current ratio^b</i>	
1998	0.67
1999	0.86
2000	0.55
<i>Debt-equity ratio^c</i>	
1998	0.78
1999	0.92
2000	0.38

Gwh = Gigawatt hour.

Note: Figures for 2000 are unaudited. Exchange rate is CR 3,800 = US\$1.

a. Operating income or losses divided by revenues.

b. Current assets divided by current liabilities.

c. Long-term liabilities divided by total equity.

Sources: EDC consolidated financial statements; World Bank projections.

driven more by poor availability than high technical and nontechnical losses (although peak demand, driven by the high percentage of domestic consumers, is also a factor). The load factor for EDC-owned generation is about 45 percent, primarily because of the dispatch rules that give private IPPs priority to sell power to EDC. The inability to finance new generation internally has led to contracting with IPPs. In 1994 MIME first sought expressions of interest from private developers to help it rapidly expand capacity. A number of memoranda of understanding were signed between the government and investors. On the basis of these mem-

Box 3.1 IPPs in Cambodia**Phnom Penh IPP1**

A 35-MW diesel plant commenced commercial operation in 1997. The project is sponsored by a Malaysian group, CUPL, which holds a generation license issued by MIME and an 18-year power purchase agreement (PPA) with EDC. The PPA contains no penalties for any failure to meet targets.

Phnom Penh IPP2

In 1996 EDC signed a 25-year PPA with Cambodia Power Company, a joint venture between Beacon Hill & Associates and Mosbacher Power Group, for a 60-MW combined cycle gas turbine fueled by naphtha. The project has never reached financial closure, in part because of concern about high capital costs totaling US\$93 million or US\$1,550/kilowatt (*Phnom Penh Daily* 1999, September 8).¹ Whether this project will be commissioned or not is unclear.

Phnom Penh IPP3

In response to the delays in commissioning the second IPP in Phnom Penh, EDC sought a temporary capacity addition in the form of a 15-MW diesel plant. Initially it approached Khmer Power Utility, with whom it signed a PPA. This was subsequently replaced by a three-year PPA signed in October 1999 with Jupiter Power Cambodia, Ltd., a joint venture of Jupiter Power International, Canada, and Caterpillar Power Ventures International, Bermuda. The plant was commissioned in early November 2000 at a total cost of around US\$10 million (about US\$560/kilowatt) with initial financing from the U.S. Overseas Private Investment Corporation.

Provincial center IPPs

Following the negotiation of the first Phnom Penh IPPs, the government decided to prequalify developers for IPPs in eight provincial centers, which were to be awarded based on a competitive bidding process. Jupiter Power has three small IPPs in Battambang, Pursat, and Kompong Cham, the first of which (Pursat) commenced operations in 1997. These operate under contract with the relevant provincial authorities under the supervision of MIME. There are private operators in a further eight provinces producing from about 1.5 MW to 5 MW each.

Kirirom IPP

A PPA is under negotiation with a Chinese developer for the rehabilitation of the Kirirom plant, a 12-MW hydroelectric facility. After some debate the National Assembly passed the agreement and it is awaiting debate in the Senate.

1. As a comparison, recent World Bank assessments of capacity expansion in Cambodia have assumed a combined cycle gas turbine capital cost of US\$850/kW (World Bank 1999).

oranda of understanding, power purchase agreements have been negotiated directly with investors.

Despite significant interest from private sector power producers, EDC and the government in general lacked both experience and access to independent advisors during the negotiation process, and the process did not benefit from competitive bidding. This meant that ensuring that projects were commissioned on a least cost basis or met technical criteria that would limit the likelihood of delivery failure was difficult. Furthermore, the government has yet to develop formal policies and methods for analyzing important issues such as the use of sovereign guarantees. As a result of these difficulties projects have been delayed, and at least one is reported to have been abandoned.

Private small-scale service providers

Between 6 and 13 percent of the more than 2 million rural households have access to electricity from various private sector providers (the figure is uncertain because most private rural providers are not formally registered). About two-thirds of the households receive supplies through isolated grids and the remainder through batteries (Enterprise Development Cambodia 2001). The prices these rural suppliers charge vary widely and are not controlled directly by the government. Average prices charged by the providers are high at US\$0.51/kWh, and range from US\$0.25/kWh to US\$0.90/kWh.⁵ These prices indicate a substantial ability and willingness to pay on the part of at least some rural consumers (for more details see Enterprise Development Cambodia 2001).

Small-scale power producers provide about 60 MW of capacity. They have largely financed their initial capital costs from their own funds (although the Association of Cambodian Local Economic Development Agencies [ACLEDA] has provided limited finance to some rural energy providers), and consequently the scope of their activities is limited by their access to funds.

Private sector activity in extending electricity supplies in rural areas has been significant, and potential to extend the activity is considerable if existing constraints are addressed. While the government's current focus in provincial towns appears to be on extending public sector activities, in rural areas it is strongly committed to an International Development Association project that will rely on private entrepreneurs for small-scale electricity supply.

Government and donor initiatives

MIME is responsible for carrying out the government's rural electrification strategy. (Although the Ministry of Rural Development [MRD] is responsible for rural water and road infrastructure, it currently has no involvement in the power sector). MIME is also responsible for planning, finding the necessary resources, and monitoring the implementation of projects in rural areas. The government is currently seeking about US\$10 million per year over a 10-year period from donors for a rural electrification program that might include establishing rural electricity providers. These would be established with the help of MIME's Rural Electrification Cell. The government has identified a pilot project that will serve to begin this process. It will take place in Ramdoul district and involves the installation of a 600-kilovolt ampere (kVA) diesel station and 72 kilometers (km) of single-wire distribution line and associated transformers. The total estimated cost of the pilot project is US\$628,000. The private sector has not been involved with this pilot.

Both the World Bank and the ADB are developing other rural electrification projects. The World Bank's proposed project is based on two initiatives as follows:

- Extending new transmission lines carrying power from Thailand and Vietnam, which it would partly finance, into adjacent rural communities. This would serve as the basis for the development of a national grid under the auspices of EDC.
- Creating a privately administered fund to help small-scale private providers finance the extension of their services to poorer communities. As currently envisioned, the fund would work in conjunction with a private investment fund that would make small commercial loans available to these providers. The grant funds for extended connections would be paid to providers after they had expanded their services to the poor and their performance had been audited and approved.

The ADB's proposed project is based on working with EDC to rehabilitate and extend existing local grids in provincial towns. These would first require considerable rehabilitation to serve the towns before the networks could be extended into rural areas. Table 3.4 shows the government's estimated investment requirements for the power sector over 2001–03. The only identified source of funds is the ADB rehabilitation plan for provincial towns.

Table 3.4 Estimated investment requirements in power, 2001–03
(US\$ millions)

Project	2001	2002	2003	Total	Government	External	Unfunded
Expansion of power system	18.0	3.0	0	21.0	0	0	21.0
Power rehabilitation in provincial towns	6.0	6.0	4.0	16.0	0	16.0	0
Rural solar support	0	1.1	2.3	3.4	0	0	3.4
Hydroelectric Mondulkiri	1.4	1.7	0	3.1	0	0	3.1
Hydroelectric development plan							
Stung Battam and Stung Mongkol	0.4	0.3	0	0.7	0	0	0.7
Rural electrification	1.0	3.0	3.0	7.0	0	0	7.0
Design and implementation of Siem Reap	1.0	2.0	2.0	5.0	0	0	5.0
Total	27.8	17.1	11.3	56.2	0	16.0	40.2

Sources: Government of Cambodia (2001b); Ministry of Planning (2001).

Legal and regulatory framework

EDC's legal status is based on the 1996 royal decree. Responsibility for energy sector policy rests with MIME, which, together with the MEF, is also responsible for regulation, although in practice tariff approvals are obtained from the prime minister.

Tariffs

Tariff setting lies at the center of the government's regulation of EDC. The government is revising the current tariff structure in an attempt to decrease the degree of cross-subsidy from commercial and industrial to residential load, and thereby decrease autogeneration by businesses. The tariff recognizes four classes of consumers: residential, commercial, industrial, and government (including NGOs and embassies) as follows:

- Tariffs for residential consumers use a rising block tariff structure involving limited cross-subsidy from large to smaller consumers. Tariffs range from CR 350/kWh (US\$8.8) for the first 50 kWh/month up to CR 650/kWh/month (US\$16.3) for consumption above 100 kWh.
- Tariffs for commercial and industrial consumers range from CR 480/kWh for large commercial users to CR 650/kWh for small commercial users (US\$12.0 to US\$16.3)
- Tariffs for the government and NGOs range from CR 700/kWh to CR 800/kWh (US\$17.5 to US\$20.0).

Tariffs set by rural electricity suppliers are not explicitly controlled by either the federal government or local provincial authorities. As mentioned earlier, they vary considerably across the country (mainly due to varying prices of fuel) from about CR 1,000/kWh to CR 3,600/kWh (US\$0.25 to US\$0.90).

Licensing

EDC is licensed through the 1996 royal decree. The license continues in perpetuity unless the government revokes it or sells more than 50 percent of the company. The license does not provide EDC with an exclusive right to serve customers within any of the areas it serves.

In theory, all rural electricity enterprises must be registered and have a license. Enterprises with capacity in excess of 125 kVA must register at the MIME offices in Phnom Penh. Registration is a formal process and does not involve any inspection of facilities or service provision, although owners are supposed to provide MIME with business plans. Licenses are issued for three years and are renewable for an additional three-year period upon application by the owner. Unlike EDC, the initial license and renewal provides the licensee with an exclusive right to supply customers within a specified area.⁶

Enterprises with a capacity of less than 125 kVA may register at MIME's provincial offices. They receive a one-year license that can then be renewed an indefinite number of times following annual applications. These licenses also provide for exclusive service to customers within a defined area. Although these procedures are clear, most rural electricity suppliers are not licensed. Their status is based on ad hoc agreements with local district and commune authorities.

New regulatory framework

The licensing and tariff-setting mechanisms and participation by the private sector in the sector will change with the implementation of the new regulatory regime. The new Electricity Law was passed in November 2000 and promulgated in February 2001. It established

a new regulatory body, the Electricity Authority of Cambodia (EAC). The law follows international best practice by separating the roles of policymaker and regulator and placing the latter with an independent body. Key features of the EAC are as follows:

- It will comprise a three-member commission, to be appointed by the prime minister through royal decree for three-year terms (the assignment of staff has started).
- Its independence will be protected by limiting the grounds for dismissing commission members and by funding it directly from license fees rather than through Parliament.
- Its duties include licensing, setting tariffs, enforcing performance standards, resolving some kinds of disputes, and establishing a uniform system of accounts.
- In fulfilling its responsibilities with regard to tariff setting, the EAC will be guided by requirements that include the development of tariffs that reflect costs and the use of performance-based approaches where this is considered to be in consumers' interests.

The law will greatly enhance the regulatory framework for the power sector. It places explicit requirements on the EAC to ensure that tariffs allow companies to recover legitimately incurred costs.

There is currently no explicit regulation of tariffs for rural suppliers. The new regulator will have to balance two risks: low-quality, high-cost service in an unregulated environment and the imposition of a tariff regime that discourages private sector entry altogether. Each of these issues depends on the extent to which the government, or the EAC on behalf of the government, should be involved in the detailed regulation of rural suppliers. Implicitly, given the EAC's objectives, it also focuses on the best approach for expanding supply to most households that currently do not receive network services.

New licensing regime

The law establishes a new licensing framework for the power sector. Generation, transmission, distribution, retail supply, dispatch, bulk sales, and subcontractors will all be separately licensed, although there is a provision for a consolidated license covering multiple activities. Initially EDC will be granted a consolidated license. The law contains one important restriction regarding the licensing of EDC's functions: a single, monopoly

national transmission license should be granted to a state-owned company. Although the law also provides for a special purpose transmission license to be granted to the private sector for concession projects involving the national grid, for example, build-own-transfer (BOT) and build-own-operate (BOO), the government and not the EAC will determine the conditions under which this license is awarded. This provides the government, not the regulator, with considerable influence over the development of the transmission system and, potentially, over final tariffs that would have to recover the costs of any new transmission investment.

The law provides the first formal legal framework within which IPPs and other private power projects will operate. To date, all arrangements with IPPs have been undertaken following ad hoc negotiations with EDC and the government, without any clear licensing process. However, in addressing this issue the law appears to require that all power producers, irrespective of how small they are, obtain a license, a requirement that could affect the future operations and development of small systems.⁷

The law raises a number of issues that the government and regulator together will have to deal with carefully. Most of these issues center on the treatment of new and existing rural private providers. The new framework should encourage further development of private sector provision by creating a clear framework within which suppliers can operate, although some areas could provide barriers to entry.

As indicated earlier, the law appears to require all generators to obtain a license from the EAC. The cost of this process, and even of registering in Phnom Penh, must remain affordable for small-scale providers.

Quality of supply

One of the main justifications for EDC's extension into rural areas is the assumption that a public service provider can offer higher-quality supply than the existing rural operators. EDC's electrification effort in provincial towns is based on bringing a 24-hour supply to those towns, compared with the 4 hours private rural distributors typically offer. However, EDC has not yet demonstrated its ability to provide a 24-hour supply in provincial towns, even where economies of demand exist, such as in Phnom Penh. The ability of small-scale providers to step up service as demand for higher-quality service increases may be greater than the

potential of a public provider to offer the service in newly electrified areas.

Opportunities for private sector participation

There are major opportunities for the private sector in meeting the forecasted demand for electricity. These range from large and small IPPs,⁸ through isolated systems supplying the needs of rural consumers, to private sector participation in EDC itself. PPI offers both new funds for investment in needed capacity as well as expertise to increase the efficiency of current operations.

Figure 3.2 outlines EDC's demand forecast for electricity in areas to be served by EDC's grid through 2011 and projected sources of new supply. EDC's forecasts exclude the demand for electricity in rural areas, because EDC is unlikely to meet this over the medium term.

Small-scale and rural power system expansion

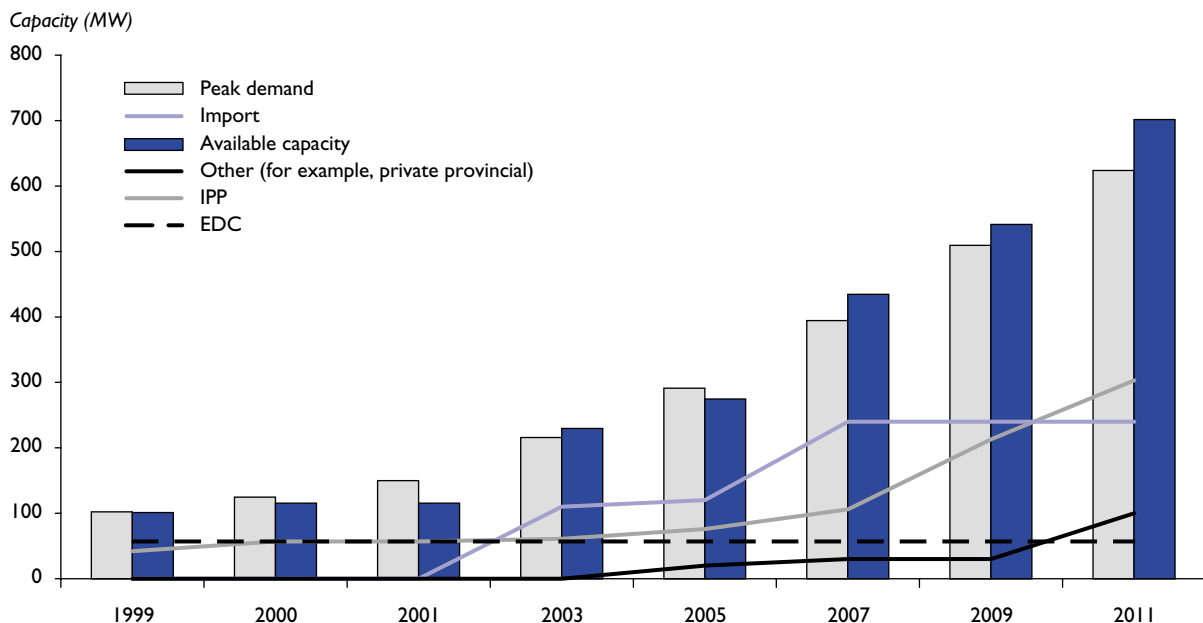
The private sector is expected to play a growing role in meeting the demand for electricity in rural areas. The ability of small-scale private providers, both domestic and foreign, to expand their involvement in the sector depends largely on the following factors:

- *Regulatory requirements.* While the new regulatory framework must establish and maintain acceptable

quality of service standards to be provided by private operators, it should not impose onerous quality standards on existing and new rural providers. Maintaining lower barriers to entry under the new regulatory regime and limiting the cost and complexity of any licensing requirements will be necessary ingredients for continued expansion of service into rural and peri-urban areas.

- *Access to financing.* The strengthening of the microfinance institutions and an extension of their ability to lend will be crucial elements in the further development of small-scale power provision. Increasing both the size of loans and the length of time over which loans are made will be central to allowing existing providers to expand their services and new providers to enter. The survey of rural enterprises undertaken by Enterprise Development Cambodia indicated that more than 60 percent of existing providers' expansion plans were limited because of a lack of funds, either because of low profits or the lack of finance.⁹
- *Rational use of subsidies.* As the government pursues rural electrification strategies to bring service to small communities throughout Cambodia, officials may find that the opportunity cost of providing public resources to expand public utilities is greater

Figure 3.2 Demand-supply balance in EDC's growing service area, selected years



Source: EDC data.

than the cost of targeted assistance to customers served by private providers. As such, the use of output-based aid or performance-based aid structures may help private providers to initiate or expand service without the distortions associated with typical subsidies. These schemes are discussed in more detail in chapter 7.

Private provision in provincial towns

In addition to rural areas, opportunities for PPI also exist in larger towns around the country. Outside Phnom Penh, the towns and regions with the largest predicted demand over the next five years include Bantey Meanchey, Battambang, Kompong Cham, Kandal, and Siem Reap. In each case opportunities exist either for the private sector to take over the operation of the existing, but barely functional, grid from EDC or to be allowed to enter and supply its own electricity. In each case coordination with donors will be important. This is especially true for many of the towns that fall under the ADB's rehabilitation plans that are being undertaken through EDC.

Providing future generating capacity to EDC through IPPs

As EDC's forecasts indicate, electricity demand is expected to continue to grow rapidly. There is a significant risk of large-scale power cuts in Phnom Penh un-

less substantial new capacity is commissioned, with EDC forecasting requirements for up to 90 MW of additional capacity by 2003. IPPs are expected to supply much of this.

Private management, operation, and/or ownership of EDC

Opportunities may exist for private sector participation in EDC itself. Even though EDC's system is small, it is comparable to systems elsewhere in the world where the private sector has been invited to take over the operations, management, and investment requirements of power utilities in exchange for regulated access to the revenue stream of the customer base. Even as it exists now with multiple isolated systems under its control, EDC could provide an attractive investment opportunity for a potential lease operator, concessionaire, or owner. Moreover, EDC's current restructuring plan may, over a 10-year period, see it transformed into the operator of a national grid. If this plan is implemented, it could allow for separate private sector participation in EDC's existing generation capacity and distribution networks.¹⁰ The appropriate role for the private sector will need to be studied further, both the appropriate form of PPI (for example, asset sale, concession, lease) for generation and distribution and supply services and whether PPI can be introduced into transmission as it has in other countries, such as Argentina.

Notes

1. Banlung, Kompong Speu, Kampot, Prey Veng, Serey Sophon, Stung Treng, Svey Rieng, and Takeo.

2. A significant proportion of demand is supplied through autogeneration. All the large hotels in Phnom Penh and Siem Reap, which would represent the majority of EDC demand if connected to the grid, use their own generators.

3. Out of total estimated peak demand in Phnom Penh of 90 to 100 MW in 1998, EDC estimates suggest that 28 MW was from consumers who also use unconnected capacity to meet their regular requirements and 16 MW was from consumers using EDC capacity only as backup rather than for their regular power needs (World Bank 1999).

4. Operating costs are determined largely by fuel costs, which have increased substantially over the past couple of years. If oil costs fall these costs will also decrease. However, the comparison between EDC's tariffs and autogenerators' variable costs is valid only for a

relatively short period, because the life of most autogenerators is quite short. They require new capital investment for overhaul or replacement every two to three years, making the consumer's capital cost contribution much higher.

5. The vast majority of generation is provided from diesel-powered generators, and consequently prices are heavily dependent on the price of fuel. Estimates indicated that prices have doubled over the past two years because of increases in fuel costs.

6. Whether enterprises will be allowed to renew a license more than once is not clear. This has yet to occur and a firm policy does not appear to be in place. As discussed later, in practice it may be up to the new regulator to decide.

7. The law does say that "The [generation] License issued under this section is for the primary purpose of promoting the safe, reliable, and economic operation of the national transmission grid and connected facilities."

This may imply that any generator unconnected to the national network need not be licensed; however, this is not clear.

8. For example, a feasibility study is currently under way for a possible 180-MW combined cycle gas turbine power plant in Sihanoukville. This would supply power to the southeast and to Phnom Penh through a new transmission network. One of the reasons for proposing this project appears to be the existence of offshore gas, though whether such a plant would be viable is not clear.

9. The low profits may be due to the extremely small size of many providers. The ability to borrow to create the working capital required to expand and earn appropriate profits will be central to the success of the rural electrification effort.

10. The generation capacity is so old and expensive that decommissioning these plants and having the private sector build new ones may be more efficient.

4

Water and Sewerage

Sector overview and market structure

The structure of Cambodia's water sector can be characterized as one in which isolated, vertically integrated systems provide water supply services to communities without providing sewerage services.¹ Most systems are publicly owned and are operated by either MIME, the MRD, or, in the case of the capital city, by the Municipality of Phnom Penh and the MPWT. A handful of private providers also offer treated, piped water delivery to parts of provincial and district communities.

Despite this plethora of ownership arrangements, the government estimates that only 29 percent of the rural population and 48 percent of the urban population have access to safe water. Since the population of Cambodia is largely rural, these data signify that only about 32 percent of the total population has access to piped water (MRD 2000). At the same time, the performance of a number of public and private institutions over the past five years has demonstrated that, despite various problems, there is considerable ability to meet consumers' demands.

Service provision in Phnom Penh has improved dramatically since the early 1990s, and currently about 550,000 people, roughly half the population, are served by the rehabilitated public water supply utility. Expansion plans exist to extend coverage to nearly the entire population in the capital within three years.

Outside Phnom Penh each of the 23 provincial towns is officially served by a water utility, but in practice many do not have functioning networks. Even in

those towns with treated water supplies, coverage is generally less than 15 percent. The total number of people served by household connections across all the towns is only about 80,000. Several towns are served by private network providers that have customer bases ranging from about 200 to 1,700. Private providers also provide bulk water supplies in some towns and villages. At the district level supplies are also provided by boreholes or by taking water directly from lakes and streams.

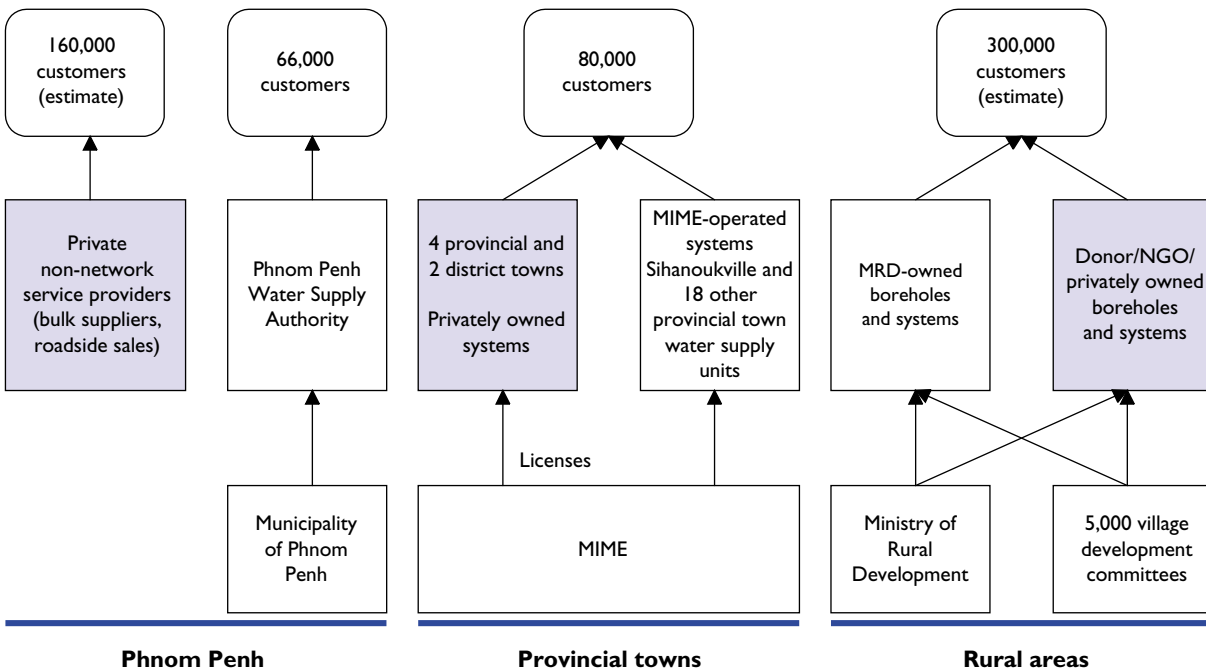
The situation is much worse for sewerage. Outside Phnom Penh Cambodia has no organized sewerage systems. Even within Phnom Penh most sewage drains directly into the river and none is treated.

The water sector consists of both public and private, regulated network providers and a wide range of unofficial (unlicensed or unmonitored) bulk water suppliers. Figure 4.1 outlines this institutional structure and the role of official suppliers.

Unlike in the power and telecommunications sectors, there is a clear division of responsibilities between urban and rural water supply. This division, along with the involvement of various other ministries for health and environmental reasons, means that the water sector is characterized by the large number of ministries and other institutions involved. The following institutions are responsible for different aspects of water resources, water supply, and sanitation:

- *MIME*. MIME is responsible for providing urban water supplies outside Phnom Penh.² MIME runs water supply facilities in 23 provincial towns, in 3 of which it has granted licenses to private operators.

Figure 4.1 Institutional structure of the water sector



Note: In its 1998 Annual Report the Phnom Penh Water Supply Authority (PPWSA) estimates that it serves about 550,000 people. It also estimates that it has 66,000 customers (as noted in this figure). This would imply an average of more than 8 customers per connection. In practice, some of PPWSA's customers are bulk water suppliers who on-sell. The total population served by the PPWSA includes these indirect sales. The shaded boxes represent private ownership.

Source: Government of Cambodia.

MIME has also granted licenses to six other private operators that run systems in district towns.

- **MRD.** The MRD is responsible for rural water supplies and sanitation. It oversees the operations, tariffs, and quality of water supplied by noncommercial organizations, that is, nonprofit agencies such as NGOs, donors, and local cooperatives. It also coordinates donor activity in rural water supply.
- **Phnom Penh Water Supply Authority (PPWSA).** The Municipality of Phnom Penh is responsible for water in the capital, while the national government retains responsibility for sanitation. Thus the operation of the water supply network is the responsibility of the autonomous PPWSA, while sanitation is currently the responsibility of the MPWT.
- **MPWT.** The MPWT is responsible for sanitation in provincial towns, including Phnom Penh.
- **Ministry of Water Resources and Meteorology (MOWRAM).** MOWRAM was established in 1999 to define the policies for and strategic development of

water resources. It currently has a limited role in the water sector and focuses mainly on granting water abstraction rights.

Other ministries and agencies also play a role in the sector's operations and finance. For example, the Municipality of Phnom Penh reports to the Minister of the Interior. The minister can therefore influence tariff and other policy decisions concerning the PPWSA.³ In addition, the Ministry of the Environment is responsible for monitoring the water quality of effluent from industrial and other sites and the Council for the Development of Cambodia (CDC) is the main body through which any foreign private sector interest is channeled.

Recognizing the complexity of the sector and the confusion that these overlapping roles create, the government has moved to clarify institutional responsibilities by creating a coordinating committee for the sector composed of senior representatives from the ministries involved, from the CDC, and from the Mu-

Box 4.1 | Water sector policies

The water supply policy statement outlines the government's policies in six main areas as follows:

- *Supply should meet local requirements.* Approaches should be adopted that are responsive to both supply and demand and are based on local circumstances, such as geographical, political, and historical background.
- *Private sector participation is important.* The private sector shall be encouraged to be involved in all areas of service provision through service contracts, management contracts, lease contracts, or concession contracts. (The policy does not explicitly discuss asset ownership, although current projects suggest that the private sector can also own the assets.)
- *Tariffs should cover all costs.* These costs include efficiently incurred operations and maintenance costs, depreciation charges, taxes, and return on capital.
- *Vulnerable groups should be protected.* A clearly defined set of subsidies should be in place so that the poor can access the network. Until the development of such a policy, the focus should be to provide connections to the network through cross-subsidies or credit.
- *Service provision should be decentralized.* Decentralization should be pursued and a plan developed for the financial autonomy of the public water suppliers that will lead to establishing them as public enterprises.
- *An independent regulator should be set up.* An independent regulator for the water supply sector shall be established for the whole country to build confidence and create a credible, competent, transparent, and impartial regulatory mechanism that will guard the interests of all stakeholders.

nicipality of Phnom Penh. However, while the committee provides a central forum through which the various institutions could coordinate their actions, it has no formal authority to make decisions within the water sector.

Through its ministries, the government has recently approved a water supply policy statement that sets out its approach to water supply throughout Cambodia (see box 4.1).

In addition to this approved policy, the MRD has prepared a draft policy on rural water supply and sanitation that emphasizes the decentralization of water supply, operations, and financing. Once it has been finalized it will be incorporated into the water supply policy.

Sector performance

Compared with countries with similar levels of GDP per capita, Cambodia's water systems supply relatively few households with piped water and there is no treatment of sewage.

Water supply in Phnom Penh

The PPWSA dominates the official water supply within Phnom Penh. The city also has many informal water sellers who are not explicitly licensed by the government.

The PPWSA was recreated in 1980 after being dissolved by the Khmer Rouge. Its main objectives are to

- Provide an adequate quantity of clean water at a reasonable price
- Sell water at an affordable price, taking into account local incomes and the need to maintain and invest in the network
- Ensure the quality of water produced by the treatment plants
- Keep water losses to a minimum.

Other listed objectives include promoting water conservation, maintaining good relations with its customers, and training its staff.

Since 1993 a series of technical assistance grants provided by the United Nations Development Programme, the World Bank, the ADB, and the governments of France and Japan have helped to rehabilitate the water supply system and develop the human resources and management capacity of the staff. In 1996 the PPWSA was transformed into a public enterprise. It was granted greater administrative and financial autonomy under Subdecree 52 of December 1996, which established it as a publicly owned corporate entity with its own board of directors. Table 4.1 presents its physical performance over 1998–2000 and targets for 2003.

The network has been substantially rehabilitated and expanded, the number of customers served has nearly tripled since 1986, and physical losses have been reduced considerably. This impressive record is the result of strong management together with substantial donor assistance for both direct investment and training.

The PPWSA's performance is, in some important areas, similar to that of water utilities elsewhere in Asia

Table 4.1 Physical performance of the PPWSA, selected years

Category	1998	1999 (estimated)	2000 (estimated)	2003 (target)
Number of connections	50,410	60,480	67,020	73,300
Domestic consumers (percentage of total consumers) ^a	59	61	62	63
Production (m ³ thousands)	39,984	42,000	42,000	82,250
Average daily production (m ³ thousands)	109.5	115.1	115.1	225.3
Nonrevenue water (losses, %)	56	45	27	25

m³ = cubic meters.

a. The balance is mainly commercial and industrial users.

Source: PPWSA (1998).

Table 4.2 Comparative industry performance, selected Asian cities, most recent years

Town	Population (1995 figures)	Nonrevenue water (%)	Staff per 1,000 connections
Phnom Penh, Cambodia	1,000,000	27	6.3
Chittagong, Bangladesh	1,000,000	35	27.7
Bandung, Indonesia	2,250,000	51	7.7
Kuala Lumpur, Malaysia	1,370,000	36	1.12
Mandalay, Myanmar	670,000	60	6.3
Colombo, Sri Lanka	2,800,000	51	7.3
Chonburi, Thailand	224,000	38	2.6
Ho Chi Minh City, Vietnam	4,731,000	34	6.4

Source: ABD (1997).

(table 4.2). Its efficiency, measured in terms of the number of staff per 1,000 connections, is the same or slightly better than that in Bandung, Colombo, and Ho Chi Minh City. Its performance as measured in terms of nonrevenue water is lower than that of many other major cities in the region.

Past funding for Phnom Penh's water supply system was focused on rehabilitating the bulk supply and distribution network. This led to a significant improvement in the level of unaccounted for water and a network expansion to cover more than half of the city's population. Under these operating conditions, the PPWSA more or less breaks even (table 4.3).

The PPWSA's average cost is about CR 900/cubic meter (US\$22.5). If tariffs are increased to better reflect costs, then it should have sufficient revenue to maintain the existing network. Table 4.4 provides the utility's current tariff levels for different consumer groups.⁴ Once the proposed tariffs have been implemented and cost recovery has been achieved, the utility's main concern would be finding funding for system expansion and, potentially, for sewerage treatment works.

Table 4.3 PPWSA's income statement, 1997–2000 (US\$ millions)

Category	1997	1998	1999	2000
Water sales	2.7	3.2	3.9	5.5
Connection revenue	0.1	0.6	0.5	0.3
Total revenue	3.2	4.4	3.2	6.4
Operating costs	1.9	2.4	2.1	2.3
Total expenses ^a	2.9	4.1	4.5	5.4
Net profit	0.3	0.2	0.5	1.0

Note: Exchange rate: CR 4,000 = US\$1. Asset base was approximately US\$78 million in 1999.

a. Includes depreciation and interest charges in addition to operating expenses.

Source: PPWSA (1998).

Water supply outside Phnom Penh

Outside Phnom Penh the government's policy is to create financially self-sustainable and autonomous water supply entities. As a first step it granted the water authority in Sihanoukville a large measure of financial and operational autonomy by Ministerial Decree Number 524 of September 2, 1996. The Sihanoukville Water Supply Authority is the only water authority outside Phnom Penh currently empowered to collect

Table 4.4 Current tariff structures for the PPWSA

Category	Block (m ³ /month)	Current tariff (US/m ³) (effective since January 1, 2000)
Domestic customers	0–7	13.8
	8–15	19.3
	16–50	25.3
	51 and above	31.8
Administrative customers	Flat rate	25.8
Commercial, industrials, and private wholesalers	0–100	23.8
	101–200	28.8
	201–500	33.8
	501 and above	36.3

Source: PPWSA data.

its own revenues, incur expenditures, and manage its operations as a commercial undertaking. It is no longer subject to the Treasury Law applicable to government departments. Table 4.5 outlines the state of the water authority in 2000.

Officially the government, through MIME, operates the public utilities in 20 other provincial towns; however, these are all in need of substantial repair and few have more than 1,000 connections. Examples of such provincial towns include the following:

- *Battambang*. Despite a population of more than 70,000, the local water utility has only about 3,100 connections and unaccounted for water totaling about 50 percent.
- *Kampong Speu*. The existing public network, which had about 1,000 connections, has been transferred to the private sector.
- *Pursat*. The public network serves a town with a population of about 25,000 and has about 1,000 connections and unaccounted for water of about 30 percent.

Table 4.5 Sihanoukville Water Supply Authority, 2000

Category	Amount
Number of households	12,014
Number of connections	964
Production (m ³ /day)	2,000
Tariff (block tariff structure, CR/m ³)	900/1,200/1,540
Connection fee (US\$)	80
Unaccounted for water (%)	40
Revenue (approx., US\$)	115,000

m³ = cubic meters.

Source: MIME data.

In all other reasonably large towns, such as Kompong Thom, Kompong Chhang, and Kampot, the population served by the networked utility is well below 1,000 connections.

In response to the generally poor development of networks outside Phnom Penh, private operators put forward proposals for privately financed companies in six towns (Sisophon, Kompong Speu, Takeo, Kien Svay, Sre Ambel, and Udong) that were accepted by the government. Five BOT contracts have been awarded for periods of 23 to 30 years and one BOO contract has been awarded. This entrepreneurial effort was led in three towns by water supply managers who have developed their own water treatment manufacturing plants and entered into partnerships with local construction companies and business people. The schemes have been in operation for up to four years. All the private operators share some similar characteristics and face similar challenges, namely:

- *Financing*. Most of their investment and working capital is generated internally from shareholders, other businesses, or both. Little is borrowed from banks or NGOs. Private operators consistently cite the lack of adequate financing for investment as the greatest difficulty facing new schemes, much greater than the need for technical support or the licensing process.
- *Technical support*. External engineering advice was used to design the systems. In most cases the advice came through MIME, which provided an expatriate engineer, but was paid for by the private company.
- *Licensing and contracts*. The companies have relatively long-term contracts with the provincial governors (between 23 and 30 years) and renewable (every 3 years) licenses with MIME. None of the private operators doubted that their licenses would be renewed.
- *Cost and quality*. Consumers indicate that private operators provide higher-quality service than comparable public sector counterparts at a generally higher cost (though this may be misleading, because public suppliers are often subsidized).
- *Tariffs*. MIME regulates private providers' tariffs, which in general are about CR 1,500/cubic meter (US\$0.39).
- *Collections*. Their collection rates are quite high, typically above 90 percent.

- *Connections.* Their rate of connections has slowed following the connections made as part of the initial setup.⁵

The process for awarding both the contracts and licenses to these operators was not transparent. Furthermore, no clear criteria or procedures for awarding future contracts and licenses have been established.⁶

Given the complicated institutional structure and lack of a clear legal framework, these companies' emergence and apparent success is remarkable; however, a combination of more entrepreneurs and extension of existing enterprises will be required if a substantial proportion of the population is to have access to clean water. The legal and institutional structure needs to encourage entrepreneurs, but at present is in danger of discouraging them. The Cambodia PPI water map (appendix 2) illustrates the location and size of existing private sector operators of piped water systems as well as potential locations.

An important issue in encouraging expansion is the selective use of exclusive agreements for service provision. Exclusivity provides private companies with increased security over their revenue flow, which facilitates the financing of up-front capital expenditures; however, exclusive agreements can inhibit service expansion by limiting new entry and diminishing the incumbent operator's incentives to connect new clients. In some countries this is sometimes addressed by including connection targets in the license agreement. This type of approach was followed for the existing private sector licensees, which had to submit targets for new connections to receive their licenses from MIME, but these were apparently not binding targets, just indications of expansion plans. Other sectors and countries have used alternative arrangements that limit exclusivity, but protect the core business of the investors. In Panama's rural electricity licensing regime, for example, periods of exclusivity are determined by a given community's distance from the principle network.

Non-network rural activities

Rural water supply activities take place under agreements with village development committees (VDCs), sometimes also referred to as community development committees. These elected local bodies are designed to represent local inhabitants in defining community needs; to initiate actions; and to be the point of contact

with higher levels of government, NGOs, and potential private sector suppliers. The MRD requires VDCs to be established before it will participate in community rural water projects. There are currently about 5,000 elected VDCs out of a total of 13,000 villages. They exist within a hierarchy that also includes communal rural development committees at the district level and the provincial rural development committees. These latter two committees are not elected and report to the MRD. Through the VDCs local communities are encouraged to contribute to the initial capital costs of establishing piped water facilities, either financially or in kind, for example, by providing labor. In practice, how many VDCs manage to do this is not clear, and experience to determine whether the VDCs manage to maintain the systems following their installation is as yet insufficient.

Estimates indicate that about 15 percent of the rural population has access to clean water supplies, mainly through about 40,000 boreholes. In the 1980s and early 1990s rural water supply activities were assisted by the United Nations Children's Fund (whose drilling equipment is still maintained and used by the MRD) and Oxford Famine Relief, mainly through the drilling of boreholes. However, the MRD has changed the focus of rural water supplies from a project-oriented approach to attracting local entrepreneurs, NGOs, and others to provide services demanded by communities. These institutional arrangements are creating the conditions for community-led water supply investments. The continued development of the VDCs is an encouraging step that provides clear, locally supported bodies through which water needs can be managed.

Legal and regulatory framework

As in other sectors, Cambodia's recent history means that there is only a limited legal framework governing the water sector. The urban water sector operates under a set of informal rules, practices, and regulations. Consequently, while private sector involvement faces few legal constraints, there are also no clear procedures for new entry.

The following are the main legal parameters defining the institutional framework:

- *Autonomy.* The Law on the General Status of Public Enterprises (June 1996) defined the operation,

governance, and supervision of public enterprises and granted them legal independence and a degree of financial autonomy. They are nevertheless still subject to various state controls, and each is overseen by the relevant ministry. In relation to the water sector, in December 1996 the government approved Decree 52 that established the PPWSA as a public enterprise and obliged it to operate according to commercial practices and prepare annual business plans. It has not granted this autonomy to public sector water suppliers outside Phnom Penh.

- *Legal basis for PPI.* The legal basis for granting licenses to the private sector is uncertain. MIME issued what is termed a general principle (Number 02 GTS, dated June 10, 1997) laying down the basic principles for PPI. The licenses granted to date have been based on this general principle. In the absence of a specific law on PPI, the licenses and contracts derive their legal sanction from the other cross-sectoral laws and subdecrees discussed in the section on water supply outside Phnom Penh.
- *Regulation.* The government has adopted a water supply policy that includes a specific provision for establishing a water supply regulator. Although the regulator's scope, powers, and functioning have yet to be finalized, its responsibilities will include issuing licenses to both the public utilities and private sector operators and regulating tariffs.
- *Law on Water Resources.* MOWRAM has drafted a law on water resources, which is now under discussion and includes the granting of water abstraction licenses by MOWRAM. It also provides for the licensing of wastewater discharges to be done in consultation with the Ministry of Environment. The procedures for granting such licenses is proposed to be the subject of a subdecree. Fees, which have yet to be set, will be charged.

The existing legal and regulatory framework requires further development, as does the system for setting tariffs. Currently, the only formal statement of tariff-setting principles is the general principle that enjoins MIME to set the tariff using the "water cost calculation method" by allowing an appropriate profit of 20 to 25 percent to the private party. The private party is required to submit detailed proposals for this purpose that indicate fixed and variable costs and expected margins based on an estimated volume of production.

In practice, whether any detailed formula is used is unclear. Tariffs in Phnom Penh are substantially below those in the rest of the country (up to one-sixth as much), where tariffs all fall within a narrow range. Tariffs for private network providers are set to allow them to recover their costs.⁷

In addition to tariff setting, two further issues require consideration. The first is the role of provincial authorities. Current regulation and general oversight of the sector are split between two ministries. MIME oversees water provision in the main towns (sometimes through its provincial offices), while the MRD oversees water provision in rural areas. The new regulatory framework will have to consider whether or not this is an appropriate division of responsibilities. In particular, local authorities, especially local governors, currently have an ad hoc role, that is, their permission appears to be required to set up a private operation, but there is no legal basis for their role and they do not monitor or regulate the operation once it has been established.

The second issue is the quality of supply. Licensees are currently required to supply water samples to MIME at regular intervals, normally three or four times a year. These are tested for basic quality indicators, such as the amount of suspended matter. However, this procedure appears to be implemented haphazardly and does not apply to unlicensed bulk water suppliers, and there is no explicit quality control of boreholes and wells dug by private operators in rural areas. The regulatory framework should encompass both the appropriate authority for and the degree of quality control. As with other sectors, maintaining universal quality standards may not be appropriate (that is, requiring the same standards in Phnom Penh as in rural districts); however, some protection against contaminated supplies must be provided.

Opportunities for private sector participation

Table 4.6 presents the PIP for 2001–03. While the majority of projects listed remain unfunded, most of these are in the areas of flood control, irrigation, and drainage. The true short-term opportunities for investment in water supply lie in provincial towns and peri-urban areas not served by piped distribution systems. In the medium term the existing utilities may provide opportunities for investment, lease, or concession arrangements.

Table 4.6 Estimated investment requirements in the water sector, 2001–03 (US\$ millions)

Project	2001	2002	2003	Total	Government	External	Unfunded
Phnom Penh water rehabilitation	4.9	3.2	0	8.1	1.7	6.5	0
Phnom Penh water supply and drainage	4.3	1.9	0	6.1	0.6	5.5	0
Rural water supply	0.8	0	0	0.8	0	0.8	0
Sihanoukville sewerage	2.8	1.3	0	4.1	0	4.1	0
Rehabilitation of water supply	0.5	0.2	0	0.6	0.3	0.2	0.1
Provincial town improvement	1.7	2.6	1.0	5.3	5.3	0	0
Water sector policy framework	0.04	0.04	0	0.08	0.03	0.05	0
Rehabilitation of rural water supply	0.4	0.9	1.0	2.3	0	0	2.3
Siem Reap water supply	1.0	1.4	1.9	4.3	0	0	4.3
Takmao water supply	0.9	2.1	0	3.0	0	0	3.0
New machinery and equipment	1.7	0	0	1.7	0	0	1.7
Construction of flood protection dyke	0.09	0.3	0	0.4	0	0	0.4
Rainfed rice quality improvement	0	1.1	0.9	2.0	0	0	2.0
Drilling of 113 wells	0.03	0	0	0.03	0	0	0.03
Irrigation system rehabilitation and construction	0.5	0.6	0.6	1.7	0	0	1.7
Topography of irrigation	0.38	0.3	0	0.68	0	0	0.68
Construction of irrigation system	1.2	1.7	2.3	5.2	0	0	5.2
Small irrigation system	0	2.5	3.5	6.0	0	0	6.0
Topography and maintenance of irrigation system	0.6	0	0	0.6	0	0	0.6
Repair and maintenance of hand pumps	0.6	0.7	0.7	2.0	0	0	2.0
Phnom Penh flood protection and drainage	4.1	10.5	10.7	25.3	0	0	25.3
Total	26.5	31.3	22.6	80.3	7.9	17.1	55.3

Source: Ministry of Planning (2001).

Provision of small-scale, rural water systems

The recent emergence of private sector network water suppliers, despite a lack of clear rules and procedures, indicates the potential for substantial private sector involvement in the sector (see box 4.2).⁸ The main con-

straint reported by existing private sector operators is their inability to borrow funds at reasonable rates, that is, at interest rates below about 25 percent per year. Increased private sector provision may depend on access to financing, and given Cambodia's average income

Box 4.2 Small-scale private sector water provision

Despite the absence of a clear, transparent legal and regulatory framework, the private sector has taken important steps in assuming a key role in water provision. Using existing businesses to provide working capital and inputs (most private operators either also run or are associated with a construction company that undertakes the initial construction of the water treatment facilities and main trunk lines), entrepreneurs have established themselves in six small towns. They have invested amounts ranging from about US\$300,000 to US\$1 million. They have established operations that include not only water supply to connected households, but in some cases they have also

- Put in place installment plans for paying connection charges
- Franchised areas of the distribution network to other businesses that pay a fee to supply a given area
- Sold to wholesalers that then on-sell to remote regions beyond the reach of the network

- Set up a factory to manufacture the equipment required in treatment plants.

While not overstating the importance of the current size of the private sector in water supply, it should be noted important steps have been taken in that Cambodia now possesses

- Individuals with experience in setting up water supply companies in relatively small towns
- A factory in Phnom Penh that produces the equipment required for treatment plants, such as storage and treatment tanks
- Construction companies with experience in setting up water supply systems in areas that previously lacked any piped supply.

levels, the development of targeted subsidy programs, for instance, subsidies covering some of the capital costs of connection.

As discussed in chapter 7, preferred approaches to subsidization focus on output, that is, actual service provision to needy consumers. The World Bank and MIME are currently designing a program for Cambodia's water sector that would provide grant funds to private operators on a per connection basis after they have implemented capital expansion programs into designated areas. The commitment to the connection subsidy by the grant managers may also help private providers obtain up-front financing for their business development plans.

Outside Phnom Penh, ample opportunities for the private sector are available in Sihanoukville and the other provincial towns currently served by public water networks. Table 4.7 lists potential towns for PPI. While many of these are relatively small, a few are larger than some of the towns the private sector is currently serving. If necessary, private sector interest could be stimulated by grouping towns together.

Private participation in existing water service providers

The government is currently making progress in setting up a regulatory framework for the water sector, which should increase the confidence of private sector investors and operators, who will seek a transparent and

Table 4.7 Selected towns with potential for PPI in the water sector

Town	Province	Number of households	Population
Prek Phnov	Kandal	11,257	55,253
Kep City	Kep City	5,369	28,660
Mokol Borey	Bantey Meanchey	4,352	23,900
Pailin	Pailin	4,133	22,906
Suong	Kompong Thom	4,392	22,889
Udor Meanchey	Udor Meanchey	4,027	22,361
Chamka Leu	Kompong Thom	4,325	22,243
Preah Vihear	Preah Vihear	4,133	21,580

Source: MIME data.

stable environment. However, there are currently no definitive plans for private sector involvement in the PPWSA or any of the other larger water utilities, such as in Sihanoukville. Given the need for more financing to extend network coverage and to invest in sewage treatment, there may be a role for private sector participation in the PPWSA and other urban water utilities. International investors have shown considerable interest in a wide range of water and sewerage projects and have informally expressed interest in the operations of the PPWSA and the Sihanoukville Water Supply Authority. Appendix 2 contains information about these towns' populations, households, water connections, current tariffs, connection fees, and unaccounted for water.

Notes

1. Throughout this chapter, except where specifically stated, the term "water sector" refers to the "water and sewerage sector." Currently Cambodia does not have any sewerage services that treat effluent. Sewerage consists of piping wastewater away from its source.

2. There is currently no clear definition of urban versus rural water supplies. The working practice is that MIME oversees all water supply through networks, while the MRD oversees the remaining sources of supply. However, MIME also oversees wholesalers who purchase from network operators. Therefore MIME's oversight extends to networks and for-profit private operators, while the MRD oversees non-networked and NGO, donor, or community coopera-

tives that provide water without commercial considerations.

3. In practice, decisions as important as tariff changes currently require the permission of the Council of Ministers. Thus the Ministry of the Interior's influence is exerted through its seat on the council.

4. Note that informal bulk water suppliers charge about CR 15,000/cubic meter, which provides strong evidence of consumers' ability to pay for water.

5. Some of the operators introduced installment plans to help people afford the connection charge when they noticed connection rates falling. This appears to have increased demand for new connections.

6. These findings are generally in agreement with a recent World Bank study and survey

of the private providers (Garn, Isham, and Kähkönen 2000).

7. MIME sets them once a year and, in theory, they are intended to allow operators to recover both operating and capital costs, including a prescribed rate of return. In practice, the tariff-setting process appears to be based on historic levels with limited analysis of whether or not these are too high or low.

8. Note that the supply of water outside networks (for example, in bottles or from kiosks) has long been a private sector activity, and while prices are considerably higher than for water from networks, these supplies do constitute a major source of drinking water for much of the population.

5

Telecommunications

Sector overview and market structure

The telecommunications sector has witnessed more private sector involvement than any other infrastructure industry in Cambodia. To date, the MPTC has issued five mobile licenses and one international gateway license to private companies, and recently completed a 10-year cooperation agreement with another private company for the operation of the primary international gateway. Each of these agreements is in the form of a joint venture between the operator and the MPTC.

Despite the involvement of the private sector in almost all aspects of operations, telecommunications can also be described as the area of Cambodian infrastructure with the greatest degree of centralized control. A single central government agency, the MPTC, shares in the ownership of all mobile services, the fixed line network, and the international gateways. It also sets telecommunications policy and acts as the regulatory agency.

Even with the universal presence of the government, some degree of competition in service provision has emerged among the dominant private partners in mobile joint ventures. Figure 5.1 shows the sector's structure and ownership.

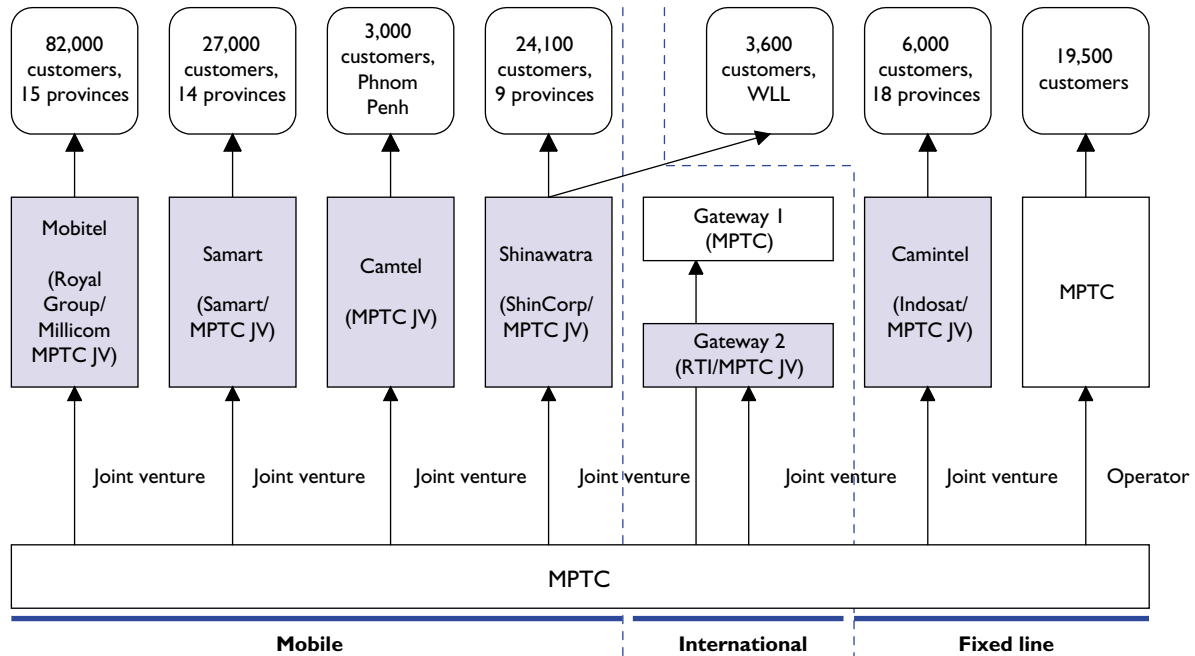
Despite the technology and operational expertise brought to the country by multiple investors and operators, Cambodia's telecommunications sector faces a number of challenges, including a lack of transparency in the process for awarding licenses; the forced large-scale revenue sharing between private operators and the MPTC; the government's conflicting responsibili-

ties of ownership, policymaking, and regulation; and the low-use and high-cost performance of the fixed line networks.

Even though the government has not issued a clear and comprehensive statement of its policy for the telecommunications sector, key elements have been set out in legislation and public policy documents. These include the draft Telecommunications Bill, which states that national policy toward the sector is "to encourage private investment as contained in the Investment Act" and that "ownership of telecommunications networks shall be vested with either a government state enterprise or private companies," and the Telecommunications Master Plan, which endorses the use of joint ventures and BOT contracts between the government and the private sector. The MPTC has elaborated key policies to support these elements (see box 5.1).

In February 1997 the Council of Ministers approved the sector strategy document, "Telecommunications Master Plan for the Rehabilitation, Commercialization, and Restructuring of MPTC," drawn up with assistance from the International Telecommunications Union and the United Nations Development Programme. Although mainly an investment plan, it also contains several policy recommendations that were adopted through its approval by the Council of Ministers. These are the separation of the MPTC's policy functions from its operational roles of providing services in post and telecommunications and the use of joint ventures between the MPTC and the private sector.

The Subdecree on the Organization of MPTC (October 22, 1997) also outlines some sector policies,

Figure 5.1 Structure of the telecommunications sector

JV = joint venture.

WLL = wireless local loop.

Note: The shaded boxes indicate private-public joint ventures.

Source: Government of Cambodia.

such as the MPTC's regulatory functions and the operation of the fixed network as public enterprises.

Sector performance

The telecommunications sector has undergone rapid change during the last decade. Cambodia had approximately 3,000 working lines in 1993 and more than 100,000 by 2000. Four mobile companies offer services and Internet access is now available even in provincial towns. However, the combined fixed and mobile penetration rate is currently only around 1.54 per 100 inhabitants, which is low by both regional and international standards. The low fixed network penetration rates are due to the collapse of the network during 1975–90. Recent increases in fixed network coverage have come about through investment under foreign assistance and has mainly benefited Phnom Penh. Geographical coverage has not increased significantly.

Table 5.1 provides an overview of the sector's performance by contrasting telephone coverage in Cam-

bodia with that in other countries in the region and at similar income levels in other parts of the world. Although important progress has been made, with the fixed line penetration rate increasing to 0.25 per 100 by 1999, it remains one of the least connected countries in the region and perhaps the only country in the world with mobile penetration rates double those of fixed line penetration.¹

As noted, penetration rates in Cambodia have risen since 1998, and by the end of 2000 the fixed line penetration rate was 0.27 per 100 inhabitants and the mobile penetration rate was 1.27 per 100 inhabitants. Even with these recent improvements, fixed line penetration remains low compared with other countries, while mobile phone penetration is high in relation to Cambodia's relative gross national product (GNP) per capita. In line with this trend, demand for mobile connections is forecast to increase over the next decade from current levels of about 135,000 connections to more than 200,000 connections. While demand for fixed line connections is predicted to rise at about 6

Box 5.1 MPTC policies

- The development of the national network should conform to the 1997 Telecommunications Master Plan. The MPTC will implement recommendations made in the master plan for restructuring, including creating a national telecommunications company.
- All new network facilities should, as far as possible, conform to the latest designs and be fully digital. In the case of mobile telephony, global system for mobiles technology (GSM) should be used.
- The MPTC will encourage the participation of the private sector, including in the formulation of appropriate legislation and regulations.
- Tariffs for all services and operations will be under the control of the MPTC. Operators must submit tariffs for approval.
- Switching will, to the extent possible, be standardized, and where economic and feasible, transmission systems should use fiber optics for the main links and microwave technology on smaller-capacity links.
- The priority is to build a national fixed network and achieve a penetration level of 3 percent by 2007, and within this priority will be given to rural areas. Rural networks are required to be provided to at least every village or small community.
- The priority for all projects is to provide training for Khmer staff, including transferring employees, where appropriate, to joint venture companies.
- Customer networks should consider various types of outside plant networks for different solutions in towns, cities, and villages. In low-density areas, wireless technology should predominate.

Source: Ministry of Commerce.

percent per year, whether the MPTC will be able to meet this new demand is not clear.

Mobile services are being widely used for basic telephony in Cambodia because the quality of the fixed network is so poor and coverage is so low. This may only be a short-term solution to the need for improved communication technology for two reasons: first, fixed networks are generally cheaper than mobile networks, particularly in urban areas; and second, provision of data services such as the Internet is difficult over second-generation mobile phone networks.

The most pressing problem in the sector is the low level of investment and the resulting poor performance of the network. There are three main reasons for this: the uncertainty private investors face because of the multiple roles played by the MPTC, the lack of a clear

framework for awarding licenses and setting regulatory rules, and the MPTC's poor financial and technical performance in operating the fixed line network.

The MPTC network covers Phnom Penh and some provincial towns, although the availability of lines in most centers outside the capital is restricted. The access network has recently been upgraded in Phnom Penh with support from the Japanese aid program, and additional lines have been added in provincial towns along the fiber optic lines installed with German assistance. The German government is considering providing further support to install a fiber optic cable around Lake Tonle Sap. This would improve security on the trunk routes to the border.

The mobile networks provide coverage in 15 provinces, covering about 25 to 35 percent of the population, with plans to expand into at least 8 more provinces. Coverage has increased significantly since the mobile companies began offering services. The MPTC does not monitor or enforce any roll-out obligations that may be contained in the companies' licenses (although these are confidential, and whether they contain specific roll-out obligations is not clear), therefore the expansion seems to have been driven by commercial motives. The mobile operators have built their own network of links between provincial centers based on a combination of microwave, satellite, and, where possible, fiber links. There is a limited amount of leasing of capacity between mobile networks on trunk links, and all the mobile companies with provincial networks lease trunk capacity to the MPTC. Appendix 3 shows the current coverage of the primary mobile service providers.

The recent rapid increase in both penetration and coverage has largely been due to the roll-out of mobile networks. The introduction of prepayment packages, digital networks, and special introductory offers has led to a surge in take-up. The following paragraphs describe each service in turn.

Fixed line services

MPTC. Fixed line services are provided mainly by the MPTC. The network has a maximum switching capacity of approximately 30,000 lines, but currently only has 19,500 subscribers because of limitations imposed by the copper access network. Approximately 85 percent of the MPTC's lines are in Phnom Penh. The network has 600 km of fiber optic cable linking Phnom

Table 5.1 Performance of the telecommunications sector, selected countries

Category	Cambodia	India	Lao PDR	Philippines	Tajikistan	Thailand	Uganda	Vietnam
Main lines per 100 inhabitants (1999)	0.25	2.65	0.65	3.88	3.48	8.57	0.26	2.67
Cellular lines per 100 inhabitants (1998)	0.57	0.12	0.12	2.38	0.01	3.25	0.15	0.24
Pay phones per 1,000 inhabitants (1998)	0.02	0.36 ^a	0.04	0.15	0.03	1.88	0.06	0.01 ^a
Faults per 100 main lines per year (1997) ^b	35.10	174.00	—	5.20	99.30	25.90	80.00	—
GNP per capita (1999) (US\$)	260.00	450.00	280.00	3,815.00	290.00	1,960.00	320.00	370.00

— Not available.

a. 1996 data.

b. Faults per main line per year, an indication of quality of service, are relatively low in comparison with countries with similar incomes. This is likely because the fixed network is relatively new and not very extensive.

Sources: ITU (2001); GNP per capita: World Bank Development Indicators database (August 2, 2000).

Penh with the Thai border at Poipet and the Vietnamese border at Phum Bavet. Remote switching units link provincial centers along Route 5 and Route 1 to the network through the fiber optic trunk links. Fiber optic rings also link exchanges in Phnom Penh.

In principle, the MPTC should return all revenues earned to the MEF and the MEF should authorize all expenditures by the MPTC. In the first 11 months of 2000 the MPTC remitted approximately US\$22 million to the national budget from the operation of the fixed network, the revenue-sharing agreements with the mobile companies, and interconnection charges. During the same period the MEF authorized approximately US\$16 million of expenditure by the MPTC. The MEF exercises only limited financial control and monitoring, therefore these figures are unlikely to represent the total revenues passing through the MPTC. However, the MPTC's operations and the revenue-sharing agreements clearly represent a significant source of revenue for the government, amounting to approximately 2 percent of total government revenue in 1999 (World Bank 2000).

Figure 5.2 shows the architecture of the MPTC's fiber network and interconnection points for other operators.

Camintel. Camintel is the second national fixed operator and is jointly owned by the MPTC and Indosat of Indonesia. Its network is based on the network initially set up and operated by Indosat on behalf of the United

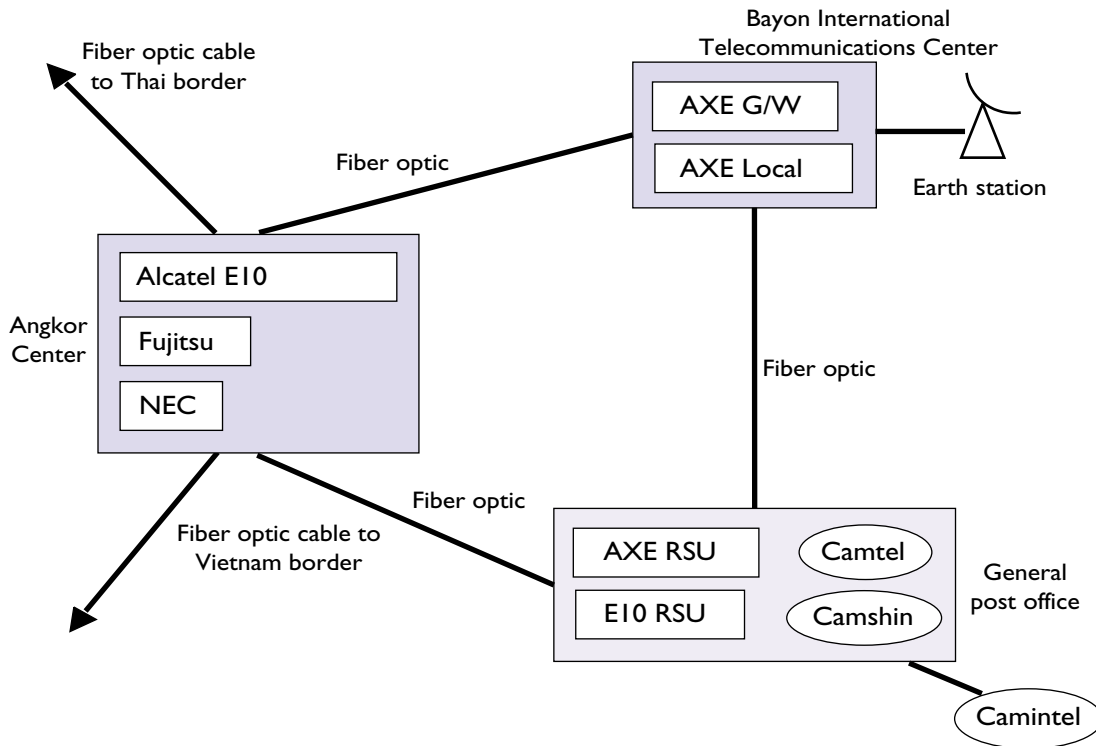
Nations Transitional Authority for Cambodia in 1993. It is currently a joint venture between the MPTC and Indosat and has approximately 6,000 lines on a network of private automatic branch exchanges in 18 provinces. The software is outdated and is unable to meet certain regulatory requirements, for example, it does not provide calling party identification information.

Shinawatra wireless local loop. Shinawatra, also known as Camshin, is a Thai telecommunications company that provides fixed wireless local loop services under a joint venture with the MPTC. It uses both analog NMT 450 technology and digital GSM 1800 technology. The former service has about 3,100 subscribers and the latter about 500 subscribers. The service uses its mobile network, but provides fixed handsets to customers. Licenses are not publicly available, therefore it is not clear whether Shinawatra provides fixed and mobile services under the same license or if it has separate licenses.

Mobile services

The four companies currently providing mobile services in Cambodia are Mobitel, Samart, Shinawatra, and Camtel. They are all joint ventures between the MPTC and private companies, which means that the ministry receives a given percentage of the gross revenues. Mobitel is a joint venture between the MPTC; the Royal Group, a large Cambodian company; and Millicom, a telecommunications company based in Luxembourg.

Figure 5.2 Schematic diagram of the MPTC's fiber network



Note: Letters and numbers within boxes indicate types of switches used.
Source: MPTC.

The other three are joint ventures between the MPTC and telecommunications companies based in Thailand. Their characteristics are outlined in table 5.2.

International services

MPTC. In 1990 Telstra International of Australia (then called OTC International Australia, Ltd.) was awarded a 10-year business cooperation contract with the MPTC to install and operate an international gateway and the pay phone system. Telstra spent approximately

US\$20 million installing a local switch, two earth stations, an international gateway exchange, a telecommunications building with air conditioning, and systems for international accounting and billing. Under this contract Telstra received 49 percent of the revenue from incoming calls and 12 percent of the revenue from outgoing calls. In addition, the mobile networks interconnect directly with the international gateway, which was also used as the main trunk exchange for switching between the mobile networks (90 percent of the calls handled by the international switch are local calls being switched between networks). This contract came to an end in 2000 and has not been renewed because Telstra has decided to withdraw from providing this service in Cambodia as part of a new global strategy. The MPTC is currently responsible for operating this gateway.²

Operator	Type of network	Coverage	Number of subscribers
Mobitel	Digital	15 provinces	82,000
Samart	Digital and analog	14 provinces	27,000
Shinawatra	Digital and analog	9 provinces	24,100
Camtel	Analog	Phnom Penh	3,000

Source: MPTC data.

Royal Telecom International. Royal Telecom International is a joint venture between the MPTC and Tele2, which has been awarded a license to operate a second inter-

Table 5.3 Telstra Internet services price list, 2001

User	Start-up fee (US\$)	Deposit (US\$)	Monthly fee (US\$)	Free hours per month	Cost per additional hour (US\$)
Low	30	50–100	22	3	3.8
Standard	30	100	55	13	3.0
Frequent	30	200	110	32	2.8

Note: Only Telstra data are shown because Telstra is the main private provider and the information is available.

Source: Telstra data.

national gateway. Tele2 is a large European operator specializing in long distance and wireless broadband services. It is a subsidiary of Millicom International Cellular, which is a telecommunications company based in Luxembourg with cellular operations in 19 countries, including Mobitel in Cambodia (which is operating under the name Sanbao Telecom). Millicom also operates in India, Mauritius, Pakistan, the Philippines, Sri Lanka, and Vietnam. The gateway came into operation in November 2000. Consumers can select which of the two gateways to use by dialing different prefixes for international calls; however, the scope for price competition is understood to be limited.

Other services

Cambodia has three Internet service providers: Big Pond, operated by Telstra; Camnet, operated by the MPTC (following its initial establishment with Canadian assistance); and a small service run by Camintel. Table 5.3 shows the tariffs for Telstra's Internet services.

One constraint on the number of Internet service providers is the availability of leased lines. Both fixed network operators provide Internet services and are therefore reluctant to allow entrants to use their networks.

Several other telecommunications companies have expressed an interest in investing in Cambodia. Korea Telecom set up a company called Mekong Telecom Mobile to provide a trunk radio system during the mid-1990s. Korea Telecom also launched a pager business during 1999.

Finally, American Cambodian Telecom received a license to provide wireless local loop services using code division multiple access technology; however, the company is not currently operating in Cambodia.

Rural services

The provision of telecommunications services in rural areas is extremely poor. Until the recent expansion of

the mobile networks there was no service in these areas. Expansion of the fixed network into rural areas would require a high level of investment, which may or may not be economically viable. Even if it is feasible, it is unlikely to happen under the current institutional arrangements.

Currently roll-out or coverage requirements are not included in MPTC licenses. Future licenses could include flexible requirements that would allow companies to install public phones in some areas instead of private lines, thereby decreasing the cost of rural provision and possibly making increased coverage financially viable.

Moreover, the pricing regime may inadvertently hinder expansion into less densely populated areas. More detailed studies will be required as part of the pricing reforms to ensure that policies do not distort the development of fixed line versus mobile services and to ensure that access is provided to the poor. Box 5.2 provides an example of successful telephony extension into rural areas through the use of microfinance organizations. Privatizing the MPTC's operations would increase efficiency and investment. This might, in itself, boost roll-out in areas outside Phnom Penh even without any specific regulatory intervention if increased efficiency makes expansion into rural areas profitable.

Commercial performance and tariffs

Unlike the other sectors where public corporations have been publishing their accounts, the performance of the private operators in the telecommunications sector is not subject to public scrutiny. Furthermore, the MPTC has not been publishing accounts that permit an analysis of its performance, although a set of accounts is under preparation. Given this lack of data, the commercial performance of the sector is examined by looking at current tariff levels in Cambodia compared with others around the world.

Box 5.2 Rural supply in Bangladesh

Grameen Bank, the well-known microcredit institution, has established a subsidiary nonprofit company, Grameen Telecom, to support the roll-out of telephone access to rural areas in Bangladesh. Once a signal from the national cellular operator GrameenPhone (35 percent owned by Grameen Telecom) reaches a village, Grameen Telecom buys a subscription and handset that are provided to a local operator, typically a woman entrepreneur. The purchase is funded by a loan from Grameen Bank to Grameen Telecom.

The pay phone operator charges for calls according to a tariff schedule laid down by Grameen Telecom. The difference between these tariffs and those levied by GrameenPhone is used to repay the initial loan and subscription charges, as well as to provide an income for the pay phone operator. The total loan involved is US\$312.50, which is repaid in weekly installments over two to three years. Repayment rates are 98 percent, extremely high for this form of finance.

The Grameen program has been successful in extending telephone services to almost 3 million villagers. It provides a powerful example of how microcredit institutions can support infrastructure projects to help the poorest in society.

Company performance in Cambodia is also crucially dependent on two other important factors: coverage, which in turn affects the subscriber base, and the form of revenue-sharing agreement entered into with the government.

Tariffs are relatively high. This is probably due to a combination of the following factors:

- The cost of the initial investments
- The burden of the revenue-sharing agreements that the companies must sign with the MPTC
- The lack of effective competition.

In theory, the MPTC is responsible for setting all tariffs for telecommunications operators. In practice, however, it does not enforce controls over the tariffs other operators charge. Table 5.4 summarizes the MPTC's retail tariffs. It shows that the price of calls is much lower in Phnom Penh than in provincial towns. There is no clear cost-based reason for this differentiation.³ It also shows the high prices of international calls. This is common in countries where competition either does not exist or is ineffective.

Table 5.5 compares selected tariffs in Cambodia with average tariffs for the region and in three European emerging markets. The data clearly show that Cambodia has both high usage charges and fixed fees relative to the other countries. There are a number of possible reasons for this:

- The small size of the network means that the MPTC does not benefit from the economies of scale achieved by operators of bigger networks.
- The low level of investment in new technology has prevented the MPTC from taking advantage of developments in communications technology.

Table 5.4 MPTC telephone tariffs, 2000 (US¢/minute)

Category	Domestic			International		
	Local within Phnom Penh	Local within provincial town	Long distance	To Lao PDR, Thailand, and Vietnam	To other Asian countries	To the rest of the world
<i>Fixed line^a</i>						
Call on MPTC network	1	1	15	150–135	160–142	180–162
Call to wireless local loop	6	22	22	—	—	—
Call to mobile	17	17	17	—	—	—
<i>Mobile^b</i>						
Mobile to fixed line	10–25	10–25	16–110	MPTC + (22 – 110)		
Mobile to on net mobile	2–36	2–36	2–36	MPTC + (22 – 110)		
Mobile to off net mobile	16–110	16–110	16–110	MPTC + (22 – 110)		

— Not available.

Note: All prices include 10 percent value added tax.

a. The monthly fee is US\$8 in Phnom Penh and US\$6 in provincial towns.

b. The monthly fee is US\$11 to US\$110. Mobile operators offer a wide range of packages.

Source: MPTC data.

Table 5.5 Average retail tariffs in Southeast Asia and other emerging markets, various years (US\$)

Service	Czech		Indonesia, 1997	Lao PDR, 1998	Malaysia, 1998	Poland, 1998	Romania, 1998	Thailand, 1998	Vietnam, 1996
	Cambodia, 1998	Republic, 1998							
Residential connection	182.67	108.43	422.33	90.96	12.76	122.99	30.98	81.00	244.73
Business connection	182.67	108.43	572.66	90.96	12.76	122.99	30.98	81.00	244.73
Residential monthly subscription	12.28	3.10	15.03	1.52	5.10	3.86	3.68	2.42	6.16
Business monthly subscription	12.28	3.10	22.19	3.03	8.93	3.86	3.68	2.42	6.16
Three-minute peak local call	0.10	0.07	0.08	—	0.02	0.07	0.09	0.07	0.11

— Not available.

Source: ITU (2001).

- The lack of competition in Cambodia limits the downward pressure on prices and does not provide an incentive to improve efficiency.

Legal and regulatory framework

The legal and regulatory framework for the telecommunications sector is established through several pieces of legislation, namely:

- The Council of Ministers' Subdecree on Post and Telecommunications of March 5, 1987
- The Council of Ministers' Decision on Procedures to Control Tariffs of December 11, 1991
- The Law on the Formation of the MPTC of January 24, 1996
- The Subdecree on the Organization of the MPTC of October 22, 1997.

The latter is the most important of these. It establishes the MPTC as the body responsible for providing post and telecommunications services. Under the subdecree the MPTC is permitted to enter into partnerships with private companies and is authorized to issue licenses. It is also responsible for representing Cambodia in international agreements. Article 14 states that the MPTC shall establish two public enterprises for the purpose of providing telecommunications and postal services. How the MPTC's assets under joint ventures with private companies would be treated if the operational arm of the MPTC were corporatized is not clear.

To address the lack of a comprehensive law governing the sector, the MPTC has prepared a draft Telecommunications Bill, the key provisions of which are set out in box 5.3.

The main issue with this draft is the establishment of the proposed independent regulatory authority.

Box 5.3 Draft Telecommunications Bill

The Telecommunications Bill is currently being debated and is likely to undergo significant changes before being enacted. The key provisions in the current draft cover the

- Creation of a telecommunications authority to regulate the sector and an outline of its functions
- Allocation of responsibilities within the sector, with the MPTC being responsible for setting policy; the telecommunications authority for regulation; and operators, possibly including a publicly owned one, providing services
- Procedure for licensing
- Standards and technical requirements
- Creation of a fund to pay for universal service obligations
- Information and dispute resolution procedures.

Whether the draft bill will be presented to Parliament in the near future is not clear, and there are divisions within the government over whether or not the framework envisioned by the bill is appropriate. One reason for this is that the current structure, especially the revenue-sharing agreements and combined operational and regulatory role of the MPTC, provide the government with considerable revenues. The government is not convinced that the benefits of the new system would outweigh the immediate loss in annual revenues.

The importance of adopting a new law is reflected in the recommended changes to the institutional structure of the sector. The current regulatory arrangement gives the MPTC conflicting roles. The ministry is responsible for setting prices and for enforcing interconnection agreements in its role as a regulator. It operates the fixed network and one of the international gateways, and it is responsible for issuing licenses to competing operators. It also develops policy for the sector.

Box 5.4 Requirements for obtaining a telecommunications license

In principle, private companies have to meet a number of requirements prior to receiving a license from the MPTC. The main requirements are

- Company registration at the Ministry of Commerce
- Minimum registered capital
- Availability of office space and approved necessary equipment
- Professional qualifications
- Application submitted to the CDC and the Council of Ministers
- Company articles and memorandum of association
- Agreement on joint venture and revenue sharing with the MPTC.

In practice, however, some of these requirements may be waived or additional requirements may be added.

The government therefore raises revenue through the same organization that is charged with regulating the sector. A good example of the impact of this is the licensing of an operator to run the second international gateway, but then limiting its ability to compete by constraining it to charge the same price as the MPTC. Separating the functions of the MPTC into policy, regulation, and operations would increase the sector's transparency and improve the likelihood of fair competition in the sector. The publication of existing licenses would also help to increase the transparency and openness of the regulatory regime.

Licensing

Companies offering telecommunications services or operating networks in Cambodia require a license (box 5.4). The MPTC is responsible for issuing these licenses, but there is no well-established or transparent procedure in place, and the government has recently stopped issuing new telecommunications licenses for an unspecified period.

Licenses are confidential documents in Cambodia; however, in general terms, a telecommunications license would be expected to include the following provisions:

- Specification of the service to be offered
- Term of the license and situations that would lead to it being revoked

- Revenue-sharing arrangements between the MPTC and the private operator technical specifications
- Regulatory obligations, for example, traffic data-reporting requirements.

Allowed revenue

Under the existing legal framework the MPTC sets the tariffs of all telecommunications operators. In practice, it only has direct control over interconnection charges and the retail prices of MPTC services. According to the 1993 Financial Law, tariff decisions are supposed to be made in consultation with the MEF because they affect state revenues; however, no formal mechanism exists for joint decisions on tariffs. Competition in the market is relied on to put downward pressure on mobile retail prices. In addition, telecommunications companies pay a 20 percent profits tax and a 10 percent value added tax.⁴ Between 1995 and May 1999 telecommunications companies qualified for tax breaks on imports of capital investment goods. Telecommunications companies do not qualify for the 9 percent profits tax rate that is available to new investors in other industries because of the government's belief that this incentive is unnecessary to attract private sector participation in this sector.

The MPTC also issues regulations on interconnection charges that apply to all operators that are, in principle, cost based. However, variations in network architecture among operators mean that the current common interconnection charges do not reflect true costs for all operators. The MPTC issued the most recent interconnection regulation on February 22, 2000. In addition to the interconnection charges, operators pay US\$0.10 per minute as a regulatory fee and US\$0.20 per minute as a universal service obligation contribution.

Although not specified in any law, telecommunications companies that wish to invest in Cambodia have been required to set up joint ventures with the MPTC. The terms of these agreements are believed to vary widely. In general the MPTC owns a minority equity stake (approximately 15 to 20 percent) and receives a proportion of gross revenues. This share was 51 percent of gross revenue from incoming calls through the international gateway, but is understood to be lower for mobile operators.

Under revenue-sharing arrangements operators do not gain the full incremental revenue from gaining a

new customer. There are alternative measures, such as privatizing the MPTC, that the government could take that could boost investment and improve performance without reducing the level of revenue generated.

Current reform initiatives

The World Bank and the PPIAF are currently preparing a program of assistance in relation to regulatory reform of the telecommunications sector. This will involve the following key components:

- Supporting the introduction of fair competition rules
- Developing an interconnection regime appropriate for a competitive telecommunications market
- Developing a rate re-balancing policy and designing a program to implement it in a competitive telecommunications market.

This work was expected to be finished by June 2002, although its implementation will require renewed commitment from the government to pursue reform and pass the draft Telecommunications Bill or an amended version of it.

Opportunities for private sector participation

Table 5.6 shows the government's estimated level of required investments in telecommunications over the next three years. The government has not allocated any budget for these programmed investments nor has it secured direct support from donors.

The government is unlikely to issue any new second generation mobile licenses in the foreseeable future. The small size of the market suggests that new entrants into the mobile market would find it difficult to operate profitably; however, some consolidation among

existing companies is possible, which might free up spectrum.

While it is unclear whether the fiber optic investments or system upgrades will be of interest to the private sector, the two areas of the telecommunications sector that are likely to be attractive to private sector investors are the fixed network and wireless local loop technology.

Fixed network joint venture or operating contract

The MPTC is broadly in favor of increasing private sector involvement in the operation of the fixed network through a joint venture or a business cooperation contract.⁵ Private sector operators would be able to bring both the technical expertise and financial resources required to run the network effectively. While the government has been involved in negotiations with a local company, an agreement has not yet been reached.

For the fixed network to benefit fully from private sector involvement, fair and transparent competitive bidding needs to be adopted for any form of contract, joint venture, or more intensive approach to PPI. As the potential for competition between fixed service providers is unlikely, competition for the right to operate is a second-best scenario. The alternative is a semi-monopolistic operating contract granted on an exclusive basis under opaque conditions without independent regulatory oversight. This approach is unlikely to produce efficient operations or lower costs for consumers.

Partial or full privatization of the MPTC's operating activities

The corporatization and privatization of the MPTC would allow the government to earn tax revenue from

Table 5.6 Estimated investment requirements in telecommunications, 2001–03 (US\$ million)

Project	2001	2002	2003	Total	Government	External	Unfunded
Telecommunications network, central provinces	1.8	1.8	1.0	4.6	0	0	4.6
Upgrade SDH/STM-1 to SDH/STM-4	0.7	0.0	0.0	0.7	0	0	0.7
Enhancement of MPTC's training institute	2.4	1.8	1.2	5.4	0	0	5.4
Fiber optic cable, Phnom Penh to Lao PDR border	1.0	2.0	7.0	10.0	0	0	10.0
Optical fiber links	1.4	2.0	4.7	8.1	0	0	8.1
Fiber optic cable, Phnom Penh to Sihanoukville	2.8	2.0	5.2	10.0	0	0	10.0
New main switch and transit	3.2	0.0	0.0	3.2	0	0	3.2
Rural telecommunications network development	2.5	0.0	0.0	2.5	0	0	2.5
Total	15.8	9.6	19.1	44.5	0	0	44.5

Sources: Government of Cambodia (2001b); Ministry of Planning (2001).

the profits of the operating company. Privatization would result in increased operating efficiency and new investment that would boost tax earnings. In addition, nonconfidential license fees could increase transparency, reduce uncertainty for new investors in the sector, and increase investment through improved incentives.

Currently, there is some resistance to the prospect of corporatizing and privatizing the MPTC's operational divisions because the government sees the ministry as a significant source of revenue. However, the cost of inefficient and overpriced services is not included in that basic calculation, and neither is the opportunity cost of the potential revenue from a share sale. In recognition of the importance of reliable and cost-effective communications services to economic growth and of the revenue to be gained from the sale of fixed service networks, governments are increasingly turning to the private sector to provide both technical and management expertise as owners of the fixed line network. Box 5.5 summarizes the recent partial privatization of the fixed line service in Mauritania, which has fewer subscribers than the MPTC's fixed line network and managed to raise more than US\$250 million from the sale of a minority shareholding.

There currently appears to be unsatisfied demand for fixed line services. The network is small and relatively new, following significant donor-funded investment during the past few years, and is therefore likely to be an attractive purchase for private investors. Before privatization could be completed successfully, the government will need to consider the following issues:

- The MPTC's network is likely to be more attractive to prospective investors if the domestic fixed network is bundled together with the international gateway.
- The MPTC's operations could be sold outright or as a long-term concession. Investors are likely to be more interested if the company is sold outright.
- The license would need to be clarified and made public, including fees, interconnection requirements, universal service obligations, and other charges.
- The regulatory framework should be established and clarified, particularly with respect to price controls and the interconnection regime.

Box 5.5 Private sector participation in Mauritania

Beginning in 1999, Mauritania, a country with a GNP per capita of US\$390 and 2 million inhabitants, embarked on a telecommunications reform program to improve the performance of its poor telecommunications services. Mauritel had about 16,700 fixed line connections and a waiting list of 47,800 connection lines. The telephone penetration was 0.64 lines per 100 inhabitants, and at a rate of 1,400 new connections per year, Mauritel would have required more than 30 years to meet the demand for connection lines. To improve communications services the government introduced comprehensive sector reform in 2000–01. The reform included issuing two mobile phone licenses, privatizing the fixed line operator Mauritel, creating a specialized sectoral regulator, and reforming tariffs.

After selling two mobile licenses in June 2000, the Mauritanian government privatized the fixed line operator Mauritel, also through competitive and transparent tender. Two bidders led by Maroc Telecom and Portugal Telecom submitted financial offers. The winning bidder, Maroc Telecom, offered US\$48.1 million (US\$14.4 million share purchase and US\$33.7 million capital increase) for a 54 percent stake in Mauritel, while Portugal Telecom proposed US\$12 million (US\$3.6 million share purchase and US\$8.4 million capital increase).

The winning bid valued the company at US\$96.3 million prior to the capital increase and US\$130.1 million after the capital increase, implying a per line value of US\$3,012 prior to the capital increase and US\$4,065 after the capital increase. The privatization package of Mauritel included substantial roll-out obligations for the operator, including quadrupling the size of its fixed network in five years and meeting international quality standards as established by the International Telecommunications Union. The failure to meet these goals will force Mauritel to pay significant penalties.

The following factors account for the success of the Mauritanian telecommunications reform experience:

- A comprehensive legal framework with complete separation of operations and policymaking along with independent, transparent regulatory processes
- A competitive market structure with a five-year limit of protection for international licenses
- A pro-competition universal access policy
- A transparent reform and licensing process
- A clear tariff reform program with re-balancing of rates to be implemented over three years
- The strong government support for the reform.

Source: World Bank PPI database.

Notes

1. While it may be true that modern technology allows individuals to move straight to mobile telephony, thereby eliminating the need to develop fixed line services to the same extent, there are important advantages to fixed line services that suggest Cambodia is currently underprovided. For example, lower unit costs and higher data rates (important for Internet access) on fixed lines compared with mobile networks mean that there is likely to be demand for these services in Cambodia that is currently not being met.

2. Whether the MPTC has the required expertise to operate the gateway alone is not clear. It is seeking private sector partners.

3. Providing local call services in provincial towns may be more expensive because of the small numbers of subscribers and the higher costs of maintenance; however, this would not account for the large difference in tariffs.

4. The value added tax is not payable on postal services, but it is on telecommunications services. Companies are permitted to

regard expenditure on fixed network services as a business expense, and therefore pass the tax on, but this is not permitted on mobile services.

5. A form of contract between the state and a private company that allows the company to undertake business in Cambodia and share revenue with the state without creating a separate legal entity.

6

Transport

Sector overview

The development of Cambodia's transport system is an essential element in the economic growth of the country and improvement in the quality of life of its people. Without passable roads, reliable rail service, and navigable waterways, farmers remain isolated from markets, consumers pay higher prices for delivered goods, workers are hindered in their mobility, and trade is stymied. A recent study of rice production, marketing, and distribution needs identifies poor transport infrastructure as one of the main hindrances to the movement and exportation of rice (Ministry of Commerce and Ministry of Agriculture, Forestry, and Fisheries 2001). The tourism industry, one of Cambodia's greatest sources of hard currency earnings and employment opportunities, can only develop to its full potential with a safe and efficient aviation sector as well as reliable overland connections to neighboring countries.¹ While the government and several donors have committed significant resources to Cambodia's transport over the last 10 years, the sector's network elements—roads, rail, and waterways—are still struggling with insufficient maintenance, degradation from floods, and lack of investment funds, all in the face of increasing demand.

Institutional, regulatory, and legal framework

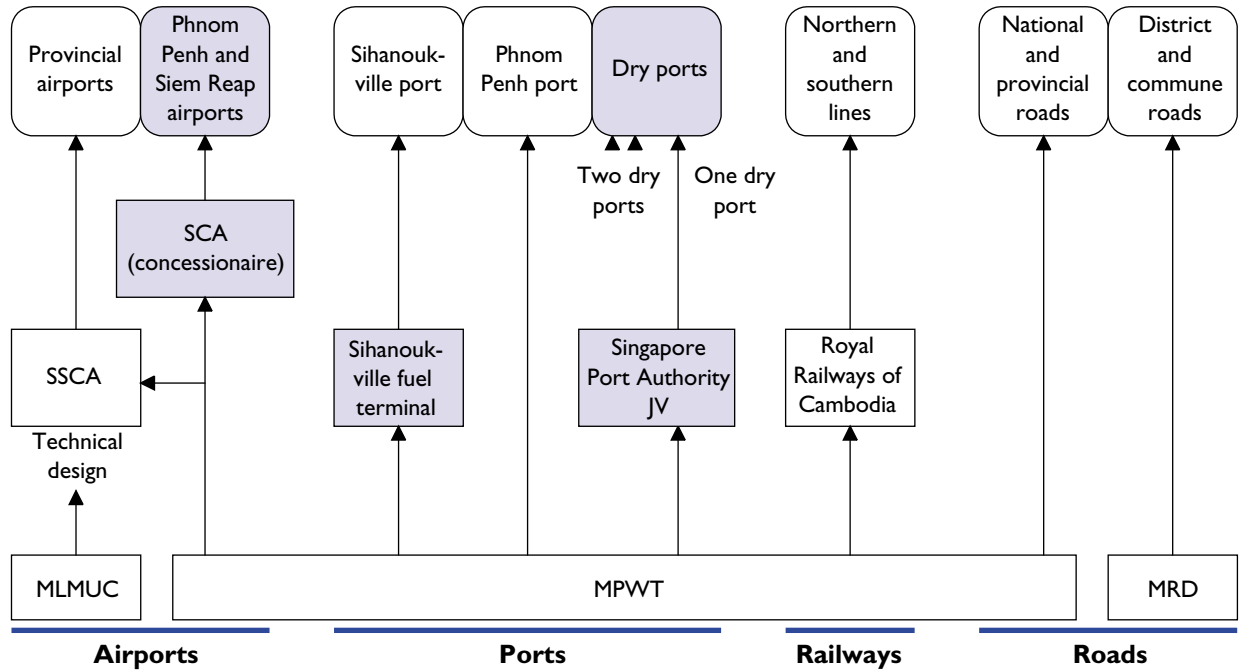
Although Cambodia does not have a transport master plan or a coherent strategy for developing services among competing and complementary modes, oversight for the sector is primarily housed in a single

agency, the MPWT. As figure 6.1 shows, the MPWT's responsibilities cut across the operations, ownership, management, and regulation of the entire sector, although it shares responsibility for air transport and rural roads with other government departments.

The transport sector lacks a unifying regulatory framework. Rather, the sector is covered by some of the laws common to all investment in Cambodia, for example, the BOT Subdecree and the Law on Investment (see chapter 7), along with ad hoc laws and decrees passed to create specific entities and institutions within the transport sector. The MPWT maintains responsibility for the following:

- Preparing laws and issuing regulations, directives, and standards necessary for improving the performance of the transport sector
- Preparing all medium- and long-term plans for transport and public works
- Planning, managing, and executing the public works of provincial departments, including cities and parastatal organizations, in relation to road, rail, and maritime transport
- Providing skills training to MPWT staff
- Maintaining technical cooperation with foreign countries, international organizations, and NGOs to promote the development of the transport sector.

The current legal and regulatory framework for the transport sector consists primarily of subdecrees on the maximum gross weight of vehicles as well as the Traffic Code. The government acknowledges the need to de-

Figure 6.1 Structure of the transport sector

JV = joint venture.

MLMUC = Ministry of Land Management, Urbanization, and Construction.

SCA = Société Concessionnaire de l'Aéroport.

Note: The shaded boxes indicate private sector participation.

Source: Government of Cambodia.

velop the framework so that it can formulate a comprehensive transport policy and plan to establish priorities for the use of limited funds.

Roads and rail. No specific legislation governs investments in either the road or rail sectors. However, in practice both the MPWT, the MEF, and the relevant municipality or governor have the authority to concession roads and oversee any tolls that result. Royal Railways of Cambodia (RRC) continues to operate an annual deficit arising from a combination of its tariff structure and poor track conditions leading to low demand. As it receives little government support and no external funding, RRC is dependent on recovering costs directly through tariffs that are set by the government through the Council of Ministers.

As a member of ASEAN, Cambodia has acceded to several agreements on mutual recognition of driving licenses and inspection certificates, on facilitation of goods in transit, and on protocols for road vehicles. It is also a party to the Greater Mekong Subregional Agree-

ment to facilitate cross-border traffic between Cambodia, Lao PDR, Thailand, and Vietnam. Cambodia has also entered into similar bilateral agreements to facilitate cross-border traffic with the governments of Lao PDR and Vietnam (Government of Cambodia 2001b).

Ports. The port sector has been recently reshaped through government decrees (Subdecrees 50 and 51, 1998) that created the port authorities in Sihanoukville and Phnom Penh. These decrees create governing boards for the port that report directly to the Minister of Public Works and Transport, and through the minister to the Council of Ministers, on all matters from port operations to tariff policy.

Aviation. The legal framework governing airways and airports is the only one to be partly developed. Carved out from the Ministry of Defense's Directorate of Civil Aviation in 1991, the Department of Civil Aviation was established through royal decree in 1992. The administration of the code was vested in the Civil Avia-

tion Authority of the Kingdom of Cambodia. In January 1996 the SSCA was formed to report directly to the Council of Ministers on regulatory matters within the sector. While the functions of the Civil Aviation Authority were passed to the SSCA, there is no underlying legislation to provide the SSCA with the authority to perform its responsibilities. The SSCA is often ignored when decisions are made that pertain to civil aviation developments; however, a draft subdecree on the organization and general functioning of the SSCA is currently being formulated, and a draft Civil Aviation Code was submitted to the National Assembly for approval after approval by the Council of Ministers in October 2001.²

Regulatory requirements. An overview of the sector indicates that there is sufficient competition among modes of transport that minimal formal economic regulation may be required, at least in the near term, although the tolling of roads where competition from rail or waterways is not possible would require special consideration. The other likely exception is aviation, where the private airport concessions, given to one operator, require an independent counterpart able to negotiate landing fees and terminal rents that secure the required returns on investment for the operator without hindering growth and competition in the sector.

The small number of agreements with the private sector and the potential for competition among modes of surface transport may signify that the creation of an independent regulatory body is not warranted at this time. However, the future need for toll road maintenance and rehabilitation concessions, the growing importance and complexity of the airport concessions, and the possibility of agreements for private operations in rail and ports warrant the analysis of the long-term feasibility of a transport regulatory body. More immediately, however, the government will need to draw up and implement procedures for the rational design and bidding of contracts and concessions, the formulas for cost recovery, the methodology for determining performance obligations to be applied to operators of transport systems, and the mechanisms for oversight. Much of the tendering procedures will be the same for other areas of infrastructure (see chapter 7).

Although the structure of the sector as a whole appears relatively centralized, in each of the transport

modes the responsible authorities oversee, manage, and implement their own policies within the confines of available resources. These arrangements are described in more detail in the subsections of this chapter dedicated to roads, rail, ports, and airports.

Potential role of the private sector

The government has already begun to allow private sector investment and operations in transport. The degree of private sector activity and the form of involvement varies across modes, with the railroad remaining entirely public at one extreme and both major airports concessioned to the private sector at the other extreme.

Despite this nascent involvement of private sector investors and operators, the investment needed to rehabilitate, expand, and maintain the nation's transport network is a major burden for the government. According to the Ministry of Planning's PIP for 1996–2000, the target for transport sector allocations totaled more than US\$500 million, or 23 percent of all public spending.³ This is greater than the allocations for health and education combined. In terms of the perceived financial requirements for rehabilitation and expansion, transport represents the single largest sector in the economy. In terms of the actual money disbursed on projects during 1996–2000, the PIP states that transport and communications together represented a staggering 51 percent of public expenditures.

Despite the dominance of the transport sector in terms of targeted public expenditures and actual public spending, public resources are simply insufficient to meet the sector's needs. Table 6.1 illustrates the size of the gap between available resources and the needs of the sector.

The division of resources sought by the government reflects the use of the different modes of transport. As figure 6.2 shows, road transport carries about 65 percent of all surface passenger traffic and 70 percent of all freight traffic. A further 212,000 passengers traveled through domestic airports in 2000, while domestic airborne cargo levels totaled about 11,000 tons.

While the government estimates that its investment requirements for all transport sectors will total about US\$250 million for 2001–03, it is only able to cover less than 7 percent of those needs out of its own budget. While donors have pledged approximately an additional US\$210 million, this amount, along with some several

Table 6.1 Estimated investment requirements in transportation, 2001–03 (US\$ millions)

Mode	2001	2002	2003	Total	Government	External	Unfunded
Roads and bridges ^a	189.4	170.5	167.6	527.5	45.9	168.3 ^b	313.3
<i>Rail</i>							
Rehabilitation of southern line	11.3	24.9	17.1	53.4	0	0	53.4
Rehabilitation of northern line	0	8.0	18.0	26.0	0	0	26.0
Thai rail link restoration	9.1	10.0	10.0	29.1	0	0	29.1
Subtotal	20.4	42.9	45.1	108.5	0	0	108.5
<i>Ports and waterways</i>							
Sihanoukville rehabilitation	15.7	16.9	8.2	40.8	0	40.8	0
New cargo wharf	0.3	1.0	1.0	2.3	0	0	2.3
Dredging Mekong channel	1.0	2.0	1.5	4.5	0	0	4.5
Geographic information system database of Mekong	2.5	4.6	0	7.0	0	0	7.0
Improvement of Tonle Sap	0.1	10.1	1.6	11.8	0	0	11.8
Chong Khneas river port ^d	3.2	6.0	0	9.2	0	0	9.2
Subtotal	22.8	40.6	12.3	75.6	0	40.8 ^c	34.8
<i>Airports and aviation infrastructure</i>							
Siem Reap airport rehabilitation	5.4	5.1	0	10.5	2.6	7.8	0
Civil Aviation Authority institutional strengthening	0.05	0	0	0.05	0	0	0.05
Civil aviation system	1.6	1.6	2.1	5.4	0	0	5.4
Airports feasibility study, Koh Kong, Preah Vihear, Battambang, Rattanakiri	0.5	1.0	0	1.5	0	0	1.5
Mondolkiri airport	0.3	0.6	0.5	1.4	0	0	1.4
Air traffic control system	2.3	4.5	1.5	8.3	0	0	8.3
Subtotal	10.2	12.8	4.1	27.1	2.6	7.8 ^e	16.7
Total	242.8	266.8	229.1	738.6	48.5	216.9	473.3

Note: Numbers may not add because of rounding.

a. US\$9.2 million for the costs of rehabilitating the Chong Khneas river port have been reallocated from the road investment program to roads and waterways.

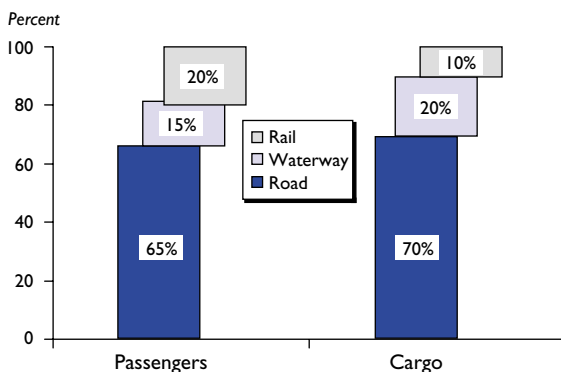
b. Primarily donor funds.

c. Entirely donor funds.

d. Reallocated from road investments.

e. Primarily private investor funds.

Sources: Government of Cambodia (2001b); Ministry of Planning (2001); SSCA data.

Figure 6.2 Passenger and cargo traffic by surface mode of transport, yearly average, 1995–99

Note: Surface transport carries an average of 227 million passenger-km per year and 395 million ton-km per year.

Source: MPWT data.

million from the private sector (mostly from existing airport operators), only comes to another 29 percent of the sector's anticipated needs. Where will the additional 64 percent, about US\$473 million, come from? The private sector's potential and willingness to fill that need will depend on government initiatives in the area of sectoral reform, and will vary from mode to mode, as do the government's funding and donor activity.

The following sections of this chapter explore the potential for private sector participation in transportation on a mode by mode basis. While each mode offers a different set of opportunities and challenges for the private sector, a transport PPI map that illustrates both current involvement and potential areas of investment for the private sector can be found in appendix 4.

Roads

Institutional framework and market structure

Roads are Cambodia’s only mode of transport with a nationwide network, and as such are particularly important at all levels of economic and geographic activity. Although the total road network is estimated at 34,000 km, only about 10,400 km are usable by motor vehicles. During the 1970s, an estimated 75 percent of road bridges were destroyed and many roads were made unusable by mining and sabotage. Attempts to rehabilitate the network during the 1980s and early 1990s were hampered by the scale of the task and the shortage of funds. Rising traffic levels meant that roads deteriorated faster than the limited repairs could be carried out. The floods in 1991 were particularly severe and took a heavy toll on the network. Concerted efforts by donors during 1992–96 resulted in the repair of a skeletal spine of major national roads in the south and center of the country. Inadequate maintenance and further heavy floods in 2000 have destroyed much of that work.

The MPWT sets standards for highway design and construction, and through its provincial departments undertakes maintenance and repair activities with its own labor. National roads are the direct responsibility of MPWT headquarters, while the management of the provincial roads is delegated to the provincial departments. The MRD is responsible for the transport network at the district and commune levels. It receives funding directly from the Treasury for maintenance and new road development and coordinates with the MPWT’s provincial departments for the required engineering and planning expertise.

Table 6.2 provides an overview of the length of roads per inhabitant compared with other developing countries. The data clearly show that Cambodia’s road network is inadequate in terms of geographic coverage and, given the condition of the roads, as a fundamental option for transport for the population.

Subsector performance

Through much of Cambodia, roads serve as the only access to and within rural areas. They are generally in poor condition, mostly unpassable by motorized vehicle, and suffer from a lack of funding for repair and maintenance. Figure 6.3 shows the road network by

Table 6.2 Roads per inhabitant, selected countries, various years

Country	Roads per land size (km road/100 km ² surface area)	Roads per capita (km/1,000 people)
Cambodia (all roads)	5.9	3.3
Cambodia (passable by motorized vehicle)	1.8	1.0
Lao PDR	9.2	3.9
Tanzania	9.3	2.5
Thailand	12.3	1.1
Uganda	11.4	1.2
Vietnam	7.1	1.2

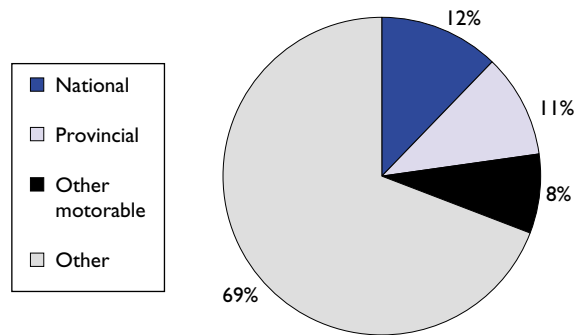
Sources: CIA (2000); Frontier Economics data.

type of road, while figure 6.4 compares road coverage across the region. Even in comparison with other developing countries, the percentage of paved roads is unusually poor in Cambodia.

Only two national roads with a combined length of around 400 km (10 percent of national roads) are in good condition: Highway 4, about 250 km between Phnom Penh and Sihanoukville, which was rehabilitated by the U.S. Agency for International Development in 1994–95; and Highway 6A/7, about 150 km between Phnom Penh and Kompong Cham, which was rehabilitated using Japanese aid over a five-year period beginning in 1994.

The impact of road conditions on Cambodia’s economy is direct and immediate, with rural and agricultural communities suffering the most. For example, the costs of transporting rice over rural and provincial

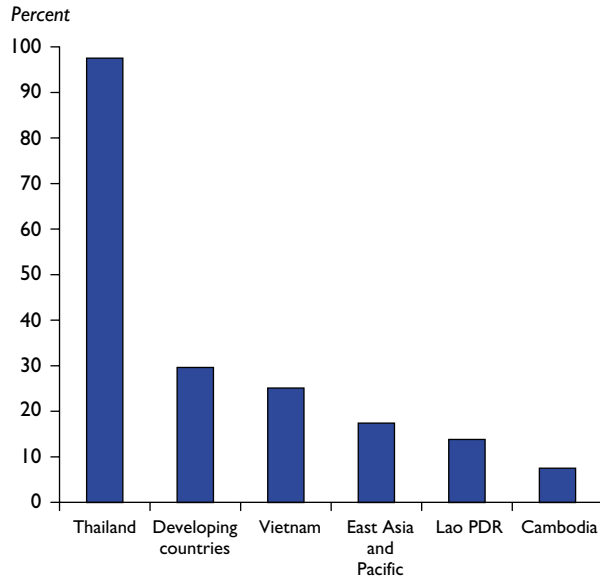
Figure 6.3 Type of roads, 1999



Note: “Other motorable” refers to district roads that are good enough to allow motorized vehicles. “Other” refers to roads that are not usable by motorized vehicles.

Source: ADB data.

Figure 6.4 Paved roads as percentage of total road surface, selected countries and regions, 2000



Source: World Bank (2000).

roads in poor condition may run as high as CR 300/ton-km, while rates for those using the divided highway between Sihanoukville and Phnom Penh amount to only CR 55/ton-km. This difference could affect the delivered cost of a 20-ton container of rice by US\$10 to US\$20, depending on the distance between production site and market. Shippers estimate a reduction in transport costs of 30 to 40 percent between Bat Dambang and Phnom Penh if National Road 5 were to be rehabilitated (Ministry of Commerce and Ministry of Agriculture, Forestry, and Fisheries 2001).

Opportunities for private sector participation

Cost-recovery potential for toll roads. While economic growth will increase road traffic, the potential for toll roads to recover costs depends on the requirements imposed on investors. That is, traffic levels on any road are unlikely to allow for full recovery via tolling for new lane construction or other major capital expenditures. Traffic levels are extremely low, with three of the busiest highways not forecast to surpass 2,500 vehicles per day before 2011. A general rule of thumb is that successful concessions for new road investment, operation, and maintenance require about 15,000 vehicles per day depending on consumers' willingness and abil-

Table 6.3 Traffic levels on selected highways, 1997 and 2011

Highway	Total vehicles per days, 1997	Total vehicles per day, (2011 projected)
5 (to Thailand)	1,070	2,404
6 (to Siem Reap)	413	664
7 (to east Cambodia)	606	1,286

Sources: ADB data; 1998 survey of observed movements.

ity to pay (for a survey of PPI experience see Estache, Romero, and Strong 2000). Table 6.3 shows traffic levels in 1997 and projected levels in 2011.

The roads sector depends on donor agencies for funding; little government money is available for either construction or maintenance. From 1992–99 donor funding averaged 85 percent of the total funds invested in roads (MPWT data for 2000). A road fund has been proposed to address this issue that would be based on an additional tax on gasoline. The funds would be dedicated to road maintenance and construction. In the meantime, government funds are raised in other ways. For example, in 1999 a special payment of CR 5 million (approximately US\$1.4 million) for road maintenance was made from the operating surplus of the Sihanoukville port. Similar arrangements, along with donor funds, are expected to be used in the future.

There is also the potential for collecting revenue from tolls, as has begun with the two toll roads around Phnom Penh (box 6.1), although the type of traffic on Cambodian roads will affect the feasibility of this initiative. Out of approximately 296,000 vehicles licensed in Cambodia between 1990 and 1999, 223,000, or 75 percent, were motorcycles. Automobiles totaled 55,000, or 18 percent of licensed vehicles, while the primary targets of tolls—buses and all categories of trucks—only accounted for 19,000 vehicles, or 6 percent of the total.

Current private sector activities. Despite the low traffic levels and the unfavorable mix of vehicle types, Cambodia already has some experience with private sector participation in the roads sector. Box 6.1 describes two existing toll roads. Although these two examples have done little to lift the burden of investment and maintenance in roads and bridges from the government's budget, the precedent is worth noting, as are the lessons

Box 6.1 Existing toll roads

Cambodia has two operational toll roads, both around Phnom Penh. The first runs between the bridge at Steung Mean Chey and the junction with Highways 3 and 4 at Chaom Chau, a total of 6.5 km. The road is paved and serves the garment factories and the dry port in the industrial park to the south of the international airport. The second runs from the junction with Highway 3 east of the city center to an intersection with Highway 5 to the north of the city center at Chrang Chamreh Muoy. The route length is also about 6.5 km, but the road is currently unmade and passes through medium-density formal and informal residential areas.

Both roads are separately operated under a private joint venture between a Cambodian company (Meng Steang) and a Malaysian company. Both require the concessionaire to reconstruct on an existing alignment (initially US\$2 million and US\$5 million for the two roads, respectively). The concession periods are 20 years for the first road and 40 years for the second. Tolls, set by the municipality, are CR 5,000 for heavy trucks and CR 3,000 for light trucks. Other vehicles can use the roads toll-free. The municipality receives 5 percent of the operating profits of the concession. Tolls are fixed, but can be altered through “amicable renegotiations” with the municipality if necessary.

In 2001 an agreement was signed between a Cambodian company (AZ Distribution) and the government that grants rights of tolling along National Road 4, the 220-km divided highway connecting Sihanoukville and Phnom Penh. While details of the agreement have not been made public, officials have indicated that the concession will last for 35 years and includes a provision for a small degree of revenue sharing with the government. The obligations of the concessionaire are evidently limited to periodic maintenance, while the government commits not to build a competitive route during the period of the contract.

learned from the design of the concessions and the lack of competition for the opportunity.

New toll road potential. Despite the two examples of toll roads, undertaking major investments, backed exclusively or primarily by tolls, will be extremely difficult given prevailing traffic levels. The main opportunities for the private sector will focus on maintenance or rehabilitation funded from tolls and/or from government remuneration, possibly through the use of shadow tolls. During the next five years the government estimates that maintenance costs alone will total more than US\$13 million, approximately US\$1,000 per km of rehabilitated road.

The PIP provides details of the government’s total road investment and maintenance plans (see table 6.1); however, these figures are not based on a transport sector policy or strategy that provides reliable projections of investment needs. Donor-supported analysis that would define specific capital expenditure and maintenance needs in the sector has only recently begun. An order-of-magnitude estimate of road maintenance resource requirements can be made based on the annual investments of US\$50 million in the sector since 1995. Given the need for increased annual recurrent expenditures for each investment, the maintenance budget for roads is expected to be in the vicinity of US\$10 million per year.⁴ Discounting the wage bill, this figure is approximately quadruple current expenditures on maintenance.

High-priority projects are the completion of the rehabilitation of

- Highway 1, which will improve access to Vietnam
- Highway 5, which will improve road transport between Phnom Penh and Thailand
- Highway 6, which will improve connections between Phnom Penh and the major tourism attraction at Angkor Wat.

In addition, planned improvements to Highway 7, together with completion of the new road bridges across the Mekong, will open up the agricultural and tourist potential of east Cambodia (see box 6.2).

Railways

Institutional framework and market structure

Cambodia’s rail sector is a vertically and horizontally integrated service provided by RRC, a state enterprise within the MPWT that oversees operations and investment. The government fixes budgets and prices and approves all of RRC’s purchases and investments. The MPWT, through its Construction Division, is responsible for the technical design and implementation of railway development. Rail infrastructure and rolling stock operations for passenger and freight services on both lines, the northern and southern, are integrated RRC operations.

Subsector performance

Overview. Rail service can be described as only marginally relevant to current movements of goods and

Box 6.2 PPI opportunities in roads**Highway 6 rehabilitation (Thai border–Siem Reap)**

There may be interest in rehabilitating Highway 6 on a BOT basis from the border with Thailand to Siem Reap and to operate the road with tolls. A feasibility study would be required to measure the cost of rehabilitation against the potential revenue stream based on forecasted traffic levels and travelers' willingness and ability to pay tolls. Tolling Highway 6 may require analysis of the need for bifurcated tolling rates that differentiate tourists from local citizens. The airport concessionaire in Siem Reap and government transport planners should be brought into the discussions, because the development of Highway 6 may affect traffic levels at that airport.

Maintenance contracts for larger roads

There are some opportunities for using private sector services to maintain and manage sections of existing roads and to design and supervise construction for new sections. For example, Highway 4 to Sihanoukville is currently heavily traveled by trucks and is in good condition, but needs funds for ongoing maintenance if it is not to deteriorate. The other highways—especially from Phnom Penh to Siem Reap and the Thai border to Siem Reap—may offer further opportunities. Maintenance contracts could be paid from a mix of tolls and government commitments, including shadow tolls based on the number and types of vehicles observed on the roads over time. This would require a long-term budgetary commitment for the government's contribution, which may not be feasible, as well as close coordination with a number of donor agencies that are currently involved in road rehabilitation.

people. RRC requires operating subsidies, but is unable to offer a competitive service with roads given the poor condition of track and rolling stock, the unreliable services, and the lack of funds for rehabilitation. Nonetheless, RRC operates its services through rural areas to the northwest and southwest of the capital. Low passenger fares and limited or difficult alternative access routes to some villages mean that the train service provides an important mode of passenger traffic. By contrast, the distribution of goods to rural areas relies almost entirely on road and river transport.

Despite economic growth and increasing domestic mobility, the importance of the railway as a passenger service has declined since 1993, and although freight rail traffic has increased slightly during the same period, it remains a small percentage of the country's freight transport. The ports of Phnom Penh handled nearly 1.5 million tons of dry cargo in 1999 and about

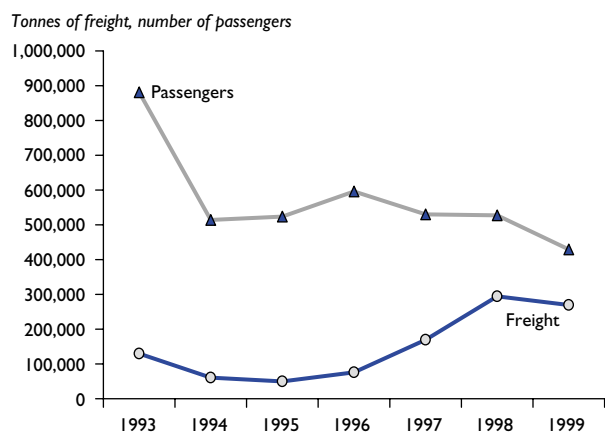
600,000 tons of fuel, and more cargo was trucked between Cambodia and Lao PDR, Thailand, and Vietnam. Total rail movements that year accounted for less than 300,000 tons of freight, or about 14 percent of the port throughput figures (figure 6.5). This indicative share of cargo has fluctuated in recent years but was about the same in 1993.

A lack of funds, combined with attacks on the railroad over the last 30 years, has resulted in train services that are slow, with an average speed of only about 15 km/hour, and subject to delays and cancellations. RRC is thus only able to provide limited service. It operates two or three trains per day on the southern line and three or four trains per day on the northern line. All trains are mixed freight and passenger services. The small capacity and low level of demand for rail services in Cambodia compared with those in neighboring countries are evident from the comparators provided in table 6.4.

Table 6.5 outlines one measure of railway efficiency: ton-km transported per wagon. Even though Cambodia has a small stock of wagons, RRC clearly performs poorly compared with regional rail systems, reflecting the low levels of use.

RRC comprises two single-track main lines of meter gauge, both of which carry passengers and freight (there are also some branch lines and railheads to cement factories, quarries, and the river port in Phnom Penh). The first line is the southern line, constructed between 1960 and 1969, which runs between Phnom

Figure 6.5 Total freight and rail passenger traffic, 1993–99



Source: Royal Railways of Cambodia.

Table 6.4 Railway infrastructure, selected Asian countries

Country	Demand Thousands, 1999		Capacity, 1999				Infrastructure Total track (km)
	Freight tons	Passengers	Rolling stock				
			Total locomotives	Mainline diesel locomotives	Freight cars	Passenger coaches	
Cambodia ^a	300	410	21	14	200	25	591
Malaysia	5,200	5,370	107	—	4,189	220	1,801
Myanmar	1,800	53,180	354	275	7,572	1,070	3,991
Thailand	8,700	67,761	—	331	9,169	1,176	3,940
Vietnam	4,700	9,310	400	—	4,105	765	2,652

— Not available.

a. Cambodia also has seven shunting locomotives.

Sources: CIA (2000); World Bank rail database (2000); RRC data.

Table 6.5 Freight efficiency, most recent years

Country	Ton-km per wagon (millions)
Cambodia	0.86
Philippines	4
Tanzania	599
Thailand	360
Uganda	140

Source: World Bank rail database (2001).

Penh and the main international port in Sihanoukville. It runs for 263 km, 9 km of which it shares with the northern line on the approach to Phnom Penh. The second line is the northern line, build between 1929 and 1943, which runs between Phnom Penh and Sisophon, and is 337 km long. It serves agricultural areas that are poorly served by road, and could potentially connect with the Thai railway system, becoming part of the proposed Trans Asian Railway linking the ASEAN subregion with China.

While RRC has been unable to cover its own operating expenses and last posted a gross margin of –24 percent, most of the lost business appears to come from the southern line. Figure 6.6 illustrates how the southern line's freight traffic has been a small portion of total levels. Similarly, passenger traffic on the southern line has plummeted to less than 10 percent of its 1993 levels, and as with freight, now represents less than one-third of RRC's total traffic. Whereas the southern line represented 69 percent of passenger traffic in 1993, by 1999 that share had dropped to 30 percent even as the RRC's total traffic dropped from 881,000 to 429,000 passengers. More startling perhaps is that the southern line only increased its movement of freight by 55,000

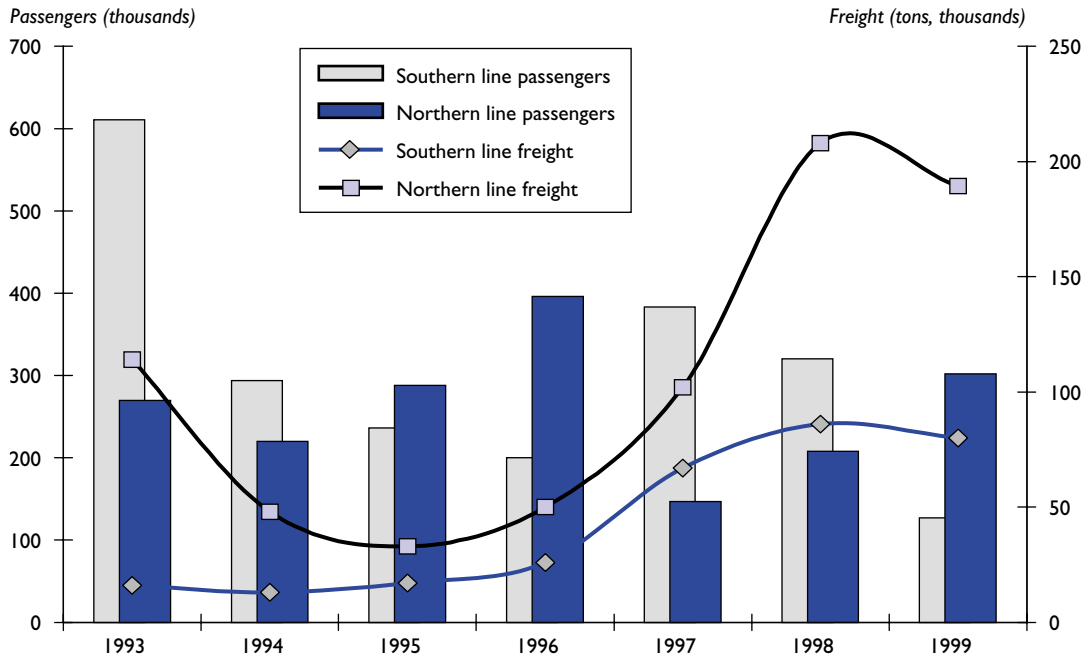
tons between 1993 and 1999, although the port of Sihanoukville's general cargo throughput alone grew by 433,000 tons during that same period and fuel shipments grew by another 230,000 tons. This is an indication of the railway's inability to compete against trucking on Highway 4, at least under current operating conditions.

The data presented in figure 6.7 reveal how few railroads in industrial and developing countries are able to compete with roads for short distances. Socialist economies—in which the use of rail was centrally planned, dependency on hard currency inputs such as fuel was avoided at all costs, and railheads were built regardless of the economic efficiencies associated with alternative modes of transport—used rail to a much higher degree than those economies in which the rail networks are forced to compete with roads and waterways. The trend lines demonstrate that at 500 km, rail serves an average of about 25 percent of traffic in industrial countries and 20 percent in developing countries.

While Cambodia's rail lines will be subjected to unique cost constraints and competitive pressures from other modes of transport, this analysis suggests that without some degree of subsidy, for the lines in and out of Phnom Penh to compete for a significant portion of the traffic will be difficult if competitive roads are developed and maintained.

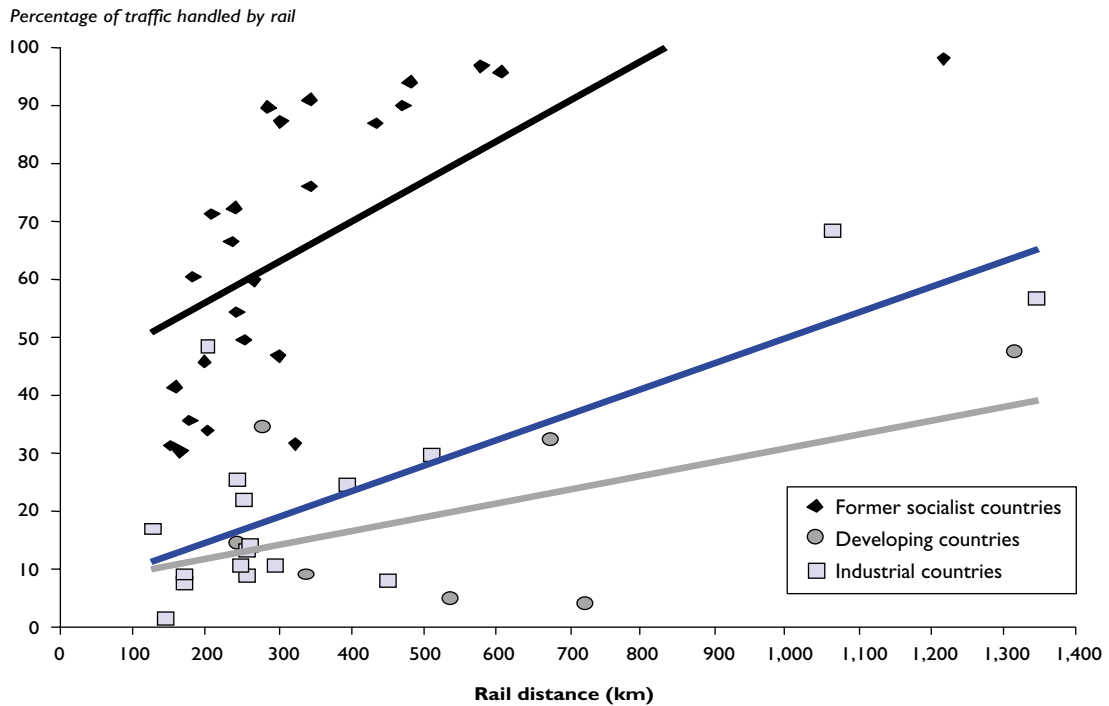
In figure 6.8 the lengths of the two rail lines are placed against the trend lines from industrial and developing countries to illustrate the “capture potential” of the railroad, that is, the portions of cargo and passengers that are likely to travel on each of RRC's two rail lines or on both lines from Thailand to Sihanoukville.

Figure 6.6 Passenger and freight traffic on the northern and southern rail lines, 1993–99



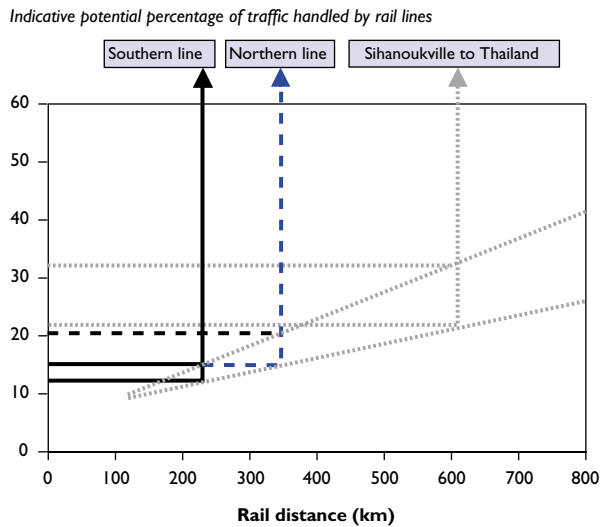
Source: RRC data.

Figure 6.7 Relationship between distance and competitiveness of rail



Source: Thompson (2001).

Figure 6.8 Indicative “capture” potential of Cambodian rail



Source: Authors.

The true capture potential of each line would depend upon a number of factors, including the following:

- The potential efficiency of the operations
- The competitiveness of the rail tariffs
- The speed and frequency of service
- The value of the goods being transported (higher-value shipments, such as containerized goods, are more likely to be transported by road)
- The condition of competing roads
- The use of incentives (for instance, tariff subsidies or capital commitments) or disincentives (such as tolls or fuel taxes) to encourage one mode of transport versus another
- The price of gasoline for truckers
- The handling charges for transferring cargo or containers to rail.

Without attempting to weight these many variables, the indicative analysis indicates that, given the length of the lines, each line may be able to capture and hold 15 to 20 percent of its competitive traffic to and from Phnom Penh once the northern road network has been improved. Up to one-third of any long-haul traffic between the Thai border and Sihanoukville might be willing to move across rail. Of course, the use of targeted subsidies may enable those approximate benchmarked capture rates to increase. For example, if the port of Sihanoukville’s yearly earnings surplus were used on rail rehabilitation rather than road maintenance, rail might

be able to improve its reliability and average traveling speeds while road conditions would suffer.

Cost recovery potential and investment needs. As the railroad’s last major tariff adjustment was in 1994, passenger fares are notably low, approximately CR 4,000 (approximately US\$1) per trip from Phnom Penh to Battambang and CR 3,500 from Phnom Penh to Sihanoukville. In 1993 estimates indicated that passenger services had generated nearly 40 percent of RRC’s revenues, but in recent years this has fallen to about 15 percent. This decline has been partially offset by growth in freight traffic consisting of long-distance imports, which accounted for around 80 percent of the northern line’s revenue by 1998. Freight tariff structures, determined by the government, are set for each commodity rather than per means of carriage. Difficulties determining the weight of cargo requires RRC to sell freight space by the wagonload, which often puts it at a disadvantage compared with road haulage. Because of the uncompetitive tariff structure and levels, operating costs have not been recovered and insufficient funds are available for rehabilitation and maintenance of track, locomotives, and rolling stock. Table 6.6 summarizes RRC’s financial performance in 1995–98.

Even though RRC is unable to cover its operating expenses, the government has identified massive investment needs to rehabilitate the lines and to close the gap between Cambodia and Thailand’s rail networks. The PIP 2001–03 calls for US\$108.5 million to rehabilitate the entire rail system—subjected to a full feasibility study to be funded by Japan—although no funds have yet been identified for this. Estimates of the investment needs taken from the MPWT’s contribution to the PIP are as follows (see also table 6.1):

- *Southern line:* The MPWT has estimated the cost of rehabilitating the southern line at more than US\$53 million, although this likely includes the costs of

Category	1995	1996	1997	1998
Revenues	1.1	1.1	1.0	1.5
Operational expenses	1.4	1.5	1.5	1.9
Operating profit	-0.2	-0.4	-0.5	-0.4

Source: RCC data.

purchasing new locomotives and other investments that may be made more economically.

- *Northern line:* Requirements are estimated at US\$26 million, which includes the reconstruction of the Sisophon–Poi Pet section and the rehabilitation of the rest of the northern line.
- *Thai rail link.* The track on the 48 km between Sisophon and the Thai border at Poipet was removed in the 1970s. There is also a gap of 15 km from Poipet to the nearest station on the Thai network at Aranyaprathet.⁵

Clearly the government has yet to identify resources for rehabilitating the railroad.

Opportunities for private sector participation

The current state of disrepair in the railways has arisen largely because of insufficient rehabilitation funds—resulting from below-cost tariffs and a relative lack of government or donor support—in combination with growing competition from roads. Consequently, while opportunities for the private sector in rehabilitating, maintaining, and running existing rail infrastructure may be available, private sector interest will depend on reforms in pricing arrangements. Moreover, proper due diligence about the potential role of the private sector will need to be conducted by service area (rolling stock or infrastructure), by line (southern, northern, both lines, or new lines), and by form of involvement (concessions, leases, management contracts, or outright ownership).

Currently, there is almost no private sector activity in Cambodia's railway except for private sector financing of the repair of tanker wagons used to transport oil. The opportunities shown in box 6.3 represent the potential areas for private sector involvement in rail.

Ports

Institutional framework and market structure

The nation's port sector operates under the auspices of the MPWT, which oversees investment, operations, and charges. Port authority management, terminal operations, stevedoring, warehousing, and ancillary services are largely vertically integrated at the major facilities and held under government ownership, with the same agencies responsible for regulating rates and charges and for operating protocols. The country's main port, Sihanoukville, was reconstituted as a port

Box 6.3 PPI opportunities in rail

Southern line (Phnom Penh to Sihanoukville)

The southern line offers opportunities as a freight service concentrating on block train haulage of oil, construction materials, and containers. Even though the highway connections to the south have been improved, Highway 4 is already congested, and unless funds for maintenance are found, the road will also deteriorate.

Sisophon to Siem Reap

RRC reports private sector interest in building a railway from Sisophon to Siem Reap (105 km at an estimated cost of US\$60 million to US\$70 million). Although it seems unlikely that potential traffic levels would render such an investment feasible without the use of unrealistic government or donor guarantees, a feasibility analysis may be worth undertaking. If the project is found to be feasible, the development of this link could be competitively offered on a BOT concession basis.

Phnom Penh–Bangkok

If the missing links on either side of the Cambodian–Thai border were built, potential might exist for long-distance freight and passenger traffic between Thailand and Cambodia.

Maintenance contracts

There might be opportunities to involve local engineering contractors in repair and maintenance, which currently is carried out totally in-house by RRC.

Land sale

The railway has considerable land assets, including underused marshaling yards extending over 200 hectares in the capital. This and similar assets might be disposed of, with windfall revenue going toward restructuring the railroad and preparing for private sector participation. The land might also be used to attract private finance or participation in the railroad's operations.

authority in June 2000, at which time it was granted considerable autonomy. Its board, which is chaired by the port director, can approve changes to port charges, although the MPWT retains ultimate veto rights.

Cambodia's port sector comprises one deep seaport in Sihanoukville, a port on the Tonle Sap in Phnom Penh, three dry ports around Phnom Pen, and several small river ports that have mostly fallen into disrepair. Table 6.7 shows the most significant port facilities.

Subsector performance

Sihanoukville. Cambodia's only deep seaport is at Sihanoukville. It is used mainly for general cargo and

Table 6.7 Main ports

Public	Private
Port of Sihanoukville, only deep sea general cargo port • 1.3 million tons dry cargo	Oil terminal at Sihanoukville • About 320,000 tons fuel
Port of Phnom Penh, two international terminals, one domestic wharf • 110,000 tons dry cargo • 340,000 tons fuel	One dry port in Phnom Penh, joint venture between Singapore Port Authority and Sihanoukville Port Authority
Port of Koh Tong • About 150,000 tons dry cargo	Two dry ports in Phnom Penh

Sources: Government of Cambodia (2001b); Sihanoukville Port Authority and MPWT data.

container traffic and is the primary channel for imports to and exports from Cambodia, handling approximately 70 percent (by weight) of all cargo in and out of the country. Of nonfuel imports and exports, Sihanoukville handles about 80 percent of the nation's cargo. Consequently, the port and access to it are vital to the economy.

The port of Sihanoukville was originally built in 1956 and was rehabilitated with a loan from the ADB in 1996. Its current characteristics are as follows:

- Berth lengths: old quay of 580 meters (jetty 290 meters long accessible on both sides), new quay of 350 meters
- Maximum allowable draft alongside berth: old quay 7.5 to 8.5 meters alongside; new quay 10 meters alongside
- 11,000 gross registered tons capacity for breakbulk vessels
- Annual throughput of general cargo of approximately 1 million tons
- Storage capacity: old quay warehousing space of 12,000 square meters and general cargo storage of 35,000 square meters, new quay warehousing of 24,000 square meters and container yard of 25,000 square meters
- Cranes and handling equipment: seven mobile cranes (80 tons maximum) and five super stackers (up to 45 tons).

Under a US\$42 million loan from the Japanese government, Sihanoukville is now undertaking a large-scale expansion. The expansion includes

- Lengthening berths, with a new 400-meter quay for general cargo and enlargement of 11 berths in 2001,

a container terminal starting with one 240-meter berth and eventually increasing to three 450-meter berths, and construction of a bulk cargo terminal with two 300-meter berths

- Dredging the basin to a depth of 8.5 to 9 meters
- Reclaiming 508,000 cubic meters of land
- Developing a container yard including two 50-ton gantry cranes and six trans-tainers
- Preparing 50 hectares of land for a free trade zone
- Developing the port's road, power, and lighting networks.

The Sihanoukville port, which generates a 40 percent surplus on turnover, is the only part of the MPWT that produces significant revenue for the government. The government pays for the capital development of the port, primarily through donor assistance from Japan, while the retained surpluses cover equipment replacement and small-scale development. Annual transfers to the government are not determined in advance, but are based on the port's ability to pay and the government's needs. An overview of the port's finances is provided in table 6.8.

Phnom Penh. Cambodia's second port facility is the river port at Phnom Penh operated by the Phnom Penh Port Authority under the MPWT. It has two international terminals downstream from the Friendship Bridge on the Tonle Sap River. One is a small, floating pontoon; the other, closer to the bridge, has river wharves. Upstream from the bridge is a terminal for smaller domestic vessels. The ports of Phnom Penh are responsible for only about 8 percent of Cambodia's dry cargo imports and exports, but handle about half of all fuel shipments.

Table 6.8 Summary financial details, Sihanoukville Port Authority, 1996–99 (US\$ millions)

Category	1996	1997	1998	1999
Revenue	9.6	10.0	11.2	13.8
Expenses	5.4	5.3	7.0	8.4
Gross profit	4.3	4.7	4.1	5.4
Tax	1.1	1.2	1.0	1.3
Other transfers to state	1.3	2.4	1.3	1.3
Revenue per ton (US\$)	1.48	1.54	1.69	1.56

Note: Container lifting charges for 2000 amounted to US\$78 for a 20-foot container and US\$118 for a 40-foot container.

Source: Sihanoukville Port Authority data (2000).

Koh Kong. Finally, there is a public port at Koh Kong, near the Thai border, which is now handling about 150,000 tons of cargo per year. Its future growth is linked to the rehabilitation of National Roads 5 and 48.

Waterway transport facilities. Although ports are the main points of entry into Cambodia for cargo, both river and rail transport to and from the ports are underutilized. Their effective use would require rehabilitating about five river ports as well as some dredging. The main facilities for rural port services along the northern reaches of the Mekong between Phnom Penh and Kratie and onward to Stung Treng were largely destroyed by the Khmer Rouge government and would require significant dredging to increase traffic. The lower reaches of the Mekong can accommodate vessels of up to 2,000 dead weight tons all year round, provided dredging is undertaken. The Tonle Sap can only handle smaller vessels, with siltation of the entrance to the Great Lake serving as a bottleneck. The Bassac River is usable by vessels under 100 tons and services trade with the delta area in Vietnam.

Liquid bulk terminal. In addition to container and dry goods shipping, a private sector oil terminal is located approximately 15 km north of the main port. It has a small, stone wharf jetty, but is primarily served by pontoons that allow vessels with a 6-meter draft to pump oil into the storage facilities. The Port Authority of Sihanoukville also has jurisdiction over the oil terminal, receiving navigation and shipping dues and monitoring the standard of operations.

Throughput trends at the major port facilities. The port at Sihanoukville handled about 884,000 tons of cargo in 1999 and 1.3 million tons in 2000. The oil terminal throughput was about 257,000 tons in 1999 and was expected to have been about 320,000 tons in 2000. Table 6.9 shows the growth in cargo at the two main facilities, Sihanoukville and Phnom Penh. These data reveal a fundamental trend in the sector: the emergence of Sihanoukville as the predominant importing and exporting facility. This trend is likely to continue in the near to medium term as a result of the planned expansion of Sihanoukville with subsidized funds, the lack of funds for waterway deepening and maintenance, the priority given by the MPTC and donors to competitive road development over waterways (or rail), and the poor condition of the secondary river ports.

Opportunities for private sector participation

Current role of the private sector. The private sector operates two dry ports around Phnom Penh, one close to the airport and one to the north of the city. The Sihanoukville Port Authority also operates a 19-hectare dry port on the outskirts of Phnom Penh in a joint venture with CWT (Singapore Port Authority), which owns 49 percent of the equity.

During peak periods three private companies in Sihanoukville offer stevedoring services to the seaport. These are basically privately managed labor pools that work on the general cargo berths and handle breakbulk cargo—bagged cement and fertilizer—rather than container cargo. These private stevedores do not contribute to the port's investment needs by supplying cranes,

Table 6.9 Cargo throughput at main ports of entry, 1991–2000

Port	Tons, thousands					Annual growth rate % 1991–95	Tons, thousands					Annual growth rate % 1995–2000
	1991	1992	1993	1994	1995		1996	1997	1998	1999	2000	
<i>Sihanoukville</i>												
Dry cargo	132	279	451	506	636	48	650	650	661	884	1,334	16
Fuel	1	5	23	41	72	191	91	145	224	257	319	35
Total	133	284	474	547	708	52	741	795	885	1,141	1,654	18
<i>Phnom Penh</i>												
Dry cargo	188	325	195	269	178	–1	158	236	254	116	—	–7 ^a
Fuel	241	246	322	334	387	13	427	423	365	343	—	–5 ^a
Total	429	571	517	603	565	7	585	659	619	459	—	–6 ^a

— Not available.

a. 1995–99.

Sources: MPWT and port of Sihanoukville data.

forklifts, or other handling equipment. Water supply to vessels is also provided through a private operator.

Finally, the nation's oil importing facility is privately owned and operated. The domestic fuel distributor, Sokimex, purchased the terminal in 1996 from the government, and Caltex and Shell operate storage facilities (Tela has a site but it is not developed). That importing facility is being expanded to handle larger vessels.

Potential opportunities. In other countries general cargo and container ports of all sizes have successfully introduced private sector participation to shift some of the costs associated with port investment to the private sector and to increase cargo handling speeds; turnaround times for vessels; and transfer efficiencies for ship to storage, road, and rail transport. Throughout much of the world, including Indonesia, Malaysia, the Philippines, and most of Latin America, general cargo terminals have been concessioned, while in the United Kingdom the ports have been sold. In Colombia the port authorities themselves have been concessioned and the terminal operations or stevedoring services within the ports subcontracted. The port of Fuzhou, China, which is only slightly busier than Sihanoukville, is operated by PSA Corporation of Singapore.

By allowing private sector terminal operators to charge handling fees and, in the case of Colombia, wharfage and berthage fees, private port facilities are able to recover the costs of significant levels of investment. Moreover, private operators are motivated to increase cargo throughput and number of vessel calls so as to increase profit. As time is generally the greatest cost contributor to the shipping industry, the net result of the concessioning programs has been less congestion, more efficient movement of goods, cheaper imports, and more competitive exports. Table 6.10 illustrates the impact of private operations on Colombia's general cargo ports.

Congestion does not appear to be a significant problem at Sihanoukville as a result of the 1996 reha-

bilitation program funded by the ADB; the incremental improvements financed from the positive, dollar-based cash flow; and the Japanese government's willingness to provide the port with more than US\$40 million in concessionary lending for basin deepening, new berths, a new container terminal, and landside expansion. However, even if annual growth rates in cargo throughput drop from 16 to 10 percent, the amount of cargo passing through the port of Sihanoukville will double over the next seven years. Eventually, investments in updated handling equipment, further expansion, and even alongside berth or turning basin dredging may be necessary. The risk associated with those investments could be transferred to a private sector operator, possibly through a long-term concession that provides sufficient time to recuperate capital costs through tariffs. Even if demand for the facility does not outstrip the planned capacity, the incentives and efficiency of a private terminal operator could be brought to bear on the port of Sihanoukville and donor money could be used for other projects that are less likely to recover costs without a subsidy.

Port tariffs at international terminals are generally indexed in dollars or, as with the Cambodian ports, actually charged in dollars. This means there is no currency mismatch on the part of developer-operators, a core reason for the attractiveness of port investments over other areas of infrastructure. Moreover, port costs as a percentage of the delivered price of goods are small for higher valued shipments, such as containerized cargo or fuels handled at liquid bulk facilities. This means that port projects at general cargo or liquid bulk facilities are often able to attract private financing. Low currency risks and favorable price elasticity mean these investments have high potential for cost recovery.

The financing dynamic described does not always hold up for river ports. First, a larger percentage of cargo is domestic transport rather than import or export cargo, meaning that tariffs, even when indexed to dol-

Table 6.10 Impact of private operations on Colombia's general cargo ports

Indicator	One year before concessions	Three years after concessions
Average vessel waiting time	10 days	No wait or hours (depends on the port)
Working days	280 days per year, 15 hours per day	365 days per year, 24 hours per day
Containers/vessel/hour	16	25
Tons/vessel/day breakbulk	750	1,700

Sources: World Bank (1997) Gaviria (1998), and National Department of Planning data.

lars, are sensitive to currency devaluations, local inflation, and the shifting value of the goods shipped. Second, a larger percentage of goods shipped are of low value, because waterway shipment is typically the slowest and most economical means of transport. As such, transport costs are typically a large portion of the total delivered costs of the goods being moved and price elasticity for related charges stiffens. Finally, many goods handled by seaports can only be shipped by ocean, providing deep seaports with a certain element of captured cargo. Waterway port facilities, by contrast, must compete with roads, and even rail. This modal competition and price sensitivity explain how cargo levels at the ports of Phnom Penh can drop despite overall economic growth and booming traffic levels at the main seaport.

Thus private sector investors and operators are generally less attracted to river port development projects than to seaport terminals unless the projects are backed by long-term contracts from shippers or the project is part of an integrated supply chain. Table 6.1 shows the dollar costs of rehabilitating and expanding the ports and waterways of Cambodia during 2001–03.

Although the Sihanoukville rehabilitation is being funded by the Japan Bank for International Cooperation, the MPWT has identified another US\$35 million in dredging, waterway, and river port development projects that do not currently have a source of funding. At the very least, the ministry should consider contracts with private sector dredging companies for plans to deepen and widen the waterway system and tying rehabilitation and expansion costs at Phnom Penh, Chong Khneas, Koh Tong, or other river facilities into operational agreements with the private sector—namely, concessions or terminal leases—so as to maximize the operating efficiencies of these ports and rationalize the investment decisions.

Airports and Aviation Infrastructure

Institutional framework and market structure

As with other sectors of the economy, Cambodia's aviation infrastructure emerged from the years of civil unrest in poor condition: neglected airfields and terminal buildings, a serious dearth of air traffic control and navigation infrastructure and trained personnel, and little institutional or regulatory structure. In recognition of the importance of aviation infrastructure to connecting

outlying provinces and to fostering the growth of the country's tourism industry, the government has recently taken several initiatives to improve airport and air traffic infrastructure and to strengthen the regulatory and institutional arrangements that underpin the industry. This subsection focuses on the structure, performance, and opportunities of Cambodia's airports and aviation infrastructure.⁶

Like most infrastructure in Cambodia, the airports are centrally developed, maintained, and regulated. However, the sector has undergone several changes in recent years and is now one of the more complex areas of infrastructure, with a separate regulatory institution created under a subdecree and long-term agreements with the private sector to operate and manage the two largest airports and the air traffic control infrastructure. In relation to policy setting and physical development, several government agencies remain involved in the sector, namely:

- The MPWT, through its Airports Construction Division, is responsible for the technical design and implementation of major runway development.
- The Ministry of Urban Management, Land, and Construction is responsible for the technical design and implementation of building development.
- The SSCA is responsible for planning, regulating, licensing, and monitoring all aviation activities and reports directly to the Council of Ministers.

On behalf of the government, the SSCA is a signatory to six International Civil Aviation Organization conventions and is the key agency involved in negotiating and signing bilateral agreements, memoranda of understanding, and air linkage agreements in the Greater Mekong Subregion. The SSCA is also responsible for operating all of Cambodia's airports with the exception of the two international airports at Phnom Penh and Siem Reap. Its responsibilities include maintaining, operating, and developing air navigation; controlling and managing air traffic; registering aircraft; certifying airport and aircraft operations; licensing air crews; and regulating civil aviation. The airports at Phnom Penh and Siem Reap have been concessioned to a single international operator. An airport committee comprising representatives of the MPWT; the Ministry of Land Management, Urbanization, and Construction; and the SSCA monitors the two international airports assisted by an independent interna-

Table 6.11 Number of runways of differing lengths, selected Asian countries, 2000 (meters)

Country	Longer than 3,047	3,047–2,438	2,437–1,524	1,523–914
Cambodia	0	2	2	2
Lao PDR	0	1	4	4
Thailand	6	11	17	18
Vietnam	8	3	5	3

Note: A runway length of 3,047 meters is the approximate size required by a Boeing 747, although precise length requirements depend on the plane's weight with fuel and cargo.

Source: CIA (2000).

tional engineer. In December 2000 a private Thai company signed a joint venture agreement with the government to develop and operate Cambodia's air traffic control system.

The government has stated its intention to transform the SSCA from a single centrally controlled government agency into the following separate and autonomous entities:

- A regulatory and safety authority responsible for setting, monitoring, inspecting, and enforcing safety, security, and economy standards throughout the civil aviation sector (airlines, airports, and air navigation services provider)
- An autonomous air navigation system corporation that would provide commercial, customer-focused services throughout the Phnom Penh region
- An autonomous airport corporation or corporations responsible for airport operations throughout Cambodia on a commercial basis.

Subsector performance

Airports. Currently the SSCA operates, manages, and maintains seven airports, and two airports—serving Phnom Penh and Siem Reap—are under private management and operational arrangements. The main airport for Cambodia is Pochentong Airport in Phnom Penh, which was Cambodia's only international airport until 1999 when the airport at Siem Reap, adjacent to Angkor Wat, was also opened for direct international flights.

While each province has an airport or airstrip, at present only five receive scheduled domestic flights: Battambang, Koh Kong, Mondulhiri, Stung Treng, and Rattanakiri. The SSCA operates and manages those five airports, as well as those at Preah Vihear and Kratie. Sihanoukville's airport, Kang Keng, is currently non-

operational, although plans to reopen it under a BOT type of arrangement are under consideration.

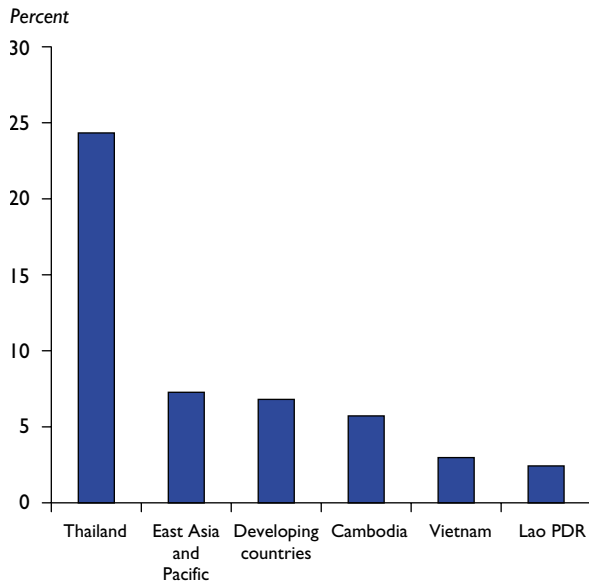
The Phnom Penh airport can accommodate planes of a size up to an Airbus A300.⁷ Siem Reap accommodates planes up to the size of an Airbus A320. Major expansions of the terminal capacities of both these airports are under way. At the other domestic airports, smaller turboprop aircraft provide most services.

Table 6.11 provides a regional comparison of runway lengths.

The current 25-year concession agreement for Phnom Penh's airport extends to 2020, as does the 20-year agreement for Siem Reap. In 2000 about 830,000 passengers and 11,600 tons of freight passed through the Phnom Penh airport, while the airport at Siem Reap had about 310,000 passengers and little or no freight (Société Concessionnaire de l'Aéroport figures based on the first 10 months of 2000). A comparison of the passenger throughput of Cambodia's airports with that in other countries in the region shows that both as a percentage of the population (figure 6.9) and in terms of absolute numbers of passengers, Cambodia enjoys a relatively high level of civil aviation activity, especially compared with its neighbors to the east.

Traffic at Phnom Penh increased rapidly until 1996; however, domestic civil strife and the crisis in Southeast Asia led to a sharp fall in traffic from 1996–98. Since 1998 traffic growth has again been substantial, increasing by nearly 30 percent, although passenger numbers remain below 1996 levels. Freight traffic, although still small, has also increased rapidly since 1998—by nearly 200 percent based on annualized 2000 data. The opening of Siem Reap to direct international flights has more than doubled the total passengers going through the airport in two years. Figure 6.10 illustrates these trends.

Figure 6.9 Air passenger throughput, selected countries and regions, 2000 (percentage of the population)



Source: World Bank data.

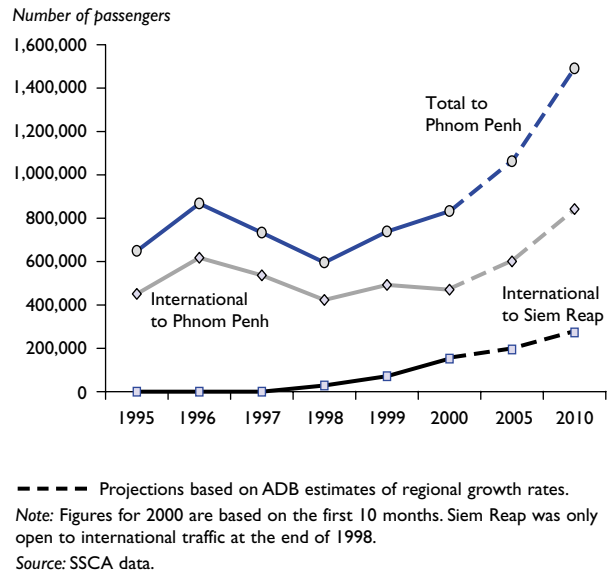
Air Traffic Control and Navigation Systems. On the basis of the International Civil Aviation Organization's Regional Air Navigation Plan, Cambodia has assumed responsibility for and exercises control over its own fly zones, with air traffic areas being divided between international and domestic air traffic service route systems. Currently control services are limited to Phnom Penh and Siem Reap, because the low level of air traffic outside these areas does not justify a full control service.

According to the SSCA, medium-term goals for air traffic service in Cambodia should focus on

- Preventing collisions
- Maintaining an orderly flow of traffic
- Providing essential information for flight control and search and rescue.

Flight information services above 19,500 feet are provided by area control in Bangkok and Ho Chi Minh City, and six area control towers in Cambodia provide information below this altitude. As the current Aeronautical Information Service is inadequate, detailed statistics and information about most air navigation activities are unavailable. Nonetheless, area control centers reported 10,034 aircraft overflying Cambodia in 2000, a 4 percent increase over 1999.

Figure 6.10 Air traffic trends, 1995–2010



Cambodia has entered into a 15-year contract with a Thai company to develop and maintain the nation's system for air traffic control services. Under the arrangement, the SSCA will be challenged in its designated role as regulator, because it will be contractually obliged to operate the system under the guidance and direction of the contractor.

Opportunities for private sector participation

Current role of the private sector. Cambodia's two international airports—at Phnom Penh and Siem Reap—have been contracted out to a French-Malaysian concession joint venture, Société Concessionnaire de l'Aéroport. The concession for Phnom Penh airport is for operations, management, and development, while the one for Siem Reap is a management and operations contract, although the government is reported to have requested the Société Concessionnaire de l'Aéroport to finance and undertake some construction at Siem Reap.

In May 1995 the Council of Ministers accepted a proposal for the design, construction, financing, and operation of Pochentong Airport in Phnom Penh from VINCI-Mohibba Masteron, a French-Malaysian joint venture. The concessionaire appears to be concentrating on redeveloping the existing facilities. The original concession period was for 20 years, but damage to facilities during disturbances in 1997 and the subsequent loss of international traffic, along with other difficul-

ties, led to a renegotiation of the pace and scale of planned investment, the extension of the concession to 2020, and a further concession for Siem Reap. While these agreements are not public, the Siem Reap agreement is believed to prevent the government or a competing private company from opening another airport to serve the Siem Reap/Angkor Wat area.

In December 2000 the government and SMART Corporation of Thailand entered into an exclusive 15-year agreement whereby SMART established a company under Cambodian law to develop and operate the civil air traffic control and air navigation system in the country on a build-cooperate-transfer basis. The agreement provides for a 70:30 split of profits between SMART and the government, respectively. The concessionaire has agreed to invest US\$17.5 million to update air traffic control facilities, and in return will collect revenues from overflying fees.

Future opportunities. Table 6.1 shows the estimated investment requirements for civil aviation infrastructure according to the government's latest PIP. The major

unfunded investment needs relate to air traffic and civil aviation systems, a large portion of which may be covered by SMART's investment. The studies for which the government intends to seek funding, however, correlate to several provincial airports identified for upgrading and privatization, including Koh Kong, Preah Vihear, Stung Treng, Rattanakiri, and Mondulakiri. The ability to attract the private sector into investing in and operating these domestic airports will have to be analyzed as part of the feasibility analyses.

In addition to future secondary airport investments, the government will have to clarify the policy for airport development in Siem Reap. The potential for a second airport development in Siem Reap outside the current concession agreement is uncertain, as is the right or ability of the current concessionaire to extend its agreement beyond 2005. Competitive and transparent tendering processes should be considered for any new concessions to demonstrate the validity of the operator's rights and to avoid the uncertainties and renegotiations that arose with the Phnom Penh concession when Siem Reap was opened for international traffic.

Notes

1. According to Ministry of Commerce estimates, in 1999 the tourism sector was Cambodia's second or third largest export sector, after garment exports, competing for second place with the combined legal and illegal exportation of forest products. The value added of each Cambodian tourism worker is estimated at US\$2,000, over 50 percent more than the value added of a garment worker and double the value of repatriated income per expatriate Cambodian worker.

2. The International Civil Aviation Organization, which oversees international standards for airlines and airports, recently reviewed Cambodia's performance, and provided more

than 300 recommendations necessary to bring Cambodia's aviation sector up to international safety and security standards. Few of these have been carried out.

3. The PIP combines transport allocations with communications, but the vast majority of projects appear to be in transport. As the MPWT is a shareholder in all profitable telecommunications operations, communications is a large net contributor to the budget.

4. Estimate provided by the World Bank, assuming 3 percent of yearly expenditures on road development equaling US\$7.5 million per year plus approximately US\$2 million to

US\$3 million per year for maintenance of roads built prior to 1995.

5. However, there is traffic from Thailand, principally cement and other construction materials. The traffic is carried by road from Thailand to the railhead at Sisophon.

6. It does not analyze the civil aviation industry itself, which is generally considered a competitive and contestable service without the major sunk capital costs associated with infrastructure investments.

7. While Boeing 747s could operate out of the airport, it would have restricted route length. Europe and North America would be beyond this allowable distance.

7

Cross-Cutting Issues

Many of the opportunities for and constraints on expanding private sector participation in infrastructure can be assessed at a sector-specific level. However, a number of important issues are substantially common across infrastructure, and in some cases, across the economy as a whole.

Legal environment

General legal structure

Cambodia's legal system remains at an early stage in its evolution. Currently Cambodia has no commercial code, corporate law, or bankruptcy law.¹ The absence of a commercial code means that, in effect, there is no explicit legal framework governing contracts or a process to define and deal with bankruptcy. The absence of a bankruptcy law is one of the reasons why borrowing from banks is difficult.

The government has been addressing these constraints. Since 1994 it has been preparing the Commercial Code, which comprises eight sets of laws, the first two of which the National Assembly adopted in May 1995. An amendment to the Law on the Commercial Regulations and Commerce Registry provided for the transfer of jurisdiction over the registration and maintenance of the Commercial Register from the Commercial Court to the Ministry of Commerce. The Ministry of Commerce then lifted all restrictions on foreign companies and allowed them to freely engage in trading activities. Foreign companies needed only to register with the Ministry of Commerce and pay tax.

All laws, once enacted, are published. However, there is no requirement to publish licenses or concession contracts, which tend to be treated as confidential.

The courts system has not yet established a reputation for independence, competence, or efficiency, which is a significant source of concern among investors. In the absence of a high level of comfort in the domestic judicial process, foreign investors emphasize international commercial arbitration. To facilitate such arrangements, Cambodia is a party to the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards and is in the process of joining the International Centre for the Settlement of International Disputes. Cambodia has also signed a number of bilateral investment treaties that provide for arbitration and has ratified the ASEAN Protocol on Dispute Settlement.²

Law on Investment

The 1994 Law on Investment and subsequent amendments provide the central pillar around which investment takes place.³ The law provides for the equal treatment of local and foreign investors in all areas except land ownership.⁴ This law provides guarantees against the nationalization of industries and allows the creation of 100 percent foreign-owned companies and the use of skilled workers from overseas. This law also provides the basis for the subdecrees that created the CDC as the central authority responsible for handling foreign investment. These decrees include potential incentives for foreign investors in infrastructure. The free flow of

foreign exchange and the right to repatriate currency and hold foreign exchange bank accounts is guaranteed in the Law on Foreign Exchange.

The following are the main limitations to foreign investment under the Law on Investment:

- Investment incentives cannot be assigned or transferred to another party.
- Land necessary for investment must be vested in Cambodian citizens or legal entities deemed to be citizens of Cambodia, that is, at least 51 percent owned by Cambodian citizens; however, foreign investors may lease land for up to 70 years.
- Employment of foreign nationals is limited to certain management personnel, industry experts, and family members.
- Rights and benefits granted to the investor by the CDC may be withdrawn if the investor violates or fails to comply with the conditions stipulated by the CDC.

The government is currently reviewing the Law on Investment with assistance from the World Bank's Foreign Investment Advisory Service. The changes being contemplated attempt to re-balance incentives for investors with the requirements for government revenue and efficient resource allocation. This involves reconsidering some of the tax schemes for foreign investors.

By regional standards even the current Law on Investment offers significant guarantees and incentives for foreign investors aimed at encouraging the flow of capital into the country. However, the operation of the approval procedures in practice and the perceived additional costs of obtaining investment approval may limit the attractiveness of investment in Cambodia compared with other prospective destinations for investment in the region.

No formal restrictions are placed on the level of foreign participation in Cambodian companies. As a result many foreign investors choose to establish 100 percent foreign-owned limited liability companies in Cambodia. The only legal reference to company registration requirements is given in Instruction Circular Number 360 of December 1997, and this lacks detail. The absence of a company law has led to ad hoc practices of company incorporation, which generally simply require the agreement of the MEF or, for small projects, of the local governor. A transparent registration process will be part of upcoming reforms to the legal framework.

Government organization and decisionmaking

General structure

Cambodia is divided into three levels of jurisdiction: the central government, 20 provinces and 4 autonomous municipalities (Phnom Penh, Sihanoukville, Kep, and Pailin), and districts and communes. Provincial and municipal administrations fall under the Ministry of the Interior and are the direct representatives of the central government. They in turn appoint officials at the district and commune level. The provincial and municipal administrations participate in the preparation of the national budget as it relates to their jurisdictions and issue land titles and operating licenses to businesses with annual profits of less than CR 6 million (about US\$15,000). In practice the line between the authority of different levels of government is blurred, for example, private water projects appear to require explicit authorization, often from both provincial governments and the central government.

The central government is formally embodied in the Council of Ministers. The council is chaired by the prime minister and includes two deputy prime ministers (who are also in charge of separate ministries), senior ministers, and ministers of state. In addition, secretaries of state report directly to the Council of Ministers. The prime minister is empowered to execute all decisions adopted by the Council of Ministers and can use his or her own authority to issue subdecrees approved by the council.

The incomplete nature of the legal system, coupled with an unclear allocation of responsibilities between the levels of government and among agencies at the same level of government, creates costs and uncertainty for investors. It also raises concerns about transparency and corruption. A recent survey found that 84 percent of Cambodians felt that bribery is the normal way of doing things, but that 98 percent believed that ending corruption was important (Center for Social Development 1998). Foreign investors interviewed as part of the CFR process echoed these concerns.

Institutional responsibility for PPI

Responsibility for dealing with private infrastructure projects and related reforms tends to reside in the sectoral ministries, although the MEF is also involved in actions with budget implications or involving multilat-

eral lending agencies. While this approach can facilitate integration with sector planning and sector-specific expertise, countries that are proposing to undertake major initiatives in the private infrastructure field often create small, cross-cutting units specializing in private infrastructure matters to support the sectoral agencies. This permits fostering deeper expertise in cross-cutting issues and creates a vehicle for leveraging lessons of experience between sectors, promoting coherent policy approaches, acting as a central contact point for investors to some extent, and coordinating capacity building and marketing activities. In some countries these units have a degree of institutional autonomy, such as the BOT Center in the Philippines or its counterparts in the Republic of Korea and Vietnam. In other cases these functions are undertaken by a specialist cell within the ministry of finance or by a technical secretariat to an interministerial committee, as is the case with a new unit being established in Indonesia.

Subdecree 70 of July 2001 further strengthens the CDC's role as the central agency responsible for project evaluation, investment promotion, strategic planning, and interministerial coordination. All BOT projects and long-term investments are explicitly placed under the CDC's jurisdiction, and it is described as the "one-stop shop" for both public and private sector investments. Even though the subdecree provides the CDC with specific responsibility for approving projects and conducting bidding processes, its precise terms of reference will require careful study to ensure that its role in relation to ministries and agencies is clearly defined.

PPI Approval and Transaction Processes

Over the last several years the government has entered into BOT agreements, licenses, and sale contracts with private sector investors and operators for some of the country's most important infrastructure services, including the two international airports, its primary fuel terminal, mobile telecommunication rights, the air traffic control system, and most recently the only passable two-lane highway in the country. None of these transactions has benefited from published performance requirements, a competitive bidding process, or established procurement procedures, and none of the agreements has been subjected to public scrutiny. The agreements have been entered into with both foreign and

domestic investors and are signed by government officials ranging from line ministry secretaries of state and undersecretaries in central ministries to senior members of the Council of Ministers.

Formal approval processes

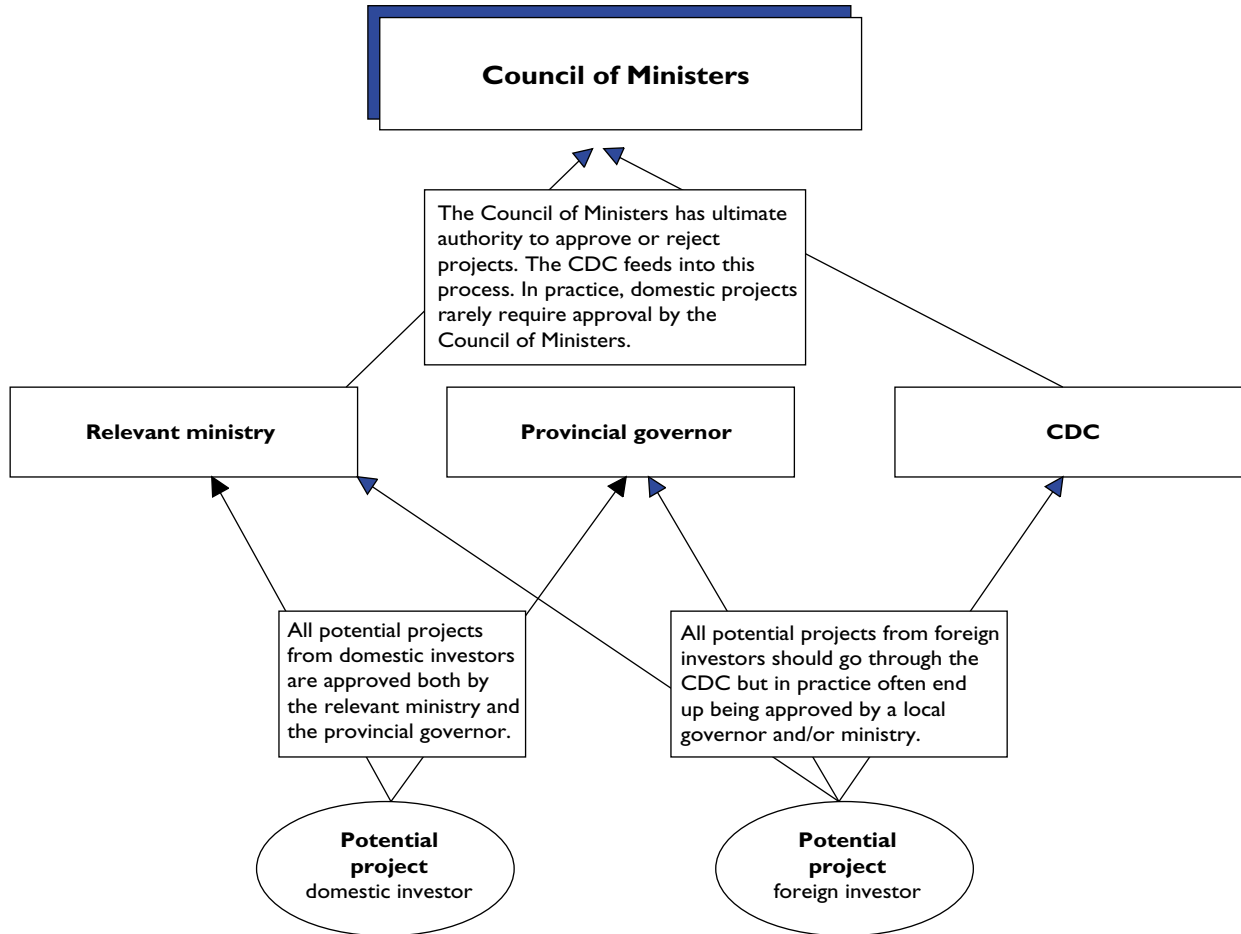
Proposed investments in infrastructure generally require the prior approval of three separate agencies: the MEF, the CDC, and the ministry under which the project falls. While in recent years CDC approval has not been a prerequisite for a particular investment in practice, it is required if the investor wishes to apply for any of the tax exemptions or other privileges. With the exception of telecommunications, all infrastructure sectors are eligible for special rates on profit, withholding, value added, and income taxes. They may also benefit from decreased import duties, although exemptions on duties were under negotiation in early 2001. Figure 7.1 illustrates the approval process.

Once the CDC has received a correctly completed application it is required to respond within 45 days (although more recently the process has been faster, about 28 days). Following a decision, the applicant has the right to file an appeal with the CDC within 25 working days.⁵ While in theory the CDC should be the institution charged with agreeing to all new foreign private sector projects—arising from unsolicited, solicited, and competitively bid procedures—in practice this is not the case. Companies frequently bypass the CDC and propose projects directly to government officials.

Public procurement and PPI contracts

Since passing the Law on Investment, Cambodia has enacted several subdecrees that could be used to clarify approval and procurement procedures. In 1995 the Subdecree Governing Public Procurement (Number 60) established the Office of Public Procurement, which is now staffed with 60 procurement officers and housed under the MEF. In practice, however, the Public Procurement Office is only tasked with reviewing process and procedures related to purchases that draw from the national budget. As a result, the office's authority has not been extended to BOT, concession, or similar agreements between the government and the private sector, because they do not explicitly require fund transfers from the government. In addition, while Subdecree 60 lays out standard contracting mecha-

Figure 7.1 Outline of approval processes



Source: Government of Cambodia.

nisms based on the ADB standard terms for procurement, it leaves ample room for the use of direct purchase or direct contracting if the relevant government agency chooses to define the purchase as “urgent.”

The government’s Governance Action Plan of 2001 recognizes the need for the government to strengthen its commitment to procurement principles and standard bidding practices and calls for new legislation before 2004. The following are the two main areas in which the MEF is to take action in relation to strengthening enforcement and scrutiny (Government of Cambodia 2001a, Section 5[ii]):

- Reviewing arrangements for enforcing the decree on public procurement, preparing measures to improve the situation, and starting implementation in the short term (within a year) plus reevaluating the

legal framework in the medium term (two to three years). The monitoring benchmark would be the amount of procurement carried out under the auspices of the Public Bidding Office.

- Reevaluating the legal framework governing public procurement and introducing legislation to promote efficiency, transparency, and accountability in the medium term (two to three years). The monitoring benchmark would be the extent of public consultation.

In 1998 Cambodia promulgated the Subdecree on BOT. The decree attempts to set out the general framework within which BOT arrangements can take place and deals with such matters as the maximum contract term and requirements for competitive bidding. The main provisions are outlined in box 7.1.

Box 7.1 Selected clauses from the Subdecree on BOT**Article 1**

The BOT contract is a contract between the public legislator who provides the concession and a private legislator, called a license holder, who is in charge during the construction and infrastructure management. The license holder undertakes responsibility for any loss and returns all infrastructure to the government without indemnity at the end of the contract.

Article 3

Only infrastructure projects announced by the CDC or by another unit that has been granted the rights to do so by the government are recognized as subject of the BOT contracts. Eligible infrastructure sectors include electricity generation, roads and highways, ports, communication networks, railways, hospitals, schools, airports, sports stadiums, tourist areas, new cities, hydroelectric power plants, dams, clean water industries, and recycling factories.

Article 4

The contract must specify the rights of the government or other public legislator in case the license holder does not respect the contract. The contract will provide the license holder with monopoly status for a maximum duration of 30 years.

Article 6

Ministries or the public legislator can sign a BOT contract witnessed by a representative who is of Cambodian nationality or by a foreigner.

Article 7

The license holder can transfer the contract to a third party provided at least 30 percent of the investment plan has been completed, the current license holder continues to be responsible with the third party until construction has been completed, and the transfer is agreed to by the government or the public legislator.

Article 8

The government or public legislator has the right to punish the license holder or terminate the contract if the license holder is declared bankrupt, does not respect clauses in the contract despite warnings, or violates Cambodian laws or regulations.

Article 9

The selection of the license holder for the BOT must be carried out through international or national competitive bidding unless the bidding process did not achieve any result or the project requires a license holder with special qualifications.

Article 14

All disputes will be resolved based on conditions outlined in the contract.

While Article 9 includes an escape clause for competitive bidding, in practice the entire subdecree seems to be frequently ignored. The apparent inability to enforce the subdecree has raised questions about whether or not there might be advantages in creating a new BOT law or a similar instrument governing private infrastructure arrangements.

International practice on this subject varies, and the most effective legal regimes are tailored to the issues of particular concern in each country. In the Cambodian context there may be advantages in using such a law to address the following issues:

- To clarify and confirm the acceptability of a range of modalities of PPI, including not only BOT arrangements for new infrastructure development, but also concessions, leases, and licenses for existing assets.
- To establish clear and effective rules governing the transparent procurement of private infrastructure projects. This would involve a progression of processes and regulations that are still missing and reflect the chronology of investment, including
 - A defined process for identifying viable projects so that the government can actively solicit the private sector
 - A defined process for responding to unsolicited bids for the management, operations, concessioning, or purchase of existing assets
 - A defined process for conducting transactions according to the principles of transparency and fair competition (particularly important in infrastructure, where competition may be limited once the right to provide service has been transferred to the private sector)
 - Requirements for the public availability of BOT agreements, licenses, leases, concessions, and all other forms of contracts between the government and private sector investors.
- To confirm that international arbitration is available to resolve disputes arising from private infrastructure projects.

These requirements are consistent with the findings of the Governance Action Plan, which in its section on legal and judicial reform calls for “promoting wide dissemination of laws and regulations” and “completing gaps in legislation and developing a legal framework for the private sector.”

National auditor

The enforcement of procurement requirements as applied to PPI projects may eventually be aided by the National Audit Authority (NAA) once that agency is fully operational. Established by the Law on Audit of 1998 and subsequent subdecree, the NAA is an autonomous public entity that is independent from the executive branch and responsible only to the National Assembly. The NAA's main task is to audit the accounts of government entities, and its responsibilities include reviewing all matters related to public accounts, public moneys, and public assets and liabilities and reporting instances of abuse, excesses, extravagance, fraud, inefficiency, irregularities, and wastage (for details on the NAA's powers see the Subdecree on Organization and Functioning of the National Audit Authority and Internal Audit, Section 2, Article 12). The auditor general was named and approved by the National Assembly in mid-2001, but the office remains unfunded and lacks staff and resources. The NAA's Organizational Structure and Functions Plan anticipates a total staff of 100, broken down as follows:

- 10 auditors dedicated to “joint venture and foreign investment companies”
- 20 auditors dedicated to state and public enterprises, such as the ports of Sihanoukville and Phnom Penh, the railroad, EDC, and the PPWSA
- 25 auditors dedicated to government ministries
- 20 auditors dedicated to World Bank and ADB projects and programs
- 15 researchers and an additional 10 directors and deputy directors.

Indeed, Article 2 of the 1998 Law on Audits defines “government institutions” subject to audit not only as “ministries, agencies, authorities, and state enterprises,” but also “contractors or suppliers of goods and services to the government under contracts.” The NAA's responsibilities are defined broadly with regard to external and functional audits, which are intended “to ensure that the activities and operations related to a function within government institutions are being conducted in a manner that complies with applicable laws, regulations, and policies. Such audits inter alia include procurement, . . . contracts. . . .” Thus procurement procedures and contractual arrangements between the private sector and government agencies and

ministries may clearly be subjected to oversight and review by the auditor general.

Inevitably, the role that the NAA can play in improving the transparency, fairness, and competitiveness of PPI arrangements will be determined by two factors: first, the political will and independence of the auditor general; and second, the government's ability and willingness to provide the NAA with sufficient human and financial resources to conduct the necessary contractual and functional audits while also fulfilling its extensive internal auditing obligations. In the meantime, the government should rededicate itself to the intent of the BOT Law and the procurement subdecree.

Regulatory approaches

The regulatory frameworks put in place to determine the rights and obligations of infrastructure providers and consumers have far-reaching implications for the potential to attract private sector involvement, the efficiency of those operators, and their responsiveness to consumers. While regulatory frameworks need to be tailored to the circumstances in each sector, three cross-cutting issues are particularly important in countries like Cambodia.

Exclusivity

As mentioned in chapter 2, most infrastructure sectors were once considered to be natural monopolies, in the sense that a single firm could supply the market at lowest cost. Moreover, some governments found that awarding exclusive rights to infrastructure providers was a convenient strategy for attracting investment, raising revenue, or creating structures under which some users pay higher prices to cross-subsidize other users.

While the situation needs to be considered sector by sector, Cambodia should be especially cautious about awarding exclusive rights for several reasons. First and foremost, experience in many countries has shown that competition, where feasible, offers far superior results to monopoly. Second, particularly in sectors such as power and water, small-scale private providers have the potential to serve a sizable proportion of the population, and attempts to confer exclusive rights on a single provider may lead to a reduction in services. Third, cross-subsidy approaches are rarely effective

when the primary goal is to expand access to services, as the service provider has weak incentives to serve customers from whom it will not be able to recover the full costs of supply. Finally, monopolies require careful regulatory control to avoid abuse of market power and to ensure incentives for efficiency, but these kinds of regulatory arrangements create risks for investors, require skills that are in extremely short supply in Cambodia, and provide opportunities for corruption.

Regulatory rules and discretion

Regulatory systems for infrastructure in countries of the Organisation for Economic Co-operation and Development include a relatively comprehensive set of rules governing most aspects of service provision and entrust regulatory agencies with significant discretion in applying and adapting those rules to individual circumstances. Great care needs to be taken in attempting to translate regulatory systems of this kind to Cambodia. First and foremost, regulatory discretion is a source of uncertainty, and hence of risk for investors, and these risks are more pronounced in countries with limited experience in regulation and where overall political risk is perceived as high. High risks will result in reduced investor interest, reduced investment, and higher tariffs. Second, regulatory systems of this kind require substantial technical capacity, which for the most part remains scarce in Cambodia. Third, discretionary regulatory systems create opportunities for corruption. While the detailed approach will need to vary from sector to sector, these considerations suggest that Cambodia should take care to ensure that its regulatory systems are adapted to its particular circumstances.

Room for misuse of regulatory discretion can be minimized by structuring a regulatory system that ensures the regulatory agency's accountability. This can be achieved by means of several measures, such as "light-handed" regulation, which relies on the existing legal framework; clearly defined formulas for tariff adjustment; transparent regulatory decisionmaking; and extensive information disclosure.

Regulatory agencies

Most regulatory systems, including those that follow the general principles outlined above, create some regulatory tasks. While details vary from sector to sector, these typically include some role in applying regula-

tory rules and in monitoring and enforcing compliance with the regulatory framework. Two general issues warrant consideration in Cambodia: first, regulatory independence, and second, whether such agencies should be created for each sector or on a broader basis.

Regulatory independence refers to the measures taken to ensure that regulators function effectively. Three underlying ideas are involved, namely:

- That the regulator operates at arm's length from regulated firms to avoid conflicts of interest
- That the regulator operates at arm's length from political authorities so that decisions are not influenced by short-term political considerations, such as a reluctance to raise tariffs when increases are clearly justified
- That the regulator has the resources necessary to do its job professionally, which usually involves funding the agency from levies on regulated firms rather than from the general budget and exempting personnel from civil service salary restrictions.

The more discretion the regulator has, the more important these measures are, but even in systems with relatively little discretion, measures of this kind are important to reduce the risks investors face, to ensure that service providers honor their regulatory obligations, and to provide specialist support to the government when dealing with possible renegotiation issues. As Cambodia begins to make its first power regulator operational and works on developing a national water regulator, the country would benefit from efforts to maintain the independence of these institutions, even given the understanding that full independence will not be achieved overnight in a country where even the independence of the judiciary is questioned.

When a country is creating specialist regulatory agencies the question arises whether it should have one agency for each sector or a single agency for all or most infrastructure sectors—a so-called multisectoral agency. In each case the rules applied to each sector will need to be adapted to the particular circumstances of the sector. The issue is whether rules for multiple sectors might be given to a single agency to administer. Both approaches have ample precedent internationally, and each approach has its strengths and weaknesses. The main advantages of multisectoral agencies are as follows:

- The sharing of resources could achieve economies of scale. This can be a particular advantage in rela-

tively small economies where personnel with technical expertise in utility regulation are scarce.

- The resistance to the agency becoming captured by utilities and sectoral ministries is likely to be stronger, thereby providing greater comfort to investors and to consumers.
- The ability to deal with common issues in a consistent way is improved, thereby reducing distortions. This advantage is becoming increasingly important as we see a trend toward the emergence of multi-utilities, that is, service providers that provide more than one utility service, for example, water plus power supply.

The main advantage of sector-specific regulatory agencies is that they can focus on the issues in a single sector. In some cases, regulatory agencies created initially for one sector might be given responsibilities for additional sectors over time, as could happen with Cambodia's power regulator.

Land acquisition and resettlement

While Cambodia enacted the new Land Law in 2001, no clear legal process is available whereby either investors or the government can acquire land for infrastructure projects.⁶ Article 44 of the Cambodian Constitution allows the government to expropriate land provided that the owners receive “fair and just compensation” in advance of the expropriation, although the definition of fair and just compensation has yet to be clarified in a future subdecree.⁷ In addition, the Law on Investment assures investors that the state will not adopt policies that adversely affect their right to use the property they own (Article 9). Finally, the bilateral agreements mentioned earlier include measures to deal with disputes over rights to land. The transfer of land ownership between private persons is expected to be governed by the Civil Code, which has yet to be enacted.

Beyond these rights, the government has been working to create a formal framework outlining the process for land expropriation. It has created the Resettlement Committee under the auspices of the MEF to deal with this issue for public projects, that is, projects owned and operated by the government. The committee consists of representatives from the Ministry of Land Management, the MEF, and NGOs, and is responsible for deciding on appropriate compensation

for land expropriated for public sector infrastructure projects. It was used to settle compensation claims when ADB-financed projects required the resettlement of people living along Highway 1.

As noted, the new procedure only applies to public projects. The absence of formal title to much of the land and legal prohibitions on foreign ownership of land have led the government, in line with other countries in the region, to encourage concession and lease arrangements that do not require the permanent transfer of land to the private sector. However, even within this framework, the government has yet to decide whether it is willing to use its authority to help private companies gain access to land. This means that resettlement issues continue to impede infrastructure projects. For example, the construction of a second runway at Pochentang Airport has been postponed indefinitely, partly because the concessionaire and the government were unable to agree on the resettlement of affected households. Similar problems are expected when the Sihanoukville Port Authority finalizes its own elaborate plans to move and re-house a community of fishermen and their families who live on land on which the port envisions the development of an export processing zone.

Financing environment

As outlined in chapter 2, the ability to mobilize local finance can be an important constraint on private sector participation in infrastructure, particularly for larger greenfield projects that will receive revenues primarily in local currency.

Local capital markets

Cambodian financial markets are small. Because of the country's recent history, low per capita income levels, and a lack of confidence in the banking system, most funds neither originate from nor end up in the commercial banking sector. More than 92 percent of M1 money supply (cash and demand deposits) is outside demand deposit accounts. The local debt market is limited, both in terms of liquidity and maturity on loans. The maximum length of time for which money can be borrowed is about two years, and the average length of all deposits is six months. In addition, the amounts lent are relatively small: most loans are around US\$1,000 or

Table 7.1 Larger Cambodian banks, 2000

Bank	Estimated assets (US\$ millions)	Average loan size to businesses (US\$)	Number of branches
Canadia	105	< 1,000	9
ACLEDA	15	1,500	13 ^a
Cambodian Commercial	2	—	3
Rich Nation	< 1	—	3

— Not available.

a. Plus 45 district offices.

Sources: National Bank of Cambodia (2000); Overseas Cambodian Investment Corporation (2000); Frontier Economics data.

less and few exceed US\$50,000. These amounts are insufficient to finance even relatively small infrastructure projects.

Seven foreign banks have branches in Cambodia (Bangkok Bank, Crédit Agricole Indosuez, First Commercial Bank, Krung Thai Bank, May Bank, Standard Chartered, and Thai Farmers Bank), but all basically serve existing overseas clients (along with some embassies), and none is looking for or accepting new local customers. There are also about 15 locally incorporated banks.⁸ As noted earlier, these banks are characterized by their limited lending abilities and their concentration in Phnom Penh. The only formally licensed bank with a significant presence outside Phnom Penh is ACLEDA (now a single corporate entity). Table 7.1 provides an overview of the largest institutions, and these banks are discussed in more detail in box 7.2.

Official interest rates have declined slowly, but steadily, from about 19 percent per year in 1996 to about 15 percent in 2000; however, interest rates on small loans vary depending on the project and the borrower. In 2000 the Rural Development Bank was on-lending concessionary loans (loans provided to the government by donors) to NGOs at about 12 percent;⁹ however, the bank does not provide retail borrowing services to private companies.

While the main limitation on lending is the lack of financial resources, the absence of bankruptcy laws and uncertainty about the general contracting framework mean that banks cannot be reasonably certain of their ability to repossess any collateral that is offered. In addition, the lack of land titles resulting from the Khmer Rouge's destruction of ownership documents limits those who can prove ownership over any substantial amount of collateral.

Box 7.2 Leading banks in Cambodia

In terms of amount lent and number of customers, Canadia and ACLEDA banks are the largest in Cambodia (but small by international standards). Canadia, which has about 30 percent of the deposit market, has total assets of about US\$105 million. It has nine branches, three of which are in Phnom Penh. ACLEDA, a former microfinance institution, has assets totaling about US\$15 million, and had plans to raise an additional US\$3.5 million from shareholders during 2001. ACLEDA has the most extensive branch and office network, with 13 provincial branches and 45 district offices; however, the average size of its loans to businesses is US\$1,500 and to microbusinesses about US\$100. None of these banks' deposits is for longer than two years, and other than shareholders, they have no other access to long-term funds. Consequently, they lend at interest rates of about 1.2 percent per month and for durations not longer than two years. ACLEDA has some limited experience of infrastructure lending, having provided partial financing for some of the private water providers (see chapter 4) and rural electricity providers (see chapter 3). Canadia does not have any experience lending for infrastructure projects other than some small loans to farmers for water pumps.

None of the other banks approach either of these in size. The next largest locally incorporated banks, Rich Nation Bank and the Cambodian Commercial Bank, have only three branches each, and the remaining locally incorporated banks have fewer.

While in theory the seven foreign banks have access to large asset bases, in practice, whether they can use those assets to offset liabilities incurred in Cambodia is not clear.

Infrastructure financing

As regards infrastructure, the financial markets are unable to contribute significantly to anything other than small-scale projects for limited terms. Consequently, in addition to entrepreneurs' own funds, by far the most common form of financing for infrastructure projects

such as small water and power networks or individual wells and generators, private infrastructure projects tend to be supported through microfinance schemes. While most microfinance loans are provided to farmers, ACLEDA and other banks have provided small-scale loans to entrepreneurs to set up small infrastructure services, for instance, for small generators to provide power to a few households. More substantial loans have been provided to larger network providers such as private water companies, but lending on any scale from domestic finance institutions for infrastructure projects has been limited. For example, ACLEDA has made about 119 loans to rural electricity enterprises totaling US\$203,480, about 50 percent of which were to battery charging businesses.¹⁰

To date, foreign capital markets have not been accessed for local infrastructure projects, although some projects have used foreign markets indirectly, for instance, through donor financing, foreign guarantees, and export-import credits. How then, do Cambodia's existing small-scale infrastructure providers finance their capital costs? As figure 7.2 illustrates, family borrowing and informal lending make up the majority of the financing available to small-scale private power providers, while the operator's own equity underpins the capital structure.

With 85 percent of loans holding tenors of only 12 months or less and interest rates typically in the range of 1 to 2 percent per month, for these power providers to expand into or start up medium-scale operations of

more than a few hundred connections has been extremely difficult. The difficulty of finding outside financing partially explains why Cambodia has hundreds of small-scale power providers, but only a few private providers of delivered water: greenfield development in the water sector often requires much higher levels of initial capital. Other factors such as lower mobility of assets also contribute to the lower number of small-scale providers in the water sector.

Currency risk mitigation

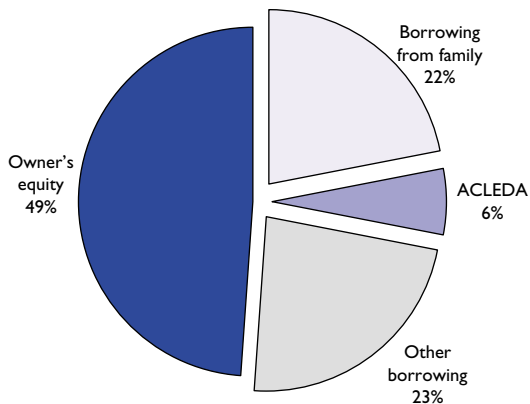
The money supply is characterized by extensive dollarization of the economy. While both riels and dollars are freely used, more than 70 percent of M2 money supply (cash, demand deposits, and time and savings deposits), by value, is held in U.S. dollars, and more than 97 percent of time and savings deposit accounts, by value, are U.S. dollar accounts (National Bank of Cambodia 2000). Consequently, to the extent that any loans are made, local banks are free to provide them in either dollars or riels. The National Bank can intervene and buy or sell dollars to stabilize the exchange rate, but has not done so since 1998, because the currency has been relatively stable against the U.S. dollar.

The banks' balance sheets reflect this extensive dollarization, with about 96 percent of their assets and 95 percent of their liabilities held in U.S. dollars. Despite seeking to de-dollarize the economy, there appears to be no explicit government or National Bank policy about the medium- to long-term relationship between the dollar and the national economy. In addition, while the number of riels in circulation appears to have been relatively constant over the past two years, the number of dollars has been rising steadily.

To some extent the highly dollarized economy limits investors' currency risk, although whether or not revenues would be in dollars depends on the sector. Another favorable characteristic of the dollarized economy is that no currency controls are in effect and investors are free to repatriate funds as they wish.

To increase confidence in the banking system, the National Bank is re-licensing each of the commercial banks. Other measures aimed at increasing confidence in the sector involve extensive technical and financial support from international donors. Under guidance from the International Monetary Fund, the National Bank is to privatize the Foreign Trade Bank, and the

Figure 7.2 Sources of capital funds for small-scale private power providers



Source: Enterprise Development Cambodia (2001).

prime minister recently agreed to set up a committee to examine the need for local equity and treasury debt markets, both of which are central to the ability to finance infrastructure locally. The ADB, along with the French Development Agency, have agreed to fund a financial sector development project, the Road Map for Financial Development in Cambodia. The ADB is also supporting the Rural Development Bank, both by using it to channel funds for some rural development projects and through technical assistance.

Subsidy schemes

As discussed in chapter 2, for rural projects or those with a disproportionate number of low-income consumers, some degree of public subsidy may be justified for infrastructure services to meet the needs of the poorest members of society. This section offers some broad observations on possible designs for such schemes.

Objectives

The starting point in designing any subsidy system should be to identify clear objectives of the support system. In some cases efficiency considerations may support the provision of a subsidy. This may be the case, for example, where consumption is associated with a positive externality, such as the public health benefits associated with access to basic sanitation services. Where the goal is to expand access to services, particularly by those who live in areas where the costs of connection are higher than average, the subsidy should usually be directed to supporting connection to services rather than to ongoing consumption.

If the objective is to ensure that all citizens can afford consumption of at least some minimal level of services that are deemed essential, subsidies might be directed to some minimal (“lifeline”) units of consumption under increasing block tariff structures rather than to all units of consumption. This strategy may be a relatively efficient mechanism for helping those already connected to the network, but does not assist those who currently lack access. Indeed, tariff structures of this kind can actually create disincentives for firms to expand services to low-consumption households.

Beneficiaries

Once the objective is clearly defined, the next question concerns the class of intended beneficiaries. In many

cases information problems will make precise targeting infeasible. In these cases the costs of including unintended beneficiaries and excluding intended beneficiaries need to be weighed carefully, taking into account the scheme’s objectives and the resources available to finance subsidies. In countries with relatively sophisticated social welfare systems, targeting households based on an analysis of survey data on poverty and the consumption of services may be possible. In other cases targeting on the basis of residential areas, as done in Colombia, may serve as a reasonable proxy.

Funding sources

Two main options are available for financing infrastructure subsidies: general taxation revenues, and levies on other consumers of the same service. In addition to the distributional consequences of these alternatives, which will vary in each sector and country context, efficiency implications must be considered. The relative efficiency of the two funding sources can be considered based on three dimensions.

Allocative efficiency. Raising revenue from any source involves some allocative inefficiency. In the case of cross-subsidies, the cost comes from reduced consumption of the implicitly taxed service. The higher the elasticity of demand for the taxed service, the greater the efficiency loss. If the demand for access is less elastic than the demand for consumption, which will often be the case for infrastructure, subsidies funded by levies imposed on access charges will have lower efficiency costs than those funded by levies on consumption. Traditional telecommunications cross-subsidies financed by high long distance charges may be particularly costly in this regard. It is not difficult, for example, to construct hypothetical cases in which the allocative efficiency costs of raising revenue exceed 50 percent of the funds raised.¹¹

Yet the allocative efficiency costs of raising revenue through the general tax system may also be significant. While this needs to be considered in the context of each country’s tax system, some commentators have estimated that the cost in the United States may be as high as 40 percent of the revenue raised.

Compatibility with competition. Traditional cross-subsidies require monopolistic market structures, because without these, those paying the higher prices would defect to other suppliers and so undermine the basis for the cross-

subsidy. The costs of maintaining monopoly provision to finance cross-subsidies will vary between industries. In sectors such as telecommunications, where the welfare benefits of competition are undisputed, maintaining monopoly provision will have a high cost. In other sectors the potential costs of preserving a monopoly will depend on the extent and form of competition that is feasible in the sector and the structure of the subsidy.

In this context several countries have developed cross-subsidy systems that are more compatible with competitive markets. In telecommunications, for example, countries like Australia and the United States fund cross-subsidies from levies on the naturally monopolistic components of the system—interconnection—rather than on consumption.

Transparency. The magnitude and direction of transfers under traditional cross-subsidies are opaque, limiting scrutiny by stakeholders. Funding subsidies through general taxation increases the transparency of transfers, because they will be considered as part of the annual budget process alongside other claims on public expenditure. However, it is also possible to increase the transparency of cross-subsidies by making the earmarked levy an explicit part of the monthly bill and the subsidy an explicit part of beneficiaries' bills, and to mandate regular reporting of the level and direction of aggregate transfers.

Delivery mechanism

Traditional cross-subsidies are delivered via a single service provider that is directed to set prices according to a regulated tariff schedule and to manage the necessary financial transfers internally. Several alternatives exist.

First, the amount of the subsidy may be transferred directly to the targeted beneficiary, whether as a cash payment, a tax deduction, or a voucher tied to expenditure on the specified service. Cash payments and tax deductions may be efficient means of meeting distributional objectives, but may raise concerns about the subsidy being expended on items other than intended. Voucher schemes address this concern, but can involve relatively large administrative costs.

Another variation is for the subsidy to be channeled through the service provider, but with consumers bearing the onus of demonstrating their eligibility, which may also be conditional on paying the unsubsidized

portion of the bill. This is the approach adopted in Chile, for example.

Subsidy costs

Clear definition of objectives and careful targeting of intended beneficiaries can help to reduce the costs of the subsidy. These approaches can be complemented by additional measures.

One approach particularly relevant to the goal of expanding access by the poorest is to permit the use of technologies and solutions other than the traditional, high-quality networked utility. For example, subsidies might be permitted for the installation of public phones rather than a whole local network (see Wellenius 1997) or for off-grid electrification.

Competition can also be used to reduce the costs of the subsidy. For example, rights (and obligations) to provide subsidized services may be allocated through competitive auctions to the bidder demanding the lowest subsidy, as in rural electrification and rural telephony in Chile (see Jadresic 2000; Serra 2000; Wellenius 1997) and passenger railways in Argentina. When a dominant utility has a universal service obligation, other firms may be given the opportunity to take on the obligation if they believe they can meet it for less than the dominant firm, as happens in the Australian telecommunications sector.

Administrative costs

In evaluating design options a consideration of the administrative costs and the demands involved is important. The administrative costs include any costs the government or utility incurs in collecting revenue for the scheme, in determining eligibility, and in managing delivery of the subsidy.

Traditional cross-subsidies will usually have relatively low administrative costs. Cross-subsidies funded through more explicit levies and transfers may have slightly higher costs. Direct subsidies funded from the budget may impose no additional administrative costs for fund raising, because the administrative apparatus for collecting taxes is already in place, but the extra administrative costs of providing explicitly targeted direct subsidies, however they are funded, may be high. For example, a simulation of administrative costs for different types and illustrative levels of subsidies in Panama showed that for a water consumption subsidy of US\$1.50 per month, the administrative costs absorbed

40 percent of the total value of the subsidy, whereas for a one-off sewerage connection subsidy of US\$750, the costs fell to 7 percent (see Foster, Gomez-Lobo, and Halpern 2000). In some cases it may be possible to reduce administrative costs by drawing on selection procedures developed for other purposes or by jointly administering a scheme across several services rather than on a sector-specific basis. The latter approach may be of particular interest to Cambodia.

Output-based aid

Traditional approaches to providing infrastructure and other public services channel public funding, whether sourced from domestic taxpayers or international development assistance, to the labor, materials, and other inputs consumed by state-owned monopolies. These arrangements often do not provide a link between the funding and the delivery of services. Incentives for efficiency and innovation in service provision have been weak, as has accountability for performance. For countries such as Cambodia, with public investment programs that are much greater than the available resources, the opportunities for leveraging scarce public resources through private financing have been limited.

An output-based approach to structuring public support for Cambodia's infrastructure might address these weaknesses by delegating service delivery to a third party under contracts that link payment to the outputs or results delivered (figure 7.3). It thus has the potential to

- Improve the targeting of recipients
- Enhance accountability for service delivery
- Enhance incentives for efficiency through greater use of competition as well as contract-based incentives

- Expand opportunities for innovation through greater use of outcome- or output-related performance measures
- Leverage private financing.

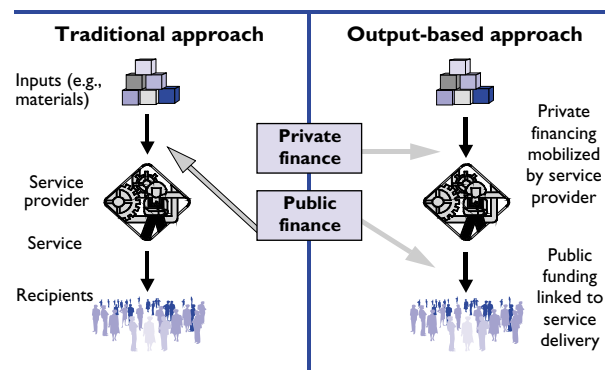
The focus shifts not only from inputs to outputs, for instance, from pipes to delivered water, but also toward the long-term desirable outcomes specific to each sector, for example, lower infant mortality as a result of improved water delivery.

No standard models of output-based aid schemes are available, and approaches need to be adapted to the characteristics of the service and to the environment in which it will be delivered. In general, however, the following issues should be clarified when designing output-based aid schemes:

- The role and sustainability of public funding
- The eligibility to receive the services that attract public funding
- The eligibility to provide services
- The choice of market environment, performance standards, and link between payment and performance
- The other aspects of the contract, such as the form and duration of the contract and dispute settlement mechanisms
- The administrative structure of the scheme.

Currently, MIME is piloting an output-based aid scheme to encourage private sector involvement in semi-urban and provincial water supply by subsidizing a portion of the connection costs associated with delivered water systems. Similarly, an electrification program is under consideration that will provide incentives to investors willing to provide solar-based technologies to rural communities. Both schemes require proof of the delivery of service as the key output before releasing the assistance funds; are targeted at private sector service providers; and are based around competitive, transparent bidding procedures. Such initiatives may strengthen the role of private financial intermediaries in supporting small-scale investments in Cambodian infrastructure and may encourage Khmer entrepreneurs to expand into provincial and rural communities that previously appeared to be unattractive investments. Thus assistance programs that use output-based aid provide an opportunity to improve the private sector's ability to deliver the services that the poorest segments of society require, be it for rural roads, community pay phones, or small-scale water or power systems.

Figure 7.3 Traditional versus output-based approaches



Source: World Bank.

Notes

1. The Law on Banking and Financial Institutions provides the legal basis for banks in Cambodia, but provides only for the general licensing and monitoring of financial institutions. More generally, the legal framework within which the financial sector operates is given by the 1996 Law on the Organization and Conduct of the National Bank of Cambodia, the subsequent Law on Banking and Financial Institutions, and the Law on Foreign Exchange. More recently, the National Assembly adopted the Insurance Law, which will provide the framework for licensing insurance companies.

2. By the beginning of 2001 Cambodia had signed bilateral investor protection agreements with China, Germany, Indonesia, the Republic of Korea, Malaysia, Singapore, Switzerland, and Thailand.

3. This has been modified through a number of subdecrees: Number 88 on the Implementation of the Law on Investment of the Kingdom of Cambodia, December 29, 1997; Number 48 on the Amendment of the Subdecree on the Organization and Functioning of the CDC, May 21, 1999; and Number 53 on the Amendment of the Subdecree on the Implementation of the Law on Investment of the Kingdom of Cambodia, June 11, 1999.

4. Foreigners cannot own land, and therefore cannot own more than 49 percent of a com-

pany that owns land. However, foreigners or companies controlled by foreigners can lease land for up to 70 years, and the lease may be renewed. There are currently no legal provisions for land expropriation for infrastructure or other projects.

5. The CDC charges fees for this process: a submission fee of US\$100 for projects of US\$1 million or less and of US\$200 for projects over US\$1 million, and an approval fee following approval of the application of US\$500 for projects of US\$1 million or less and of US\$1,000 for projects over \$1 million.

6. The situation in Cambodia is complicated by the general lack of documents testifying to land ownership, because most deeds were destroyed when the Khmer Rouge abolished land ownership. Although historic rights are being restored, this is a slow process.

7. A translation of the full article reads as follows: "Legal private ownership shall be protected by law. The right to confiscate properties from any person shall be exercised only in the public interest as provided for under the law and shall require fair and just compensation in advance" (Cambodian Constitution, Article 44).

8. As of November 2000, there were 19 locally incorporated banks; however, following requirements to increase their capital bases in order to retain their licenses, a number of

these banks are closing. How many will remain is not clear, but the number is likely to be between 7 and 15.

9. Although a number of other conditions made the effective interest rate higher, for example, there was an additional 1.5 percent fee, and interest payments had to be made up front.

10. Other, currently extremely small, micro-finance institutions have expressed an interest in lending to infrastructure projects. For example, Maxima Microfinance is interested in increased lending, but its total lending portfolio in 2000 was US\$60,000 and its average loan size was US\$300. It would need a substantial injection of both human and financial capital to extend lending into infrastructure.

11. Consider a traditional telecommunications cross-subsidy financed, in the presence of monopoly, by raising the per minute price of off-peak long distance calls. Suppose the marginal cost of an extra minute is essentially zero, but that in the absence of the cross-subsidy the company would set the off-peak per minute price at US\$0.25, thus using the variable charge to cover some of the company's fixed costs. Now consider an increase in the price to US\$0.50 to provide revenue for subsidies. If the price elasticity of demand for off-peak calls is 1, the allocative efficiency cost will be 75 percent of the revenue raised.

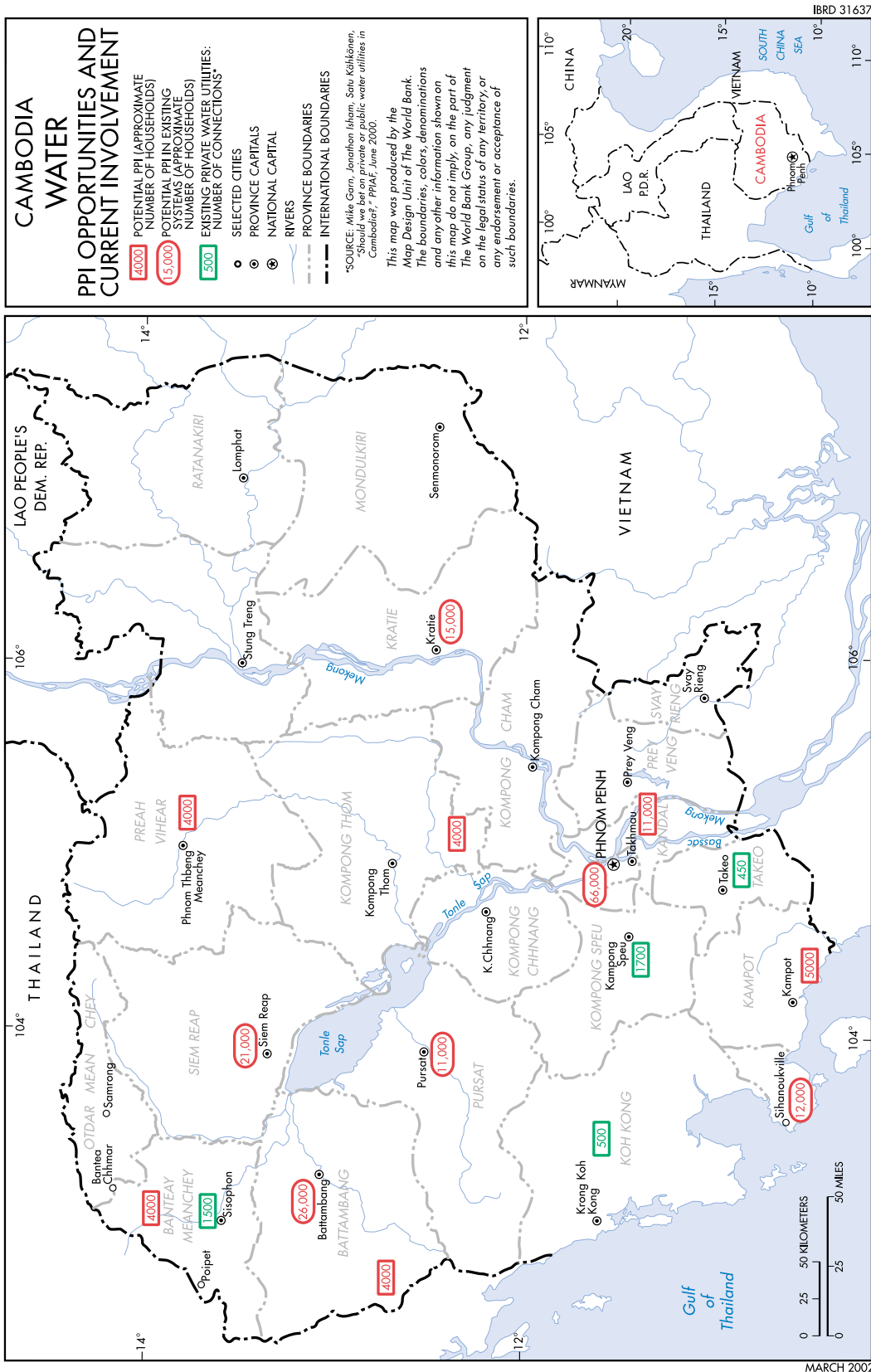
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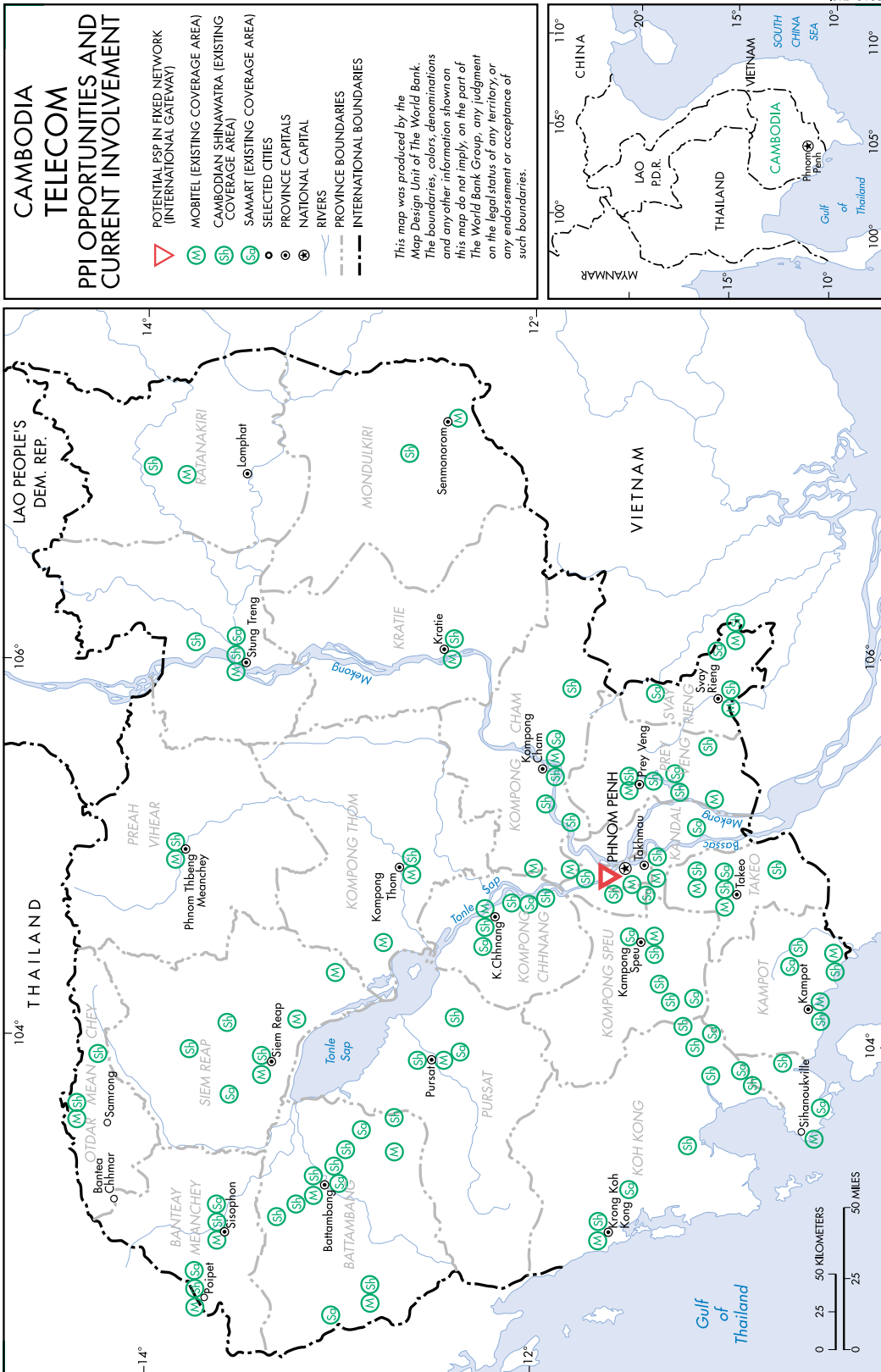
Appendixes

Appendix 2

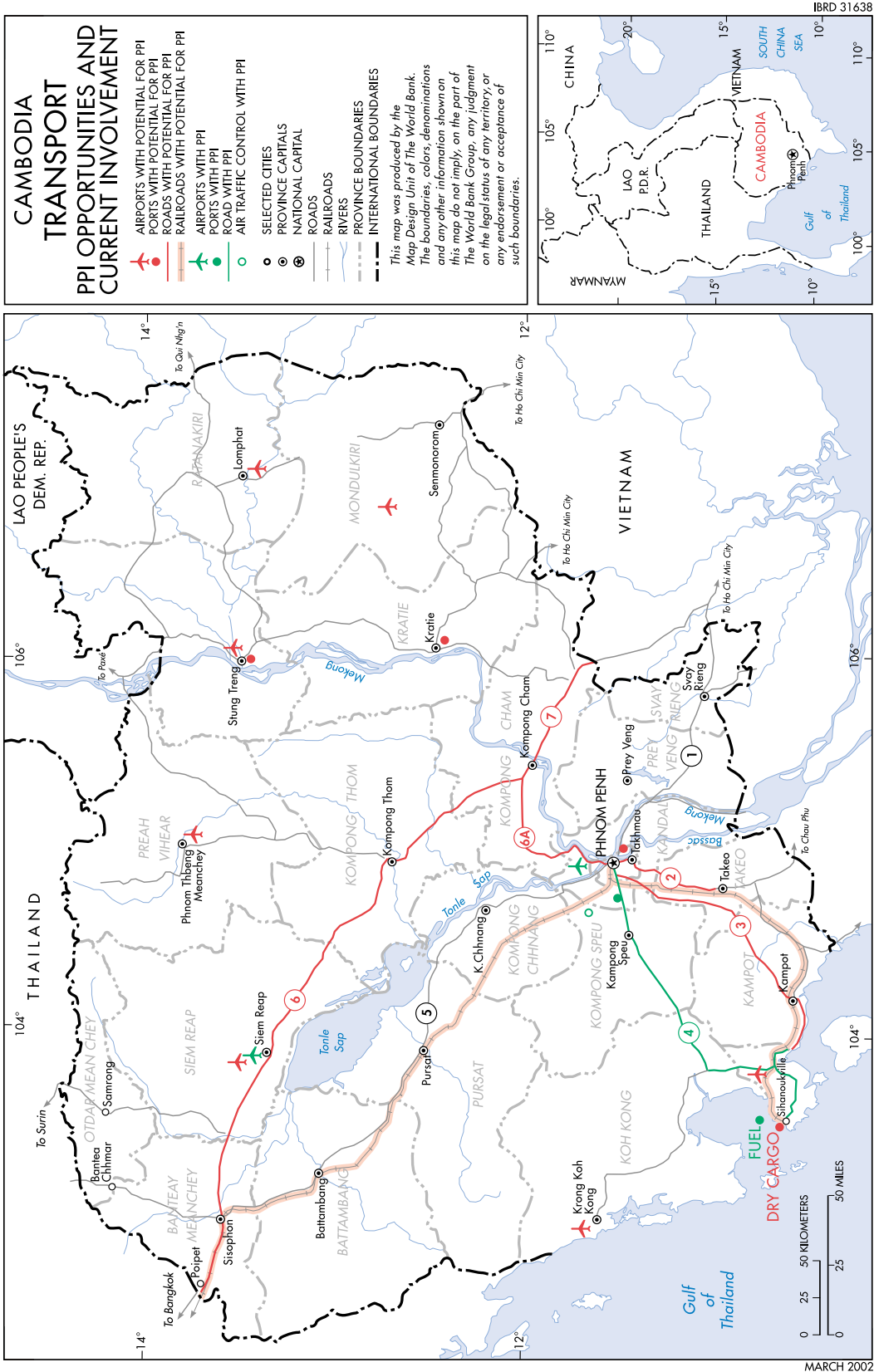


Appendix 3

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Appendix 4





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