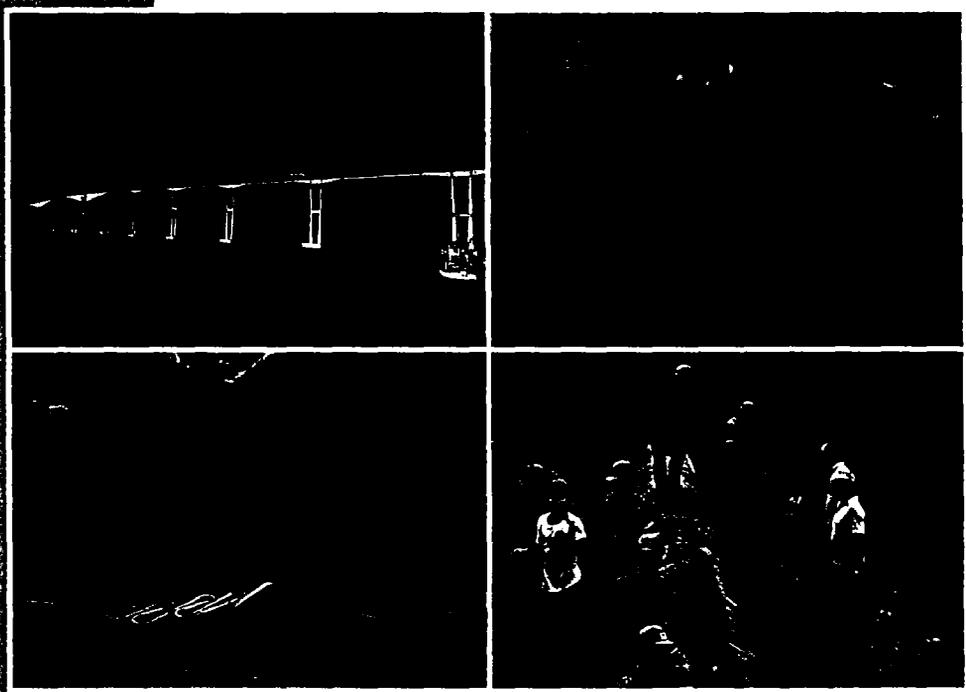


DIRECTIONS IN DEVELOPMENT

- July 1989  
1995

Meeting the  
Infrastructure  
Challenge in  
Latin America  
and the Caribbean





**Meeting the Infrastructure  
Challenge in Latin America  
and the Caribbean**

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DIRECTIONS IN DEVELOPMENT

**Meeting the Infrastructure  
Challenge in Latin America  
and the Caribbean**

The World Bank  
Washington, D.C.

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# Contents

Foreword	<i>vii</i>
Summary	1
Sector Components of the LAC Infrastructure Report	2
The Decentralization of Public Services	4
World Bank Financial Assistance	5
Capital Market Development	5
Coordination among Multilateral Agencies	6
Introduction	7
Regional Needs for Investment in Infrastructure	8
Lessons Learned	12
Innovative Options for Public Sector Monopolies	13
Private Sector Participation	14
User Charges	16
Environmental Considerations	18
Applying the Lessons to Latin America and the Caribbean	20
Decentralization of Public Services	20
Investment Options	21
Sectoral Programs	24
World Bank Assistance for Infrastructure	29
Guidelines for Future World Bank Lending	30
Approaches to Promote Private Sector Financing	31
Technical Assistance for Private Sector Participation	35
Selected Components of the LAC Infrastructure Report	36
Power and Natural Gas	36
Telecommunications	39
Transport	40
Water Supply and Sanitation	43
Decentralization of Public Services	47
Development of Capital Markets	49
Coordination among Multilateral Agencies	52
The Inter-American Development Bank	52
The International Finance Corporation	53
The Multilateral Investment Guarantee Agency	55

## Boxes

1	Efficiency Gains from Privatization	15
2	Municipal Credit in Colombia: A Success Story	24
3	Privatization of Telecommunications in Chile	25
4	Regulation of the Power Sector	26
5	Water Tariff Regulation in Chile	28
6	Privatizing Water and Sanitation Services in Lima	34
7	Nonmotorized Transport in Lima	41
8	Brazil's Innovative Program for Water Pollution Control	45
9	Innovative Water and Sanitation Planning: Brazil's PROSANEAR	46
10	Strengthening Subnational Governments in Argentina	48
11	The Jamaica Private Sector Energy Fund	50

## Figures

1	Per Capita GDP and Infrastructure Stock, 1990	9
2	Operating Efficiency in Selected Infrastructure Sectors, 1990	10
3	Infrastructure Investment Levels in Latin America and the Caribbean, 1970s and 1980s	11
4	Infrastructure Investment Levels in the LAC and EAP Regions, 1980s	11
5	Per Capita Infrastructure Investment and per Capita Savings	22
6	World Bank Infrastructure Loan Commitments in Latin America and the Caribbean	30
7	IDB Infrastructure Loan Commitments in Latin America and the Caribbean, 1972–92	53

## Table

1	Asset Requirements per Dollar of Annual Revenue	23
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## Foreword

The countries of Latin America and the Caribbean stand at a point of transition. During the 1980s—the so-called “lost decade”—in the face of the unavoidable need to correct macroeconomic imbalances, economic growth largely came to a halt, some of the poor became poorer, and not only new investment but even routine maintenance of economic infrastructure was often neglected or deferred. For most of the countries in the region, the immediate challenges of stabilization, adjustment, and reform was successfully met. But progress can never be taken for granted, as the recent crisis in Mexico shows. The lessons from Mexico are clear: economic development requires deep and sustained reform of domestic policies and institutions. In their absence, a country cannot compete successfully in the global marketplace and cannot for long live at a standard that is not commensurate with its productivity.

Sustainability is at even greater peril when the poorest segments of the population do not benefit from economic growth or—worse still—are asked to pay a disproportionate share of the cost of adjustment. Coming to the Latin America and the Caribbean (LAC) Regional Office of the World Bank after a number of years absorbed in the economic issues facing East Asia, I am struck by the fact that even a good year’s growth performance in LAC falls far behind what is considered normal on the other side of the Pacific. Clearly, to achieve any meaningful improvement in the living standards of the poor, the LAC countries will have to achieve far higher rates of growth than those realized so far.

Among the key lessons I have drawn from the East Asian experience is the crucial role that the provision of infrastructure can play in facilitating competitiveness and economic growth. If LAC is indeed to seize opportunities for faster growth, urgent attention must be paid both to remedying the infrastructure deficiencies caused by past neglect and to preparing for the new demands the future will bring. As the analysis we present here suggests, the needs of the region are large, requiring perhaps \$60 billion annually over the years to come.

Meeting these needs will call for a multipronged approach. The past decade has witnessed radical shifts in previously accepted paradigms about the nature of public goods and public services, “natural monopolies,” and the respective roles of the public and private sectors. It is now evident that, given the right policy environment, a very wide

range of infrastructure and services can be provided at least partly through private investment, allowing fiscally constrained governments to concentrate their own efforts far more selectively and effectively than before. Redefining this public-private partnership is a vital challenge for countries of the LAC region.

The public-private partnership will entail much greater reliance on the private sector for efficient provision of infrastructure services. But private sector efforts will not be forthcoming unless stable and consistent policies reduce the perceived risks and allow efficient operators the prospect of reasonable returns on capital invested. In all instances, the parties need to realize that such policies should avoid self-defeating manipulation of tariffs. To attract overseas investors, issues of convertibility and repatriation of earnings will need to be faced squarely.

This report suggests a number of ideas to help countries address their infrastructure challenges, including a variety of models for structuring the participation of domestic and international private capital. The report also states the World Bank's commitment to serve as a proactive catalyst for mobilizing private capital for improved infrastructure service provision in LAC. The World Bank will intensify efforts toward policy and regulatory reform and contribute financial resources or provide guarantees to help strengthen infrastructure in LAC. We will do this in close collaboration with the International Finance Corporation, which provides direct financing to private investors, and the Multilateral Investment Guarantee Agency, which offers political risk insurance. The Inter-American Development Bank will also be a partner in this effort. Even so, the countries of the region and the domestic and international private sectors will have to take the lead in meeting the challenges outlined here.

I regard the present infrastructure report as work in progress rather than a finished product. There is much that we all still have to learn about which approaches can be made to work most effectively. I am equally convinced that the time for us to begin is now.

*Shahid Javed Burki*  
*Vice President*  
*Latin America and the*  
*Caribbean Region*

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## Summary

The *World Development Report 1994* (New York: Oxford University Press) demonstrates that infrastructure can support economic growth, reduce poverty, and make development environmentally sustainable. The economic returns on infrastructure investment and rehabilitation are high. In Latin America and the Caribbean (LAC), economic growth has, in fact, always been underpinned by the development of infrastructure. When the debt crisis of the 1980s forced the region's countries to slash both current and capital funding, infrastructure suffered disproportionately. The result was physical deterioration of infrastructure, compounded by inefficient delivery of services. This has significantly eroded the region's chances of competing in global markets. At the same time, pollution of air and water has reached crisis dimensions in major urban areas such as Mexico City, São Paulo, and Santiago. Traffic congestion in large cities has cut urban productivity. And the region's extremely skewed income distribution has limited access to essential services for those who most need it—the poor.

Inefficient public sector monopolies are widely blamed for the ineffective infrastructure services provision. A growing number of countries are now demanding alternatives, especially options involving the private sector. Three converging forces have created an opportunity to reverse the trend and accelerate the development of infrastructure. First, innovations in technology have combined with the regulation of markets to provide alternatives to inefficient public monopolies. Second, there is increasing acceptance of a wider role for the private sector in infrastructure. And third, there is greater concern about poverty reduction and environmental sustainability.

In order to raise operating efficiency and catch up with the investment backlog, infrastructure funding would have to rise sharply. Annual requirements in the LAC region between 1991 and 2000 are estimated at \$24 billion for power, \$14 billion for transport, \$12 billion for water supply and sewerage, and \$10 billion for telecommunications.<sup>1</sup> The sum of those investments, \$60 billion, represents about 4.4 percent of regional gross domestic product (GDP) in 1993. This level of investment appears feasible on macroeconomic grounds, given that

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1. All dollar amounts are current U.S. dollars. A billion is 1,000 million.

capital expenditure on infrastructure was 4.1 percent of regional GDP in the 1970s and 3.0 percent in the 1980s. The estimated investments could undoubtedly be reduced through greater private sector participation. The private sector generally makes better use of existing capacity by emphasizing preventive maintenance and rehabilitation, areas in which the public sector has been notoriously weak.

The LAC infrastructure report proposes to expand sharply World Bank assistance for raising operating and investment efficiency in the infrastructure sectors; to improve services for the poor; to accelerate the effort to create the regulatory framework and policies that will enable the private sector to operate and invest; to coordinate more closely the push for more infrastructure financing with the International Finance Corporation (IFC), the Multilateral Investment Guarantee Agency (MIGA), the Inter-American Development Bank (IDB), and other public and private financial institutions; and to substantially increase direct infrastructure lending where warranted. The higher levels of infrastructure investment should be paralleled by the systematic development of domestic capital markets to increase the volume and improve the terms of domestic savings for financing infrastructure.

### Sector Components of the LAC Infrastructure Report

The region of Latin America and the Caribbean is one of sharp contrasts and diverse infrastructure needs, making it impossible to formulate a general prescription for meeting those needs. Three themes, however, apply across all countries and sectors and form the cornerstone of the LAC infrastructure report: infrastructure should be managed like a business, not a bureaucracy; competition should be introduced—directly if feasible, indirectly if not; and users and stakeholders should be given a strong voice and real responsibility.

What emerges is the necessity of a public-private partnership where the guiding principle is to allocate the management and ownership of assets based on comparative advantages of operating and investment efficiency. It follows that the success of the World Bank's effort in infrastructure should be measured by the totality of public and private resources attracted and by improvements in the efficiency of service delivery.

Invariably, different sectors will move through three stages of transformation: the creation of appropriate, stable legal and regulatory regimes, the commercialization and corporatization of public enterprises, and increased private sector participation in both operations and investment. The pace of transformation will vary and will have to be supported by generous technical assistance. Highlights of the proposed components of the report follow.

*Power and Natural Gas*

Certain activities in the power sector, such as generation and distribution in large urban areas, will be attractive to private investors. Others, such as rural electrification and distribution in small municipalities, are likely to remain under public ownership for the foreseeable future. But here too it is possible to enlist the expertise of the private sector in the form of service and management contracts.

Some projects with long gestation periods or high risks, such as large hydroelectric projects, will probably be implemented by the public sector. Similarly, projects that affect the power sectors in more than one country are likely to entail risks that the private sector will not be quick to assume. One example would be a binational generation project built on international waterways. Another would be a transmission project integrating countries within a region to take full advantage of efficiencies of scale when one country cannot absorb the entire output of a power project. The public sector will sometimes opt for joint public-private ownership. In such cases, capital infusions in jointly owned enterprises will require public capital.

Natural gas transmission projects are intermediate between the energy and transport sectors. The World Bank could well finance them, given their importance for promoting regional trade and for introducing more environmentally friendly fuels.

*Telecommunications*

The telecommunications sector is the most promising for privatization. Public companies can be very profitable and generate substantial fiscal revenue when they are privatized. Winning bidders commit themselves to large investment programs with commercial financing without sovereign guarantees. Under these circumstances, World Bank assistance is likely to be limited to the legal and regulatory reforms that precede privatization. However, the IFC and MIGA are well placed to support such investments. The World Bank could also play a role in financing residual projects, such as local and rural telephone service, where underdeveloped domestic financial markets will make it difficult to obtain long-term financing.

*Transport*

With 73 percent of its population living in cities and towns, Latin America is the most urbanized region in the developing world, and improving urban traffic management is a central concern. Efforts are also being made to provide low-cost transport options that are both

environmentally sound and within the reach of low-income populations. The road subsector, including bridges and tunnels, is capital-intensive in relation to the potential revenue. However, private sector participation can often be successfully introduced through private concessions to operate ports, railways, and road segments constructed and financed by the public sector. The World Bank aims at expanding its financing of road maintenance to support private sector contracting. Legislation should be modified to encourage competition among different transport modes and between private and public operators. Most countries in the region need both to invest in transport infrastructure and to reform their administrative, customs, and information systems in order to become credible suppliers in the global market.

#### *Water and Waste*

Competition can be introduced in the water sector through franchising, whereby specialized private firms bid for lease contracts and concessions to operate, maintain, and expand the water and sewerage systems. Legislation to permit franchising is needed in most of the region, as is transparent regulation. The argument holds for the collection and treatment of both liquid and solid waste. The World Bank plans to expand assistance for rehabilitating water institutions and systems with the private sector, to fund the treatment of wastewater in order to protect the urban environment, and to extend connection rates for both water supply and sewerage in order to provide the urban poor with long overdue convenience and health benefits. Technical and financial assistance to the solid waste sector will also gain importance.

### The Decentralization of Public Services

Responsibility for public services is becoming decentralized to provinces or municipalities in most of the region. The expected outcome is more efficient service in tune with local needs and preferences. Difficulties have appeared, however, because municipal institutions lack sufficient capacity to prepare, implement, and operate and maintain public service projects. Putting the private sector directly in charge of services in large municipalities is a promising strategy. Bank technical assistance could include, among other things, preparation for private service contracts, drafting of standard, efficient model contracts, and cost-effective procurement of municipal services. The World Bank also could assist its borrowers to set up project evaluation offices at provincial and local levels. Technical assistance should also be available to the central government agencies that either directly implement private sector participation or oversee municipalities in their drive toward greater private sector involvement. Better project preparation is vital for helping countries attract private and public financing.

## World Bank Financial Assistance

In direct support of infrastructure in IAC, the World Bank expects to finance up to \$3 billion annually, or 5 percent of total annual needs of \$60 billion. The Bank will seek maximum leverage for its lending by bringing in financing from both private and public sources. Four approaches to achieve a financial multiplier effect are proposed: (a) intensifying efforts to increase traditional public-private infrastructure cofinancing; (b) using World Bank guarantees to protect against sovereign policy or contractual risks in order to attract more private lending; (c) creating infrastructure funds (financed by the Bank or other sources) that jump-start capital flow by promoting and structuring bond or loan funds, perhaps using available guarantees; and (d) with projects that the World Bank plans to finance, designing them from the outset in a way that will facilitate private sector participation whenever the government chooses.

## Capital Market Development

Much of the revenue and expenditure for infrastructure is in local currency. In order to avoid excessive foreign financing of local expenditure creating a foreign exchange exposure, it is of central importance to develop domestic capital markets. Instruments for contractual savings, such as pension funds, need to be developed. Expanded savings could then be attracted to long-term infrastructure investment through regulations with incentives that promote private sector financing.

The World Bank intends to support this local market development while encouraging international private capital flows. To bridge the gap between project developers and lenders, prospective Bank loans and guarantees will be designed to mitigate public sector performance risk, which many lenders are unwilling to bear. The Bank will seek to complement—or, where appropriate, to promote—important market institutions and instruments necessary to sustain private investment flows. These include fund managers, rating agencies, commercial credit enhancement providers, etc. For local market development, it is also necessary to continue the Bank's focus on improved financial sector regulation, efficient payment systems and clearing mechanisms, and empowerment of private institutional investors.

In countries where private capital market services are more developed, the World Bank will attempt to support—and not supplant—existing markets. This could include the financing of bond rollover assurance facilities, which permit borrowers to tap available funding maturities in the market with the confidence that subsequent issues will not be preempted by general market dislocation. Such a facility was recently approved to support general-purpose bank debenture is-

suance in Argentina, but the approach could be applied to infrastructure financing as well.

### Coordination among Multilateral Agencies

The Inter-American Development Bank continues to be a major financier of infrastructure in the region. The World Bank and the IDB increasingly share sector work and coordinate their activities in the region, and this trend should intensify under the infrastructure report. Within the World Bank Group itself, the International Finance Corporation promotes development of the private sector in member countries, and the Multilateral Investment Guarantee Agency encourages private investment flows to developing member countries through its investment insurance program.

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## Introduction

Economic growth in Latin America and the Caribbean has always been closely supported by the development of infrastructure.

The debt crisis in the 1980s led to a crisis for infrastructure which had been funded from national budgets that were cut drastically. Public works that had been financed through foreign debt and deficit spending because domestic savings were low now suffered disproportionately. Existing facilities deteriorated from lack of upkeep as current budgets were cut.

The steady erosion of infrastructure in LAC has reduced significantly the region's chances of competing in global markets. At the same time, the reorientation of trade flows toward the Pacific and the growth of regional trade agreements such as the Andean Pact, Mercosur, and the North American Free Trade Agreement (NAFTA) have created a need for cost-efficient, reliable public services. Poor infrastructure management and inefficient delivery of services have become a major constraint on export growth.

With 73 percent of its population living in cities and towns, Latin America is the most urbanized region in the developing world, and the urban environment is experiencing commensurate pressure. "Brown pollution" of air and water has reached crisis dimensions in major urban areas such as Mexico City, São Paulo, and Santiago. The steady deterioration in the quality of water supplies and sanitation services led to a cholera outbreak in the region in 1991 after an absence of more than 100 years. Traffic congestion in large cities has cut urban productivity. And the region's extremely skewed income distribution has limited access to essential services for those who most need it—the poor.

The crisis in the delivery of public services is in many ways a crisis of government itself, since the public sector has until recently been the main provider of infrastructure services. Inefficient public sector monopolies are widely blamed for the failure to provide adequate services at a reasonable cost. More and more countries are demanding alternatives that involve the private sector. The World Bank's *World Development Report 1994: Investing in Infrastructure* analyzed alternatives for improving infrastructure on the basis of lessons learned worldwide. The infrastructure report described in this book applies these findings to the LAC region.

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## Regional Needs for Investment in Infrastructure

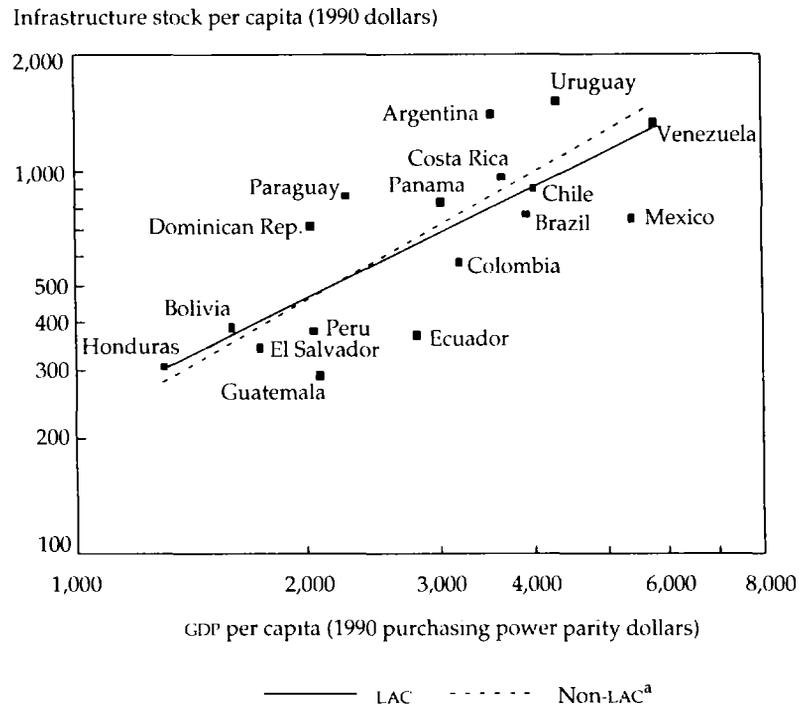
The countries of Latin America and the Caribbean reflect the close linkage between the growth of infrastructure and that of GDP per capita (figure 1). Historically, for each percentage point of growth in GDP per capita, the infrastructure stock has grown by 1 percent. With the resumption of economic growth in the region, a combination of insufficient infrastructure capacity and poor management will quickly limit the possibilities for sustained growth. The backlog of investment alone as a result of the debt crisis is close to \$100 billion. In addition, failure to maintain facilities has made much costlier rehabilitation unavoidable.

Empirical evidence shows that the efficiency of both investment and operations has been low. It seems to be the rule rather than the exception that power losses are close to or above 20 percent, that too many telephone calls fail to go through, that roughly half of all paved roads are in poor condition, and that unaccounted-for water, including leakage, is more than 50 percent of water produced (figure 2).

To catch up with the investment and rehabilitation backlog created during the 1980s and to raise service levels and so spur growth, infrastructure investment levels must rise sharply.

In addition to investment needs, estimated at more than \$60 billion a year, annual maintenance requirements are considerable. Total infrastructure capital stock in the region is estimated at close to \$350 billion. Of this sum, the power sector accounts for about \$170 billion, transport for \$100 billion, water supply and sewerage for \$60 billion, and telecommunications for \$20 billion. Annual maintenance costs would amount to almost \$7 billion, assuming an average 2 percent applied to the existing capital stock in 1993.

The required annual investments in infrastructure of \$60 billion represent 4.4 percent of regional GDP. Even during the 1980s, despite the austerity brought on by the debt crisis, the major countries in LAC were able to invest 3.0 percent of their combined GDP in infrastructure. During the 1970s the same countries invested as much as 4.1 percent of GDP in infrastructure, although often wastefully (figure 3). In contrast, East

**Figure 1. Per Capita GDP and Infrastructure Stock, 1990**

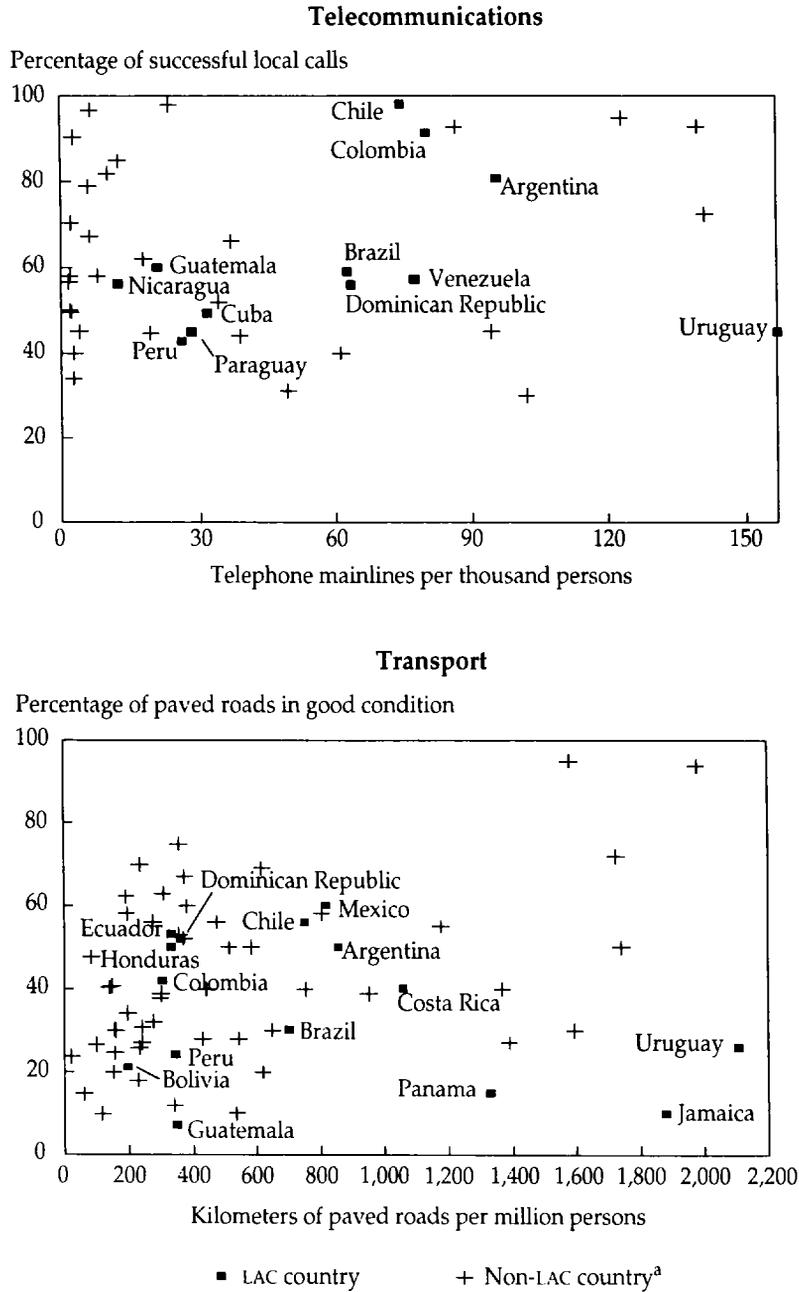
*Note:* Infrastructure includes power, transport, telecommunications, and water and sanitation. Scales for the x- and y-axes are logarithmic. The slopes of the LAC and non-LAC regression lines are 0.98 and 1.12, respectively.

a. The non-LAC sample includes sixty-nine industrial and developing countries.

*Source:* World Development Report 1994 data base and methodology.

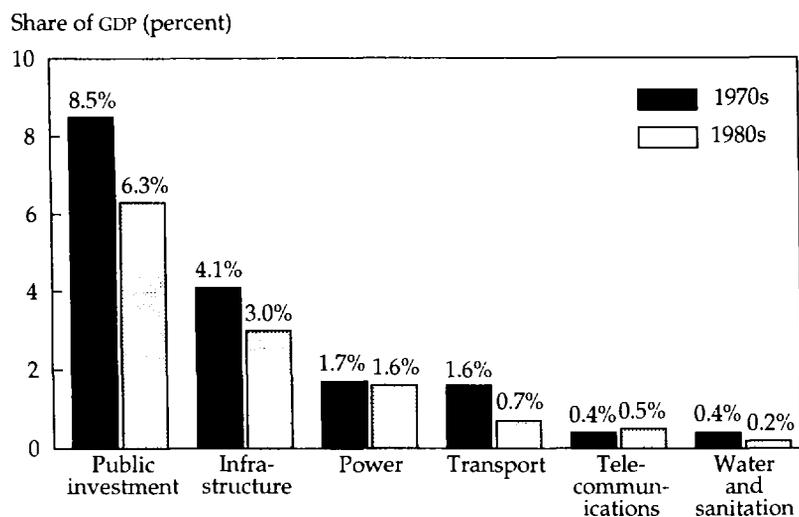
Asian countries have been devoting 4.7 percent of GDP to infrastructure investments (figure 4) and are planning to increase the proportion to 7 percent a year to keep pace with their high economic growth rates.

**Figure 2. Operating Efficiency in Selected Infrastructure Sectors, 1990**



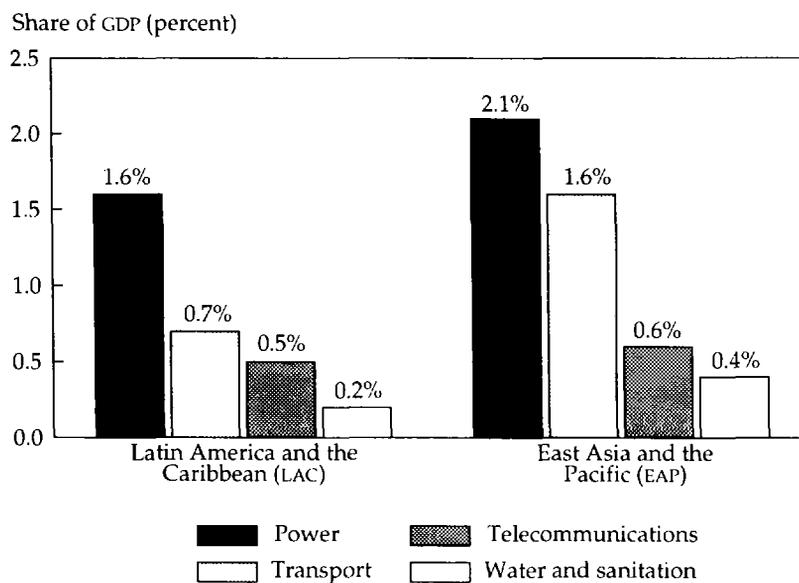
a. The non-LAC sample includes sixty-nine industrial and developing countries.  
 Source: World Development Report 1994 data base; International Telecommunications data base; World Bank data.

**Figure 3. Infrastructure Investment Levels in Latin America and the Caribbean, 1970s and 1980s**



Source: World Bank data.

**Figure 4. Infrastructure Investment Levels in the LAC and EAP Regions, 1980s**



Source: World Bank data.

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## Lessons Learned

The *World Development Report 1994* shows how infrastructure can support economic growth, reduce poverty, and make development environmentally sustainable. The emerging global markets have allowed developing economies with comparative cost advantages to capture market share—but only if they can offer demand-responsive and highly reliable transport and telecommunications systems. Yet high investments and coverage achieve little without efficient service. Failure to meet demand is widespread in developing countries and is costly in terms of waste and suffering for those without services. The greatest failure arises when the physical infrastructure has been built but cannot provide reliable and safe service because of inadequate maintenance or poor management.

The causes of poor performance lie in the incentives facing providers. Better incentives exist that could transform public services so that:

- Infrastructure can be managed like a business, not a bureaucracy.
- Competition can be introduced—directly or indirectly.
- Users and other stakeholders can be given both a strong voice and responsibility.

The promise of better service is closely linked with public-private partnership. Under this approach, the role of governments would change: they would be primarily responsible for creating the legal and regulatory framework and policies needed to safeguard the interests of all customers, protect the environment, and enable public and private providers to administer the required services.

This message is in sharp contrast to the reality of the developing world, including the LAC countries. Until recently, alternatives to public monopolies were only rarely contemplated. Public services have been regarded as natural monopolies, with competition being ruled out because it was considered wasteful. The result was a serious conflict of interest; public sector institutions were the sole providers of service and were accountable only to themselves for the quality of service. The consequences were, too often, shoddy performance and safety problems: power brownouts that obliged industries to install standby capacity or lose production; long waiting lines for telephones and erratic service; rapidly mounting traffic congestion in urban areas; unsafe and slow interurban transport; and unsafe or absent water service, with little wastewater treatment.

Fortunately, three converging forces have created an opportunity to reverse the trend and accelerate development of infrastructure. First, innovations in technology and in the regulation of markets have paved the way for alternatives to inefficient public monopolies. Second, there is growing acceptance of a wider role for the private sector in infrastructure. And third, there is greater concern about poverty reduction and environmental sustainability.

## Innovative Options for Public Sector Monopolies

### *Technological Innovations*

Changes in technology have struck at the contention that natural monopolies offer the cheapest service because of their economies of scale. The emergence of combined-cycle power plants has allowed independent power producers to build relatively small plants that supply industries and sell surplus energy to the national grid at competitive prices. The explosive growth in mobile telecommunications has created a versatile alternative to fixed-line monopolies, holding out the promise that ultimately each consumer will have access to services everywhere—an unsurpassed convenience. Electronic road-pricing systems, which already allow monitoring and debiting for the use of traffic arteries, have dramatic potential for managing traffic and making such infrastructure commercially viable.

### *Competitive Innovations*

The notion of the cost-effectiveness of natural monopolies has been modified in another way: natural monopolies are not monolithic and can be opened up to competition. One method is unbundling. An example of vertical unbundling is the division of electric power service into generation, transmission, and distribution to allow competition in generation, where the scope for competition is greatest. An example of horizontal unbundling is the splitting up of public service monopolies into geographic service areas to enable comparisons and competition among separate service providers. Another way to introduce competition is for alternative providers to bid for the concession to provide service for given periods; competition then forces the public service providers to improve efficiency.

### *Regulatory Innovations*

For those services that by their nature are natural monopolies, such as transmission and distribution, monopolistic providers have to be monitored and regulated to prevent excessive tariffs, to ensure that poor customers are not excluded from service, and to control undesirable

external effects such as environmental pollution. The regulator should be an impartial body, separate from government policymakers, consumers, and providers of services.

The various types of regulation have their advantages and drawbacks. *Rate of return regulation* permits tariff increases up to a maximum allowed rate of return. This can lead to a “cost-plus” culture in which the rate base is inflated through overinvestment and unreasonable costs are passed on to consumers. Under *price caps*, utilities are encouraged to operate and invest as efficiently as possible within the constraint of a maximum allowed price. This model has been selected in the United Kingdom in the wake of privatizations of public services. In *yardstick regulation*, as used in Spain, individual service providers are regulated by comparing them with efficient prototypes. Under *contract regulation*, practiced in the water supply industry in France, municipalities contract with service providers; regulation is left to the vigilance of the partners, and contract disputes are litigated in civil courts.

The regulatory function should be clearly separated from the government to remove any appearance of political interference. In this fashion, the regulatory framework becomes a tripartite constellation in which governments, regulators, and service providers all serve consumers.

### Private Sector Participation

The breakup of public monopolies has opened the way for private sector participation, although in infrastructure this is nothing new. Many of the canals, ports, public utilities, railways, and urban transport systems in Latin America and the Caribbean were built by private companies during the three decades preceding World War I. Recent interest in private sector participation has been driven by three objectives: to achieve greater efficiency in operations and investment; to raise fiscal revenue by selling profitable systems or concessions; and to expand the coverage and quality of infrastructure through privately arranged financing (box 1).

Private sector participation takes many forms. The simplest is a service or management contract by which private contractors assume responsibility for operations and maintenance. Contracts typically are of short duration but offer the advantage of higher efficiency. The private partner can assume a longer-term and greater responsibility through lease contracts, in which systems are leased and operated by private firms. In this case the responsibility for investment and financing remains with the public sector. Fuller efficiency gains are possible through long-term concessions and “build-own-operate-transfer” contracts, under which the private partner not only finances new works but constructs and operates them for indefinite or specified periods. Finally, entire public utilities may be sold to the private sector.

**Box 1. Efficiency Gains from Privatization**

Until 1982 the water supply system in Murcia, Spain, was managed directly as part of the municipal administration. Lack of administrative autonomy led to poor financial performance and erratic water service. To raise efficiency, a municipal enterprise was created in 1982, but financial and service performance failed to improve. Finally, in 1988, a jointly owned public-private company was created in partnership with a specialized private water company. Operations improved radically and rapidly. Within four years, water consumption dropped by 25 percent as a result of better control and metering. Losses in the system were reduced from 46 to 26 percent. And an operating deficit of \$3 million was transformed into a profit of \$2 million, while the tariff rose more slowly than the cost-of-living index.

*Financing Investments*

The financing of infrastructure involves both difficulties and opportunities. Most infrastructure entails large and lumpy capital costs that take decades to be amortized. Financing poses special problems where long-term domestic capital markets do not exist or where domestic and foreign investors alike demand high-risk premiums. Infrastructure financing, for its part, can accelerate the development of capital markets. Infrastructure developers and certain institutional investors share a long-term outlook. The stable returns of public utilities are particularly attractive to institutional investors such as insurance companies and pension funds. The financing of infrastructure can force improvements in appraisal capabilities and diversify risks for local commercial banks as well as for holders of equity and bonds. Exploitation of these links can be promoted through prudential regulation, improved disclosure and reporting standards, and the development of credit-rating capabilities and credit-risk insurance.

The privatization of power and telecommunications can give a powerful boost to local stock markets. The aggregate proceeds from the privatization of public monopolies have been especially high in Latin America, with the greatest activity being in telecommunications. More than half of the equity investments have been foreign. The shares of privatized utility companies dominate market capitalization in Buenos Aires, Mexico City, and Santiago. In all cases, a significant proportion of the shares were sold to the general public, and shares were also allocated to employees. In Chile up to a third of the equity capital of privatized companies came from the private pension funds that by law receive 10 percent of all salaries. The rapid growth of savings in Chile has made that country a regional force in the financing of infrastructure, with Chilean enterprises investing in privatized utilities in neigh-

boring countries. (Similarly, private-public utilities in some countries and sectors in Europe and the United States have become a potential source of equity capital for privatized public utilities.)

Domestic and foreign loans pose special challenges. Long-term, fixed-rate loans are more difficult to secure than equity in developing countries because loans do not enjoy the upside returns of equity, yet they share many of the same risks. Access to long-term loans and bond markets invariably requires more sophisticated capital markets and the development of credit ratings for countries, agencies, and projects. High-quality credit ratings can open up access to the very large contractual savings of life insurance companies and pension funds in the United States and elsewhere.

### *Analysis of Risk*

Rigorous risk analysis is essential for effective infrastructure development. Risk is always present whether infrastructure is publicly or privately owned and operated—but its consequences differ. Public decisionmakers and operators often attach too little importance to risk if they have grown used to subsidies that cover financial shortfalls. Private investors react differently; losses affect their profits and wealth and, in extreme cases, bankrupt them. They tend to become risk-averse and to demand adequate compensation for accepting risks. Yet efficiency in operations and investment will come about only if the private investor is forced to assume risk in return for financial compensation. Governments must understand the fundamental relationship between private investors' risks and rewards. Investors are particularly averse to unclear and frequently changing policies. At the same time, private investors need to understand that governments must follow procedures, so that the public interest will be protected.

There are three main types of risk, corresponding to the preparation, construction, and operations stages. Risks are related to government policies, to fluctuations in demand, and to the tariff levels allowed. When government policies are predictable and transparent, policy-induced risks are commensurately low. Where the country economic and political environments are predictable and stable, preparation and construction risks are reduced, in part because the foreign exchange exposure and transfer risks are reduced. As a rule, private investors and operators in developing countries rarely assume policy-induced risks. This is particularly true for risks related to tariffs, which may be politically driven.

### User Charges

The ultimate guarantee to investors and lenders is the tariff, which determines project profitability and cash flows. When governments hold down tariffs, both rates of return and investor interest decline.

The predictability of tariffs is paramount, since investors and lenders abhor uncertainty. Transparent rules for tariff setting can alleviate investor risks. Perceived risks also differ between the privatization of already operational public utilities with established markets and the construction of new “green-field” plants, where demand is more uncertain. In both cases private investors, to limit their own risk, will attempt to fund investments as much as possible from the cash generated by the privatized companies.

Tariff schedules that reflect service costs promote efficient consumption and financial autonomy, but they may appear to conflict with efforts—motivated by considerations of public health and income redistribution—to subsidize consumption by poor consumers. This thinking has led to tariff schedules that are lower than the cost of service to consumers. Studies have shown that such subsidies benefit better-off consumers more than the poor for whom they were originally intended. Because the poorest consumers are usually not connected to the public service system, they are shut out from the available subsidies. Even if they manage to connect to the public system, they invariably receive much smaller subsidies than better-off consumers, since per capita consumption of all public services is positively correlated with income. A study of five Latin American countries found that water and sewerage subsidies to better-off consumers were 1.3 to 2.8 times those to poor consumers. Similar results were reported for Algeria and Hungary, where the subsidies for services such as electricity, household gas, and urban transport to the better-off were 2.5 to 3.8 times as high as subsidies to the poor.

The contribution of infrastructure to reducing poverty lies in its ability to provide equal access to essential services. In reality the poorest one-fifth of the population usually lack connections to safe water supplies and sanitary sewerage systems, are without electric power, and have few or less-affordable transport options. Subsidizing access to public services is often more useful for the poor than price subsidies. Providing credit so that poor consumers can pay the large one-time cost of connection is highly effective, since these consumers tend to have difficulty in raising the necessary cash. Subsidies of consumption charges are better provided from general tax revenue and should be precisely targeted to low-income consumers. Charging uniform tariffs, while at the same time providing subsidies from general tax revenue rather than through cross-subsidies, also reduces the risk that utilities will ignore poor consumers. Indeed, the guarantee of recouping the full cost of providing service to poor consumers creates an incentive for utilities to strive for complete coverage. Informal service alternatives—or no service at all—are invariably costlier in terms of time, money, disease, and inconvenience. However, cross-subsidies are so embedded in tariff systems in Latin America and the Caribbean that reforms require firm commitment.

The provision of infrastructure is central to the reduction of poverty. Access to at least minimal infrastructure services is one of the criteria for defining welfare. Infrastructure reduces poverty and promotes social development in different ways. Access to clean water and sanitation helps reduce mortality and morbidity, promotes better health, and improves the productive capacity of the poor. In addition piped water has important gender-specific effects, since women are usually in charge of the time-consuming task of drawing water.

Other infrastructure such as transport and communications are key for the ability of the poor to obtain employment, both directly during the construction phase and long-term in other productive activities. The effect is particularly significant in rural areas, since more infrastructure raises farm productivity, reduces risk, and stimulates non-farm employment.

### Environmental Considerations

Environmentally sustainable development should not have to mean forgoing convenient and productive infrastructure. However, it does require appropriate technologies, quantification of externalities, and participation of the groups affected by environmental externalities. In the past, environmental risks associated with large infrastructure projects were frequently underestimated. Subsequently, environmental safeguards have been improved a great deal. The matter takes on special relevance when private sector participation is being promoted and private investors are unwilling and unable to assume environmental risks. The public sector will have to adopt realistic expectations for the processing time and resources necessary to anticipate and control environmental consequences. The public sector will also find itself obliged to shoulder most of the environmental risks under large infrastructure projects, and it will subsequently factor these risks into user charges.

Infrastructure development can benefit the environment in a number of ways: by promoting greater efficiency in the use of resources and by substituting new and cleaner technologies for old, polluting ones. The substitution of clean technologies for polluting ones is exemplified by the wider use of natural gas, rather than other fuels such as coal or fuel oil, for power generation and heating.

More efficient resource use is well illustrated by the electricity sector, where underpricing is the rule, not the exception. The result is that many developing countries use 20 percent more electricity than they would if consumers paid the true marginal cost of supply. In contrast, sensible energy prices create incentives for industry to use waste heat—for example, through cogeneration—and for all consumers to improve efficiency in heating, motive power, refrigeration, and lighting. The gain is double, in the form of lower costs and reduced resource use

and pollution. Similarly, efforts to reduce the unacceptably high distribution losses in power systems directly benefit the environment.

The underpricing of the extraction of water has at times upset the ecological equilibrium. And excessive dependency upon rigid administrative criteria for allocating scarce water has created an inefficient and costly pattern of water use. Again, pricing water appropriately and allowing markets to operate freely would encourage water conservation and help protect the environment.

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## Applying the Lessons to Latin America and the Caribbean

The analysis and lessons in *World Development Report 1994* have special relevance for Latin America and the Caribbean. There, the inefficiencies in existing infrastructure are so entrenched and the investment requirements in new infrastructure so large as to convince a growing number of countries that the public sector alone will be unable to produce the needed boost in the quality and coverage of services. Governments are increasingly becoming aware of the conflict of interests inherent in their triple role as policymakers, overseers and judges of the quality and cost of services, and providers of services. Only a new partnership between public and private interests—governments, regulators, and service providers—can generate benefits for both consumers and economies.

In the LAC region, private sector participation has been pioneered by Argentina and Chile. Whereas Argentina's recently created regulatory entities are still evolving and untested, Chile has more than ten years of experience with regulatory bodies in power, telecommunications, and water supply. Private sector participation has commenced in other countries, including Bolivia, Jamaica, Mexico, and Peru, but the legislative and regulatory systems are not fully operational. The remaining countries are still in the preparatory stages of either regulatory reform or concerted private sector participation. The necessary political will, legislation, regulations, and institutions are weak in this large group.

### Decentralization of Public Services

Rapid and wholesale decentralization in the LAC region has changed the financial, political, and institutional terms of public service provision. Under new rules for revenue sharing, local government receives a larger share of central funds. The process offers opportunities but also carries risks. The greater proximity to the populations served should provide for more local participation and less expensive service, but if local institutions are unprepared, service quality and reliability could suffer. Specifically, if local institutions are unable to collect for services provided, they may substitute central revenue sharing for tariff collections.

With increasing decentralization, investment decisions and management of vital infrastructure need to be radically reformulated. The changes are far-reaching in large federal systems such as those of Argentina, Brazil, Mexico, and Venezuela, where states have their own constitutions and prerogatives, including the right to create banks, establish investment funds, authorize debt, and occasionally adopt privatization laws, personnel regimes, and even environmental standards.

As countries complete the revenue-transfer phases of decentralization, they will face the more difficult task of transferring responsibility for services and regulation. Municipal institutional capacity always becomes the most serious constraint on efficient implementation of decentralized service delivery. Attempts to bolster capacity directly through staff training may encounter problems with rapid turnover of trained municipal employees, compounded by the difficulty of attracting skilled staff to small municipalities. But decentralization does create an opportunity to institute basic reforms of the municipal work force. Popular participation also holds promise for increased cost-effectiveness in local government operations.

## Investment Options

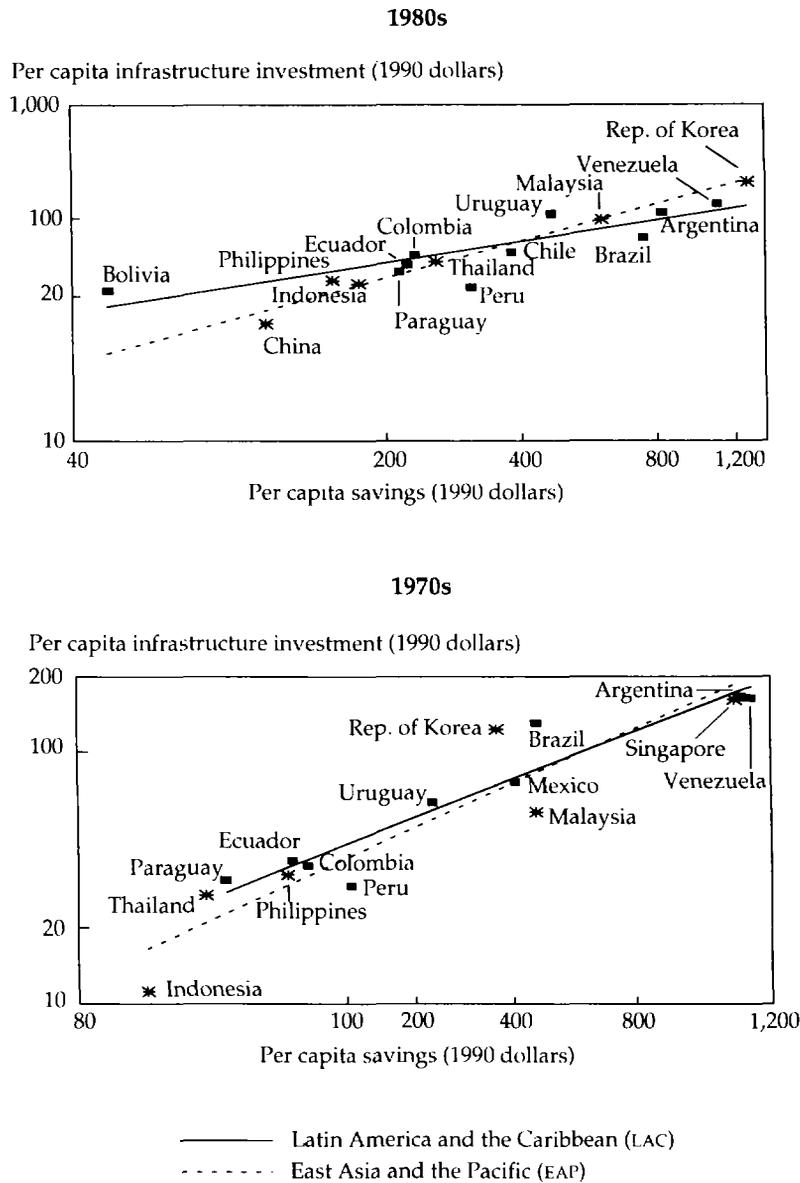
### *Investment Profile*

The financing of current and capital expenditures confronting the LAC region appears feasible on macroeconomic grounds. A region that achieved capital expenditure of 4.1 percent of GDP in the 1970s and 3.0 percent of GDP in the 1980s should not find it impossible to raise the investment ratio to the necessary 4.4 percent of regional GDP, as implied by an annual volume of \$60 billion. This investment effort is actually more modest than the annual \$130 billion that the Asian Development Bank estimates its member countries should invest to meet demand in the East Asia and Pacific (EAP) region. The Asian investment effort amounts to 7 percent of regional GDP, an increase from the present 4.7 percent a year.

However, the LAC region saves and invests proportionately less than does EAP. Aggregate savings in LAC, which amounted to 19 percent of GDP in 1965, rose marginally, to 20 percent, by 1980. In contrast, in the Asia region savings increased from 23 percent of GDP in 1965 to 30 percent in 1980. If the LAC region were to emulate Asia—particularly East Asia, where savings and investment ratios are even higher—domestic financial markets would need to be much developed.

The LAC and EAP regions differ in another important respect: as per capita savings grew during the 1980s, LAC increased its per capita infrastructure investments at a considerably lower rate than did the EAP

**Figure 5. Per Capita Infrastructure Investment and per Capita Savings**



*Note:* These graphs show average values over the period when data were available. That period varies among countries. Scales for the x- and y-axes are logarithmic. The slopes of the LAC regression lines are 0.62 for the 1980s and 0.87 for the 1970s; the slopes of the EAP regression lines are 1.10 for the 1980s and 1.00 for the 1970s.

*Source:* World Bank data.

countries (figure 5, top panel). Regression analysis indicates that for each percentage point of growth in per capita savings, the LAC countries increased their per capita infrastructure investments by 0.6 percent. In contrast, the EAP countries during the same decade increased their per capita infrastructure investments by 1.1 percent for each percentage point of growth in per capita savings. The most likely explanation for this marked difference is the effects of the debt crisis of the 1980s, which forced LAC countries to devote savings to servicing their external debt. As might be expected, the relationship between per capita infrastructure investment and total domestic savings was more similar in the two regions during the 1970s, before the debt crisis (figure 5, bottom panel).

#### *Development of Capital Markets*

Appropriate mechanisms for setting tariffs, promoting competition (including entry and exit of service providers), protecting consumers, and resolving disputes through independent regulatory commissions all help in attracting the needed private and public capital to infrastructure projects. However, even the presence of such a regulatory framework and competent regulators will not guarantee investment financing unless measures are taken to develop domestic long-term bond markets. Reliance on foreign debt is no substitute because it can generate difficulties over the long run, given the mismatch between tariff revenue in local currency and debt service obligations in foreign currency.

The large debt requirements and the long-term, stable revenue flows of infrastructure projects make them natural investments for institutional investors with long-term liabilities. Table 1 presents representative data on asset requirements as a multiple of annual dollar revenue. The proportions vary among subsectors: for example, financing for water systems and toll roads is more difficult to secure than that for telephone companies and electric utilities, since the former are more capital-intensive in relation to annual revenue.

**Table 1. Asset Requirements per Dollar of Annual Revenue**

<i>Sector</i>	<i>Amount (dollars)</i>
Water systems	10–12
Toll roads	7
Electric utilities	3–4
Telephone companies	3

*Source: The Nation's Public Works: Report on Water Supply, consulting report to the National Council on Public Works (Washington, D.C.: Wade Miller Associates, Inc., 1987); World Bank estimates based on data on French toll roads.*

**Box 2. Municipal Credit in Colombia: A Success Story**

Over the past twenty years Colombia's municipal credit institution has evolved through successive incarnations into the Financiera de Desarrollo Territorial (FINDETER), an autonomous agency under the Finance Ministry. FINDETER does not lend directly to municipal governments but operates as a discount agency to private and state-owned commercial banks that make the loans, appraise the projects, and monitor performance. The system's success has depended on the quality of FINDETER's staff and that of the intermediaries through which it lends. Under the control of the Finance Ministry, it has been relatively insulated from political pressures. Between 1975 and 1990 more than 1,300 projects, with a value of more than \$1 billion, were financed, assisting 600 municipalities. The system's funding does not rely on government budgetary appropriations but rather on bonds, recycling of its loans, and foreign credits from bilateral and multilateral sources.

Pension funds, insurance companies, and mutual funds are natural investors in infrastructure. Except in Chile, the development of domestic long-term funds is at an early stage throughout the region. The typical problems include the nascent development of funded public or private pension systems; excessive investment restrictions on pension funds, insurance companies, and mutual funds; a tax and regulatory bias against mutual funds (often in favor of the banking sector); and inadequate rating services.

Direct access to private capital markets is highly desirable for large projects. At the same time, such direct financing is highly complex. For the time being, many smaller governments and projects rely on specialized institutions (such as FINDETER in Colombia, discussed in box 2) that can develop a capacity for assessing municipal projects and also provide some technical assistance to the municipalities. Such lending can also benefit from central government aid.

### Sectoral Programs

The various infrastructure sectors offer widely varying prospects and require tailored financing solutions. *Telecommunications* would probably pose the least difficulty for raising and investing an annual \$10 billion, corresponding to 0.7 percent of regional GDP. The privatization of the telephone systems in Argentina, Chile, Mexico, and Venezuela illustrate the point. These four countries alone have managed an annual investment volume of about \$3 billion since privatization. In the two years following privatization, Venezuela invested as much as had been invested during the preceding twenty years of public ownership with no government funding or guarantees. In addition, the sale

of parts of the telecommunications industry provided considerable revenue for public sector owners. Recently, a 35 percent controlling share of Peru's telecommunications system fetched a price of \$2 billion, with commitments to invest \$1.5 billion in the first five years of the concession.

Judging by the experience in these countries, privatization of the telecommunications industries in the rest of the LAC region would be a powerful boost for the development of local capital markets. But inflows of foreign equity and loan funds could eventually be reduced by the competition offered by telecommunications privatizations elsewhere in the world. These developments would reduce the scarcity value of the early privatizations of the systems in Argentina, Chile, and Mexico, which contributed to their success (box 3). Underdeveloped domestic financial markets, combined with the risks of foreign exchange convertibility, can at times make long-term financing impossible even for telecommunications.

The *power* sector is likely to be the next easiest to finance. Unbundling of the sector into generation, transmission, and distribution, with the subsequent participation of the private sector, is practically complete in Argentina and Chile and has been initiated in countries as diverse as Guatemala, Jamaica, and Peru (box 4). Reforms are well under way or under consideration in Brazil, Mexico, and other countries. Meeting LAC's estimated annual requirement of \$24 billion, corresponding to 1.8 percent of regional GDP with public and private investment, seems feasible, given that the major countries in the region devoted 1.6 percent of regional GDP to power during the 1980s.

*Natural gas* occupies an intermediate and increasingly important role between the power/energy and transport sectors. Several important

### **Box 3. Privatization of Telecommunications in Chile**

In January 1988 the Chilean government sold nearly 50 percent of CTC, the Chilean telephone company, to a strategic investor, after an international tender. CTC embarked on a program to double its number of lines within five years. In 1990 CTC undertook the first Latin American equity issue in the international capital markets since the 1960s, raising \$92.5 million through American Depository Receipts on the New York Stock Exchange. In April 1993 CTC became the first Chilean company to issue convertible bonds abroad; the \$200 million issue of ten-year bonds was oversubscribed. CTC's five-year investment program of \$1.36 billion was completed six months early and 6 percent under budget. Phone line capacity doubled, and the 23 percent annual growth rate was one of the highest in the world. At the same time, the number of employees per thousand lines fell from 13.7 in 1989 to 6.2 by June 1993, mainly as a result of the doubling of network capacity with no increase in staff.

**Box 4. Regulation of the Power Sector**

In a number of countries, reform programs have challenged the idea that the public provision of electric services inevitably requires protected public monopolies. For the most part these countries are relying on competition as much as possible. At the other end of the business, at the customer-supply level, competition is also possible and has been introduced in Argentina, Chile, Norway, the United Kingdom, and other countries. It has been generally accepted that special forms of regulation and protection of sectors are not necessary in power generation except perhaps in a few special circumstances. Yet in some instances the basic premise has not proved correct, and unanticipated constraints on competition have appeared.

The lesson is that the regulator must have a specific mandate to monitor the performance of the sector as a whole to determine if competition is in fact occurring. Moreover, it is widely acknowledged that the powers of the regulator must be spelled out by law to reduce the risk of arbitrary or biased behavior on the part of the regulator. However, the regulator should have enough flexibility to deal with unanticipated situations and, in particular, should possess the power to take direct action or refer cases to antitrust authorities.

As an example, in the United Kingdom the Office of Electricity Regulation has concluded from experience that the present extent of competition in generation is not sufficient to avoid market domination and monopolistic behavior by the two largest generators. The parties have now reached agreement—under the threat of a referral to the Monopolies and Mergers Commission—on certain restraining actions and price caps, as well as on divestiture of about 6,000 megawatts in generating capacity.

gas projects are planned in the region, such as pipelines between Bolivia and Brazil and from Argentina to all its neighboring countries. Pipelines can bring about greater trade and regional integration. These projects would also have environmental benefits.

The many subsectors of *transport* call for annual investments of \$14 billion, or 1.0 percent of regional GDP. Airports, ports, railways, toll roads, and urban mass transit are revenue producing with present technology, while for general road transport, electronic debiting technology is just being developed. Ports and railways have already been partially privatized in Argentina, Chile, Colombia, and Mexico. Private sector participation in ports and railways is particularly beneficial because little new investment is immediately required in these subsectors and private management is more efficient than past public sector management.

Half of the annual \$14 billion requirement for transport would have to be spent on long-deferred maintenance and rehabilitation. Private sector participation could well follow the successful examples of multi-year maintenance contracts in Brazil and Chile. Funding will probably be from general budget revenue. A case could be made for earmarking revenue to ensure that sufficient funding will flow to maintenance, because it generally yields much higher returns than new construction.

Most of the remaining annual transport expenditure would be in urban areas. Part of this could be offset by traffic management that would also reduce air pollution. Urban and interurban toll roads are expected to play a less prominent role, given the difficulties in making them financially attractive for private sector participation. Experience from Argentina, France, and Mexico shows that successful toll roads require large traffic flows and long concession periods to become financially attractive to a risk-averse private sector.

*Water and sanitation* present greater problems. In contrast to telecommunications and power, water supply is often considered a social service. Perhaps as a consequence, expanding coverage has been emphasized with little regard to cost recovery or sound institutional and human resource policies. This has led to falling operating standards in existing systems as a result of lack of maintenance and the virtual absence of systematic training of sector staff. In the absence of rational tariff policies and clear legislative and regulatory regimes, the sector will have more difficulty in attracting private sector participation to fund its annual \$12 billion investment bill. This would be equivalent to almost 1.0 percent of regional GDP, up from the 0.2 percent of GDP in the 1980s. Control of water and air pollution will require a central role for the public sector because of the very large externalities involved and since market-based investments are in the embryonic stage.

Where the private sector has been invited to participate—the promising concession in Buenos Aires is one example—improvements in service quality and staff productivity have followed. The concessionaire in Buenos Aires reduced the number of employees by half, from 7,600 to 3,800, within a short period of time, all through voluntary departure of staff attracted by severance incentives. However, there has been relatively little new investment. To mitigate the risks and induce increased private sector participation, the public sector may have to play a larger role much longer than in the telecommunications and power sectors. Intermediate forms of private sector participation, such as lease contracts and companies with mixed public-private ownership, can combine efficient private sector management with public guarantees that facilitate financing of investment. Predictable and transparent tariff policies will be crucial (box 5).

**Box 5. Water Tariff Regulation in Chile**

Chile's Superintendency of Sanitary Services (SSS), created in 1989, is an autonomous, decentralized entity, with a legal personality and an independent budget, whose head (superintendent) is appointed by the country's president. Its main functions are to grant concessions for water supply and sewerage services; to set up and control compliance with norms and technical standards for the design, construction, and operation of water and sewerage systems, as well as industrial wastewater discharges; to review investment plans; and to set tariffs and control their implementation.

A new approach to the pricing of water supply and sewerage services was adopted to bring the policy more in line with the government's overall policy of letting market conditions establish prices of goods and services. For each of the regional water utilities, water and sewerage rates are calculated by the SSS and approved by the Ministry of Economy, based on the replacement value of existing installations, expected service levels, and a fifteen-year investment program. Maximum rates are fixed in real terms for a period of five years, adjusted to nominal terms whenever inflation exceeds a certain level. To allow for consumer expectations and behavior, the new rates were applied step by step during a five-year transition period (1990–94). Eventually the tariffs will cover the full cost of service, including amortization of investments, and will eliminate the present system of cross-subsidies for low-consumption residential consumers.

Alongside the new pricing system, the government adopted a system of direct subsidies for low-income consumers. The aim of the subsidy is to ensure that the water service remains affordable to the urban poor; it is also a protective measure against financial deterioration of the water companies, which might occur if the increased water bills were not paid by a certain segment of the population. The subsidies are financed from the central government budget, made available through the municipalities directly to the water supply and sewerage concessionaires. Eligibility for the water subsidy is based on household criteria as determined by the Ministry of Planning. The same criteria are used for other social subsidies to the urban poor, e.g., housing. Low water consumption is no longer a qualifying criterion for the subsidy, which covers only about 50 percent of the cost of the first 15 cubic meters.

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## World Bank Assistance for Infrastructure

Throughout the 1980s, World Bank lending for infrastructure continued to be important in the LAC region. During 1971–93, annual commitments for the infrastructure sectors averaged \$1.7 billion (in 1993 prices). Annual lending peaked in 1980 at \$2.6 billion and then began to decline. By 1994, World Bank commitments for infrastructure in the region dropped to \$1.6 billion.

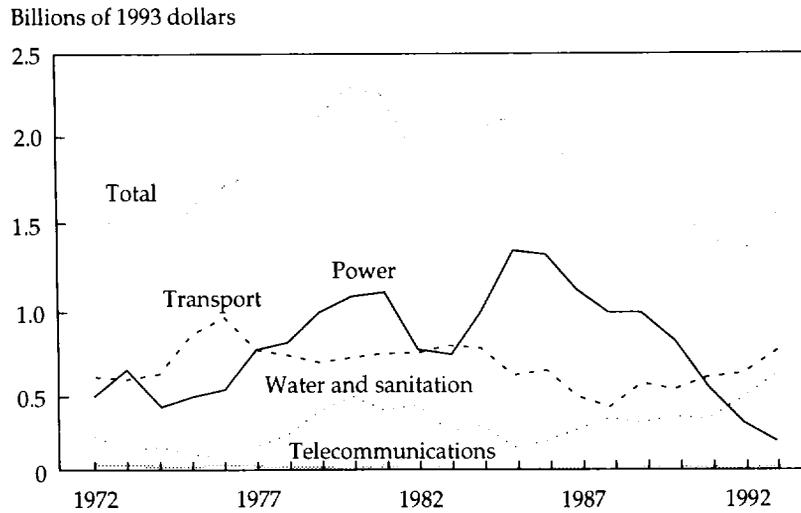
The composition of infrastructure lending changed over the period (figure 6). Power absorbed a significant share of regional lending until the mid-1980s, but lending to this sector all but dried up in recent years. Transport lending decreased in absolute terms, whereas lending for water supply, sewerage, and waste disposal grew.

The form of World Bank lending has been limited by the need to obtain guarantees that meet its statutory requirements for satisfactory guarantees. Article III, section 4, of the Bank's Articles of Agreement specifies that "the Bank may guarantee, participate in, or make loans to any member or any political subdivision thereof and any business, industrial, and agricultural enterprise in the territories of a member," subject to certain conditions. The first condition is that

when the member in whose territories the project is located is not itself the borrower, the member or the central bank or some comparable agency of the member which is acceptable to the Bank fully guarantees the repayment of the principal and the payment of interest and other charges on the loan.

To ensure compliance with this condition, the Bank has always sought a direct guarantee of the loan from the member country. However, private sector participation is still possible—through service and management contracts, leasing contracts, mixed public-private companies, and hybrid concessions. Under all these forms of private sector participation, the public sector remains responsible for financing at least part of new investment and remains the owner of the assets. The Bank could also lend or issue guarantees directly to a private enterprise, provided that it could obtain suitable counterguarantees from the government.

**Figure 6. World Bank Infrastructure Loan Commitments in Latin America and the Caribbean, 1972–93**



Note: The curves show a three-year moving annual average.

### Guidelines for Future World Bank Lending

World Bank assistance for infrastructure must be more relevant to individual countries' needs, designed to capitalize on the rapid growth of private sector participation, and implemented more economically and promptly. Future lending should draw upon the lessons learned from project implementation, and serious country-wide implementation problems should be reflected in proposed lending targets. Slow project execution can often be explained by a multiplicity of project objectives, all of which are difficult to satisfy. Institutional weaknesses in the borrowing countries have been another perennial problem.

To speed up implementation of future Bank-financed projects, a "parallel-track" lending strategy is emerging, in which sector policy and institutional reform, and physical project implementation, are pursued in tandem, using different instruments for lending and technical assistance. A parallel-track strategy can be flexible and can accommodate different paces of progress in the three areas.

Higher levels of infrastructure lending should at all times be consistent with evolving country assistance strategies. Individual projects should be clearly linked to the countries' objectives for economic growth, poverty reduction and human resource development, and environmental sustainability. By the same token, the Bank will have to recognize the substantial variations among countries in the region. The

size, administrative and historical tradition, and economic development of any country have a direct bearing upon the legislative and regulatory regime and upon the degree of unbundling of sector activities.

To ensure the necessary links with each country's macroeconomic objectives, future infrastructure lending should rest on a sound intellectual foundation—that is, on coherent economic and, above all, sector analyses. Analytical work in the countries and the Bank will have to expand and be firmly tied to the evolving lending program.

In all instances, future infrastructure lending should promote private sector participation. This holds true for all sectors but particularly for power and telecommunications, which offer the most immediate promise for the private sector because there is no economic rationale for direct government ownership and management. Large segments of transport infrastructure and urban water and sewerage operations, properly designed, could also attract private sector participation. The success of the proposed program should be measured by the totality of public and private resources attracted and by improvements in the efficiency of service delivery.

### Approaches to Promote Private Sector Financing

Private sector financing should be a cornerstone in the strategy to meet the estimated \$60 billion in annual financing. According to present plans, it appears feasible for the World Bank to double its present infrastructure loan commitments in the region to \$3 billion annually, or 5 percent of the annual financing needs. Bank funds should be used with a view to achieving maximum leverage. Four approaches have been identified to maximize leverage of Bank funds. All assume wider use of the available Bank lending instruments.

#### *Traditional Cofinancing*

The first approach would be a continuation of the traditional model of mixed public-private financing, where multilateral and/or bilateral credits are mixed with private export and suppliers' credits. The latter are often facilitated by public export credit guarantees. During 1985–93, cofinancing of World Bank infrastructure loans in the region averaged \$1.3 billion annually. In certain years, cofinancing approached \$4 billion. With a concerted effort to involve co-lenders early in the project cycle, and with the expected increase in Bank lending for infrastructure, this type of cofinancing could very well rise further and at least equal future World Bank regional lending, or \$3 billion.

#### *Extended Use of World Bank Guarantees*

A second approach is to extend the use of World Bank guarantees to project lenders. The Bank's Board of Executive Directors recently sanc-

tioned the “mainstreaming” of guarantees to support private project lenders.<sup>2</sup> Such guarantees form a natural complement to the guarantees that the World Bank Group’s Multilateral Investment Guarantee Agency offers to investors. Given that long-term loans are more difficult to secure than equity, World Bank guarantees could play a significant role in making private sector infrastructure projects possible.

World Bank guarantees would be of two kinds: partial risk guarantees and partial credit guarantees. The former would cover the performance of certain sovereign contractual obligations such as maintaining agreed tariff formulas and an agreed regulatory framework, delivering inputs and payment risk associated with sales to the government or state-owned entities, and compensating for delays or interruptions due to government actions or political force majeure. Partial risk guarantees would also cover the transfer risk arising in those projects that generate revenue only in local currency but have payment obligations in a foreign currency. For example, the transfer risk guarantees would protect private lenders from debt service default because of delays in obtaining foreign currency due to government action, adverse changes in exchange control regulations, or deterioration in the macroeconomic environment affecting the availability of foreign exchange. However, partial guarantees do not cover commercial risk.

The partial credit guarantees could be aimed at transforming medium-term funding into long-term funding. They would provide incentives to private lenders to roll over medium-term loans at maturity, extend liquidity guarantees to enable private lenders to exit through takeout financing, and extend rolling guarantees that cover a fixed number of scheduled payments.

The Bank has provided both partial risk and partial credit guarantees. In both instances, the World Bank requires that the country provide counterguarantees to the Bank. The willingness of governments to do so will be an important factor in determining the extent to which Bank guarantees are used.

#### *Infrastructure Financing Facilities*

A third approach to increasing private investment in infrastructure would be through one or more dedicated facilities aimed at jump-starting the flow of private finance. A variety of facilities are already in the advanced stages of discussion in several countries in LAC, responding to the needs of individual markets. In many cases, a primary facility

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2. A booklet entitled “The World Bank’s Guarantees: Catalysts for Private Capital Flows” provides a fuller description of the guarantees. Copies may be ordered from the Cofinancing and Financial Advisory Services of the World Bank (telephone: 202-473-1190; facsimile: 202-477-1790).

may be one that provides protection against specified public sector performance risks.

To encourage the market to use the products offered, it is also possible to create, for example, a debt investment fund management company that pools loans for a series of private infrastructure projects in one or more sectors. Such a fund could pass through loan or bond proceeds, or it could operate as a specialized bank that retains loan interest and obtains funds through more standardized debt or asset-backed security sales. Other pooling or credit enhancement vehicles, such as specialized insurance funds, could also be utilized. In any facility associated with funding (other than public sector performance guarantees), it is expected that majority ownership and management would rest in the private sector. Public support could come in the form of passive "seed capital" or in the provision of backstopping structures designed to assure access to rollover funding by creditworthy projects in the event of market failure.

#### *Designing World Bank Projects for Private Sector Participation*

A fourth approach would aim to assist governments with private sector participation in Bank-financed projects. This approach recognizes that for many projects under public ownership and management, operations and new investment could be more effective and timely if the private sector were involved. Yet it is unrealistic to assume over the medium term that governments will always be able or even willing to implement rapid wholesale privatizations in all infrastructure sectors. In situations where the enabling environment has not yet been put in place, the World Bank is prepared to act as a last-resort financier and to help governments prepare projects for privatization in the future.

At the same time, it is clear that publicly financed and managed construction of new works may diminish the scope for achieving economies in the form of the better-designed and -executed projects that private financing and management can produce. After all, construction risk is essentially a commercial risk that is best borne by the private sector. However, where immediate private sector participation is not possible because of political constraints and insufficient private capital and interest, projects could still be designed for subsequent private sector participation.

Privatization *before* new construction might be attractive when risks are relatively low and much of the new financing is for rehabilitation. Privatization *after* new construction might be justified when private firms perceive the risks to be so high as to require an inordinately high risk premium. In these cases, the government might choose to finance and construct projects itself; it would then be free to choose the optimal timing for privatization. Alternatively, the government might decide to

identify and mitigate precisely those risks that the private sector is unwilling to assume without a substantial risk premium.

In cases where the government chooses to construct a project itself while not ruling out future privatization, the World Bank could provide technical assistance for various activities: establishing a plan and timetable with the government to privatize the facility, valuing the assets, preparing bidding documents, preparing an offering memorandum aimed at potential investors, designing a security package, identifying investors, and assisting the government with an evaluation of the bids.

Under this approach the Bank's project appraisal would assess the regulatory environment, evaluate the government's willingness to privatize the project, and analyze the risks and other factors that could affect the revenue stream of the project. The project design would include a component to finance the technical assistance necessary to assist the government in preparing and carrying out the privatization of the project whenever it wished (box 6).

The careful preparation of future private sector participation could sharply limit a number of risks for private investors and lenders. Policy-related risk would be reduced through continuous dialogue between

#### **Box 6. Privatizing Water and Sanitation Services in Lima**

The Lima Water Rehabilitation and Management Project was recently appraised and approved by the World Bank. The project's goal is to improve the efficiency of water and sanitation delivery in the metropolitan Lima area. The project will provide some 800,000 people with improved water and sewerage and supply another 600,000 people in low-income areas with urgently needed services. At the same time, the project supports the privatization of the municipal water and sewerage company, SEDAPAL.

Project implementation will have two phases and is linked to SEDAPAL's privatization process. The first phase, expected to last twelve months, corresponds to the period of privatization and ends with a comprehensive project review. During this phase, it is expected that some 20 percent of the project will be executed, addressing the most urgent needs.

The second phase will be initiated after the project review. Assuming that privatization is successful, SEDAPAL, representing the government of Peru (the recipient of the Bank loan), will sign a concession contract with the private operator. The concessionaire may elect to carry out all procurement itself and to receive the benefits of the Bank loan, in which case it will be obliged to assume all SEDAPAL's obligations for executing the investment component of the project—including abiding by the Bank's procurement rules.

the government and the Bank and through policy reform paralleling the project's preparation and implementation. Likewise, private construction risk would be sharply limited if the government chose to construct the bulk of the infrastructure works before privatization. The advantage to governments would be the possibility of reducing debt and guarantee obligations if and when the constructed projects are opened up to full or partial private sector participation.

### Technical Assistance for Private Sector Participation

The World Bank's technical assistance to enable the restructuring of legal and regulatory regimes is proving to be of central importance in preparing projects for private sector participation. During 1990–94 the Bank extended technical assistance loans for this purpose to several countries in the region. Mexico received a loan to develop the regulatory capability in the telecommunications sector, Argentina was the recipient of another loan to reform and prepare for the privatization of its public enterprises, and Peru borrowed for assistance in preparing and implementing its privatization program, including the creation of a regulatory and legal framework.

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## Selected Components of the LAC Infrastructure Report

The region of Latin America and the Caribbean is one of sharp contrasts: between countries of enormous size and countries that are very small; between some of the largest urban agglomerations in the world and almost untouched indigenous populations; between nations with sophisticated administrative and legal systems and nations that lack institutional infrastructure; between affluent populations and destitute slum dwellers; between countries that export capital and countries that depend on large capital transfers from abroad; and between countries that have fairly good coverage and quality of public services and those that lack both.

The World Bank proposes to sharply expand the assistance for raising operating and investment efficiency in the infrastructure sectors, specifically in power (including natural gas), transport, telecommunications, and water and sanitation; to accelerate the effort to create the regulatory framework and policies that will enable the private sector to operate and invest; to coordinate more closely with the IFC, the IDB, and other public and private financiers on pushing for more infrastructure financing; and to substantially increase direct infrastructure lending where warranted. The higher levels of infrastructure investment should be accompanied by the systematic development of domestic capital markets to make financial intermediation more efficient and to increase savings for financing infrastructure.

### Power and Natural Gas

Four areas of the power sector are proposed for technical and financial assistance from the World Bank. The first comprises assistance in preparing and implementing legal and regulatory reform; the second focuses on the rehabilitation of existing institutions and systems; the third includes World Bank technical assistance as an "honest broker" for privatizations; and the fourth covers the financing of systems eligible for sovereign guarantees.

*Reform of Legal and Regulatory Regimes*

Through its policy dialogue and past lending the World Bank has been closely associated with the transformation of the power sectors in the majority of countries in Latin America and the Caribbean. In a number of countries the Bank has financed the preparatory work for creating legal and regulatory regimes to enable competition in the provision of services. The findings indicate that competitive forces can self-regulate the generation segment but that transmission and distribution are natural monopolies and need to be regulated. Legal traditions and the institutional capacities of countries will need to be taken into account in the choice and details of the regulatory regime.

*Projects to Rehabilitate Power Institutions and Systems*

A country that has established a clear legal and regulatory framework has a good basis for greater private sector participation. The proper pace of privatization will ideally be contingent on the full implementation of a regulatory system, but this process is time consuming. In the meantime, there is often a need to rehabilitate both the power institutions in the sector and their installations. Such rehabilitation projects produce high returns. Rehabilitation could reduce system losses, which in a number of countries exceed 20 percent. (In well-managed systems such losses are less than 10 percent.) The high losses can be explained by deteriorating distribution systems and by deficient commercial systems and lax management in the power utilities. In addition, the availability of generators tends to be low in poorly managed and poorly maintained power systems. Rehabilitation permits dramatic increases in the availability of power generation, allowing costly additions to capacity to be deferred. Rehabilitation lends itself to private sector participation through contracting by private firms that are paid according to the documented improvement in parameters such as energy losses and total billings and collections.

*Assistance for the Privatization of Power Systems*

After rehabilitation, the next step may be the partial or full privatization of the power systems. The value of power companies increases substantially after rehabilitation. The improved data base is likely to remove some of the uncertainty and result in wider interest and higher bid prices for the facilities. World Bank assistance for power sector privatization would probably capitalize on the lessons from the large-scale privatizations in the region. In Chile laws and regulations were first modernized to enable private sector participation. Existing power

institutions were improved through rehabilitation and more rigorous management. The existing institutions were then turned into corporations to facilitate gradual selloffs of shares to the private sector. Finally, shares were sold to private interests, including investors with operating experience and a long-term strategic interest in the company; institutional investors such as privately administered pension funds with a long-term interest in the stable returns offered by the power sector; and small investors, including power company employees and individuals. The ownership structure facilitated the sustained privatization of the Chilean power sector.

Argentina followed an alternative sequence. The circumstances prompted an accelerated schedule; assets were sold off in a series of public bids while the regulatory framework was being set up. The sustainability of the reform was bolstered by allocating to the employees a 10 percent stake in the privatized power enterprise. Severance packages made it possible to substantially reduce the number of employees in the privatized enterprises.

The World Bank is well positioned to act as an honest source of technical advice in privatizations, since the Bank's Articles of Agreement make it difficult to invest directly in the privatized enterprises. The World Bank can also provide financing for the consultancy and investment banking services that are necessary for privatization.

#### *Projects to Finance Publicly Owned Assets*

The guiding principle in the infrastructure sectors should be to allocate management and ownership of assets on the basis of comparative advantage. As a rule, this will favor the private sector, with its superior expertise in operating and investment efficiency. However, there will always remain areas in which the private sector is not interested or will demand prohibitively high remuneration, at least initially. Rural electrification, for example, is likely to remain under public ownership and management for the foreseeable future. The same is true for distribution systems in small municipalities. Public ownership and relatively low service coverage make rural and small urban areas natural targets for World Bank financial and technical assistance. Even in these areas, however, it is possible to enlist the expertise of the private sector in the form of service and management contracts.

Certain projects, because of their complexity, long gestation periods, or high risks, are likely to be built by the public sector; large hydroelectric projects are an example. Projects that affect the power sectors in more than one country, such as binational generation projects built on international waterways, may well entail risks that the private sector will not be willing to assume. The same may be true for transmission projects integrating regions made up of several countries. Growing

privatization of the major segments of the power industry could free the public sector from much of the responsibility of financing generation, at least. This relief would permit the public sector to step up its efforts to provide electricity to rural areas, where service levels often lag far behind those in cities.

Finally, it is likely that the public sector will in some instances opt for joint public-private ownership. In such cases, capital infusions in jointly owned enterprises will require public capital that could be financed by the World Bank. The use of such proceeds would need to be subject to evidence of cost-effective procurement.

#### *Natural Gas*

The World Bank will make a special effort to support a number of natural gas projects, such as pipelines between Bolivia and Brazil and from Argentina to all its neighboring countries. These projects are important because they integrate regions and directly boost trade. They also yield environmental benefits: clean-burning natural gas can replace more-polluting fuels now in use.

## Telecommunications

#### *Reform of the Legal and Regulatory Regimes*

Telecommunications is the most promising sector for privatization. Public monopolies can generate substantial fiscal revenue. Winning bidders commit themselves to large investment programs with commercial financing and without sovereign guarantees. Under these circumstances, World Bank assistance is likely to be limited and to center on the legal and regulatory reforms that precede privatization.

#### *Technical Assistance for Privatization*

The World Bank could also facilitate privatization by acting as an honest broker between the legitimate interests of the public sector to maximize sales revenue and guarantee its investments and the public interest in not simply converting a public monopoly into a private monopoly.

The experience from telecommunications privatizations confirms the observation that investor equity is plentiful. A representative financing structure has been 70 percent equity and 30 percent debt. The price that commercial investors will be willing to pay for the services depends in part on their ability to minimize commercial risks. An "exclusivity" period has typically been negotiated. The early partial privatization of TELMEX in Mexico resulted in a six-year monopoly for the

commercially important long-distance services. The corresponding period in Argentina was ten years, in Venezuela nine years, and in the latest partial privatization, Peru, five years. The gradual reduction in the length of the monopoly period is most likely the result of experience that permits costs and risks to be more predictable. The positive experience has also put governments in a better position to allow competition earlier, such as through the granting of licenses to cellular telephone operators.

#### *Financing Residual Investments*

As in the power sector, there are areas in telecommunications where the long maturity of projects, in combination with underdeveloped domestic financial markets, will make it difficult to obtain long-term financing. The World Bank could finance such residual projects—for example, local and rural telephone service, which makes an important contribution to economic and social development.

## Transport

#### *Reform of the Legal and Regulatory Regimes*

The transport sector comprises a wide range of subsectors—airports, maritime ports, urban rail systems, interurban railways, pipelines, and roads, including bridges and tunnels—with specific characteristics. Many of these are capital-intensive in relation to the potential revenue generated. Some offer good prospects for successful private sector participation, primarily in management. Others, such as roads, lack the tradition of user charges even when these could be levied, as for toll bridges, roads, and tunnels. A form of private sector participation that can often be successful is private concessions to operate ports, railways, and road segments that have been constructed and financed by the public sector. The potential of monopolistic powers is mitigated, since the variety of transport modes guarantees a fair degree of competition. Legislation should be modified to encourage competition among different transport modes and between private and public operators.

#### *Urban Transport Projects*

In 1990 Latin America contained four of the world's ten largest cities. The region had forty urban areas with more than 1 million inhabitants each—more than twice the number in 1970. The number of private cars—most of which are owned and operated in cities—has grown even faster than the cities themselves. Urban traffic congestion is

reducing personal mobility, affecting the efficiency of goods distribution, and contributing greatly to air pollution, with serious health problems arising from traffic-generated lead and noxious gases. Urban bus services are now generally run by private operators, and this has raised operating efficiency and reduced the need for government subsidies. But worsening traffic congestion slows buses, and average fares are rising because of slower speeds and the longer routes resulting from urban expansion. As a result, many low-income commuters have to travel up to four hours per day and spend as much as 20 percent of their earnings on transport.

Although the private sector can provide urban transport services effectively, the government has a key role in regulating the use of scarce road space and in expanding infrastructure capacity to accommodate at least some of the growth in population and in demand for transport. The World Bank is supporting urban rail projects in Brazil; road-based urban transport projects in Chile, Jamaica, Mexico, and Venezuela; and an innovative urban bicycle program in Peru (box 7). It is likely to expand this activity, which could include such components as urban rail improvements; busways and other measures to improve nonrail mass

#### **Box 7. Nonmotorized Transport in Lima**

In 1990 the city of Lima established a program to promote the use of bicycles as an alternative mode of transport, especially for workers and students. Lima initiated the program to provide transport for people who walk long distances; to reduce costs for low-income public transport passengers while saving them time and improving their health; and to reduce air pollution.

In Greater Lima, with a population of 6.5 million, public transport to and from low-income areas is erratic. Cars, trucks, and buses contribute significantly to air pollution and congestion. The cost of public transport is expensive for the 50 percent of city residents whose average monthly income is low (\$200) or very low (\$80). People in these income groups typically spend about 12 percent of their income on transport. Accident rates are high; about 70 percent of fatal accidents result from vehicle-pedestrian collisions. Studies had indicated that Lima would be a good place to start a bicycle program, given its warm climate, level topography, and lack of rainfall.

Pilot studies are showing early promise. Under a program supported by the World Bank, Lima will build four trunk bicycle ways, primarily to help low- and middle-income workers commute to and from the Lima-Callao industrial area. A fund will be established to help people buy low-cost bicycles, and the city will conduct promotional and educational campaigns. Lima plans to monitor the results of the project for a city-wide plan to use bicycles.

transit; programs to reduce traffic-generated air pollution; upgrading of road infrastructure; paving of dirt roads (which are common in outlying slums)—a measure that can dramatically improve mobility and environmental conditions for low-income residents; traffic management, through such traffic engineering measures as channelization, traffic signals, signs, parking controls, and enforcement of traffic rules; provision of facilities for pedestrians and nonmotorized transport; and traffic safety programs. Measures to manage traffic demand, such as road pricing, that are feasible on economic and technological grounds could be linked to (and help with the funding of) major improvements in urban transport quality.

#### *Road Maintenance Funds*

Raising operating efficiency should be of the highest priority because it will directly result in tangible improvements in service delivery and will produce such benefits at the least cost. The road sector presents the clearest case of the benefits of maintenance. A highway can be maintained indefinitely at an annual cost of about 2 percent of the construction cost. If the highway is not maintained, it will have to be rebuilt, at a cost of about five times the capitalized annual maintenance cost. In spite of these very high returns, maintenance has suffered disproportionately over the past decade in Latin America. Current expenditures were reduced, and the money was often used to pay for staff salaries rather than for inputs for maintenance. The consequence of the years of neglect is that about 45 percent of the road network cannot deliver the intended service.

Although the World Bank attaches the highest priority to maintenance and rehabilitation, there is still considerable new construction that is justified. The paving of unpaved roads, rural road programs, and new highway construction will demand investment financing. Rural development is predicated on the presence of good communications, mainly in the form of roads. In addition, rural road programs have a dual benefit: they alleviate poverty by providing substantial employment for rural laborers during construction, and the finished roads contribute to increased rural productivity.

As long as the required goods and services have been obtained in accordance with Bank procurement guidelines and a legally enforceable contract has been signed, road maintenance funds could be financed by World Bank loans and public sector revenue.

Programs to improve operating efficiency dovetail with greater efforts to broaden private sector participation. The most natural transition would simply be to encourage former public sector employees to form a private firm and bid for service contracts to undertake the same functions. Experience has shown that productivity rises dramatically

under such service contracts. With increasing experience and capitalization, such management entrepreneurs can take on greater responsibility in a variety of sectors. The World Bank could also consider financing the training that would form the basis for such new entrepreneurship.

#### *Integrated Trade Systems*

The transport infrastructure itself is only a partial key to trade flows; rather, the costs, reliability, and speed of transport services will shape a country's competitive transport advantages in the regional or global marketplace. Countries will need to reform and create integrated trade systems to become credible suppliers in the global market. This requires a thorough review of administrative, customs, and information systems, in addition to investing in ports and transport channels. Regional trade arrangements create an urgent need for integrated trade systems. The World Bank has been closely involved in planning and implementing such projects for Hungary and India, which experience could well be transferred to the LAC region. Assistance could include financing of the necessary preparatory work and implementation of a streamlined administrative and physical infrastructure.

## Water Supply and Sanitation

#### *Reform of the Legal and Regulatory Regimes*

The water sector is gaining increasing attention because of its links to economic growth, poverty alleviation, and environmental sustainability. Country legislation, however, is often antiquated and in need of reform and updating, and regulation has been largely absent. With the arrival of privately provided water and sewerage services, the need for regulation has become urgent and is perhaps greatest in this sector, where the environmental and health externalities are significant. Regulation is also vital because of the local character of the water and sanitation sector, one of the best examples of a natural monopoly. Finally, the sector is central to redressing income inequalities, given its importance in providing for the basic needs of all population segments, irrespective of income level.

The centerpiece of regulation is the system of setting and charging tariffs. Tariffs should be fixed according to a preestablished methodology under which the tariff should reflect the marginal cost of service. Cross-subsidies are increasingly viewed as inappropriate in the sector. Subsidies are better handled through central budget transfers based on income tests.

At present, only two Latin American countries—Argentina and Chile—are close to having transparent legislation and regulation in the water and sanitation sector. However, a growing number of countries are introducing legislation and regulation that would permit private sector participation.

#### *Water Resources Management Projects*

The growing evidence of serious deterioration of the quality of water resources, in combination with emerging competition for scarce water, has made integrated water resources management imperative. The World Bank is actively involved with such programs in LAC and elsewhere. The emphasis is on demand management to introduce economic principles into the allocation of scarce water through the development of water markets. Such projects are likely to spread beyond traditionally water-scarce countries such as Chile, Mexico, and Peru.

#### *Sewage Treatment Projects*

The greatest challenge in the sector over the next two decades will be the implementation of low-cost sewage treatment that will at the same time permit selective reuse of treated effluents for agricultural and industrial purposes. Again, the World Bank is learning from its involvement with this type of project in Chile and Mexico. This promising experience could be transferred to other countries in the region that face analogous problems. The study and funding of sewage treatment should be seen within the framework of water resources management in different basins. Thus, sewage treatment transcends the issue of brown pollution in urban areas (box 8).

#### *Rehabilitating Institutions and Systems*

The past decade witnessed two trends that negatively affected countries' water supply and sewerage institutions. The first was the decentralization to unprepared municipalities and provinces of the responsibility for managing these services. The second was the neglect of continuous maintenance and efficient operations. As a result, the bellwether of efficient water supplies—unaccounted-for water or, loosely speaking, water losses—shot up and is now often above 50 percent. (Unaccounted-for water is, at most, 20 percent in the best-managed systems and is at times even below 8 percent.) Because of the magnitude of the problem, it is likely that only extensive private sector participation could redress the situation in the thousands of systems under municipal management. But the degradation of existing institutions and systems is such that the private sector is unwilling to take on

**Box 8. Brazil's Innovative Program for Water Pollution Control**

Brazil, with an area larger than the contiguous United States and a population of 155 million, 77 percent of whom live in urban areas, has an urgent need to manage its water resources in urban areas in an environmentally sustainable way. With the help of the World Bank, Brazil has developed an innovative approach to water pollution control based on water basin management.

The geographic, biological, and climatic features of water basins form a relatively coherent ecological system that makes them the basic natural unit for controlling pollution of water resources. With support from the World Bank, Brazil has undertaken comprehensive water basin pollution control in the urbanized basins of Guarapiranga (São Paulo), Alto Iguacu (Paraná), Santa María and Jucu (Espírito Santo), and Arrudas and Onca (Minas Gerais).

The projects are off to a good start. The expected results of the new approach are as follows: (a) all the activities—whether domestic, commercial, industrial, recreational, or agricultural—that affect water quality in a region will be included in the planning and management of water resources in an effort to ensure environmentally sound, equitable, and efficient usage; (b) urban and infrastructure planning will take advantage of economies of scale associated with collective wastewater treatment and solid waste disposal facilities; and (c) water use and pricing policies will reflect water basin characteristics and planning goals. The objectives of water basin pollution control include creating urban water basin authorities with basinwide jurisdictions, establishing a regulatory framework for controlling pollution, and creating an institutional capacity for environmentally sustainable water management. The water basin approach has proved especially useful in dealing with multimedia pollution sources and limited government capacity to enforce existing regulations. Similar initiatives are currently under way in the Colorado river basin of Argentina and the Bío-Bío river basin of Chile.

the task for the long haul, particularly given the uncertainty associated with the setting of tariffs.

This vicious circle could be broken through rehabilitation projects that would inject sufficient funds for rehabilitation but would be predicated on private sector participation. The only source of such funds in the short run would be the public sector. The World Bank is funding municipal development finance projects that include such rehabilitation. Proposed projects would insist on private sector participation in different forms: specialized private firms would be made responsible for physical rehabilitation and for operations and maintenance, and commercial banks would handle the financial transactions and collect loans.

**Box 9. Innovative Water and Sanitation Planning:  
Brazil's PROSANEAR**

A World Bank-funded project in Brazil has demonstrated that demand-oriented planning for low-cost water and sanitation requires considerable adjustments by the formal institutions of government, the engineering profession, and external donors such as the World Bank. In Brazil the Water and Sanitation Program for Low-Income Urban Populations (PROSANEAR) is investing \$100 million to provide water and sanitation infrastructure to about 800,000 people in low-income areas in eleven cities in different regions.

The preliminary findings indicate that:

- *Participation must be tailored to the population.* The PROSANEAR project—now under way for about two years—has taken a variety of approaches to involve beneficiaries in the design of subprojects. In one approach, leaders of community organizations are consulted on basic choices, and the details are then worked out with the actual beneficiaries. In another approach, agreement is reached between design engineers and beneficiaries directly, in consultation with community leaders and organizations. In both models, conflicts of interest between the water company and community-based organizations are resolved through negotiation, with the project design consultant as facilitator. Preliminary data indicate that these two approaches have dramatically lowered per capita investment costs and increased the sense of project ownership by communities.
- *Engineers need to adapt.* In PROSANEAR the participatory process has directly affected the kind of engineering advice given. For example, water companies are now required to award project design consultancies to a consortium of engineering firms or to firms working with nongovernmental organizations that specialize in community participation. The supervisory team at the national level encourages project design consultants and water company engineers to discuss plans with beneficiaries before agreeing on final proposals.
- *Donors have to adjust their practices.* The Brazilian project was approved by the World Bank without blueprints of targeted service levels or delivery systems. Instead, the appraisal report provided only broad principles for project execution and indicative targets for benefits and costs, leaving much of the design to be developed during implementation. The external donor must provide intensive supervision to work out details of the subprojects, as chosen by the communities, and to monitor and evaluate implementation. Experience so far shows that these learning-intensive, participatory projects can reduce capital costs, although they also entail increased investment of staff time by the donor.

*Projects to Extend Connection Rates*

It is estimated that about a quarter of urban residents in Latin America and the Caribbean are not connected to public water supplies and that about half lack a connection to public sewerage. The unconnected are largely the poorest segments of the population. Their alternative water supplies and sanitation services are frequently both costly and unsafe. The time is overdue for a concerted effort to implement crash programs to connect the unserved to public water systems and to sharply raise sewerage connection rates. Such crash programs should be carried out in tandem with efforts to reduce unaccounted-for water in order to convert losses and wastage into water consumed by the unconnected. The encouraging experience in countries such as Brazil and Chile indicates that connection rates could approach 100 percent. The World Bank proposes that special emphasis be placed on supplying low-income populations in both urban and rural areas (box 9).

## Decentralization of Public Services

*Projects to Strengthen Local Institutions*

In the short run, decentralization de jure has brought about neither greater cost recovery at the local level nor higher levels of public investment. Part of the reason for this unsustainable trend is, no doubt, the insufficient absorptive capacity of municipal institutions, both for project preparation and implementation and for operating and maintaining public facilities. The World Bank has experience in Argentina and other countries in the region with projects that aim at better municipal management in combination with public service investment—experience that merits dissemination throughout the region (box 10).

*Needs of Rural Infrastructure*

Addressing the large unmet demand for rural infrastructure requires special attention. The lower income levels and higher per capita investment needs combine to make it difficult to make rural infrastructure commercially viable. For this reason it is likely that the private sector will be less keen to provide infrastructure services, although management of publicly owned systems could well be private. However, there are ways to reduce investment costs and, most important, increase the likelihood that rural infrastructure will be well operated and maintained. For this to happen, it is vital that users and other stakeholders

**Box 10. Strengthening Subnational Governments in Argentina**

The steady decentralization of service delivery responsibilities in Argentina, especially since 1990, has forced a complete reexamination of how public services can best be supported within the Bank's country assistance strategy. New operational strategies at the subnational level are being formulated and implemented.

To deal with this dynamic environment, the Bank is examining the current status of intergovernmental relations in Argentina and recommending ways to enhance the potential of provinces and municipalities to contribute to national development, particularly through improved performance in infrastructure, human resources, and overall investment financing. The Bank is also making recommendations for its operational strategy so that Bank assistance is designed appropriately in the context of Argentina's highly decentralized, federal system of governance and its limitations and is consistent across sectors. Only by looking at total resource flows and institutions at central, provincial, and local levels can Bank assistance have a real and lasting effect.

be given a strong voice and responsibility in both project design and operation. Users and stakeholders should be consulted during project formulation and planning, and later given a role in the operation and maintenance of the constructed facilities.

*Dissemination of Best Practices*

The most realistic way of increasing municipal capacity to plan, implement, operate, and maintain public services is, not surprisingly, greater reliance on the private sector. Only long-term private sector participation can protect public services from the rapidly changing fortunes of local municipal administrations. An effective way to encourage more private sector participation is to share relevant experience with central, provincial, and municipal management.

*Assistance for Better Project Preparation*

The need to selectively train private firms involved in infrastructure development and operations is well documented. One task would be improving the capacity of private consulting firms to prepare projects. Another would be assisting private contractors in modernizing their enterprises. Both measures would expand the country's absorptive capacity. Insufficient capacity for project preparation has repeatedly been the cause of slow and inefficient project implementation, particularly for small local projects. The needs for funding and expertise merit

an effort by national, bilateral, and multilateral sources to improve the quality of project preparation and speed up the process.

#### *Project Evaluation Offices*

It would be of little benefit to raise the infrastructure investment ratio to required levels of regional GDP if the quality of projects did not improve. The history of public investment in the 1970s and 1980s is replete with projects with low or negative social rates of return. As a rule, countries in Latin America and the Caribbean lack the stringent guidelines and competent institutions needed to calculate social rates of return for publicly financed projects. To correct this, the World Bank could assist borrowing countries in establishing project evaluation offices. Such offices could be attached to municipal, provincial, or national institutions that decide on the use of public funding. Expert studies would materially help countries to attract bilateral private and public financing. It is precisely the absence of expert feasibility studies that increases preparation risks and deters investors and lenders. In addition, through its training unit for staff and external clients, the Economic Development Institute, the Bank could accelerate the pace of seminars on project evaluation and on private sector participation.

## Development of Capital Markets

#### *Development of Long-Term Bond Markets*

The Bank could assist in domestic financing of infrastructure projects by creating favorable conditions for long-term bond financing in general. This could entail economic and sector work, technical assistance, and institutional development to remove tax-induced biases against bond financing; facilitation of commercial paper and private placement markets; encouragement of efficient trading and settlement processes; programmatic management of the central government debt issuance to develop a benchmark for long-term interest rates; help in creating qualified rating agencies; and rationalization of administrative restrictions and taxes on foreign investment.

#### *An Enabling Framework*

Establishing an enabling framework for fully funded pension plans, insurance companies, and mutual funds would encourage domestic savings. It should ensure, without compromising prudential considerations, that the investment guidelines of institutional investors—particularly pension funds—do not constrain adequate investment in

infrastructure projects themselves or in the types of securities likely to be issued by infrastructure projects.

#### *Development of Subnational Financing Alternatives*

Development of subnational financial markets would require proper coordination of the projects in local government financial management, decentralization with capital market studies, and loan assistance to expand market-based financing for subnational governments. Specifically, capital market projects should examine such matters as the clarity of constitutional and legal limits on the borrowing authority; the need for local legislation or referenda; the legal enforceability of and limitations on sovereign immunity; restrictions on institutional

#### **Box 11. The Jamaica Private Sector Energy Fund**

In Jamaica a 1992-93 study financed by the World Bank concluded that the country's power market was too small to achieve full competition as in the U.K. and Chilean models. The study proposed instead that the government restructure the monopoly utility, the Jamaica Public Service Company, into one generating entity and one integrated transmission and distribution (T&D) company, with the T&D unit responsible for purchasing power from independent power producers to meet its demand requirements.

A Private Sector Energy Fund was set up to provide part of the financial resources for private sector projects. The fund was capitalized with two loans to the government of Jamaica from the World Bank and the Inter-American Development Bank of \$40.5 million each. To encourage private investment in the energy sector, there is a need for a clearly defined process for review, selection, and approval of subprojects. The fund can finance generating projects that form a part of the least-cost investment program for the energy sector and are competitive in price. The fund provides long-term debt subordinated to commercial lenders, and the energy price would be specified and sufficient to cover the operating costs, debt service, and returns on equity for private investors. The government of Jamaica guarantees the payment obligation to the private developer under each power purchase agreement. The plant owners assume construction risk, fuel supply risk, and operational risk.

The first loan from the fund was in the form of a "takeout" loan that refinanced five-year construction financing provided by commercial lenders. This extended the maturity of the debt financing far beyond what lenders would otherwise be willing to provide in Jamaica. A key aspect of the fund is that procurement of goods does not require international competitive bidding, because the bids are solely to supply electric energy at the lowest possible cost.

investors' holding of subnational general-purpose or revenue bonds; market capacity to rate and place subnational borrowings; limitations on subnational borrowing and budgetary discipline by subnational governments; the legality of capturing user fees, revenues, or transfers; and the consistency of tax treatment of subnational market borrowings with other borrowing or investment vehicles. The Bank would also examine schemes to lend directly to subnational governments. Finally, the Bank would examine specific market-based funding mechanisms in specific projects under the ownership of local governments.

#### *Financing an Infrastructure Intermediary*

A standard approach in the past has been for the World Bank to lend for a number of sectors through specialized government-owned banks. Experience from such lending has been mixed, prompting a search for alternative ways of supporting infrastructure investments.

In countries with undeveloped markets the Bank may have to continue being a provider of long-term capital. However, the performance of such Bank loans could be improved by directing them to private developers through financial intermediaries where private firms provide some of the equity at risk. It is important that such intermediaries also be under private management. In addition to supporting regulatory and sector reform, the World Bank could support such intermediaries through direct loans (box 11).

For countries with more developed domestic financial markets and greater access to international capital, the Bank would seek to complement such markets by acting in a second-tier role. This could, for example, involve a contingent financing support mechanism triggered in the event of market dislocation or when necessary as a complement to majority subscriptions of private local and international investors. The World Bank's assistance would be similar to the backstopping facility for private industry that was recently approved for Argentina.

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## Coordination among Multilateral Agencies

The implementation of the thrust of the LAC infrastructure report will demand much from the countries in the region in terms of legislative and regulatory reform and in terms of forging a new partnership between the public and private sectors for the provision of public services. The same spirit of partnership and closer working ties should also hold true for the different members of the World Bank Group and its sister institution, the Inter-American Development Bank. In the end, the success of these efforts will be measured by the success of the total and coordinated effort by the countries of Latin America and the Caribbean and the multilateral agencies assisting them.

### The Inter-American Development Bank

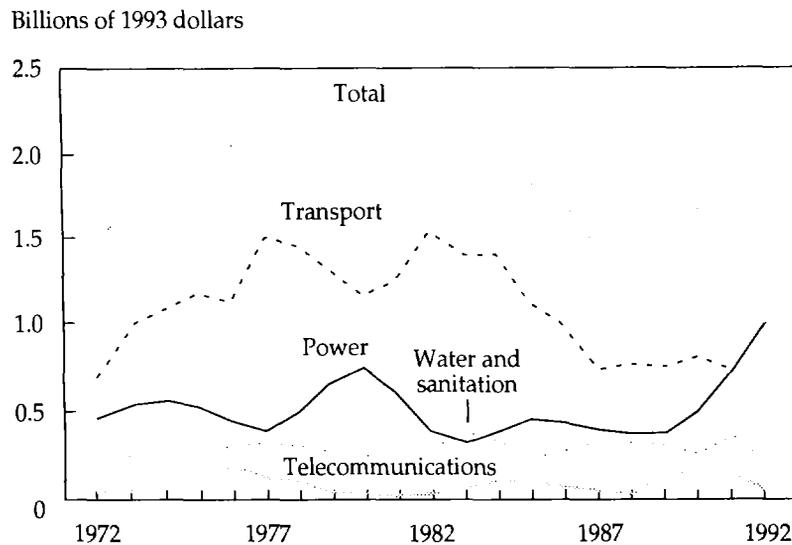
The Inter-American Development Bank has since its establishment been a major financier of infrastructure in the region. Over the 1971–93 period, the IDB committed an annual average of \$1.8 billion for the four infrastructure sectors (figure 7). For 1995 the current pipeline of infrastructure projects includes \$3.7 billion in investments, including water and sewerage projects. Judging by the 1994 infrastructure commitments of \$2.1 billion out of total IDB commitments of \$5.3 billion and IDB's sustainable level of lending, it is probable that annual IDB infrastructure lending will be between \$2 billion and \$3 billion in the medium-term years.

The IDB has the authority to make direct loans and provide guarantees to both official institutions and the private sector, while private sector operations are permitted without government guarantee, as noted in article III, section 8a, of its charter:

In the case of loans or guarantees of loans to nongovernmental entities, the Bank may, when it deems advisable, require that the member in whose territory the project is carried out...guarantee the repayment of the principal and the payment of interest and other charges on the loan.

Under the terms of the eighth replenishment of its funds, the IDB will use guarantees and cofinancing to mobilize medium- and long-term

**Figure 7. IDB Infrastructure Loan Commitments in Latin America and the Caribbean, 1972-92**



Note: The curves show a three-year moving annual average.

capital flows for project financing, and it has earmarked up to 5 percent of its commitments for direct private sector lending without government guarantee. Based on an annual sustainable lending level of \$7.6 billion, the direct lending to the private sector is equivalent to \$380 million annually and will be used to leverage private sector investment in infrastructure and public utilities. The IDB's Multilateral Investment Fund (MIF) has \$1.2 billion for grants to assist the private sector, including technical assistance for privatization, regulatory and legal reforms, and capital market development. At present, some ten infrastructure-related projects are in preparation for 1995, focused on the legal framework for private investment in water, energy, telecommunications and transport.

The World Bank and the IDB have increasingly shared analytical work and harmonized their activities in the region. This should continue in the future through sharing of sector information and preparatory work on legislation, regulation, and projects.

### The International Finance Corporation

The IFC is part of the World Bank Group but is separate and distinct from the World Bank proper. Article I, paragraph i, of its Articles of Agreement states that the Corporation shall,

in association with private investors, assist in financing the establishment, improvement and expansion of productive private enterprises which would contribute to the development of its member countries by making investments, *without guarantee of repayment by the member government concerned*, in cases where sufficient private capital is not available on reasonable terms. [Italics added.]

Article III, section 1, elaborates:

The Corporation may make investments of its funds in productive private enterprise in the territories of its members. *The existence of a government or other public interest in such an enterprise shall not necessarily preclude the Corporation from making an investment therein.* [Italics added.]

The IFC is rapidly expanding its investments and lending to the infrastructure sectors in LAC and elsewhere, and it has an important multiplier effect through its syndication of loans to other lenders under its projects. It has supported projects in power, telecommunications, transportation, and water and sanitation in Argentina, Belize, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Jamaica, Mexico, and Venezuela.

With the approval of the 1991 general capital increase and the adoption of a risk-adjusted capital adequacy framework in 1994, the IFC is well positioned, from a capital adequacy perspective, to continue strong growth in new approval volume for the rest of the decade. The projected growth of the IFC is based on its management's estimate of continued strong demand for IFC products and services, as well as on overall institutional and prudential considerations. The IFC is also exploring ways to increase its loan-participant base beyond commercial banks, and it is evaluating the possibility of securitizing part of its loan portfolio.

During the next few years the IFC expects to continue the strong growth in its infrastructure activities in Latin America and the Caribbean. New annual infrastructure investment might be between \$2 billion and \$3 billion, out of which the IFC may retain about 10 percent for its own account. The consequent leverage of the IFC investments would be substantial.

Direct cooperation between the World Bank and the IFC should be intensified and should be of two kinds. First, the World Bank, through its policy dialogue with countries, could promote and help implement the enabling policy and regulatory environment necessary for private sector development, which the IFC could support financially. Second, the World Bank and the IFC could cofinance private sector participation in infrastructure with mixed public-private ownership. The World Bank

could finance the public sector capitalization of mixed enterprises, and the IFC could support part of the private partner's financing needs. In this fashion the requirements for the World Bank to lend only with sovereign guarantees and for the IFC to invest only without sovereign guarantees could both be satisfied. Examples of such joint ownership companies exist in Spain in the water sector and would arise as the public sector corporatized public services and gradually floated shares.

### The Multilateral Investment Guarantee Agency

The Multilateral Investment Guarantee Agency was created in 1988 as the newest member of the World Bank Group, with a mandate to encourage the flow of foreign direct investment into developing member countries. To this end, MIGA provides insurance to private investors against noncommercial—that is, political—risks. MIGA also offers investment promotion services to host governments in their efforts to create an enabling environment for private foreign investment.

MIGA provides long-term (up to twenty years), noncancelable insurance for various types of new investments, including equity, shareholder and commercial bank loans, loan guarantees, and technical assistance and management contracts. The main political risks covered include currency transfer, expropriation, and war and civil disturbance.

As of December 31, 1994, MIGA had 128 member countries and an authorized capital of about \$1 billion. Twenty-three Latin American and Caribbean countries are members of MIGA, and five others are in the process of joining. To date MIGA has provided insurance to private infrastructure investors close to \$150 million in Latin America and the Caribbean, and medium-term growth promises to be substantial.

About one-fourth of MIGA's active applications for guarantees are for projects in LAC countries, including about 104 infrastructure projects. MIGA is already covering such projects as investments in two cellular phone systems in Chile, privatization of the telecommunications industry and a power transmission system in Argentina, a power plant in Honduras, and, most recently, a diesel power station in Jamaica. The power project in Honduras involved other bilateral and multilateral institutions, including the IFC. In light of current trends, MIGA expects to witness continued growth in guarantees for LAC infrastructure projects.







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