Overview: Private Sector Development and Infrastructure (PSI)

Outline

1. Introduction

This overview summarizes the major policy and program choices that are available to governments in meeting their growth and equity objectives through infrastructure interventions. It is intended to help readers in integrating the guidance provided in the individual infrastructure chapters; it is these chapters that will assist governments in preparing detailed policies, strategies, and actions for each sector.

The infrastructure chapters all concern products and services that are best provided to households and firms—by either governments or the private sector—in the context of government regulation that allows them to function efficiently and equitably. A **Mining** chapter is included in the overall infrastructure section due to the importance of governments in regulating this otherwise privately run sector. The summary recommendations for government interventions outlined in this overview chapter, however, apply mostly to the non-mining parts of the infrastructure section.

As noted in Chapter 1, poverty reduction can be measured by improvements in four dimensions: economic opportunities, capabilities, security, and empowerment. Households will experience changes in these dimensions in two primary ways: 1) increased consumption that results from growth in household incomes, and 2) increased access to and consumption of goods and services that are made more affordable by efficiency improvements, and/or government actions in support of meeting social equity objectives.

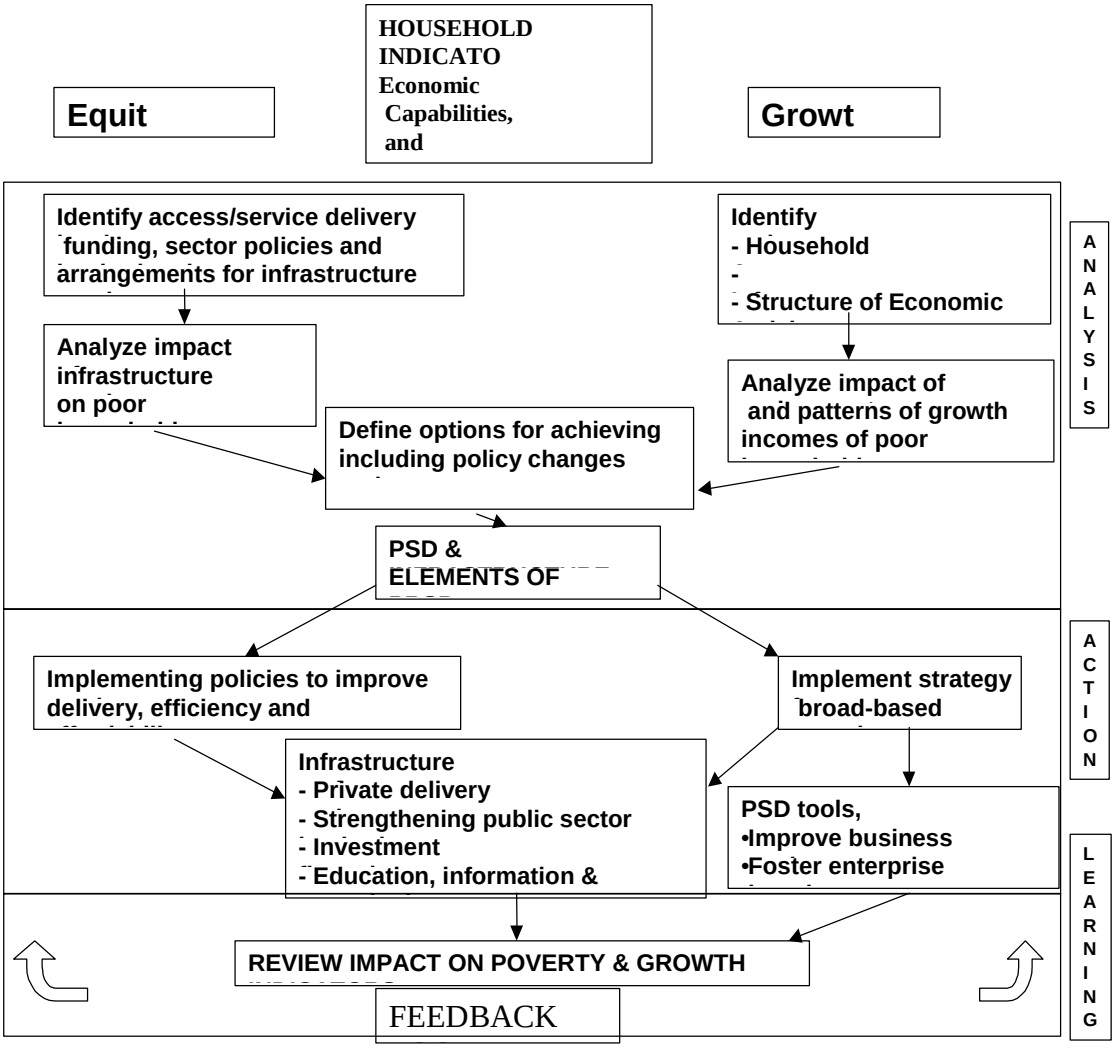
Beyond the limited role of public sector employment, incomes of poor households result from private sector activities such as sale of food and cash crops, labor, and other services. These activities are affected by quantity, quality, and reliability of access to infrastructure services. Also, several measures can help support the income and growth-generating activities of the poor. These include support to small- and medium-size enterprises (SMEs) and labor market intervention like training, and home-based income -generating activities (see the **Urban** chapter, section 2.1.1).

The availability of modern infrastructure also increases the value of the main asset of the poor, that is, labor, by reducing the time that households spend on basic subsistence activities, the time that women spend on domestic chores, and the time lost through health. However, infrastructure investments have a strongly complementary relationship with other physical and human capital in a process of balanced growth. Consequently, governments should make investment decisions based not only on the immediate economic impact of a specific infrastructure investment but also on its potential impact on overall growth. Such an analysis is normally undertaken in the context of evaluating a country's growth patterns.

Household consumption is influenced by the need for, and availability of, infrastructure services and especially by the affordability—determined by price levels in relation to household incomes—of these services. Governments can influence these prices through a variety of measures that either increase efficiency of service provision—for example, competition policy and increased private sector provision—or through subsidies that result in prices below the cost of service provision generally, or for targeted groups of households.

A conceptual framework that captures these relationships is outlined in Figure 1 and is applied in the sections that follow.

Figure 1. Private Sector Development, Infrastructure and Poverty Reduction: A Conceptual Framework



The rest of this Overview chapter is organized into three sections. The first discusses the analyses that would be helpful in clarifying the issues that must be addressed in developing infrastructure interventions to contribute to poverty reduction. The second sets out the range of options that governments may consider in detailing their strategy. The third briefly discusses practical steps and approaches to get started.

2. Analysing poverty linkages

It is important for policy makers to understand how the various infrastructure sectors affect the growth and equity dimensions of poverty reduction. Potentially significant linkages can be identified between household well being and sectoral activities, that is, the impact of sectoral indicators on poverty indicators. These linkages are discussed at length in each sectoral chapter, and are summarized in Box 1 below, under the four steps that could be followed in preparing infrastructure components of a national poverty reduction strategy. These are: 1) analyzing impacts of infrastructure on poverty; 2) developing intermediate sectoral goals; 3) designing policies and programs; and 4) assessing fiscal implications of policy and program changes. The analysis at the country level would investigate the specific nature and extent of these linkages.

Building on these potential linkages between these four categories, some measurable indicators of infrastructure services are suggested in the sectoral chapters. In general, there are two basic types of indicators: 1) service delivery indicators that measure the quantity, quality, reliability, accessibility, and affordability of infrastructure services, including education and health where appropriate, and 2) other indicators that, where applicable, measure the environmental impacts, level of regional integration, trade, and competition. The first step for users, then, is to measure the current level of these indicators in the country. Governments should find this information particularly useful by comparing the status of their country with appropriate benchmarks, such as the indicator levels in other countries at a similar level of development.

Box 1. Linkages Between Household Well being, Sectoral Activities, and Government Policies and Programs, and Their Fiscal Implications

Steps	Equity Impact on Household	Influence Patterns of Growth
1. Analyse Poverty Impacts Define impact of infrastructure on poverty outcome indicators, based on country-specific data and international norms	1. Capabilities: • Health • Education 2. Security 3. Empowerment – e.g. benefits from reduced time burdens	1. Enhanced income generation through: • Increased factor accumulation • Increased factor productivity 2. Reduced opportunity costs: • Increased convenience • Time saved • Health benefits, etc. 3. Sustainability of resource use--environmental aspects
2. Develop Sectoral Goals Define changes in intermediate sectoral indicators	1. Increased access through: • Increased availability • Increased affordability 2. Health indicators , if applicable 3. Education indicators , if applicable	1. Service delivery indicators: • Cost efficiency • Supply reliability • Supply quality 2. Environmental impact 3. Regional integration, trade, competition
3. Design policies and programs	1. Programs to increase availability and affordability and/or quality	1. Competition policy 1. Regulatory framework 2. Governance 3. Privatization, PPI
4. Evaluate fiscal implications of policy & program changes	1. Restructuring of Subsidies	1. Changes in government income, or tax revenues, and expenditure (public financing of investments)

Benchmarks for equity–that is, household access to and consumption of infrastructure services--are often available. Urban and rural benchmarks would be expected to vary and should be considered separately. As discussed earlier, the impact of infrastructure on growth is interlinked with other sectors. Consequently, benchmarks for measuring infrastructure impact on growth are less readily available. Proxy indicators that could be used are those that indicate whether demand is being fully satisfied at full cost recovery rates–for example, absence of backlogs or waiting lists.

Several methods may be used to identify country-level equity and growth indicators that would facilitate assessing their present situation. The sectoral chapters provide sources from which countries can find international and regional averages that may be used as benchmarks. Among the methods for collecting relevant information are household and or community surveys, which may entail stand-alone surveys or 'piggy-backing' on other poverty research efforts. Also, data on users and their needs, audits of physical, educational, and institutional infrastructure already in place, and information on business services are often collected by statistical offices, academic and research institutions, and universities.

The useful step is to assess the present situation in the specific country and, by comparing the outcome with the established benchmarks, based on industry or regional norms to identify critical gaps. The information gathered could be used in conducting a service gap analysis and poverty mapping (see **Urban** chapter, sections 1.2 and 1.3). A development gap could be examined by assigning a score based on attributes of the sector. Where the score indicates that a development gap exists, this area should become a priority for reform (for examples and details, see the: **Energy**, section 3.5; **ICT**, section 4.1; **Water**, section 4.1).

3. Assessing Options

After examining the gaps revealed by country-level indicators compared to the benchmarks, governments will need to consider the poverty goals that they want to achieve in the medium term and the associated changes in sector performance that would be reflected in sectoral indicators. Along with these goals, they could analyze the options available to change existing, or introduce new, policies and programs to improve sector performance as measured by the indicators (for a discussion, see the **Urban** chapter, section 2.3).

These options can be grouped into four broad categories, which are dealt with in turn in the subsections which follow.

- Sector reforms to increase competition in service delivery and regulation of service quality and prices.
- Changes in service delivery mechanisms , including privatization
- Changes in service funding, including subsidies
- Institutional reforms

A more general objective is to minimize the fiscal costs of public actions. Furthermore, during the option analysis phase, the governments can consider potential complementarities as well as trade-offs, for example:

- Within each infrastructure sector, that is, where the analysis indicates that equity and growth objectives are closely interlinked and require the same policy reform and program changes;

- Across infrastructure sectors, that is, where the analysis indicates that a consolidated package of infrastructure services is needed to have a positive impact on equity and growth; and
- Where complementary choices are not available, options can be developed that maximize improvements in service delivery and access indicators. For example, where governments would like to increase service delivery performance, they could choose private investment and participation in the context of increased competition in the sector, which also has the advantage of reducing fiscal costs. Similarly, if governments would like to increase access, they also could choose from a variety of instruments with differential fiscal impact, such as rollout obligations in concession agreements and cross-subsidies.

This phase of setting goals and designing options is closely linked to the overall PSRP, including the **Rural** and **Human Development** chapters. Parts of the process that relate to consultations with communities to establish priorities and preferences will overlap and need to be integrated with the larger participation process specified under the **Participation** Chapter. However, special attention will need to be given to including infrastructure and PSD specific stakeholders, such as network and non-network service providers and commercial users, in the consultation process.

Option 1: Sector reforms

International experience has shown the potential payoff of measures to increase competition in service delivery, and of separation of policy development from service delivery and regulation. Sector restructuring and enhanced competition have often led to improved service delivery and an improved fiscal situation. However, because the sector reform process is complex and can entail political costs, it needs to be managed carefully. The technical parts of the process—increasing competition in service delivery and price and service quality regulation; and, regulatory institutions—are discussed below. Separating the roles of policy development from service delivery and regulation is discussed under Option 4 (Institutional reform).

Increasing competition in service delivery

Traditional utility-type services like telephones and electricity are delivered through networks connecting many consumers. Historically, it was not considered feasible to have competition in delivering these services and these utilities were considered natural monopolies. However, technological changes in many infrastructure services, such as mobile phones, efficient small-scale electricity generators, electronic metering, and billing of a range of utility services, have created possibilities for competition by restructuring the network service delivery system.

Another way to increase infrastructure service delivery is to encourage the entry of small alternative service providers, competing with, or complementary to, traditional utilities whose services may not reach the poorest households. Higher unit cost or lower quality of alternative service delivery has often led to these service deliverers being ignored or even legally prohibited by policymakers (see, for example, the **Water and Sanitation** chapter, section 2.4). But it is clear they can play an important role in supplying communities ignored by traditional network delivery, even if only on a transitional basis until conventional services can be provided. Frequently, rural populations cannot be efficiently served by traditional networks because of the physical dispersal and small concentration of communities combined with lower monetary incomes than urban populations. As a result, service delivery for these rural communities entails

reliance on alternative technologies and strategies. (For more details, see the **Energy** chapter, section 4.7.)

In addition to privatization of incumbents in order to level the playing field (discussed separately below), the main elements and options to increase competition through restructuring the main network service providers are:

- Horizontal unbundiling, or introducing competition between industry participants, for example, multiple electricity generators competing with each other.
- Vertical unbundling, which separates operation of the different sectors, for example, separating production from transmission, facilitating competition within unbundled sectors;
- Free entry, enabling new entrants or the threat of new entrants, which can provide strong incentives for existing service providers to improve their services. Unnecessary restrictions on entry should be removed, and any residual licensing should be minimized to that necessary to ration scarce resources or guarantee minimum quality of operators.
- Competition for the market, or introduction of competitive processes used to award the right to serve a group of customers in areas where it is not possible to have multiple operators–for example, a transmission grid

Measures to enable alternative providers to emerge could include.

- Lifting legal prohibitions on entry into the market--for example, eliminating monopolies, avoiding exclusivity provisions in contracts;
- Removing biases against small operators in tariffs, quality, and other regulations;
- Providing effective, simple rules preventing small operators from engaging in unsafe or environmentally harmful practices;
- Assisting small operators to provide lower-cost, higher-quality services by facilitating interconnection with formal network operators, where requested.

Potential benefits from alternative providers to poor households include provision of services in areas where network services are physically unavailable. Despite often higher per unit cost than formal utility services, consuming small quantities may be more affordable for poor households because of the absence of large up-front expenditures such as connection charges. The choice of services can be adjusted to households' needs and affordability--that is, they can reduce or discontinue purchases when their incomes are temporarily reduced. Another advantage is that alternative priorities tend to be more innovative than traditional utilities in payment methods offered--tariff schemes and credit arrangements. Finally, these providers are a potential source of employment for the poor.

Price regulation

Price regulation is normally required in markets that have the characteristics of natural monopolies and are not fully contestable–for example, electricity transmission; or a water distribution company, which has been granted an exclusive monopoly. At the same time, the starting point in infrastructure service pricing is that total revenues must cover the total costs, including operations, maintenance, capital replacement, and network expansion. Unless costs are covered, a vicious cycle of declining service, reduced payments by customers, and insufficient revenue to improve service will likely result.

Various tariff schemes can be used to ensure that poor households bear relatively less of the burden of the fixed costs than other consumers–for example, richer households or business consumers. However, if prices for new connections are set below the cost of supplying people in remote or high-cost locations, the service provider will have little incentive to make those new connections. It is possible to mandate these provisions, for example, by Universal Service Access, although care is needed to ensure that the entire operation does not become unattractive as a consequence. Households without access to network services do not benefit from price regulation that makes it unprofitable to serve them without compensation elsewhere.

In determining how to regulate prices, governments should consider:

- Establishing objectives for price regulation that are consistent with sectoral and poverty goals. For most developing countries, expanding access is usually the primary objective for network services, whereas in middle- and higher-income countries, the objective may be to control prices for those who already have access. The different emphasis in low income countries suggests that pricing arrangements which allow for sufficient revenue to be generated to finance increased investment may be needed. Nevertheless, the issue of affordability is also a significant problem.
- Reducing administrative price regulation where competition among suppliers and from substitute products is sufficient to keep prices as low as is viable. For example, unbundled infrastructure sectors, such as electricity generation or mobile telecommunications, sectors with sufficient numbers of alternative service providers, for example, water vendors, and sectors with substitute products, for example, alternative fuels competing with electricity, could be considered for less intensive forms of price regulation.

Less intensive forms of price regulation could include the following measures:

- Monitoring and publishing prices, enhancing public awareness of the reasonable prices, and signaling market opportunities for potential rival suppliers.
- Freeing prices, but granting a reserve power to a regulator to set prices if they become excessive.
- Setting a relatively loose ceiling for infrastructure service prices.

Regulation of service quality

Care is needed to ensure that quality standards are not set any higher than necessary to achieve public policy objectives--that is, to ensure accessibility to, and availability, affordability, and sustainability of, the basic infrastructure services to all households. Higher quality usually implies higher costs, which may result in infrastructure services becoming unaffordable to the poorest households. Permitting differing quality levels with corresponding price differentials may be a good way of improving the affordability of infrastructure services. The ability to offer multiple price and quality options may be enhanced in an environment where additional suppliers are free to enter, and different operators can offer different types of service.

Regulatory Institutions

There is considerable international experience in institutions regulating private infrastructure services. A regulatory agency is usually required to administer pricing and interconnection rules, to monitor compliance with these and other norms, and to enforce the rules, directly or through the courts. These demanding tasks require skills in economics, finance, law, and other disciplines, as well as integrity and political acumen. Adequate and secure funding is required to ensure that regulatory agencies have access to appropriate expertise. Where agencies regulate prices or resolve disputes, it is important that they operate independently of regulated firms and short-term political influences. Safeguards of independence include appointing regulators on technical rather than political criteria, ensuring terms of appointment do not coincide with political terms, and providing protection against dismissal without just cause. Independence needs to be balanced with accountability to ensure that regulators fulfill their statutory duties. Accountability measures include scrutiny of expenditures by the government and legislature, annual activity reports, public reporting of decisions, explanation of reasons for decisions, appeal to the courts, or specialist appeals bodies and processes for receiving stakeholder views. For more in-depth discussion, see the **Governance** chapter.

Option 2: Changes in service delivery mechanisms

Options for service delivery, other than government departments and parastatals, include corporatized entities that are owned by the public sector but function under private sector rules in a competitive environment. Also, across the telecommunications, water and sanitation, energy, and transport sectors, the private sector is making a growing contribution to the investments needed to provide infrastructure services in developing countries. Infrastructure privatization can bring significant additional resources to the sector. Also, competitive environments have been more efficient than the public sector in delivering less expensive, reliable infrastructure services to the whole community, including the poorest households. The competitive advantage of the private sector has been in its sharper attention to the costs of service and to the demands of consumers.

About 15 percent of investments in infrastructure in developing countries are now made by the private sector. Annual private infrastructure investment commitments grew from $16 billion in 1990 to $66 billion in 1999, with a total of $575 billion during the decade. Donors are increasingly reluctant to assist in financing infrastructure services that could be developed and operated by the private sector, and annual private sector long-term financial flows to developing countries are now around five times those of donors. Yet Africa is an important exception to this experience; there, private sector investment in infrastructure is still low.

There are large challenges in moving to private delivery of infrastructure services, a complex process, which needs to be accompanied by the market structure reforms and regulatory reforms discussed earlier. Managed carefully, the reform process offers more efficient infrastructure services, with increased consumer access and cheaper and more reliable infrastructure inputs into other businesses. Poverty can thus be lessened through expanding economic opportunities and by directly improving the services available to the poor.

Privatization

Almost every country has begun to privatize its formal infrastructure utilities in some form. Privatization is used here as a general term covering a range of options for involving the private sector in service provision. The main options available for privatization and key features are shown in Box 2 below.

Box 2 . Main Methods for Privatization

Option	Asset ownership	Operations and maintenance	Capital investment	Commercial risk	Typical duration
Service contract	Public	Public and private	Public	Public	1-2 years
Management contract	Public	Private	Public	Public	3-5 years
Lease	Public	Private	Public	Shared	8-15 years
Concession	Public	Private	Private	Private	25-30 years
Build-operate-transfer (BOT)	Private and public	Private	Private	Private	20-30 years
Divestiture	Private	Private	Private	Private	Indefinite

An over-arching rationale for privatization is its potential to create more efficient firms and to stimulate economic growth, generating the conditions for poverty reduction. Apart from positive aggregate growth, effects privatization's direct effects on poor households may be mixed—usually with some early negative effects in exchange for greater longer-term positive outcomes:

- Employment consequences may be mixed, sometimes with a short-term decrease in employment in the affected industry, but greater longer-term increases in employment in other industries as a result of improved reliability or cost of the privatized service.
- More efficient firms may offer lower prices, benefiting all consumers.
- Access to private financing may lead to increased investment and hence improved access to services by the poor.
- Private investors will, however, require cost-covering tariffs. If tariffs are initially below cost, tariffs will need to rise, to the short-term detriment of all consumers. In the medium-term, these changes generate the funds needed to pay for enhanced investment and maintenance and should result in improved services for all.
- More efficient operators are unlikely to tolerate illegal connections or theft of services. To the extent that poor households engage in these practices they are likely to suffer from privatization.

Governments must give careful attention to the design of their privatization processes to maximize the positive and minimize the negative consequences for the poor. The terms and conditions under which infrastructure privatization occurs will have an impact on the poorest households. As a result, governments should seek to include contractual conditions at the time of privatization that will improve service delivery to poor households. Box shows some options. The governments also should ensure that privatization leads to by competing firms, rather than a private monopoly. This will result in faster service expansion, more rapid introduction of modern technology, and potentially higher employment growth (see **ICT** chapter, section 4.2). In addition to avoiding private monopolies, governments should also avoid exclusive licenses,

service standards that force the use of particular technology, and high fixed administrative costs for businesses entering the market (see **Water** chapter, section 4.1.1).

Box 3: Infrastructure Privatization and the Poor

Measures maximizing the benefits of privatization to poor households could include the following:

- If the greatest problem facing poor households is lack of access to network infrastructure, a concession contract could be awarded to the firm that commits to connect the greatest number of new consumers during the period of the concession.
- If the greatest problem is the price of services, the contract could be awarded to the firm that commits to the lowest prices to consumers within a given set of minimum standards.
- If the primary motivation for privatization is raising revenue for the government budget, it is important that the regulatory environment be established in advance, including any obligations to expand connections and arrangements for setting future tariffs. Privatization of a monopoly without any restrictions on tariffs or other business conduct might raise the most revenue, but the resulting private monopoly is likely to behave contrary to the interests of the poorest and may not be politically sustainable.

Examples from the specific sectors include the use of negative concessions in privatization contracts (**Transport** chapter, section 2.2), benchmarking utility performance based on coverage in poor neighborhoods (**Water** chapter, section 4.1.1), and concessions with investment obligations (**Energy** chapter, section 4.6).

A strong political commitment is required to successfully manage reforms that adjust market structures, introduce new regulatory arrangements, and increase private sector delivery of infrastructure services. Success also requires rigorous management, a high degree of technical skill, careful attention to stakeholder concerns, and transparency and fairness. Prospective private sector investors should also be consulted for their views about the local environment and their ideas about what is possible.

Infrastructure privatization processes may well take one to two years to finalize. When entering into what may be a 25- to 30-year contract with important consequences for citizen well being, it is important that all of the necessary reform preconditions are put into place before privatization. These include the following:

- Government needs to set up its own unit to manage the reform process and to coordinate the work of advisors. The reform unit should have highly skilled staff, should receive strong political support, and should have good access to political decision-makers.
- Help is available for the reform process. One of the best sources of advice will often be other people who have gone through similar processes. Donors have a range of technical assistance methods available to support infrastructure privatization, and private consultants offer a wide range of supporting services.
- Requiring prospective investors to compete with each other for privatization contracts is the most effective way of ensuring that the best-qualified firm is chosen. Competitive processes almost always yield better terms than negotiated contracts, and they stand up better to political scrutiny.
- Addressing the key challenge of consumer tariffs. If prices are below cost, a transition path will need to be established to ensure that the sector can be returned to cost recovery, permitting private investors to make a reasonable return while expanding and improving service delivery.

Option 3: Sources of funding and subsidies

Funding sources for delivering infrastructure services include direct users, or user charges); other users, or cross-subsidies within the sector; and other taxpayers, or subsidies from general government revenues. Interior physical access to infrastructure services is often accompanied by lack of affordability for poor households when they are available. Subsidies may be used to address these problems; however, it is important that government objectives be clear and that the chosen subsidy arrangements be sustainable and well-targeted (see also **Social Policy** chapter for further discussion).

A subsidy exists when users receive services without bearing the full cost of those services. Costs still need to be covered, including operating expenses, maintenance, replacement investment, and system expansion, to avoid progressive deterioration in service quality and ongoing failure to extend services. The potential funding sources are taxpayer revenue or revenue from other service users. Box 4 below provides a set of considerations that governments should take into account while designing a subsidy scheme.

Potential subsidies need to be evaluated according to criteria such as: coverage, or extent to which the poor are reached; targeting, or share of subsidies to where the poor live or work, and geographic distribution, predictability, or reliability of receiving subsidies; price distortion and unintended effects; fiscal costs (direct and indirect) of subsidies; delivery mechanisms; and ease of administration. There are a variety of methods for providing subsidies. These include general price subsidies; lifeline subsidies, restricted to basic need levels; burden limit, or share of household income spent on service; and cash transfers. (For a sectoral application, see the **Energy** chapter, section 4.2).

Box 4: Subsidies as Part of the Reform Agenda

General considerations that the governments should take into account while designing a subsidy scheme include the following: (Waddams Price, 2000)

- Identify the motivation for the subsidy? Is it economic efficiency? If so, connection and rental should be subsidized. Or is it equity? If so, particular groups should be targeted. Or is it on political grounds? If so, it may be important to identify the powerful potential 'losers' and find another way to compensate them so that overall gains from reform are not jeopardized. Where reforms generate winners and losers, the losers tend to identify themselves in advance and organize themselves in opposition, while the winners are likely to be dispersed and less well organized.
- Determine whether the subsidy is temporary or permanent; if temporary, make a credible timetable and arrangement for its removal.
- Subsidies require information about costs and demand. This information is needed, to provide an initial baseline and to monitor changes.
- Ensure that the regulatory system is sufficiently strong and knowledgeable to handle these issues. There are arguments for close connections between infrastructure regulators to share knowledge, since many of the issues, and some of the household demand information, will be common across industries.
- Identify the opportunity costs of subsidies. If subsidies are direct, how else might the funds have been used, and what is the cost of raising them? If cross-subsidies are involved, what are their distortions and equity implications?

Meeting poverty objectives while restructuring utility cost recovering policies involves the following considerations (see **Water** chapter, section 4.1.1 for sectoral application):

- Avoiding "reverse cross-subsidies"—ensuring that poor people are not charged more for their water than better-off users.
- Whether there are ways to Identify the poor and provide direct government payment to the utility for a portion of their bill.
- Seeking to ease the cost of connections for low-income users by subsidizing connection costs, or by allowing connection fees to be spread over a longer period, and included in monthly bills.
- Using a lifeline tariff—charging a low, often flat, rate for low-income or low-volume users. A typical ceiling for the tariff would be 6-8 liters of water per capita per day

Most subsidy schemes exclude some poor households, (errors of exclusion), while providing benefits to some richer households, or errors of inclusion.[1] This is a general challenge for targeted programs (see **Social Protection** chapter). Difficult targeting issues arise when funds are insufficient to subsidize all of the target groups. A useful principle to follow is to prioritize resources according to greatest impact. Where the benefits appear to be equal, the alternative that is less costly should be selected. On this basis, for example, network expansion funds could be directed to periurban areas rather than rural areas. Or, if poverty is greater in rural areas, the scarce funds might be directed to alternative lower-cost interventions in rural areas. The trade-offs between potential beneficiaries may be more easily considered when subsidies are direct, for example, cash grants, rather than indirect, for example, cross-subsidies.

In allocating subsidies, it is desirable where possible to use a competitive allocation mechanism. For example, in the mid-1990s, Chile used a universal access fund to increase access to telecommunications services for about one third of those households in rural areas who did not previously have access. The government identified target regions, and through a competitive-lender awarded a subsidy and a non-exclusive license to the firm asking for the least subsidy to meet certain target outcomes—for example, number of public pay phones in the region. In this way, Chile could carefully ration its universal access fund, generating around $40 million of additional private investment while spending just $2 million of public funds.

[1] These errors can often be remedied by adjusting the subsidy scheme with experience. For example, in 1989 the drinking water subsidy scheme in Chile reached only 14 percent of the target group, but by 1997, almost 75 percent benefited, by gradually altering the quantity of water subsidized and the level of the subsidy, and by extending the conditions for a household to qualify. Institutional changes were also important. The water companies were allowed to inform municipalities about households that seemed to be struggling to pay bills, thereby identifying likely targets for subsidies.

Box 5 presents some general factors to consider in assessing options to subsidise infrastructure access.

Box 5: Options for Subsidy Design and Financing

Objectives clarify. While improving the living conditions of poor households is often the stated goal, subsidized services of network infrastructure are only one among several important items of consumption, such as food, clothing, and housing, which could be subsidized. Cash transfer payments may allow poorest households more choice in selecting consumption items(see **Social Protection** chapter). Public health or environmental issues may provide justifications for subsidizing certain infrastructure services; for example, subsidizing water and sewer services may reduce outbreaks of disease. Infrastructure subsidies may be less administratively costly than a social protection system making cash transfer payments to poor households.

Targeting subsidies. Budget constraints, mean that some means of identifying poor beneficiaries is needed. Possible identifiers include household characteristics, for example, living in a particular region; retired; or single parent family; or demand characteristics, for example, using prepayment methods that are prevalent among low-income groups. Alternatively, some subsidies are universally available, such as lifeline tariffs where the first one or two consumption blocks are sold below-cost to assist low-consumption households. See **Social Protection** chapter for further discussion.

What should be subsidized? Infrastructure pricing typically has three elements: a one-off payment for connection, a fixed monthly rental payment, and a per-unit consumption payment. Where the poor lack access to infrastructure services, they are more likely to benefit from subsidized connections rather than subsidized rental or consumption. Where the principal problem is affordability for those who are already connected, targeted rental or consumption subsidies may be more appropriate.

To whom should the subsidy be given? Regardless of whom are the ultimate beneficiaries, subsidies can be delivered to consumers or producers.

- Delivery to consumer has the benefit of reaching the target group directly but may be more administratively complex than paying producers. These subsidies can be delivered through lower prices or subsidized credit; universally or selectively; to individuals or communities
- If subsidies are delivered via the producer, the amount of subsidy can be used to compensate the producer for some part of the service delivered below-cost to target households. When firms are responsible for delivering subsidies, they may need to establish cross-subsidies. Cross-subsidies may be applied between different groups of consumers, for example, from industrial to residential consumers, or within consumer groups, for example, from one group of households to another.

How should subsidies be financed? The two basic sources of finance for subsidies are general tax revenue and cross-subsidies. A third, hybrid, financing source is an industry levy, which is raised from all operators in an industry, and then used to subsidize particular target groups, for example, all telephone companies pay one percent of their revenues towards a universal service fund, which subsidizes network expansion in rural areas.

- Cross-subsidies often have the undesirable consequence of encouraging increased consumption by some consumers, thereby indirectly raising costs for all, and directly impose costs upon other consumers who must pay higher prices to finance the subsidy. Cross-subsidies are often regarded as inconsistent with competition. In a competitive market, attempts to raise prices above cost will lead to cherry-picking of high-price consumers by competitors, leaving no one to bear the costs of the subsidy. The effects of a cross-subsidy can be reproduced in a competitive market through an industry levy on all operators, the proceeds of which can be allocated to subsidize particular consumers. Because of the importance of competition in providing increased services to the poor, industry levy schemes may be more appropriate than monopoly franchises that support nontransparent cross-subsidies.
- General tax revenue has the advantage of not distorting prices in the target industry, but imposes costs elsewhere in the economy.

Careful consideration is needed as to whether the costs of infrastructure subsidies are justified (see Box 5). Direct costs to be considered include the costs (higher prices)imposed on non-beneficiaries, and the administration costs, incurred by the companies and by the government. The administration costs involve the salaries of those involved and the opportunity cost of scarce professional skill which could be used in other parts of government for other purposes. Consideration should also be given to the opportunity costs of using funds to subsidize infrastructure services. Should a funding source be used to extend telecommunications services to the rural poor, or to provide better education, or any other potential use of public funds? The trade-offs between the costs and benefits of subsidy schemes should occur in the framework of general public expenditure review, and should extend to consideration of less transparent cross-subsidy schemes.

Option 4: Institutional reform

A government can work to maximize the benefits of infrastructure reforms by assigning appropriate roles to itself and its various entities. The critical role of government is to ensure that services are available and delivered to poor households. This responsibility does not necessarily require that the government deliver these services itself, as the preceding sections have shown. The inescapable aspects of this responsibility are to make policies and write rules--laws or regulations--by which the system must operate, and to ensure these rules are enforced.

In addition to policymaking and regulation, government needs to allocate budget resources to support these policies. The **Public Spending** chapter highlights general principles that apply. In this context, the role of civil society and sub-national governments in public resource allocation should be identified. Governments may also reorganize themselves to be more poverty focused and efficient in fulfilling their governance functions. Often this entails building new capacities at central and local levels. It is particularly important in increasing the participation of the poor in the decision-making process (for a sectoral application see the **Urban** chapter, section 2.1.5).

When a government agency must deliver a service, it is critical that the regulatory responsibility for the service is outside of that agency in a body with the characteristics and responsibilities previously discussed under “Regulatory Institutions.” This omission, which is frequent, usually results in poor performance of public service delivery.

Further, where services are publicly delivered, government should also focus on ensuring that the delivery agency is guaranteed managerial autonomy in the use of assigned resources and in staffing decisions. Transparency of operations and accountability for results are also critical.

4. Implementing the Framework in the PRS Process

The analysis and review of options described above will reveal difficult choices to be made. Choices for infrastructure sectors need to be considered and prioritized in the context of strategies for other sectors, which would also be formulated as part of the Poverty Reduction Strategy process. Further, budgetary choices and their fiscal implications would need to be considered during the associated budgeting process.

It is reasonable to expect that especially during the initial PRSP cycle, data and resource limitations will constrain governments' ability to undertake comprehensive analysis. Often, for example, information will be available on infrastructure supply, especially for network supply, for

roads and power, water, and telecommunications utilities, but much more limited information is available on household and commercial consumption of infrastructure services, which are self-provided or provided by non-network suppliers, for example, small-scale suppliers of water or nongrid electricity. Similarly, while many countries now have regular surveys of household income and consumption, the availability of surveys on the impact of infrastructure access and constraints on farms and firms is much more limited.

Considering these circumstances, it is suggested that governments adopt a phased strategy:

- First, focus on readily determined impacts, for example, expanding service access to the poor while minimizing the fiscal and public capacity burden by leveraging as much private sector, non-governmental organization (NGO), and community resources as feasible.
- Simultaneously, identify key information gaps to be addressed in time for the next PRSP cycle. Options include leveraging existing survey resources and capabilities, for example, by expanding the content of Living Standards Measurement Surveys, and identifying how new surveys, for example, service delivery surveys, firm surveys, can be undertaken by incrementally building on domestic survey and analytical capabilities as much as possible. Using NGOs and communities in data collection activities has the added advantage of raising stakeholder awareness.

It is to be expected that the first round of implementation of the described framework will not produce completely satisfactory results. Monitoring and evaluation of the process and results in comparison with the objectives and targets will be critical to learning what parts of the process should be adjusted. Also, the lessons learned should offer guidance on what adjustments should be made. (see the **Monitoring and Evaluation** chapter).

Assessing the poverty outcomes of infrastructure services requires re-examining the linkages between household well being, sectoral activities, and government policies and programs and their fiscal implications. It involves reassessing whether the needs, constraints, and opportunities have been appropriately identified. Publicizing the results to stakeholders, including the poor, is critical to the process. (See **Water** chapter, section 5.0. for sectoral application)

Evaluating the changes in impact indicators may use several instruments: 1) household surveys; 2) focus groups; 3) visual observations; and 4) analysis of official records (see **Transport** chapter, section 5.3). Several monitoring and evaluation indicators are suggested in **ICT** chapter, Table 4.1, and in **Urban** chapter, section 2.2. These chapters include indicators of the sector, macro and enabling environments, program content, access to infrastructure and impact on household, communities, and organizations, to help guide appropriate choices in-country.