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***Making Infrastructure Reform Work for the Poor:
Policy Options based on Latin American Experience***



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Foreword

Throughout Latin America 125 million people still lack access to safe water; 200 million are without adequate sanitation; and an estimated 70 million still lack access to modern energy supplies. In consultations with poor communities, lack of access to infrastructure services is consistently mentioned as one of the major obstacles to improving their lives. To serve these mostly poor people and meet the needs of the region's growing population Latin America will need to invest more than \$70 billion a year in infrastructure from now to 2005. The public sector cannot do it alone. Private capital will be needed to meet the challenge, but governments must channel that capital with sound policies and regulations. The key to success is getting those policies and regulations right.

This paper explains the numerous ways in which infrastructure reform may impinge on the welfare of poor households. It identifies a broad menu of policy instruments for attenuating the impact of infrastructure reform on the poor, and provides guidance on how to define the appropriate social strategy for any particular country or infrastructure sector. Finally, it underlines the importance of integrating social concerns within the privatization process and the regulatory framework, and ensuring that these are coherent with wider policy on social protection.

The ultimate goal is to provide practical guidelines and methods to help policymakers, reformers and regulators develop diagnostics of these infrastructure needs and to ensure that strategies to address them are as cost effective as possible. It is hoped that the paper will be helpful for those working in countries about to embark on infrastructure reform, or to make significant 'second generation' policy adjustments.

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Infrastructure Reform and the Poor

Since 1990, more than 120 developing countries have invited the private sector to participate in the provision of infrastructure services. Latin America has achieved a higher degree of private sector participation than any other region, attracting about 50% of private capital flows to developing country infrastructure sectors during the 1990s. Indeed by the year 2000, 90% of Latin American countries had achieved some degree of private sector participation in their electricity, telecommunications and transport sectors, and almost half have private participations in their water sectors.

Motivation for the study. Notwithstanding the widespread adoption of private sector participation, the infrastructure reform process—both in Latin America and beyond—has raised significant social concerns. Many argue that privatization leads to tariff increases that make services unaffordable for the poor, and hands over operational responsibilities to profit-orientated multinationals that have no commercial interest in extending services to urban slums and isolated villages. In a number of well-known examples, the social unrest created by private sector participation ultimately led to the demise of the whole process (Cochabamba, Bolivia), or necessitated major contract renegotiations (Buenos Aires, Argentina).

It is certainly true that distributional and social issues only came as an afterthought in many reforming countries, and were often addressed only to resolve conflicts; such as at contract renegotiations. This is a major policy failure in a region where more than a third of the population is poor. Fiscal and efficiency concerns dominated the agenda of policymakers pressed by the severity of macroeconomic problems. Indeed, almost 60% of the private capital flows to the infrastructure sectors in Latin America during the 1990s, were captured by the state in the form of privatization proceeds rather than invested directly in the sector.

Yet, overall, the infrastructure reform process has brought significant benefits to the Latin America region, generating US\$290 billion of private capital flows during the 1990s, and leading to

substantial improvements in the efficiency of infrastructure services. In Argentina, for example, it is estimated that the efficiency gains resulting from privatization amounted to one percentage point of GDP. Moreover, there have also been some positive examples of how privatization can be made to work for the poor. These examples can provide the basis for a more conscious strategy of harnessing public private partnerships to meet social objectives that cannot be fully financed through government resources.

Outline of the study. The purpose of this paper is to distill the lessons of ten years of infrastructure reform experience in Latin America about how to make infrastructure privatization work for the poor. The paper is intended for the benefit of countries that are about to embark on infrastructure reform, or to make significant 'second generation' policy adjustments. The study integrates the Latin American experience into a menu of options from which policy makers can select the most suitable pro-poor infrastructure reform strategy for any particular country of sector. As such, the paper provides a quick reference to some of the main ideas developed in the book by the same authors—'Accounting for the Poor in Infrastructure Reform: Learning from Latin America's Experience'—published in the World Bank Institute Development Studies series. The main areas covered in the paper are listed below; more detailed material on each of them can be found in the companion book.

- **Macroeconomic and microeconomic linkages.** The paper provides an overview of the macroeconomic and microeconomic transmission mechanisms through which infrastructure reform may affect the poor. The primary focus is on the microeconomic linkages, notably the ways in which reform affects access to infrastructure services by the poor, and the affordability of consuming those services.
- **Policy instruments for promoting access.** The paper identifies a number of policy instruments that can be used to ensure that infrastructure reforms result in increased service access by the poor. The advantages and disadvantages of each instrument are

evaluated, and a number of concrete examples provided.

- **Policy instruments for ensuring consumption affordability.** The paper also identifies a set of policy instruments that can be used to ensure that infrastructure services remain affordable to poor households following sector reform. As before, the advantages and disadvantages of each instrument are evaluated and concrete examples given.
- **Defining pro-poor strategies for infrastructure reform.** The paper goes on to consider how policy-makers should go about setting social priorities in infrastructure reforms, and choosing the most appropriate policy instruments in each case. The emphasis is on undertaking simple and rapid empirical diagnostics of how infrastructure services affect the poor.
- **Assuring implementation of pro-poor reform strategies.** Finally, the paper explains how the definition of a pro-poor reform strategy requires a political commitment from the outset of the reform process, as well as the adoption of an integrated approach between privatization policy, social policy and regulatory policy.

Macro and Micro Linkages between Reform and the Poor

What are the macroeconomic linkages? From a macroeconomic perspective, there are three ways in which infrastructure reform can have an impact on the welfare of the poor:

- (a) by promoting economic growth;
- (b) by affecting employment levels; and
- (c) by reallocating public expenditures.

(a) Economic growth. Infrastructure investments are an important factor for economic growth, which is one of the main engines of poverty reduction. Evidence from Bolivia, Colombia, Mexico and Venezuela, for example, indicates that a 10% increase in infrastructure stocks has been found to lead to a 1.5% increase in GDP. While, in the Latin American region as a whole, a single percentage point of growth reduces the number of

people living in poverty by half a percentage point. Furthermore, there is evidence from Argentina and Brazil that differentials in infrastructure endowments (such as roads and access to sanitation) have been a significant impediment to convergence between rich and poor regions over the last 20 years.

(b) Short term versus long term employment effects. One of the most immediate consequences of privatization and reform is the shedding of labor to raise the efficiency and profitability of infrastructure service providers. For example, in Argentina the utilities workforce shrank from 300,000 in the 1980s to around 50,000 by 1993. The immediate impact of such lay-offs can be cushioned by the design of adequate labor redundancy packages. However, in the longer run—to the extent that sector reform contributes to economic growth and thereby new jobs—the initial layoffs in the public utilities may be compensated by job creation in other sectors. The experience is still too recent to be able to draw any clear lessons, but the successes of Chile point in that direction. The transition is however a tough one and should be a major source of concern for policymakers.

(c) The reallocation of public expenditure. Infrastructure services have traditionally absorbed large volumes of public resources to cover operating subsidies and finance new investments. Sector reform and private sector participation offer the opportunity to make these sectors financially self-sufficient, thereby freeing up fiscal resources for other programs. To the extent that these funds are diverted to programs whose incidence is more progressive than that of the original infrastructure subsidies, there is potential for reform to benefit the poor. In Colombia for instance, subsidies for the consumption of utility services such as water, sewerage, electricity and gas are substantially less progressive than public expenditures on health, education and rural programs

What are the microeconomic linkages? The microeconomic linkages between infrastructure reform and the poor fall into two categories, namely those that affect:

- (a) access to services by the poor; and
- (b) affordability of services to the poor.

(a) **Access issues.** Reform and private sector participation can affect access to infrastructure services in the following ways.

- **Rising connection charges.** Reform sometimes leads to increases in the initial connection fees for infrastructure services that may historically have been provided at minimal charge. Typical connection fees charged by the private sector are of the order of several hundred US dollars, and are thus invariably beyond the economic reach of poor households, unless there is some kind of option to pay by installments. There is thus a danger that poor households may not be able to afford service connections after the reform process.
- **Diluting incentives.** Low income families tend to live in outlying settlements that are costly to serve and consume only modest amounts of infrastructure services, which they may not even be accustomed to paying for. Since private operators are driven primarily by profit considerations rather than public policy objectives, they may not find it commercially attractive to extend services to low income customers.



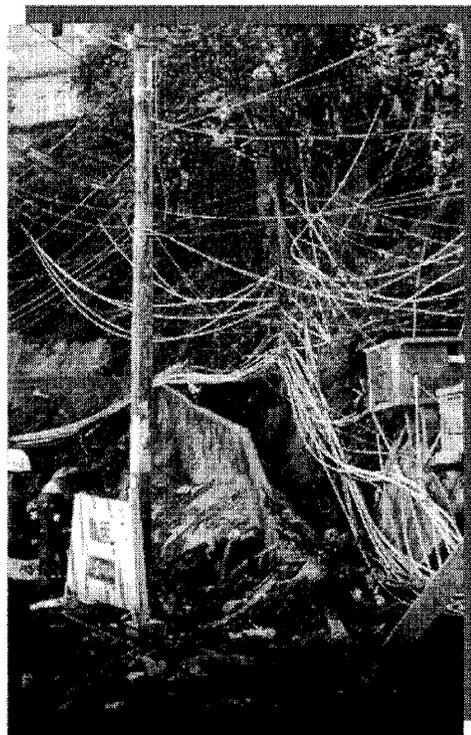
In **Colombia**, small scale entrepreneurs provide horse-drawn water deliveries to neighborhoods that lack water service.

- **Outlawing alternatives.** Many poor households rely on informal alternatives to modern infrastructure services, such as private vendors, next door neighbors or self-supply. Reform processes sometimes attempt to outlaw these small scale alternative providers

thereby reducing the options available to the poor.

(b) **Affordability issues.** Furthermore, there are a number of channels through which reform can raise affordability issues for those among the poor who already enjoy access to the services:

- **Increasing tariffs.** In order to make infrastructure services financially self-sustaining, it is often necessary to increase tariffs that have been kept artificially below the cost of provision for many years. Such tariff increases can be quite substantial (of the order of 10% to 100%) and thus may have a significant impact on the household budget of existing customers. However, it is important to note that tariff hikes are to some extent a political choice and can be significantly mitigated if the government is willing to accept a lower sale value for infrastructure assets. Moreover, where effective competition or incentive-based regulation is introduced tariffs may reduce significantly over time thereafter.



In the **Brazilian** "favelas" many households make their own informal connections to the water system, creating a spaghetti network of pipes.

- **Formalizing payment.** State-owned utilities have traditionally taken a relaxed attitude to illegality and non-payment. In contrast, private operators have a strong incentive to formalize illegal connections and enforce service payments (by means of disconnection), so as to ensure that they collect enough revenue to cover the costs of operation. As a result, following sector reform, some poor households may find themselves paying for services for the first time. However, this is not necessarily a bad thing, since illegality is often not in the interest of poor households. Informal connections are often unsafe (contaminated drinking water, risks of electrocution), and far from being free sometimes involve making substantial payments to local mafia bosses. Moreover, establishing a formal relationship with a utility can be a first step to obtaining the proof of residence necessary to obtain credit and access to other services.
- **Rebalancing tariffs.** In sectors where competition is introduced, it becomes necessary to phase out historic cross-subsidies between customer groups leading to substantial tariff rebalancing. A classic example of this is the increase in local telephone charges and decrease in long distance and international telephone charges that typically follows sector reform. To the extent that poor households make disproportionate use of services that historically benefited from such cross-subsidies, they may be adversely affected.
- **Raising quality standards.** The desire to improve service quality is often an important motivating factor in infrastructure reform. However, quality improvements generally require significant investments in upgrading infrastructure, and therefore feed through into higher service tariffs for consumers. While raising quality standards is evidently a desirable outcome, it may raise issues of affordability for low income households.

Policy Instruments for Improving Access.

How can the government make sure that the poor gain in terms of access? Whether policymakers are preparing a new reform, or fine tuning an existing reform, there are a number of different types of instruments at their disposal which can help to ensure that infrastructure reform promotes access to services for the poor. These instruments, whose main advantages and disadvantages are summarized in Table 2, fall into the following categories:

- (a) requiring operators to provide access;
- (b) reducing the cost of a connection; and
- (c) increasing the range of suppliers.

(a) Instruments that require operators to provide access. There are some regulatory instruments that can be used to counteract the lack of commercial incentives for serving low income customers.



In **Bolivia** telephone companies are meeting their contractual obligations to provide public telephone service in rural areas.

- **Universal Service Obligations.** Universal Service Obligations are typically incorporated in licenses and concession contracts and require operators to provide services within a

Table 1 summarizes the microeconomic linkages between infrastructure reform and the poor, and identifies the corresponding mitigating policy instruments that will be described in greater detail in the following sections.

Table 1: Microeconomic linkages between infrastructure reform and the poor

Access	Impact	Mitigating Policy Instruments
Rising connection charges	The connection charge may increase substantially with the arrival of private operators who must recoup the costs of network expansion.	<ul style="list-style-type: none"> ➤ Select cheaper technologies for network expansion. ➤ Provide credit for repayment of connection charges. ➤ Allow households to contribute labor for civil works. ➤ Cross-subsidize connections costs through user tariffs. Provide connection subsidies to poor households.
Diluting incentives	It may not be commercially attractive for private operators to serve poor customers who live in costly outlying areas, consume modest amounts of the service, and may not be accustomed to paying.	<ul style="list-style-type: none"> ➤ Impose universal service obligations on operators. ➤ Specify connection targets in low-income areas. ➤ Provide connection subsidies to poor households.
Outlawing alternatives	Privatization may restrict access to some alternative services, especially if connection to public network is mandatory.	<ul style="list-style-type: none"> ➤ Oblige dominant utilities to provide alternative services. ➤ Allow licensed entry of alternative suppliers. Promote partnerships between dominant utility and alternative suppliers.
Affordability	Impact	Mitigating Policy Instruments
Increasing tariffs	Average tariff levels can increase substantially (10% to 100%) due to cost recovery requirements.	<ul style="list-style-type: none"> ➤ Introduce lifeline tariffs. ➤ Apply targeted tariff discounts. ➤ Provide vouchers for services. ➤ Reduce fixed charges. ➤ Control the level of consumption. ➤ Increase frequency of billing. Use prepayment devices.
Formalizing payment	In order to improve revenue collections, private operators will formalize illegal connections and enforce billing via disconnection.	<ul style="list-style-type: none"> ➤ See above.
Rebalancing tariffs	The removal of historic cross-subsidies may accentuate increases in tariffs of services used by the poor.	<ul style="list-style-type: none"> ➤ See above.
Raising quality standards	Average tariff levels can increase, due to more demanding quality of service standards	<ul style="list-style-type: none"> ➤ Where possible, allow operators to provide different price and quality combinations to different customer groups.

Source: Own elaboration.

- specified time period to any consumer that requests them within a specified geographical area. Although politically appealing, such obligations are not all that meaningful in practice. This is because they fail to take into account the fact that low income households may not be able to afford the service, and hence would not be in a position to request it. They also overlook the fact that for communities that are entirely beyond the current network, service expansion needs to take place in a coordinated fashion, and not simply at the request of an individual.
- **Connection targets.** A tighter approach is to incorporate explicit targets requiring the operator to make a specified number of new connections within a certain time period. It is critical that the connection targets be geographically referenced to low income communities, otherwise the operator will meet them simply by taking services to the most lucrative segments of the market, (which is what would have happened anyway in the absence of connection targets). Connection targets should be carefully monitored and enforced with financial penalties. Although they represent an improvement on the Universal Service Obligation, concerns about the affordability of connection charges remain valid.

However, in practice, obligations to serve the poor are much more effective when they are combined with financial incentives. This could mean, for example, providing 'smart subsidies' to operators that connect poor consumers, or ensuring that the tariff revenue from serving poor customers fully covers the cost of service provision so that they are financially attractive to serve (even if a part of this cost is ultimately subsidized). These issues will be explored further in the next section.

(b) Instruments that reduce the cost of connection. There are a wide variety of policy instruments that help to reduce the connection costs faced by poor households. The main options are as follows.

- **Low cost technologies.** In many countries, here is a tendency to enforce rigid technological standards for infrastructure networks that are often set in industrialized countries. Although such standards guarantee a high quality service, they may also have the effect of making the service so expensive that it is unaffordable to the poor. Greater flexibility is needed to experiment with technologies that may provide a lower quality of service but at a significantly lower cost.
- **Labor contributions.** Poor households are invariably cash constrained, but may have a significant amount of their own labor time available, particularly if they live in areas affected by under-employment. It is often desirable, therefore, to allow people to contribute part of the cost of a new connection 'in kind' by volunteering their own labor to the civil works required to extend the network. Nonetheless, it is important to recognize that such volunteer labor generally requires a significant commitment from the utility in terms of training and supervision.
- **Credit lines.** One of the reasons that poor households find it difficult to pay connection charges is that they do not have any savings, nor access to credit, that would enable them to make a large capital payment. However, connection charges may become affordable if they can be spread over a sufficiently long period of time. Such credit lines can be offered directly by the utility (in the form of payment by installments) or alternatively through existing micro-credit institutions. Credits of this kind may also help households to finance the often significant complementary housing investments needed to make full use of an infrastructure connection; for example wiring in the case of electricity, and plumbing in the case of water and sewerage. There is evidence that the cost of these complementary investments may be at least as high as the connection charge itself.
- **Connection subsidies.** Where none of the previous approaches proves to be feasible, there is the possibility of providing direct government subsidies to cover at least some portion of the connection costs for customers that meet certain eligibility criteria. However, this depends on the availability of fiscal resources. Connection subsidies are relatively easy to target in the sense that a high proportion of unconnected households tend to be poor, reducing the risk of 'leakage' to unintended beneficiaries. Moreover, since the subsidies represent one time capital payments

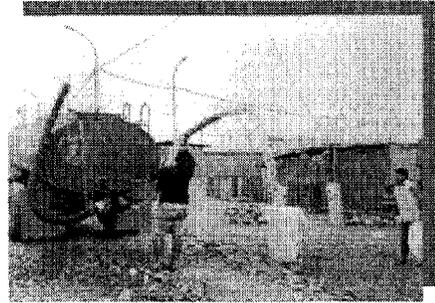
administrative costs can be kept relatively low. Finally, in some cases it may be possible to allocate connection subsidies competitively, to those operators willing to provide service at least cost. This approach has been used to considerable effect in rural telecommunications (see below).

- **Connection cross-subsidies.** Where public finance is not available, connection subsidies can also be funded by placing a general surcharge on all utility bills. This effectively introduces a cross-subsidy from existing customers to new customers, since part of the cost of network expansion is covered through the use of service tariff. This may well make sense in situations where those already connected to the network are more numerous and better-off than those who have yet to be connected. Moreover, this arrangement could also be regarded as being equitable if it is the case that existing customers received their own connections on a subsidized basis in the past.

(c) Instruments that increase supply options. Many poor households are served by small scale alternative providers rather than conventional utilities. These alternative providers frequently offer a balance of cost and quality that is better suited to low income customers than services provided by conventional utilities. Moreover, in many cases, it is simply not feasible to reach universal access to network services overnight, so that alternative services may be the only option available in the short and medium term to reach a significant portion of the population. For both of these reasons, it is important to ensure that the reform process takes into account the potential role of these providers in reaching the poor. There are a number of ways in which this might be done.

- **Broader service obligations.** In some instances there may be genuine problems with relying on alternative service providers, for example if they represent a major water quality risk, or lead to irrational exploitation of common property water resources. Where this is the case, it makes sense to redefine the legal obligation of the dominant utility from providing a particular *technology* (e.g. piped water) to providing a *service* (e.g. water to the

household) by whatever technological means is appropriate (whether it be public tanker, public standpipe, resale via a street vendor or neighbor). In this way, the dominant utility is required to take into account the needs of all the population and not simply those that are already connected to a modern infrastructure network.



In **Peru**, water utilities provide tanker service to customers who do not have piped water connections.

- **Licensed entry of alternatives.** In cases where alternative providers do not present conflicts with the public interest, they should generally be regarded as part of the solution, rather than part of the problem. Thus—far from being outlawed—they should be given full legal status equivalent to that enjoyed by the formal utility. Where feasible and appropriate, they should also be submitted to some form of appropriate regulatory control to ensure that they do not exploit their customers, either in terms of the prices that they charge or the safety of the services they provided.
- **Promotion of partnerships.** Finally, in some cases, it may be appropriate for small scale alternative providers to work in partnership with the conventional utility, building on their respective strengths and complementarities. For example, the utility may have a comparative advantage in the bulk production of potable water, while small scale providers may have a comparative advantage in billing and distributing water in precarious peri-urban settlements. The regulatory framework should be sufficiently flexible to contemplate such partnerships, where these are in the interests of the end consumer.

Table 2 provides a review of instruments, together with their advantages and disadvantages. None of these alternatives should be regarded as mutually exclusive, and indeed successful examples from Latin America combine several of the instruments.

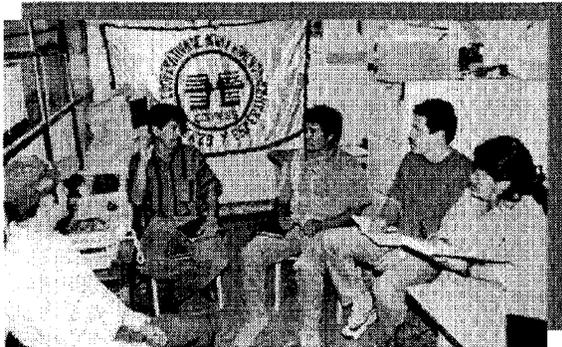
Table 2: Summary of instruments for promoting access

Instruments requiring operators to provide access		
	Advantages	Disadvantages
Universal Service Obligations	Provides a legal obligation to serve all customers, including those that may not be commercially attractive.	The obligation is rather vague, and places the onus on the customer to request the service. This may not be very meaningful if poor customers cannot afford connection charges or live far away from existing networks.
Connection Targets	Forces a concrete definition of realistic coverage targets, ensuring that unprofitable customers are served. Can be monitored and enforced by use of financial penalties.	Requires symmetrical obligation on users to connect, which limits freedom of choice. Attention must still be given to affordability of connection charges if tariffs are to be met.
Instruments reducing the cost of connection		
Low cost technologies	Improves the affordability of infrastructure connections, without generating the need for subsidies, and reduces the overall investment cost of reaching universal access targets.	May lead to reduced quality of service.
Labor contributions	Allows households to contribute in terms of an abundant resource (time) rather than a scarce resource (money). Avoids need for external finance.	There may be significant costs in training and supervising community volunteer labor.
Credit lines	Addresses what is sometimes the real underlying problem: credit constraints rather than absolute affordability.	If provided by private operator, may lead to increased risk exposure. Otherwise, requires collaboration of micro-credit institutions.
Connection subsidies	Targets subsidy funds to low income individuals. Administrative costs are relatively low as a proportion of subsidies awarded. For community level subsidies, competitive forces can be used to keep costs down.	Requires government finance and is relatively costly per household connected. User co-financing should be required to ensure commitment.
Connection cross-subsidies.	Does not require external source of funding and spreads cost over a large connected population (often with greater ability to pay than the unconnected population). Somehow equitable if connections were provided free of charge prior to privatization.	Requires the unconnected population to be small relative to the connected population. The connected population may be unwilling to shoulder the subsidy.
Instruments that increase supply options		
Broader service obligations	Ensures that an alternative is available for households who are not able to connect to the network	Except in the case of telephones, there is evidence that even poor households prefer private connections. Communal supply points tend to be unprofitable and therefore need to be closely regulated.
Licensed entry of alternatives	Provides choice to consumers. Increases competitive pressures on the dominant utility.	May make investment unattractive to dominant utility. May be difficult to regulate small suppliers to ensure adequate quality of service.
Promotion of partnerships	Improve quality of supply to communities lacking connections to the dominant utility, while reducing commercial risk to dominant utility from serving marginal communities	May be difficult to achieve collaboration between the formal and informal sectors.

Source: Own elaboration

Examples. The Latin America region presents a number of interesting examples of how these policy instruments can be applied in the context of infrastructure sector reform.

- **Connection targets—La Paz and El Alto water concession.** In 1997 the Government of Bolivia awarded a 30 year concession for water and sewerage services in the twin cities of La Paz and El Alto. The Government consciously chose to award the concession to the private operator willing to make the largest number of new connections in the low-income neighborhoods of El Alto. The winning bidder was contractually obliged to connect 72,000 families to piped water and 38,000 families to sewerage over a five-year period. As a result, the annual rate of new connections to both water and sewerage services increased by about 66% following the reform. Household survey evidence shows that the coverage of water in low income households in El Alto—which was almost static at 65% between 1989/94—jumped to about 98% between 1994/99.

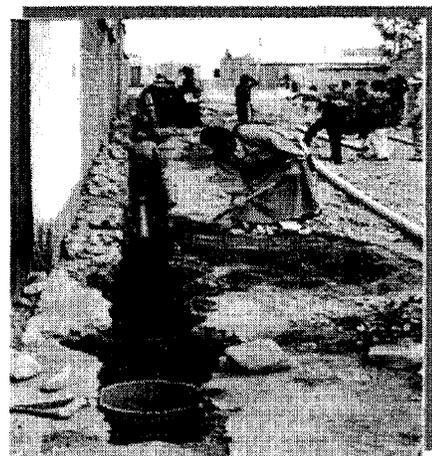


In **Guatemala**, consultations are held with the local community in advance of a new water project.

- **Low cost technologies plus community labor—Brazilian condominial water and sewerage.** The condominial approach to water and sewerage networks developed in Brazil during the 1980s is a good example of how technological innovation can be used to reduce the costs of providing infrastructure services to poor households. By routing networks through backyards and across sidewalks, instead of down the center of streets, substantial savings can be made in the length and diameter of pipes and their

necessary depth of burial. Another interesting feature of the approach is that community labor is used to build the networks. This has the double benefit of reducing costs and increasing ownership. Overall, savings of the order of 40-50% can be achieved. The condominial approach has subsequently been extended, with some success, to Bolivia.

- **Connection subsidies—Latin American rural telecommunications funds.** A number of Latin American countries—Chile, Guatemala, Peru and Colombia—have introduced rural telecommunications funds as part of the telecommunications sector reform process. These funds are usually financed from the proceeds of spectrum license auctions, or via universal service levies of the order of 1% on the turnover of the telecommunications sector. The funds are used to finance one-time capital grants to private operators willing to build and operate public telephones in commercially unattractive rural areas for a period of at least 10 years. The funds are competitively allocated to the operator requesting the lowest subsidy. These programs have succeeded in bringing public telephone services to some 19,000 rural communities, in the four countries mentioned. Moreover, every dollar of public subsidy has leveraged at least two dollars of private investment.



In **Bolivia**, local residents contribute their labor to reduce the costs of extending water and sewerage services.

- **Connection cross-subsidies—Buenos Aires water concession.** A major objective of the Buenos Aires water concession was to expand access to low income households. However, under the original terms of the contract, an infrastructure charge of \$300-\$600 for water and \$800-\$900 for sewerage was mandatory for new connections. *Even with a provision to pay by installments*, such charges were out of reach for poor families living on \$200-\$250 per month. The high level of charges provoked civil unrest, leading to a renegotiation of the original concession contract. The solution adopted was to levy a universal service fee of \$6 per month on all water customers and waive the infrastructure charge on new customers. This approach, which effectively introduced a cross-subsidy from existing to new customers, was successful in overcoming the social problems caused by the original approach.
- **Lifeline tariffs.** A popular way of reflecting social concerns in tariff structures is to define a 'lifeline' block of subsistence consumption that is provided below true economic cost. There are a number of permutations of this approach. In some cases, the 'lifeline' is available to all customers, while in others it is targeted only at specific customer groups. The revenue shortfall from 'lifeline' consumption can either be covered directly by the state, or by means of a cross-subsidy applied to those consuming higher volumes of the service. Lifeline tariffs are premised on the assumption that poor consumers tend to be small consumers. However, this is not necessarily true, if one take into account the prevalence of large families, shared dwellings, and the practice of secondary retail of services between neighbors.
- **Targeted tariff discounts.** The alternative to 'lifeline tariffs' is to use identifying characteristics (other than consumption) to target tariff discounts towards the poor. In some countries, the zone of residence is used to determine whether or not a family qualifies for discounted tariffs. While in other cases, eligibility is based on the socioeconomic characteristics of the household, or on the characteristics of the connection. As before, these discounts can either be financed directly by the state, or via cross-subsidies on households that do not qualify for the discounts. A potential drawback, compared with the lifeline tariff, is the potential need to incur administrative costs to screen customers for eligibility.
- **Vouchers.** A final variation on the theme is to charge the same tariff to all customers, but to provide low-income customers with vouchers that they can use to defray the cost of their utility bills. Under competitive conditions, this has the added advantage of allowing users to select their desired service provider. While the administrative complexities of a voucher scheme may be prohibitive and open to abuse, the basic principle of facing all customers with the same cost-reflective tariffs is nonetheless an important one because it ensures that low-income customers remain

Policy Instruments for Improving Consumption Affordability

How can the government ensure that services remain affordable for the poor? Infrastructure reform processes often necessitate significant tariff increases. Table 3 provides an inventory of the instruments that can be used to safeguard the affordability of services, together with a brief overview of their advantages and disadvantages. Broadly, these instruments influence affordability in at least one of three ways:

- (a) reducing bills faced by poor households;
- (b) reducing the cost of services; and
- (c) facilitating the payment of bills.

(a) Instruments that reduce the bills faced by poor households. Through appropriate design of tariff structures and subsidy schemes, it is possible to reduce the utility bills paid by poor households. Nonetheless, it is important to acknowledge the difficulty of designing really effective subsidy schemes. For one thing, it is far from straightforward to define simple, transparent, and accurate eligibility criteria for identifying the poor. Furthermore, the introduction of subsidies can introduce perverse distortions in the behavior of utilities and their customers.

commercially attractive to utilities. This objective can also be achieved with cross-subsidy schemes, if these are appropriately designed. One option is to treat cross-subsidies as a transparent surcharge on utility bills that automatically goes into a trust fund for financing social tariffs. Utilities are then only able to draw upon these resources against certified evidence that they are providing discounted service tariffs to explicitly identified low-income consumers.

- **Tariff rebalancing.** Tariff structures that have significant standing charges, or minimum monthly consumption charges, can be particularly unfavorable to low-income customers who may wish to consume very small amounts of the service in order to keep their bills down. From a social perspective, it is therefore desirable to keep these charges as low as possible. At the same time, it is important to recognize that for the utility such charges may be an important reflection of the fixed costs associated with billing and servicing customers.

(b) Instruments that reduce the cost of services. Another way of keeping services affordable for poor households is to reduce the cost of service provision. This can be achieved either by providing a lower quality of service, or placing physical limits on the amount of the service that a household can consume.

- **Lower quality of service.** As mentioned above, poor households may prefer to accept a lower quality of service, if in return they are charged a lower tariff. Yet, in practice, most utilities tend to offer a single service level, which is typically determined with reference to industrialized country standards, and may therefore be unaffordable for poor households. While safety standards should not be compromised, there may be other ways to differentiate the quality of service provided to different customer groups. One example is reliability, where some customers may be willing to accept a higher frequency of service interruptions in return for a lower tariff. Evidently, this kind of approach—where relevant—must always be based on consultation with the affected communities.

- **Consumption limiting devices.** A typical complaint made by low-income households is that utility bills are unpredictable, and that it is difficult to keep consumption of services within affordable limits. One way around this problem is to install physical devices that limit the amount of the service that can be drawn through the connection. In electricity, this takes the form of load limiters, which restrict the total number of appliances that can be switched-on at the same time. In water, narrow diameter connections can be used to limit the flow of water into a dwelling. While with telephone service, it is relatively straightforward to cap the number of minutes of use each month. The advantage of these devices is that they keep consumption levels—and hence utility bills—within a predetermined upper bound.

(c) Instruments that facilitate the payment of bills. There are many instances when households may be perfectly able to afford the daily cost of infrastructure services, but find it very difficult to cover a whole month's consumption in a single payment. Where this is the case, the solution may be to provide households with more flexible budgeting options.

- **Billing frequency.** A key difference between modern utilities and traditional substitutes is the frequency of payment. Whereas households buy candles and tankered water on a daily or weekly basis, electricity and piped water are typically billed no more than once per month. Since poor households have negligible reserves of working capital, it may be difficult to pay for a whole month's consumption in one go. A possible solution is for utilities to bill more frequently; although this entails significant administrative costs. Alternatively, 'utility stamps' could be sold through normal retail outlets so that households can pay for services gradually during the course of the month.
- **Prepayment devices.** One way of giving households the flexibility to budget for their use of infrastructure services is to use prepayment devices, rather than standard monthly billing. This also has the advantage of reducing the commercial risk faced by

utilities, since customers are not given credit for the use of the service. Prepayment systems have been successful in widening the ownership of cellular telephones. However, although prepayment meter technologies also exist for water and electricity, they are unfortunately still prohibitively expensive in many cases.

As before, the Latin America region presents a number of interesting examples of how these policy instruments can be applied in the context of infrastructure sector reform.



In **Guatemala**, a revenue collector presents the utility bill to a local household.

- **Lifeline tariffs—social tariffs for electricity in Honduras and Guatemala.** The electricity tariff in Honduras provides subsidized power to all domestic consumers taking less than 300 kWh per month at an annual cost of US\$17 million to the government. However, analysis shows that about 80% of this subsidy goes to non-poor households. The reason is that many poor people remain unconnected to the network, and those that are connected consume well below 300 kWh per month. A similar policy exists in Guatemala, where electricity tariffs are capped at US\$0.08 per kWh for all those consuming less than 300 kWh per month, which is to say about 90% of domestic customers. The annual cost of US\$50 million is financed via cross-subsidies on commercial and industrial customers. Given that only 40% of poor families in Guatemala have access to

electricity, about 90% of the value of the subsidy goes to benefit the non-poor. One of the key problems with both of these schemes is that the subsistence consumption level has been set extremely high at 300 kWh per month.

- **Targeted tariff discounts—geographically based cross-subsidies for utilities in Colombia.** The Colombian constitution of 1991 requires utility tariffs to be based on principles of social solidarity. This has been achieved by classifying all neighborhoods in the country into one of six socioeconomic strata, based on the quality of housing (for example, construction materials) and the extent of neighborhood amenities (such as street lighting, green areas). According to the 1994 Public Utilities Law, neighborhoods in strata one to three may have their tariffs subsidized up to a maximum of 50% for strata one tapering down to 15% for strata three. The resulting revenue shortfall is supposed to be covered from a surcharge of up to 20% to be applied to the bills of households in strata five and six, as well as commercial and industrial customers. The scheme is quite successful in reaching the poor, since 95% of them live in strata one to three neighborhoods. However, there is also a very high level of leakage, given that 80% of residents of strata one to three neighborhoods live above the poverty line.
- **Prepayment devices—cellular telephony in Bolivia.** Until 1995, cellular telephony services in Bolivia were the monopoly of Telecel. The cost of a telephone was very high, and subscribers were required to pay for both incoming and outgoing calls. In 1995, a second cellular license was awarded to Entel. With the advent of competition, calling party pay rules were adopted leading to an effective reduction in the cost of using a cellular telephone of about 70%, and prepayment telephones were introduced with payment card denominations as low as US\$5. As a result, the number of cellular subscribers in Bolivia has grown by a factor of ten between 1996/99. Moreover, prepaid telephones have accounted for 86% of the growth in mobile telephony since this modality was introduced in 1998. Anecdotal evidence suggests that a significant number

of these prepaid subscribers are artisans and micro-entrepreneurs who use the telephone primarily for receiving in-coming calls from their clients, and keep their own telecommunications expenditures under control by purchasing low value phone cards.

Defining Pro-Poor Strategies for Infrastructure Reform

How can governments determine the right social strategy for their situation? The preceding sections identified the transmission channels through which infrastructure sector reform may prejudice the poor, and presented a menu of policy instruments that can be used to attenuate these impacts. In order to apply these concepts to any particular country or sector, it is necessary to have a good empirical understanding of the social dimensions of infrastructure services in each specific context. Much of the key information may already be available from existing sources, such as census data, household surveys, or utility databases. However, significant efforts are often required to pull it all together. In some cases, it may be necessary to contemplate new survey work to collect information on key policy variables. Such information can be used to answer the following key strategic questions:

- (a) Should the primary policy focus be on improving access or affordability?
- (b) Which policy instruments are likely to be the most effective in reaching these goals?

Which infrastructure services should be given the highest social priority?

(a) Whether to focus on improving access or affordability? Clearly both access and affordability are important policy concerns. Moreover, there is no point in providing poor households with access to a service that they cannot ultimately afford to use! Nevertheless, resources are constrained and it will often be necessary to focus attention on one objective or the other. Furthermore, there is now substantial evidence that households with network access are able to satisfy their basic needs much more cost-effectively than those without. For example, in Guatemala, households with electricity pay less than \$0.10 per kilowatt-hour to light up their homes, while those without rely on candles that cost the equivalent of \$5 per kilowatt hour. While

in Port-au-Prince, Haiti, households with piped water connections pay \$1.00 per cubic meter, those without pay \$10 per cubic meter to obtain water from private vendors. This puts the whole affordability issue into perspective, and suggests that access will more often be the appropriate priority for policy makers. Answering the following questions will help to clarify the situation in any particular context.

- **What is the level of service coverage among poor households?** The essential starting point is to examine patterns of access to services by the poor. It is interesting to consider not only what percentage of the poor have access to the service, but what percentage of those with access to the service are poor. Generally speaking, these two indicators move together. In situations where a low percentage of the poor have access, only a small percentage of those with access will be poor. Consequently, resources channeled towards improving affordability are more likely to benefit the better-off, and it will therefore make much more sense to prioritize the expansion of access to the unconnected. In making this judgement, it is also helpful to compare the unit prices paid by those with access to the service, against the equivalent unit prices paid by those without access. In situations where the unconnected pay much higher prices to satisfy their basic needs (as in the examples given above for Guatemala and Haiti), it will evidently make more sense to expand access than to lower prices for existing utility customers who already enjoy a relatively good deal.

Can the poor afford the initial costs associated with connecting to the network? There are some very simple tests that can be done to evaluate the affordability of connection charges to the poor. (i) The simplest test is to divide the utility's connection charge by the monthly income of a typical poor household. If no direct information on monthly income is available, the minimum wage or official poverty line can be used as a point of reference. While there are no hard and fast rules, the resulting ratio gives a feeling for how unaffordable these charges might be.

Table 3 provides an overview of the instruments for safeguarding affordability, together with a brief description of their main advantages and disadvantages. None of these alternatives should be regarded as mutually exclusive, and indeed successful examples from Latin America combine several of the instruments.

Table 3: Summary of instruments for promoting affordability

Instruments reducing bills paid by poor households		
	Advantages	Disadvantages
Lifeline tariffs	Entails minimal administrative costs.	Based on the questionable assumption that poor customers are small consumers. However, as a result of large families, shared dwellings, and reliance on secondary retailing (sales between neighbors) this will not necessarily be the case.
Targeted tariff discounts	May provide a more reliable way of identifying low-income households.	It is difficult to find good targeting variables, and administrative costs may be significant. May be difficult to raise subsidy or cross-subsidy funds.
Vouchers	May provide a more reliable way of identifying low-income households, plus gives added flexibility for user to select service provider and ensures that low-income customers remain commercially attractive.	May be administratively complex and open to abuse, remains difficult to identify good targeting variables and raise fiscal funds.
Tariff re-balancing	Reduces burden of fixed costs on small consumers	The overall impact on affordability may not be large, and utilities may need to cover fixed costs of billing.
Instruments reducing cost of service		
Lower quality of service	Allows consumers to choose their preferred balance between the cost and quality of service.	May not always be technologically possible to differentiate quality of service provided through a common network.
Consumption limiting devices	Prevents low-income households from consuming beyond their means.	May lead to hardship if basic needs exceed imposed consumption ceiling. Moreover, required metering technology may be prohibitively expensive. Also runs against the private operator's commercial incentives.
Instruments facilitating payment of bills		
Billing frequency	Facilitates budgeting for low income households	Increases administrative costs of revenue collection, but may improve revenue collection rates.
Prepayment devices	Facilitates budgeting for low income households	May lead to 'self-disconnection'. May be costly and subject to fraud. Requires the creation of a network for selling 'smart cards' if electronic technology is used.

Source: Own elaboration

For example, if the connection charge represents six months of family income, it is clearly beyond economic reach. It is also important to find out whether the utility offers payment in installments, and if so to examine what proportion of the typical monthly income of a poor household such installments would represent. For example, if each installment absorbs 25% of monthly income, then the service remains unaffordable in spite of the opportunity to pay by installments. (ii) Furthermore, where household survey data is available, it may be possible to test affordability by examining the extent to which poor households connect to utility services when the infrastructure networks are available in their communities. Recent evidence from Guatemala shows that *about a third of households without access to electricity and piped water live right next to public mains and distribution lines*, but nonetheless fail to make a connection. While there are a number of potential explanations for this phenomenon, it clearly suggests that the connection may not be affordable.

- **Can the poor afford to use infrastructure services once they have them?** In a similar fashion, it is possible to do some simple tests of affordability for the *use* of the service. (i) Where adequate household survey data is available it is interesting to look at the amount that connected poor households pay for the service as a percentage of their total household budget. (ii) It is sometimes possible to use expenditure data to infer the physical amount of the service that families are consuming, and to compare this to some kind of subsistence benchmark, to see whether they are able to afford to consume 'enough'. (iii) It is also interesting to compare the expenditures that low-income connected households incur on utility services, with the amount paid for substitute services by similar low-income households that do not enjoy network access. For example, recent evidence from Guatemala shows that poor households with access to electricity, spend about the same amount of money on lighting and powering appliances, as poor households without electricity. However, the former derive almost thirty times as much useful energy from their electricity connection, than do the latter from

their candles and batteries. (iv) Where household survey data is not available, a simple check can be performed by using the utility tariff structure to calculate the monthly bill for a reference level of subsistence consumption. This can be compared against the typical monthly income of a poor household (in terms of minimum wages, or official poverty lines) to see what percentage of the household budget it would represent. (v) Where resources are available, a final possibility is to conduct a household survey designed to measure stated willingness to pay for the service.

(b) How to select between policy instruments?

Once the priorities have been identified, the next step is to select from the available menu of policy instruments for promoting access or affordability, whichever is considered to be the most important in any particular case. Not all of the instruments described in Tables 2 and 3 above will be feasible to adopt in every instance. However, the choice among the relevant options needs to be informed by the following considerations.

- **What would be the cost of using the instrument?** Some of the instruments described above did not have any budgetary implications, however those that relied upon subsidy mechanisms could have major costs attached. It is important to estimate the likely magnitude of these costs, and explore whether these could realistically be covered from the public budget or raised from other customers via cross-subsidies. Furthermore, it is important not to overlook the possible administrative costs that might be generated by any subsidy scheme, particularly in terms of identifying and screening potentially eligible families.
- **Does the instrument perform well in targeting terms?** A hidden—but often enormous—cost of many subsidy programs are the resources that 'leak away' to households that were not intended to be beneficiaries. As illustrated above, it is not unusual for as much as 80% of the resources from subsidy programs to end-up in the pockets of unintended beneficiaries. It is

therefore important to make a realistic evaluation of the targeting performance of the subsidy. In this respect, simulation exercises using household survey data can be a helpful point of reference.

- **Would the instrument introduce perverse incentives?** It is very difficult to design a subsidy program that does not introduce some kind of perverse incentive. A particular concern is that subsidy programs may reduce the commercial incentives for utilities to serve poor customers, by reducing the revenue that they capture from doing so. Subsidy programs can also distort the behavior of consumers in a number of undesirable ways. These include wasteful consumption by subsidized households, efforts to qualify for the subsidy by fraudulent means, attempts to sell or pass-on subsidy benefits to non-eligible consumers, and reduced interest in improving income and living conditions in order to avoid losing eligibility for the subsidy. It is also important to note that subsidies that are linked to the location or characteristics of the dwelling, may simply be capitalized in the rental value of the property.

(c) Which services should be given highest priority? While social policies tend to be

designed on a sector-by-sector basis, overall budget constraints mean that governments also need to take into account priorities within infrastructure, as well as between infrastructure and other sectors.

A number of analytical tools have been developed in recent years to aid such decisions. For example, using a method known as Consumption Dominance analysis, it is possible to quantify the poverty-reducing impact of subsidies to different sectors. Some results for the Latin America region suggest that subsidies for water and urban transport services tend to have a greater poverty reduction potential than those for electricity and telephone services.

Furthermore, by decomposing the conventional Gini index of inequality across different components of expenditure, it is possible to identify to what extent subsidies to specific services are likely to increase or decrease inequality. For example, when applied to Mexico, this methodology suggested that subsidies for water reduce inequality, subsidies for electricity are inequality neutral, and subsidies for telecommunications increase inequality. More technical details about these methodologies can be found in the book.

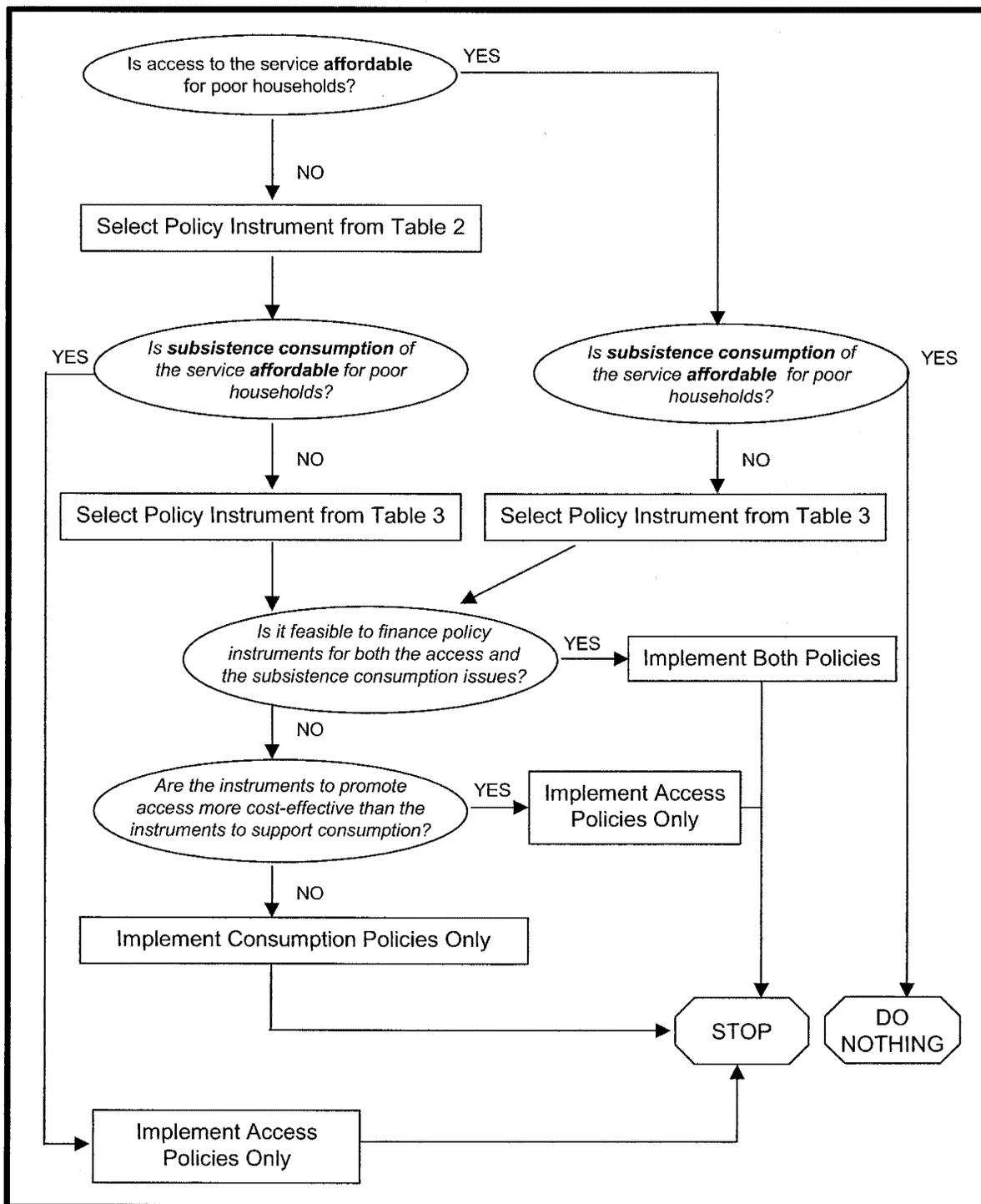
Table 4 summarizes the key questions that must be answered in order to define a strategy for pro-poor infrastructure reform, and identifies the information that needs to be collected to provide well-founded empirical answers to these questions. While **Figure 1** provides a decision tree for determining priorities between access and affordability issues.

Table 4: Summary of strategic questions and information needs

Questions	Information needs
What is the level of service coverage among poor households?	<p>Conventional coverage statistics, broken down by income or consumption decile, and preferably also by urban and rural areas.</p> <p>Percentage of households connected to utility services who are poor.</p> <p>Unit price of utility service.</p> <p>Equivalent unit price of substitute for utility service.</p>
Can the poor afford the initial costs associated with connecting to the network?	<p>Connection charge divided by typical monthly household income of the poor (e.g. two minimum wages, or the family poverty line).</p> <p>Minimum monthly installment required by utility to cover connection charge divided by typical monthly household income of the poor.</p> <p>Percentage of households living in communities served by utilities that actually make a connection to the network, broken down by income or consumption decile.</p>
Can the poor afford to use infrastructure services once they have them?	<p>Monthly utility bill for a subsistence consumption level divided by typical monthly income of the poor.</p> <p>Actual monthly expenditure on utility services by connected households as a share of household budget, broken down by income or consumption decile.</p> <p>Actual monthly expenditure on substitutes for utility services by unconnected households as a share of household budget, broken down by income or consumption decile.</p> <p>Declared willingness to pay for utility service, broken down by income or consumption decile.</p>
What would be the cost of using the instrument?	<p>Estimated total resource cost of implementing the instrument.</p> <p>Estimated administrative cost of using the instrument.</p>
Does the instrument perform well in targeting terms?	<p>Estimated percentage of beneficiaries that are poor.</p> <p>Estimated percentage of poor that are beneficiaries.</p> <p>Estimated percentage of resources that leak away to unintended beneficiaries.</p>
Would the instrument introduce perverse incentives?	<p>Anticipated behavioral impact on the utility.</p> <p>Anticipated behavioral impact on intended beneficiaries, and the rest of the population.</p>
What should be the prioritization between services?	<p>Consumption Dominance Curves.</p> <p>Gini Index Decomposition.</p>

Source: Own elaboration

Figure 1: Flowchart for prioritizing between access and affordability issues



Assuring Implementation of Pro-Poor Reform Strategies

How can governments ensure the implementation of pro-poor reforms? One of the difficulties of implementing pro-poor reforms is the need to take a coordinated approach across three different areas of public policy—privatization policy, social policy and regulatory policy. These three areas should be viewed as complementary, although the timing and institutional responsibility may be different in each case. Privatization policy and social policy actions have to be considered early on in the reform process. While the design of the regulatory framework should help to ensure that the original strategic priorities are followed through in implementation, and should incorporate the flexibility needed to adjust these priorities over time.

(a) Privatization policy. In many countries, privatization transactions are spearheaded by the Ministry of Finance, which tends to view the process in narrow transactional terms, with the focus on maximizing the fiscal revenues from the asset sale. This is unfortunate because there are some important trade-offs between the sale value of the assets, and the downstream economic and social impacts of the reform. For example, revenue considerations point towards keeping service tariffs high, minimizing rollout obligations, postponing the introduction of competition, and overlooking many of the details of regulation. However, experience shows that these are precisely the strategies that are likely to be most damaging to the poor; and indeed to the infrastructure sector more generally. It is therefore critical that at the outset of any privatization transaction, there is an attempt to form a balanced view between the macroeconomic and microeconomic impacts of privatization. This points towards having a broader representation of interests on the transaction team, including the ministries of finance, infrastructure and social policy. It also suggests that there is potentially a need to realign the incentives of transactions advisers, who are often paid success fees that reflect the sale value of the infrastructure assets.

(b) Social policy. There are many important linkages between utilities social policy, and a country's wider strategy for social protection, that need to be carefully understood in any sector reform process. According to economic principles, social policy concerns are most efficiently addressed by channeling income transfers through the welfare system, rather than by subsidizing tariffs for particular goods and services (such as utilities). However, in many developing countries, the welfare system is not adequately developed. Moreover, the administrative complexity and governance issues surrounding conventional welfare payments may make utility services appear like a practical second best approach to meeting social policy objectives. While it is undoubtedly politically attractive to use utility pricing as a means of income redistribution, the available evidence suggests that such redistribution can often be decidedly regressive. If utility policy must form part of a country's social protection system, then it is absolutely essential that the corresponding measures are much better designed than they have been in the past, and that they are coherent with the wider welfare framework.

(c) Regulatory policy. The function of the regulator is to act as an arbiter between the competing interests of the operator, the state, and civil society. After the initial privatization transaction is over, it is the decisions of the regulator that will have the greatest impact on the tariffs faced by low-income customers, the flexibility of service standards, the degree of competition in the market, and the speed with which networks are expanded into under-served areas. Since conflicts of interest will evidently arise between social and financial concerns, it is important for government to provide statutory clarification of the extent to which the regulator is responsible for meeting social objectives, and which of the various policy instruments described above are at his disposal. More generally, recent evidence shows that effective regulation is important to ensure that poor consumers get their share of the gains generated by the privatization process. Infrastructure privatization in Argentina was found to yield operational equivalent to 0.90 percent of GDP, which increased to 1.25 percent of GDP when effective regulation is taken into account. Moreover, the benefits of effective

regulation as a proportion of existing expenditures on utility services were found to be highest for the lowest income quintiles. This is because regulation acts as a mechanism for transferring rents from the owners of capital to the consumers of the services produced with that capital.

Conclusions

This paper has explained the numerous ways in which infrastructure reform may impinge on the welfare of poor households. It has identified a broad menu of policy instruments for attenuating the impact of infrastructure reform on the poor, and provided guidance on how to define the appropriate social strategy for any particular country or infrastructure sector. Finally, it has underlined the importance of integrating social concerns within the privatization process and the regulatory framework, and ensuring that these are coherent with wider policy on social protection.

The main conclusions of this study may be summarized as follows. Status quo arrangements in the utility industries (i.e. public provision and mis-targeted subsidies) are unlikely to be beneficial to poor households. Indeed, many poor would benefit from the service expansion that may be possible through privatization and which would allow them to avoid the high costs of alternative services. Moreover, there is significant evidence showing that many poor households are willing or able to pay for a regular and reliable service. They often already currently pay much more for a deficient service. The way markets are restructured, the way competition is introduced and maintained and the way regulatory commitments are implemented determine whether privatization is beneficial to the poor. Generally, the weaker the regulatory structure, the less likely that the concerns of the poor will be accommodated in public policy decisions.

The upshot of this overview is that what is really needed is political commitment. Infrastructure reform and privatization are not substitutes for responsible, redistributive welfare policies. But welfare reforms are complex and tend to be implemented only very slowly. Policies leading to

real welfare gains are needed to establish the credibility of and support for reforms that are in the interest of all in the long run. This is why, in the short-run, policymakers will have to address many of the issues discussed in this paper. Whether infrastructure reformers can hope to get anywhere depends on the design, and implementation strategy of these reforms...but they also depend on the political will to put the poor at the center of infrastructure reform, and to counter the interest groups that may have particularly strong interests in maintaining the status quo!

Further Reading

A much fuller exposition of the material presented in this paper can be found in the companion book:

- Estache, E., Foster, V. and Wodon, Q. (2002) 'Accounting for the Poor in Infrastructure Reform: Learning from Latin America's Experience', World Bank Institute, World Bank Group, Washington DC.

Another interesting book that also focuses on poverty issues in a Latin American setting and provides a wide range of country case studies is the following:

- Ugaz, C. and Waddams Price, C. (2002) 'A Fair Deal for Customers? The Impact of Infrastructure Reform in Latin America', World Institute for Development Economics Research, United Nations University, Helsinki.

Finally, the following website contains an interesting selection of papers from a recent conference on infrastructure and poverty, covering a range of sectors and case studies.

- Public Private Infrastructure Advisory Facility and Department for International Development (2000) 'Infrastructure for Development: Private Solutions and the Poor' <http://www.ppiaf.org/conference/presentations.html>