

RESEARCH REVIEW | ISSUE 1 | NOVEMBER 2020

# Effective Targeting of Water Supply Subsidies

## Introduction

The SARS-CoV-2 pandemic has taken a tremendous toll on the health and well-being of people around the globe, driving many low-income households into poverty. Recent analyses suggest these economic impacts will be long-lived, with reports from [Brookings](#) and the World Economic Forum suggesting that all progress made in reducing global poverty since 2015 was lost in the first half of 2020. These effects are expected to be most acutely felt in sub-Saharan Africa. The World Bank's latest [Africa's Pulse](#) outlook predicts a 2.1-5.1% decline in the region's economic growth this year as a result of the pandemic.

In the months and years ahead, a growing number of households will struggle to meet their basic needs for food, shelter and services such as water supply. Relief measures such as the provision of highly subsidized infrastructure and service delivery that have been launched as part of the COVID-19 emergency response will likely need to be extended for some time.

Designing programs to deliver subsidized services requires balancing two inter-related objectives: (1) providing subsidy benefits to as many eligible households as possible, and (2) preventing 'leakage' of subsidy funds to ineligible households. This is also known as avoiding *errors of exclusion* and *errors of inclusion* (Table 1). To date, water service subsidy programs in low- and middle-income countries (LMICs) have not had much success in meeting either of these objectives.

**Table 1**

A typology of subsidy targeting outcomes

	Household receives the subsidy	Household does not receive the subsidy
Household is eligible for the subsidy	Case 1: Successful targeting	Case 2: Error of exclusion
Household is not eligible for the subsidy	Case 3: Error of inclusion	Case 4: Successful targeting

For example, a recent [World Bank analysis](#) of data from 10 LMICs found that the 20% of households earning the lowest incomes received only 6% of the subsidy funds provided, while the wealthiest 20% of households received 56%. For Niger, Mali, Uganda and Ethiopia rates of exclusion error were between 97.6% and 99.9%; inclusion error rates ranged from 96% to 99.7%. In other words, almost none of lowest income households in those countries received a subsidy for water supply services, and higher-income households captured virtually all the benefit.

Why is it so hard to design water supply subsidies that benefit the households for whom they are intended? This [Research Review](#) provides an overview of subsidy targeting strategies and the conditions under which they have proven (un)successful, drawing on more than three decades of applied academic and professional research. For readers interested in more information on this topic, [additional resources](#) and references are available on the WHD website.

## How Public Service Subsidies Help

A **subsidy** is any measure that keeps the price of a good or service below market level for consumers (termed a *consumption subsidy*), or above market level for producers (*production subsidy*). Consumption subsidies are more common for water supply services, as well as for electricity, education and other public services. Subsidies enable households to consume more of a good or service than they would if they had to pay market prices. This is why subsidies are often used to ensure that goods and services considered ‘basic needs’ are available to all households at an affordable price.

Consumption subsidies take a variety of forms, but all have one thing in common: In order for a subsidy to be financially viable over the long term, the financial gap created by charging consumers less than the actual cost of service provision must be covered by a third party (Figure 1). In high-income countries, this is often achieved by charging higher-income and/or commercial or industrial customers slightly more than the cost of service, so the surplus can be used to close the gap

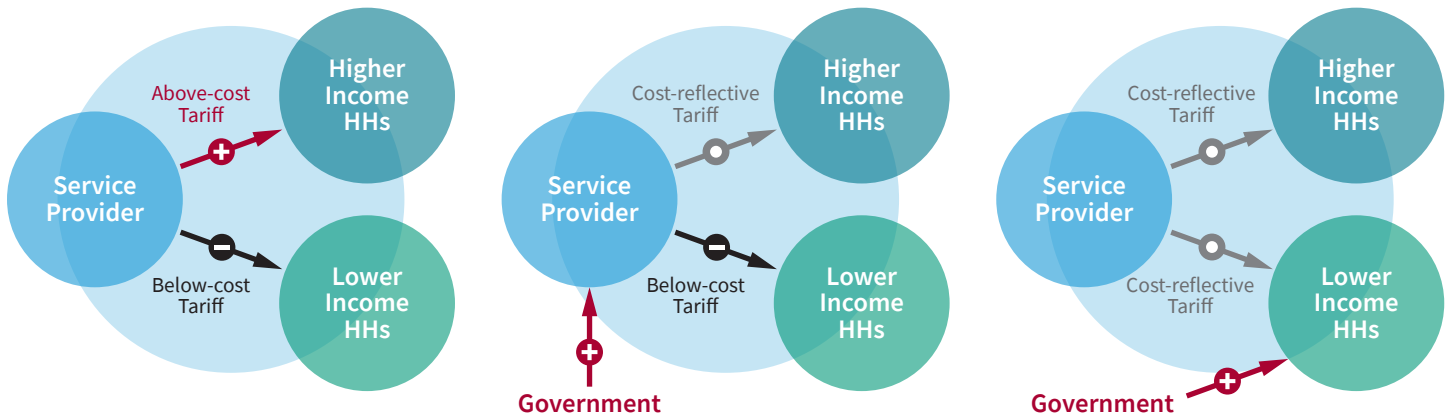


Photo credit: water.org



**Figure 1**

Funding options for water service subsidies



Adapted from the original by K. Komives et al. (2005)

for lower-income households (termed cross-subsidization). The service provider is often responsible for administering the subsidy, as shown in Option A.<sup>1</sup>

In LMICs, strict cross-subsidization is less common. Instead, water supply subsidies are often funded by government and/or development partners who reimburse the service provider for losses (Option B). The service provider is still required to administer two tariff schedules, but (in theory) will have the financial gap created by charging lower-income households less than the cost of service filled by direct payments from the government. Such arrangements exist in Colombia (Lobo and Contreras, 2003). A third alternative is for government to fully administer a subsidy by providing income support, service vouchers, or tax credits directly to households (Option C). The service provider uses the same tariff schedule for all customers, and lower-income households can use the resources provided by government to help pay their bills.

The choice among these options has important implications for the incentives that service providers, consumers and the government each face. For example, a service provider that administers a subsidy program (Option A) assumes all revenue risk associated with charging some customers less than what it costs to deliver services to them. This could incentivize the provider to prioritize service delivery to higher-income customers, who pay slightly *more* than the cost of service (i.e., who generate a profit for the provider). A strong regulator is thus important for protecting the interests of lower-income households. By contrast, with Option B it is government that

assumes the risk associated with lower income households' limited ability to pay. So long as government can be trusted to make prompt and full subsidy payments, the service provider should be motivated to deliver high quality service to every customer.

### Access versus Usage Subsidies

The scenarios above were described as subsidy programs that bring down the fee that low-income households pay for ongoing service. This type of support is called a **usage subsidy**. They are also relevant for **access subsidies**, which help households transition to a higher level of water service by reducing the up-front costs of the transition and/or by spreading out the charges over time. In communities served by a piped network, an access subsidy could help households pay for application fees or the costs of installing a service connection at their homes. Access subsidies can also support a non-networked community's transition to an improved point



Photo credit: water.org

<sup>1</sup> Whereas this discussion assumes a single service provider and system, subsidy arrangements can also operate across geographies and/or levels of service. For example, district or regional government might subsidize services in rural areas with excess revenues generated by urban consumers.

source by helping to pay for up-front costs such as drilling and the installation of a motorized or manual pump.

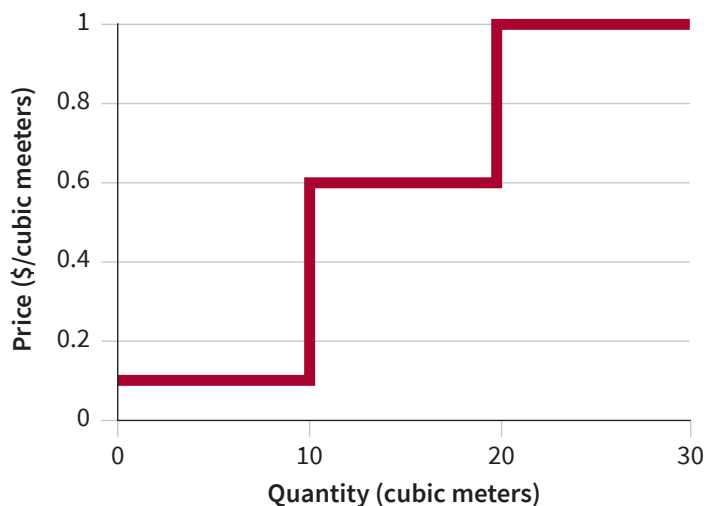
Access subsidies are typically designed as one-time support and may involve direct payment by a third party (government or a development partner) to the service provider implementing the upgrade. They may also take the form of a no- or low-interest loan that allows the household to pay its share of costs in installments over time, such as with Water.org's [WaterCredit](#) program. Microfinance programs have also supported household access to water treatment technologies in [Cambodia](#), to support small-scale private water service providers in [Kenya](#) and other service improvements. Successful programs, such as one in [Morocco](#), also recognize the importance of helping low-income households negotiate the often burdensome administrative process of moving up the service ladder.

As a strategy for targeting support to low-income households, access subsidies perform relatively well. This makes intuitive sense when one considers that lack of access to water (and sanitation) service is itself often used as a proxy for poverty. All major [composite poverty measures](#) include consideration of water supply service, and access is consistently and strongly correlated with income at the population scale. The implication is that any effort to help households move up the water services ladder – in particular ‘graduating’ from the surface water or unimproved category to ‘limited’ or ‘basic’ service – will almost certainly benefit low-income families disproportionately.

By contrast, usage subsidies for water services have been shown to suffer from much higher rates of both inclusion and exclusion error. This is particularly true for the increasing

block tariff (IBT, also called a ‘social’ or ‘lifeline’ tariff), the most common form of water supply usage subsidy. An IBT charges customers a low price (often below the cost of service provision) for the first volume of water they use, and higher prices for each subsequent ‘block’ (Figure 2). Households with relatively low water usage benefit the most from an IBT, and often represent a financial loss for the service provider. Households who use more water and are billed at higher block rates generate the extra revenue needed to cover the subsidized lifeline service. In order to cover costs overall, a provider must thus strike a balance between revenues generated from customers billed in each block.

**Figure 2**  
Illustrative increasing block tariff (IBT) structure



Although IBTs are widely used in countries across the income spectrum, this targeting strategy performs poorly in the LMIC context. One reason is that an IBT is based on the assumption that low-income households use less water than higher-income households, but this is often not the case. Lower-income families tend to have relatively more members and are more likely to share a connection with a neighbor, which means they are more likely to pay the highest unit prices for service when an IBT is used (Boland and Whittington, 2000). Indeed, several studies have found that it is low-income households who generate the majority of revenues billed in higher-priced blocks (e.g., D. Fuente *et al.*'s study of Nairobi, Kenya).

More important is the fact that the IBT was designed to subsidize water service provided through individual, metered piped water connections. Households with the lowest incomes are typically not connected to a piped network (indeed, many live in rural areas not served by piped systems), so no amount of tweaking an IBT will benefit them. In fact, the ‘balancing act’ of charging different prices can make it harder for a



Photo credit: Water.org

service provider to [cover recurrent costs](#), much less generate a profit that could be used to extend the network or otherwise upgrade services in underserved areas.

## Alternative Targeting Approaches

The IBT is a type of **untargeted subsidy**, in that all customers benefit from low pricing for the initial ‘lifeline’ volume of water. Another type of untargeted subsidy is based on assumed differences in the preferences of low- *versus* high-income households for different types of service. For example, municipalities such as Ouagadougou in Burkina Faso and Kampala in Uganda operate subsidized standpipes or kiosks that any household is permitted to use. Nevertheless, these water points are disproportionately used by lower-income households, presumably because higher-income households have private, piped water connections and are less willing to haul water from a shared public source (Foster et al., 2003).

Most water sector subsidy programs in LMICs employ some form of **targeted subsidy** and are justified with reference to poverty alleviation goals. **Means testing** is one approach to targeting that requires collecting information on each household’s income and/or wealth, often verifying it against independent sources and/or through home visits. It can be effective in identifying ineligible households (i.e., avoiding errors of inclusion); however, it is relatively costly and labor-intensive. Effective means testing also requires infrastructure and capacity for regular collection and management of data. Lastly, errors of exclusion can arise if eligible households are required to apply for the subsidy through a process that is hard to navigate for those with literacy, language fluency or similar challenges.

One of the best known means testing-based subsidy targeting in the water sector is in [Chile](#), where the national Caracterización Social (CAS) program uses detailed surveys and home interviews to assign a priority score for each applicant household. Eligibility is re-assessed every two years. Importantly, CAS is used to determine eligibility not only for water sector subsidies, but for a host of public services and social programs, such that administrative costs are spread across several sectors.

More common in LMICs is the use of **proxy targeting** (also called proxy means testing), which relies on a subset of indicators (proxies) that are believed to be correlated with income. Common proxy types include demographic characteristics (e.g. age, gender) and socioeconomic indicators such as housing stock. Some programs also accept proof from households served by another social benefits program as a proxy for eligibility. Geographic targeting is another common form of proxy targeting used to prioritize communities,



Photo credit: Flickr/SuSanA Secretariat

A water kiosk in Chipata.

districts or regions for subsidy support. It can be effective when low-income households are clustered spatially, and if providing proof of residency is not overly burdensome for an eligible household. Overall, the use of proxies can substantially reduce the cost of targeting; to avoid increased targeting error rates, however, it is important to [assess](#) the correlation between candidate indicators and household income. Undertaking analyses that help identify valid and feasible proxies is essential.<sup>2</sup>

Different targeting strategies can also be used in combination. Ghana’s Livelihood Empowerment Against Poverty (LEAP) program is an unconditional cash transfer program targeting households living in extreme poverty. Initially LEAP allowed communities themselves to identify households in need of support, then later transitioned to a model that establishes applicants’ eligibility using socioeconomic proxies.

2 Subsidy programs can of course target sub-populations that are defined with reference to characteristics other than income (e.g., vulnerable and disadvantaged). With any targeting effort, the key challenges are (1) clearly defining the status that is being targeted and (2) identifying valid and reliable indicators of that status.

Households are eligible that have a single parent caring for an orphaned or vulnerable child, someone 65 or older with no means of financial support, or someone with an extreme disability who is unable to work. Second-stage screening is based on means testing using information collected through in-person interview (like Chile's CAS program). One recent evaluation of LEAP concluded that the transition from community-based targeting to proxy-based screening plus means testing reduced errors of inclusion from 62% in 2010 to 36% in 2015 (de Groot, 2016).

## Implications for Practice

The World Bank's key finding, that most of the water service subsidies funded by governments and their development partners fail to benefit low-income households, is important but not new. Like many others conducted over the past two decades, the World Bank study reveals the magnitude and costs of targeting errors, but it is less helpful in identifying politically viable solutions to these problems. Better subsidy design and/or reform strategies requires research that elucidates the political reasoning that gives rise to and sustains particular subsidies, and that identifies opportunities to motivate stakeholders whose buy-in is essential for change. Case studies of specific targeting challenges – such as subsidizing service improvements for low-income renters who lack the authority to make water infrastructure investment decisions – would be particularly useful.

For governments, donors, and implementing organizations, evidence points to a few key considerations when deciding whether and how to subsidize water services. First, since most subsidies do not achieve their distributional objectives, initiating subsidized service is best viewed as a strategy to be pursued only if other possibilities have been exhausted. It is also much easier to give customers a subsidy than to take one away. Even where incontrovertible evidence indicates that a subsidy is not achieving its intended purpose, reformers have found it very challenging to course correct. Integrating with existing subsidy programs instead of creating wholly new initiatives may help address this challenge; it can also leverage prior investments in targeting, reduce overall costs and contribute to public-sector capacity building.

Second, launching subsidized service without a realistic plan for long-term funding of the subsidy is a recipe for service

failure. Long-term subsidy support is inconsistent with the exit plans of most donors, yet there are few successful examples of a donor funding subsidies over an initial period and then transitioning that responsibility to the government. Third, if government and its development partners do decide to offer a subsidy, evidence suggests that subsidizing access rather than usage (at least through an IBT) is more likely to meet targeting objectives. Facilitating access can take a variety of forms, from simply offering loans or installment payment programs to investing in services that target groups are more likely to use. Of course, an access subsidy should only be pursued if ongoing service can be provided sustainability, i.e., if households are willing and able to pay for the service on an ongoing basis. Without this effective demand, subsidized infrastructure *may go unused*.

Finally, effective subsidy design is not a 'set it and forget it' activity. Regular monitoring and analysis are essential to evaluate targeting efforts, detect unintended consequences and devise needed course corrections. Including monitoring and evaluation in subsidy budgets, as well as establishing metrics that support accountability mechanisms for targeting performance, can help tackle the political economy challenges that often prevent subsidies from achieving their objectives.

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