

# LESSONS LEARNED



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## Challenges in Formalizing the Supply of Electricity in Mumbai's Slums

### DEVELOPMENT CHALLENGE

Indian cities have large populations of urban slum dwellers who lack access to basic services from utility providers. Approximately 65 million people, or 17 percent of India's urban population, live in slums. In Mumbai, slums accommodate 5.2 million people—41 percent of the city's population.<sup>1</sup> Many households obtain access to electricity through illegal connections, which can be unsafe and contribute to commercial distribution losses at utilities. To address this challenge, the Indian Electricity Act of 2003 introduced a provision to increase formal access by requiring electric utilities to connect and supply any customer who can provide proof of residency.

### THE PROJECT AND ITS PARTNERS

In 2009, the Global Partnership on Output-Based Aid (GPOBA) approved a pilot project for \$1.65<sup>2</sup> million with the objective of increasing access to safe electricity supply in Indian slums through targeted output-based subsidies. The pilot focused on selected urban slum areas of Mumbai, but had potential for scale-up in other communities in Mumbai and across India if successfully implemented.

The project was implemented by Reliance Infrastructure Limited (RIL), a private sector utility, and the sole distributor of electricity in the suburbs of Mumbai. As designed, it aimed to provide 26,500 poor households with legal electricity connections and safe internal wiring, starting with the Shivaji Nagar slum. The wiring had to comply with Indian government standards, which would also meet the basic customer needs of 4.5 points of supply, or enough energy to run two lights, one fan, one television set, and one spare plug. The project benefited from a community outreach and an education program supported by the U.S. Agency for International Development (USAID) and implemented by the Slum Rehabilitation Society (SRS).

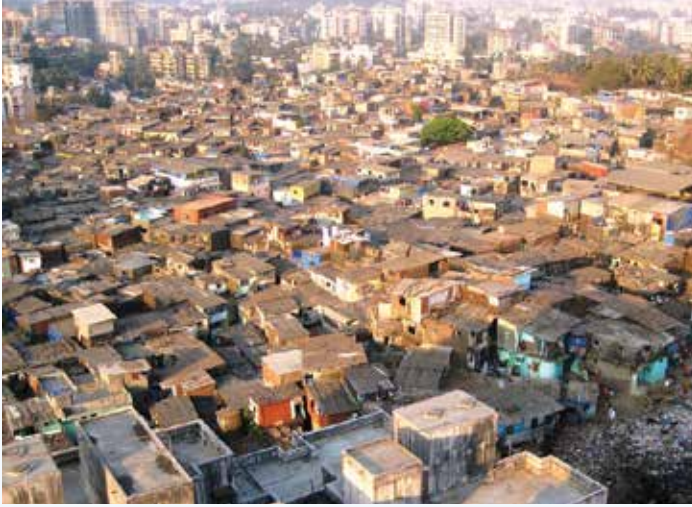
RIL was responsible for providing the upfront financing. GPOBA subsidized \$56 of the overall cost of \$103 per connection, and users contributed \$47. The aid was tied to outputs, payable once the targeted consumers obtained access to electricity connections and met the wiring requirements. RIL was required to pay for upstream network investment costs, estimated at \$110 per connection, recoverable through the tariff. To participate in the project, the slum dwellers had to provide the necessary proof of ownership or tenancy of the dwelling units, apply to RIL for legal connections, use licensed contractors to install new safe internal wiring or update existing illegal wiring, and pay their utility bills on time.

### RESULTS ACHIEVED

The project closed in June 2013, connecting only 15 households under the output-based aid (OBA) subsidy scheme. Although early awareness campaigns generated about 750 applications, many of them were found to be ineligible once the proof of residency documents required for a legal connection were scrutinized. Residents were unwilling to change the existing internal wiring and pay a higher amount for the safe wiring using standard quality material required under the project. The Slum Rehabilitation Society reported that many households expressed willingness to connect under the project, but were unwilling to pay the required end-user contribution. During the life of the project, RIL made about 7,000 new connections in Shivaji Nagar (outside of the OBA subsidy scheme); households used local electricians to install wiring that did not necessarily conform with the technical standards required by the project but cost significantly less.

<sup>1</sup> Census India 2011; Government of India and presentation by Dr C. Chandramouli, Registrar General and Census Commissioner, India.

<sup>2</sup> All monetary amounts are in US\$ unless stated otherwise.



## Lessons Learned

### 1 By not adequately compensating consumers for the additional cost of wiring, the subsidy failed to create demand for safe electricity supply.

Cost escalations during implementation increased the end-user contribution to \$72, which was 56 percent of the revised cost of \$128. This was too costly for the target households, many of which opted to pay the full connection fee of \$34 to RIL and organize their own wiring through local contractors—even though it was deemed to be of substandard quality. Splitting the limited subsidy between the connection cost and wiring did not help; the subsidy paid for 25 percent of the RIL connection fee and 50 percent of wiring from the distribution point and internally within the household. It was not enough to either stimulate demand for safe wiring or encourage the utility to connect new consumers to their network under the project.

The project demonstrated that in very poor areas where consumers have limited disposable income, there is little willingness to pay for anything beyond basic access to electricity. Hence if subsidies are to incentivize access to safe energy, they need to respond to the target population's needs and willingness to pay. Adjusting the subsidy level in response to low uptake could have allowed the project to test whether higher subsidies actually encourage households in urban slums to acquire safe electricity and stay legally connected over the medium to long term.

### 2 Failure to manage the strong informal network hampered efforts to connect consumers to the utility network.

There is a strong informal network of service providers in Mumbai slums that provide a range of services to residents, including electricity. These providers tap into the distributor's network and charge households a flat monthly rate of \$2–\$4 per month for three to four points of electricity, which would cost \$7–\$10 for 50–100 kilowatt hours from the utility. The lower cost of service from informal service providers coupled with weak enforcement of a legal connection policy hampered efforts to connect target consumers to the RIL network.

Future slum electrification projects could explore the option of partnering with local governments and the target communities to manage energy distribution in slums. Varying degrees of delegated management and participatory approaches have been used to extend water and energy

services to the poor in Africa, Asia, and Latin America, and have succeeded in equipping households with legal connections and reducing the commercial losses of distribution companies. Such approaches could extend access to the poor, especially if subsidies create incentives for them to connect legally; however, it is essential to analyze the reality of local political dynamics to design a workable project. Regulation would also need to be strengthened to penalize the illegal tapping of electricity supply.

### 3 The subsidy was too small to incentivize the service provider to implement the project as designed.

RIL is one of India's largest private sector companies, with more than \$2 billion in annual revenues. In this context, there was little incentive for the company to implement a \$1.6 million pro-poor subsidy scheme in India's financial capital, where the company's core market is industrial and residential consumers. Such subsidy schemes should be designed with clear incentives for service providers to implement them. For example, OBA schemes could support utilities to meet pro-poor access targets that they are legally obligated to attain, or support a corporate social responsibility agenda to which a company is committed. It is also important to ensure that the service provider is not incurring a financial loss by connecting low-income consumers to the system. Connection and usage costs should be covered through a combination of user fees, subsidies, and tariffs. In cases in which lenders are partially financing projects, there should be enough revenue generated to repay loans.

### 4 The project was designed in such a way that the utility company, RIL, took financial risk without return; even though the amounts were minor, it was an additional deterrent to implementing the project.

RIL was responsible for financing and implementing the overall project but, like most electric utilities, does not have the mandate to carry out any wiring beyond the meter. Hence RIL engaged licensed electrical contractors to carry out the internal wiring, and made upfront payments for the subsidized portion of wiring costs. The OBA subsidy was payable to RIL in phases once the outputs were achieved, and was staggered over a one-year period with no compensation for financing costs. To work, the project needed the utility to engage contractors and assume a payment risk if the outputs were not fully achieved. The absence of a financial incentive to compensate for such risk was an additional deterrent for the utility to connect users under the project.