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SLUM ELECTRIFICATION AND LOSS REDUCTION PROGRAM COUNTRY BACKGROUND REPORT INDIA

January 2006

This publication was produced for review by the United States Agency for International Development. It was prepared by Nexant, Inc. under Contract No. EPP-I-02-03-00007-00

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COUNTRY BACKGROUND REPORT

INDIA

FINAL REPORT

NEXANT

January 2006

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1.1 BACKGROUND

The U.S. Agency for International Development (USAID), in cooperation with the International Copper Association (ICA), has launched the Slum Electrification and Loss Reduction (SELR) Program, a three-year program (which began in October 2005) on the theme of regularizing electricity services in slum areas. The primary objective is to develop, test and evaluate customized approaches to improve electricity access and normalize services in slum areas for wide-scale implementation. Program activities include developing and designing pilot projects with local stakeholders in India and Brazil to develop customized approaches that can be replicated in these and other countries.

1.2 SUMMARY

This report provides a summary background on India's slum electrification context in support of identifying potential in-country partners and possibly other donors with the same interest to select local projects that can benefit from the USAID/ICA joint program. Covered in the report are some relevant economic and population data, energy sector structure and regulatory perspective, major initiative on slum electrification, and potential partners and opportunities. Nexant is the technical assistance provider for the Sustainable Municipal Energy Services (SMES) task order under which technical assistance for this activity is provided.

1.3 CONCLUSIONS AND RECOMMENDATIONS FOR NEXT STEPS

Indian electric utilities are in the process of undergoing major reforms and restructuring resulting from the Electricity Act 2003. They appear to be facing a number of critical issues including rural electrification, tariff normalization, and loss reduction, and slum electrification is not generally considered a very high priority action item. However, the central government has proclaimed a policy of providing access to electricity to all consumers including the urban poor, and slum electrification initiatives are being undertaken by NGOs who are trying to convince state government agencies to undertake activities to provide safe, reliable and affordable power to the poor. Also, some of the private electric utilities are initiating programs to legalize electricity connections to slum dwellers to reduce the high non-technical losses in slum areas.

These initiatives have created interest on the part of utilities as well as urban development agencies to consider slum electrification activities that may be good candidates for the USAID/ICA SELR Program. Initial contacts with some of the utilities, NGOs and government agencies have indicated their willingness to explore a pilot project under the SELR Program.

Based on the interest expressed by the NGOs, urban development agencies, and utilities, it is recommended that USAID/ICA and the Nexant team initiate face-to-face dialogues with entities that have showed some interest in slum electrification to discuss proposed project designs, expected benefits to various parties, and anticipated roles and responsibilities of the various partners, and to assess the risk associated with such projects. A country visit is planned in mid-January to conduct such meetings.

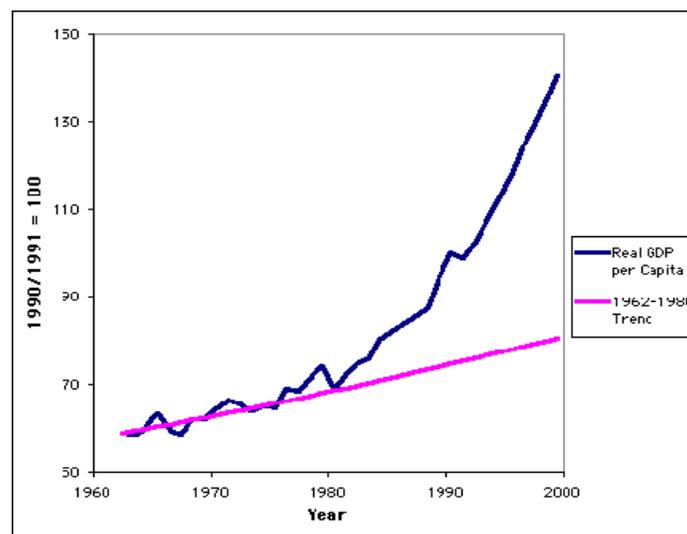
2.1 RELEVANT ECONOMIC AND POPULATION INFORMATION

2.1.1 Economy

Prior to 1990, India's economy was characterized by socialism, central planning, and an unbelievable amount of bureaucratic red tape. This so-called "license raj" strangled the private sector and led to rampant corruption and massive inefficiency¹. As a result, India's economy stagnated. In 1991 the Indian government undertook "sweeping liberalization." It dismantled import controls, lowered customs duties, and devalued the currency as well as substantially reduced or eliminated licensing and control of private investment, dropped tax rates, and broke public sector monopolies. Following this liberalization of the Indian economy has experienced significant economic growth.

The recent trends towards increased globalization and business process outsourcing (BPO), combined with India's strengths in information technology (IT), have further accelerated India's economic growth and development. This is best illustrated in the graph showing real GDP per capita from 1960 to 2000 (see Figure 1 below):

Figure 1
India - Per capita GDP – 1960-2000



¹ J. Bradford deLong, "Preliminary Thoughts on India's Economic Growth, April 2001.

Today, India is the fourth-largest economy in the world as measured by purchasing power parity (PPP), with a GDP of US \$3.36 trillion. India was the second fastest growing major economy in the world, with a GDP growth rate of 8.1% at the end of the first quarter of Fiscal Year 2005–2006². The country's economy is diverse and encompasses agriculture, handicrafts, industries and a multitude of services. Services are the major source of economic growth in India today, though two-thirds of the Indian work force earn their livelihood directly or indirectly through agriculture. In recent times, India has also capitalized on its large number of highly educated people who are fluent in the English language to become a major exporter of software services, financial services and software engineers. However, India's huge population results in a relatively low per capita income of \$3,100 at PPP, and there is an overriding legacy of “lousy infrastructure, bumbling and burdensome regulation and restrictive labour laws,”³ which have limited the economic potential of India.

2.1.2 Population

India is the second-largest country (after China) in terms of population, with a population of 1.03 billion people. Today, Indians make up 16.7 per cent of the world's population with an annual growth rate of close to two per cent (which is significantly higher than China's annual population growth of less than one per cent and the world population growth rate of 1.4 per cent annually). At this growth rate, India will become the world's most populous nation by 2050.

In 2001, India had 35 cities/urban areas with a population of more than one million people. In total, some 108 million Indians, or 10.5 per cent of the national population, live in the country's 35 largest cities. Mumbai (Bombay) with a population of more than 16 million is now the world's fourth-largest urban area followed by Kolkata (Calcutta) in fifth place.⁴

2.2 ELECTRICITY SECTOR OVERVIEW

2.2.1 Infrastructure.

As of November 2005, the total Indian generation capacity is 123.5 GW, of which 81.9 GW (66.3%) is thermal, 32.1 GW (26.0%) 3.3 GW (2.7%) is nuclear, and 6.2 GW (5.0%) is renewable energy (see Table 1 below). Of the thermal generation, coal represents 68.3 GW (55.4% of total generation), while oil and gas account for 13.5 GW (10.9% of the total)⁵. Given India's vast coal resources, and its large untapped hydroelectric potential, these two resources are likely to provide the bulk of additional generation capacity in future. Almost two thirds of the generation capacity in India is owned and operated by the states through electricity boards or electricity departments. Despite the opening of generation to IPPs in 1991, the private sector provides less than 10 GW of total generation capacity.

² Wikipedia, The Economy of India, December 2005

³ Economist, Special Report: Reform in India, October 29, 2005

⁴ City Mayors: Largest Indian Cities, based on Indian National census of 2001, see web site at: http://www.citymayors.com/gratis/indian_cities.html

⁵ Ministry of Power, Indian Electricity Scenario, November 30, 2005.

Table 1 - Power Generation

POWER GENERATION BY FUEL TYPE		
FUEL	MW	%
TOTAL THERMAL	81,939	66.3%
Coal	68,308	55.4%
Gas	12,430	10.0%
Oil	1,201	0.9%
HYDROPOWER	32,135	26.0%
NUCLEAR	3,310	2.7%
RENEWABLE	6,158	5.0%
TOTAL	123,542	100.0%

The average per capita consumption is rather low (606 kWh per capita) but is increasing rapidly. Supply has grown by 5.5% per year but demand has grown even faster. The peak load in MW exceeded available supply by over 9% and the energy demand in GWh has exceeded supply by over 7% in the last fiscal year. Indian industry has responded to supply problems by building many captive generating units.

2.2.2 National Energy Policy

Energy policies are developed and implemented by various ministries: Ministry of Coal, Ministry of Petroleum and Natural Gas, Ministry of Power, Ministry of Non-Conventional Energy Sources, and Department of Atomic Energy. The Planning Commission provides oversight and guidance for these policies. The national Parliament and the State legislatures have powers to legislate in the energy sector. In the event of a conflict, Central Law prevails. A state can however legally enact conflicting legislation with the approval of the President of India.

2.2.3 National Electricity Policy

The national electricity policy is shaped by the requirements of the comprehensive Electricity Act of 2003 ("Electricity Act")⁶. This Act provides an enabling framework for accelerated and more efficient development of the power sector. The Act seeks to encourage competition with appropriate regulatory intervention. Competition is expected to yield efficiency gains and in turn result in availability of quality supply of electricity to consumers at competitive rates. The Electricity Act requires the Central Government to formulate the National Electricity Policy in consultation with Central Electricity Authority (CEA) and State Governments. The provision is quoted below:

"The Central Government shall, from time to time, prepare the National Electricity Policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy".

⁶ The Electricity Act, 2003.

The Central Government's Ministry of Power is responsible for the National Electricity Policy which aims at laying guidelines for accelerated development of the power sector, providing supply of electricity to all areas and protecting interests of consumers and other stakeholders keeping in view availability of energy resources, technology available to exploit these resources, economics of generation using different resources, and energy security issues.

The Electricity Act promised sweeping reform and is intended to initiate various measures to reverse downward trends in financial viability of the state electricity boards (SEBs), and to create "power surplus state". Effective from June, 2003 it would initiate a transition of the power sector from a "single buyer" model of State Electricity Boards (SEBs) to a "multi buyer, multi seller" market structure. The imperatives of the emerging industry structure after the enactment of the Act are competition, trading, segregation of generation and supply, non-discriminatory open access, promotion of renewable energy and rural electrification etc. However, progress towards this new model has been painfully slow.

The Act has a strong consumer focus by enabling competition and open access and therefore providing choice to the consumer in terms of suppliers. Recognizing that electricity is one of the key drivers for rapid economic growth and poverty alleviation, the nation has set itself the target of providing access to all households in next five years⁷. As per Census 2001, about 44% of the households do not have access to electricity. Hence meeting the target of providing universal access is a daunting task requiring significant addition to generation capacity and expansion of the transmission and distribution network.

For all technical and economic matters, the Ministry of Power prescribes guidelines, and the Central Electricity Authority (CEA) assists it for the same. Regulatory authority is split between the states and the central government. The Central Electricity Regulatory Commission (CERC) is the regulatory body for the Central sector generating companies and entities engaged in inter-state supply, transmission and trading; while State Electricity Regulatory Commissions (SERCs) overlook the functioning at the State level. The Ministry of Power reports significant progress in setting up SERCs and in unbundling of the formerly vertically integrated SEBs. A feature of implementation of the Act is the participative manner in which the resulting regulations are being framed. Both the Ministry of Power's Task Force on Power Sector Investments & Reforms and the Central Electricity Regulatory Commission and the various SERCs invited viewpoints of all the stakeholders in the industry while framing the Act and the subsequent rules and regulations pursuant to the new Act.

The Electricity Act has proven to be too ambitious and the reforms are said to have stalled.⁸ In fact they are opposed by politicians more sympathetic to unions. Tariff increases have been instituted but tariffs are still less than 75% of the cost of supply to the distribution companies, resulting in inadequate investment in infrastructure.

2.2.4 National Electricity Plan

The Electricity Act requires the Central Electricity Authority (CEA) to frame a National Electricity Plan once every five years. The Plan is intended to lay out the blueprint for development of the electricity system and coordination of the activities of various planning

⁷ Ministry of Power, National Electricity Policy, November 2005

⁸ Economist: 9/24/05 "India's Electricity Reforms"

agencies for the optimal utilization of resources to serve the interests of the national economy. The Plan would include:

- Short-term and long term demand forecast for different regions;
- Suggested areas/locations for capacity additions in generation and transmission keeping in view the economics of generation and transmission, losses in the system, load centre requirements, grid stability, security of supply, quality of power including voltage profile etc. and environmental considerations including rehabilitation and resettlement;
- Integration of such possible locations with transmission system and development of national grid including type of transmission systems and requirement of redundancies; and
- Different technologies available for efficient generation, transmission and distribution.
- Fuel choices based on economy, energy security and environmental considerations.

2.2.5 Key Issues

The national electricity policy seeks to address the following issues⁹:

- Rural Electrification
- Generation
- Transmission
- Distribution
- Recovery of Cost of services & Targeted Subsidies.
- Technology Development and Research and Development (R&D)
- Competition aimed at Consumer Benefits
- Financing Power Sector Programs Including Private Sector Participation.
- Energy Conservation
- Environmental Issues
- Training and Human Resource Development
- Cogeneration and Non-Conventional Energy Sources
- Protection of Consumer interests and Quality Standards

It should be noted that slum electrification does not appear in this list of issues. To illustrate the focus on rural electrification, the government has announced a program for “Accelerated Electrification” of 1 lakh (100,000) villages and 1 crore (10 million) households. On the other hand it should be noted that the Ministry of Power has declared that it has a “development

⁹ Ministry of Power, National Electricity Policy, November 2005

mission” to provide “sufficient, reliable, quality, and inexpensive power to all”¹⁰. The USAID/ICA SELR program is consistent with this “mission”.

2.2.6 Tariffs and Consumer Subsidies

For historical, political or specific policy reasons often linked to social goals, pricing in India is generally not cost-reflective although the degree to which this is true varies by state and company. Rates are lowest in Jammu and Kashmir, Assam, and Bihar, while the highest rates (over 90% of cost recovery) are in Himachal Pradesh, Maharashtra and Tamil Nadu. However, even in these states, certain sectors, such as agriculture and low income domestic consumers, are heavily subsidized. Retail prices of electricity on average in 2003 represented less than 75% of real average costs, hampering the financial viability of the sector.

There is also a large amount of cross-subsidization between consumer categories. The agriculture and household sectors are cross-subsidized by above-cost tariffs for commercial and industrial customers and railways. Official data show that the nominal value of total subsidies to household customers quadrupled to 80.8 billion rupees (US\$ 1.8 billion) from 1992-1993 to 1999-2000. Subsidies to agriculture more than tripled to 227 billion rupees (US\$ 5.0 billion) over the same period.

2.2.7 Regulation at the Central and State Levels

To reform the tariff structure, the Electricity Regulatory Commissions Act of 1998¹¹ was passed. This Act established the Central Electricity Regulatory Commission (CERC) whose responsibilities include development of tariff policies, regulation of wholesale generation and transmission tariffs for companies owned by the Central Government or engaged in interstate sales of electricity, promotion of competition, efficiency and economy in the activities of the electricity industry, and coordination with environmental regulatory agencies to develop appropriate policies and procedures for environmental regulation of the power sector

The Act also authorized the establishment of State level Electricity Regulatory Commissions (SERCs), who would determine the tariff for electricity (wholesale, bulk, grid or retail); determine the tariff payable for use by the transmission facilities, regulate power purchase and procurement process of transmission utilities and distribution utilities, promote competition, efficiency and economy in the activities of the electricity industries, etc.

2.2.8 Status of Power Sector Reforms

By the time the Electricity Act was enacted in 2003, in many areas metering had become unaffordable, equipment overloaded and deteriorated, maintenance and investment in operations delayed or even cancelled, and quality of electric power supply deteriorated. Power cuts had become endemic. The larger and more affluent consumers increasingly had resorted to individual investment in batteries, inverters, and stand-alone diesel or petrol generators to ensure an adequate supply of electricity.

Significant power shortages and power cuts still plague almost every state due to the limited cost-recovery by utilities and the subsequent inability of utilities to provide reliable, high quality power. The result is widespread revenue shortfalls in both the utilities and the state governments

¹⁰ Ministry of Power, Power Sector Development Mission, November 30, 2005

¹¹ Government of India, Electricity Regulatory Commissions Act, 1998.

that are forced to bail them out, significantly contributing to increasing levels of state fiscal deficits. More resolve in implementing the reform of electric power distribution will be required to get cash flowing again through the system and stem both technical and commercial losses, including theft. That being said, there are some “brighter lights” emerging out of the dim as discussed below.

In accordance with the provisions of the Electricity Act, reform and restructuring has been initiated, including the break-up of the state electricity boards (SEBs) into separate generation, transmission and distribution units, each as a profit center with full accountability, privatization of distribution, and/or devolution of distribution responsibilities to local organizations (such as Panchayats/Local Bodies/Franchisees/Users Association).

By the end of 2005, some progress has been made with respect to the reforms and restructuring (see Table 2 below):

Table 2
Status of electricity Sector Reform and Restructuring

REFORM/RESTRUCTURING ACTIONS	STATES
State Reform Acts Passed	Orissa, Haryana, Andhra Pradesh, Uttar Pradesh, Karnataka, Rajasthan, Madhya Pradesh, Delhi and Gujarat
State Electricity boards Unbundled and/or Corporatized	Orissa, Haryana, Andhra Pradesh, Karnataka, Uttar Pradesh, Uttaranchal Rajasthan, Delhi and Madhya Pradesh
Distribution Companies Privatized	Orissa and Delhi
State Electricity Regulatory Commissions (SERCs) Established or Being Established	Orissa, Haryana, Andhra Pradesh, Uttar Pradesh, Karnataka, West Bengal, Tamil Nadu, Punjab, Delhi, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Himachal Pradesh, Assam, Chhatisgarh, Uttaranchal, Goa, Bihar, Jharkhand, Kerala and Tripura
New Tariff Orders passed by SERCs	Orissa, Andhra Pradesh, Uttar Pradesh, Maharashtra, Gujarat, Haryana, Karnataka, Rajasthan, Delhi, Madhya Pradesh, Himachal Pradesh, West Bengal, Punjab, Tamil Nadu, Assam, Uttaranchal, Jharkhand and Kerala

2.3 MAJOR CITIES/URBAN AREAS

2.3.1 Largest Cities

As indicated earlier, data from India’s 2001 census shows that India has 35 major cities (or urban areas) with over 1 million population. Urban slum areas are home to more than 40 million Indians or 22.6 per cent of India’s urban population. More than 600 Indian towns and cities incorporate

slum areas. The largest slum population in cities with a population of more than one million is found in Mumbai (48.9%).¹² The list of these 35 cities is provided in Table 3 and a map showing their location is presented in Figure 2 below:

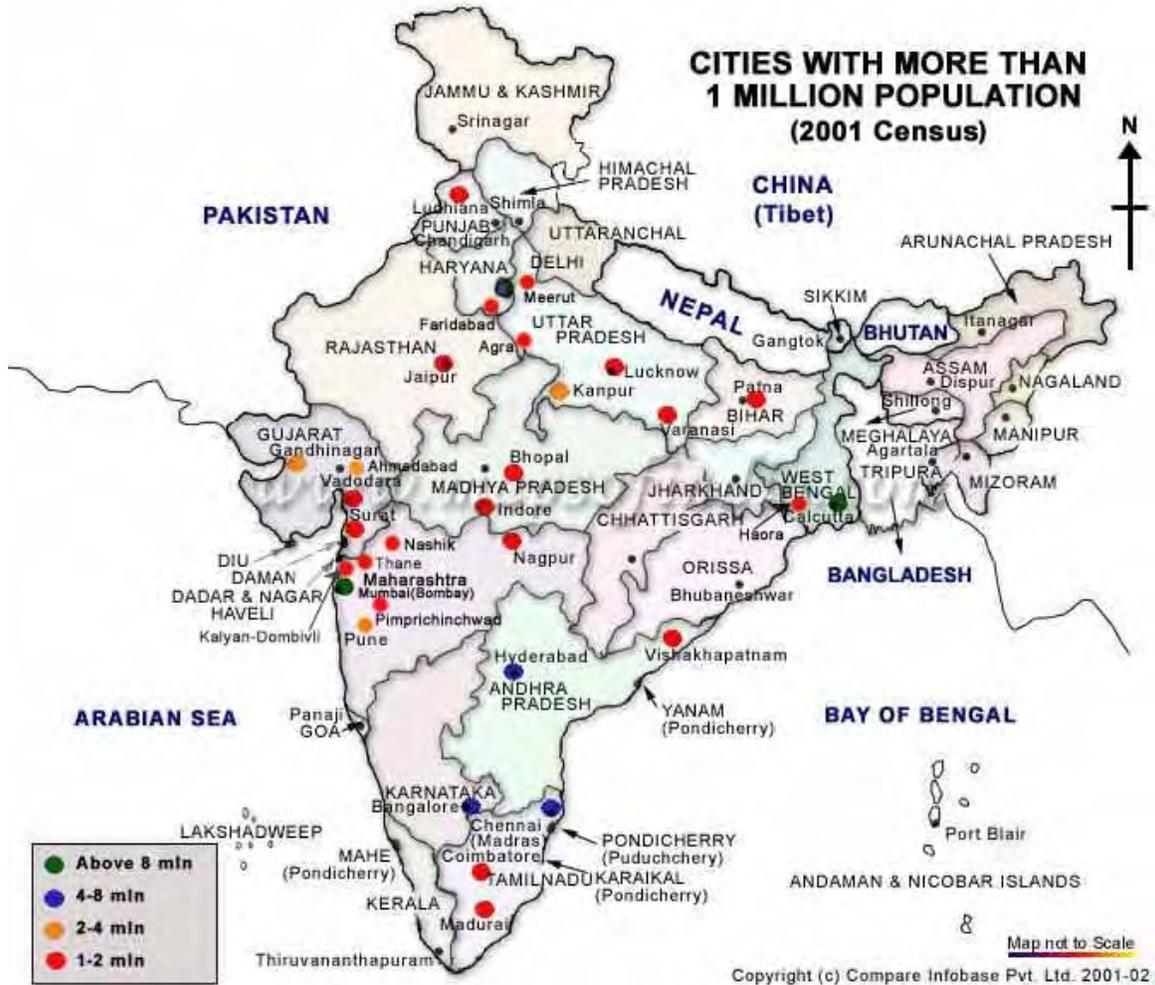
Table 3
INDIA'S LARGEST CITIES

Rank	City / Urban area	Population
1	Mumbai (Bombay)	16,368,000
2	Kolkata (Calcutta)	13,217,000
3	Delhi	12,791,000
4	Chennai	6,425,000
5	Bangalore	5,687,000
6	Hyderabad	5,534,000
7	Ahmadabad	4,519,000
8	Pune	3,756,000
9	Surat	2,811,000
10	Kanpur	2,690,000
11	Jaipur	2,324,000
12	Lucknow	2,267,000
13	Nagpur	2,123,000
14	Patna	1,707,000
15	Indore	1,639,044
16	Vadodara	1,492,000
17	Bhopal	1,455,000
18	Coimbatore	1,446,000
19	Ludhiana	1,395,000
20	Kochi	1,355,000
21	Visakhapatnam	1,329,000
22	Agra	1,321,000
23	Varanasi	1,212,000
24	Madurai	1,195,000
25	Meerut	1,167,000
26	Nashik	1,152,000
27	Jabalpur	1,117,000
28	Jamshedpur	1,102,000
29	Asansol	1,090,000
30	Dhanbad	1,064,000
31	Faridabad	1,055,000
32	Allahabad	1,050,000
33	Amritsar	1,011,000
34	Vijayawada	1,011,000
35	Rajkot	1,002,000

¹² City Mayors, [Largest Indian Cities](http://www.citymayors.com/gratis/indian_cities.html), based on Indian National census of 2001, see web site at: http://www.citymayors.com/gratis/indian_cities.html

Figure 2

INDIA – CITIES WITH MORE THAN ONE MILLION POPULATION



Source: Census of India, 2001, and www.mapsofindia.com

2.3.2 Distribution Companies Serving Cities

The Summary Table (in Appendix A) provides information linking major cities with distribution companies serving them. Except for a few “exempt” cities (e.g., Ahmedabad, Calcutta and Surat) and a few licensees – such as the former Bombay Suburban Electric Supply (BSES) now Reliance Energy Limited, Tata Power Company, Ahmedabad Electricity Company (AEC), owned by Torrent, and Calcutta Electric Supply Company (CESC), owned by the RPG Group – and the privatized distribution utilities in Delhi and Orissa, distribution is still primarily in the hands of the publicly-owned SEBs (or the newly-formed state-owned distribution companies or Discoms).

Responsibilities for distribution of electricity in a municipal area may be split. Some of the privately held distribution companies are very large and are also operating in more than one major city.

Most SEBs are effectively bankrupt as a result of political interference and mismanagement (see above discussion on tariffs). For the last several years, their revenues have been insufficient to cover the costs of providing electricity. Arrears owed to the central generating companies are now equivalent to the cost of one year of consumption. The International Energy Agency (IEA)¹³ cites the ineffective decision-making process in the SEBs as a significant restraint. There is no incentive for technical staff to implement or run cost-effective operations. The results of these failures are unsatisfied demand, poor quality of electricity and unreliable supply wherever SEBs are operating.

Private companies involved in distribution for a long time, such as Reliance Energy in Mumbai, AEC in Ahmedabad, and SEC in Surat, are performing relatively better and earning profits. However, the experience of the new distribution companies in Orissa shows that transforming state-owned distribution franchises into economically viable private ones is not an easy or quick task. Tata Power¹⁴, Reliance¹⁵ and Torrent now dominate the once-wider field of privatized distribution companies after several multi-national companies, such as AES, dropped out due to the financial crises alluded to above.

A discussion of the distribution companies in several major Indian cities follows.

Mumbai:

Three distribution companies serve different areas in Mumbai: the Maharashtra State Electricity Distribution Company Ltd (MAHADISCOM), formerly MSEB, Brihanmumbai Electric Supply and Transport (BEST), and Brihanmumbai Suburban Electric Supply (BSES). MAHADISCOM is the state owned utility (unbundled from the MSEB). BSES is owned by Reliance Energy Limited, while BEST is municipally owned and operated. The latter cooperated with the NGO SPARC in the electrification of pavement dwellers described in the next section.

BSES holds an exclusive license to distribute power to users in Mumbai's northern suburbs up to 2011. Its licensed area covers an estimated 9 million people and includes commercial, residential & industrial consumers. It operates a thermal power plant at Dahanu and distributes power from this plant using its own grid. It is an efficient operation, with the country's lowest distribution

¹³ International Energy Agency, Electricity in India: Providing Power for the Millions, Paris, France, 2002

¹⁴ Tata Power is a pioneer in the Indian power sector and is one of India's largest energy utilities. Originally established to supply power to Mumbai, it now has a presence in generation, transmission and distribution. Tata Power has an installed power generation capacity of 2,278 MW from its thermal and hydroelectric plants. It has branched into operating captive power plants (CPPs) and independent power plants (IPPs).

¹⁵ Reliance Energy Limited operates an integrated utility with generation and distribution functions. It sells to around 5 million customers and has around 885 MW installed capacity. Reliance Energy Limited's Mumbai operations cover a population of 9.0 million within an area of about 384 sq. kilometers. The Distribution network handled and sold 5,879.66 MUs in the year 2002-2003. Reliance operates in three other urban areas: Orissa, Delhi, and Kerala. Its distribution losses (presumably technical) have been reduced to 13.4% - the lowest in the country.

losses at 13.4% (comparing favorably against the national average of over 22%) and 99.99% reliability.

Delhi

Delhi is served by two distribution companies, both privately operated: NDPL¹⁶ and BSES¹⁷. NDPL is a joint venture of Tata Power and the Government of Delhi. BSES consists of two distribution companies, BSES-Rajdhani and BSES-Yamuna, and is owned by Reliance. Privatization seems to have brought large benefits. Both NDPL and BSES have substantially cut both technical and non-technical losses and improved customer service. Yet, Delhi's middle class consumers were recently able to persuade the local government to withdraw an increase of about 10% in the residential electricity tariff.¹⁸

Surat.

Torrent Power/Surat Electricity Company distributes power in approximately half of the total area of Surat under a license extending until 2028 and purchases electricity from the Gujarat Electricity Board. The rest of Surat is served by the publicly-owned Southern Gujarat Electricity Company Limited.

Hyderabad (Andhra Pradesh)

The Andhra Pradesh Central Power Distribution Company Limited (APCPDCL), a licensee (a state owned corporation), serves 5.22 million customers in seven districts in Rayalseema and Telangana areas including the twin cities of Secunderabad and Hyderabad.

Bangalore

The city of Bangalore (and surrounding area) is served by thye Bangalore Electricity Supply Company Limited (BESCOM), which is wholly owned by the Government of Karnataka. BESCOM covers an area of 41,092 Sq. km. The company has three operating zones - Bangalore Metropolitan Area Zone, Bangalore Rural Area Zone and Chitradurga Zone, and serves over 3.8 million domestic and agricultural customers.

Chennai

Chennai is still served by the state-owned Tamil Nadu Electricity Board (TNEB), which has not yet been subject to unbundling under the Electricity Act of 2003.

¹⁶ Tata holds managing control in the distribution company, NDPL, which distributes and supplies power to the north and northwest areas of Delhi.

¹⁷ BSES (Mumbai) and BSES (Delhi) have the same ownership. The original company was located in Mumbai and branched out when the Delhi distribution company was reorganized, split up into two companies and sold.

¹⁸ Ibid

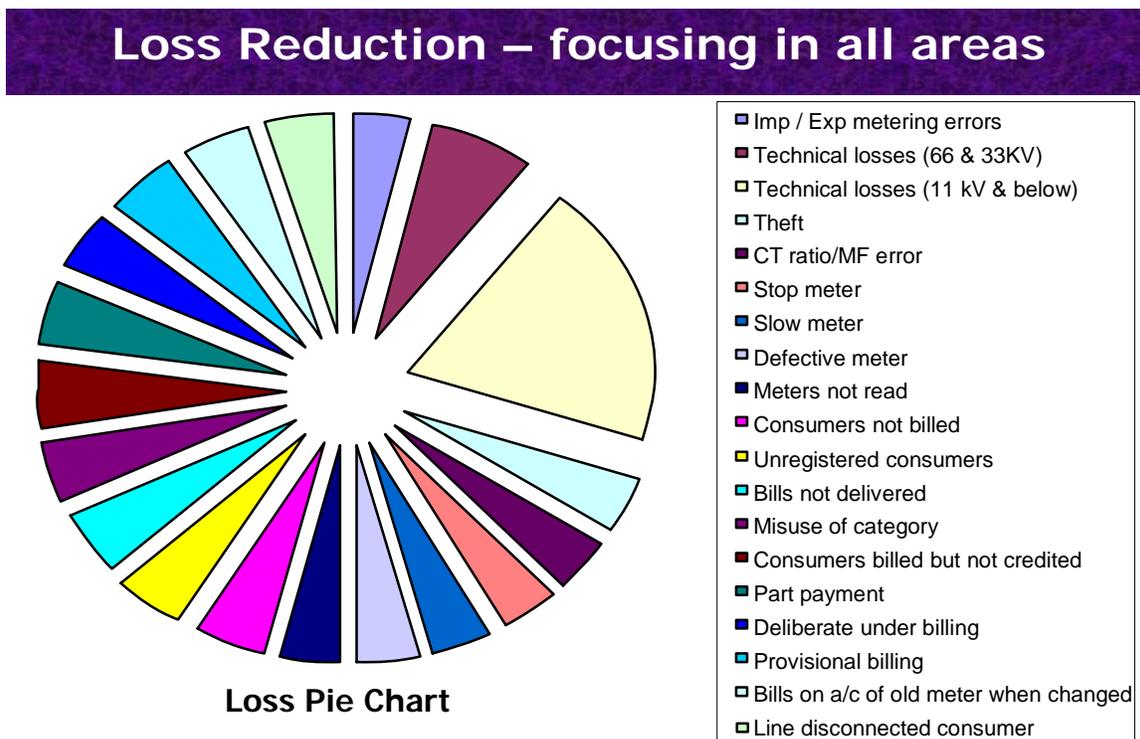
2.4 LOSS REDUCTION INITIATIVES

Technical and Non-Technical Losses.

In 2001, it was estimated that, out of total electricity generated nationwide, only 55% is billed and 41% is regularly paid for. Electricity is either stolen, not billed, or electricity bills are not paid. Transmission and distribution losses due to the inadequacy of the system are very significant, varying between 20 and 45%. In terms of sales, this means that for every kWh of net generation, between 0.8 and 0.55 kWh is billed. According to official estimates, roughly one-fourth of T&D losses are in transmission and three-fourths are in distribution.

As an illustration of the multiplicity of technical and non-technical losses in a typical Indian electric distribution system, the pie chart in Figure 3, extracted from a presentation by BSES¹⁹, shows the types of losses encountered when the private owners took over the company. It can be seen that technical losses were the most important source of loss; management and operational inadequacies amount to another significant portion, while actual theft was a rather small portion of the total loss picture.

Figure 3



¹⁹ J.P. Chalasani, BSES, “Delhi Privatization Process: BSES Experience”, Presentation, undated.

Unlike BSES Delhi and BSES Mumbai, which primarily serve urban areas, in most of the rest of India, the agricultural sector is responsible for the greatest losses of power distribution companies, as well as for state governments, largely due to heavily subsidized irrigation pumping. Such pumping demands a major portion of electricity supply (estimated at 30+% of total electricity use), while providing the smallest fraction of total revenue from electricity generation and distribution. Poor water pricing and management policies worsen this wastage of both power and water resources. The World Bank estimates that current losses in the Indian power sector amount to approximately \$5 billion per year and are growing rapidly.²⁰

IEA estimates that if most of these non-technical losses are allocated to sales to agriculture, the agriculture tariff issue could be less important than statistics make it appear. Conversely, the issue of non-payment could be more important than officially stated. Many customers, from agriculture but also households in urban areas, do not pay but continue to receive service. These customers (or their paid illegal service providers) effectively enjoy a 100% subsidy. This non-payment problem could far outweigh the official subsidies issue.

Even in Orissa where tariff reforms were introduced in 1995, political interference in the implementation of price hikes has impeded the planned reduction of T&D losses. Disconnecting non-paying customers has been made difficult. But there has been some progress. A 19.35% tariff hike for domestic consumers was allowed while high tension tariffs were decreased, thereby reducing the cross-subsidies.

2.5 ELECTRICITY ACCESS AND USAGE IN SLUMS

2.5.1 Slums in India

India remains home to the world's largest number of poor people, according to the World Bank²¹ although its middle class has grown to an estimated 250 million in the past decade. India's population in 2005 is already over 1 billion of which somewhat less than 33% is located in cities. Nevertheless, migration from rural to urban locations is fast paced and worrisome. In 1991, India had 23 cities with one million or more people. A decade later it had 35.

Slums have become an integral part of India's urban areas and the increased urbanization has led to an increase in the number of slums and the population living in them. Since information on the slums is essential for formulation of effective and coordinated policies for their improvement, the Census of 2001 administered a survey of slums and characteristics of slum dwellers²². Such delineation of slums for collection of primary data on their population characteristics may perhaps be the first of its type in the world.

The Census defined slums as:

²⁰ The World Bank, India: Sustaining Reform, Reducing Poverty, Oxford University Press, New Delhi, 2003

²¹ Ibid.

²² Census of India, 2001 Census Results - Slum Data, Office of the Registrar general, India, December 2005. (http://www.censusindia.net/results/slum/slum_index.html)

- All specified areas in a town or city notified as “Slum” by State/Local Government and Union Territory (UT) Administration under any Act including a “Slum Act”.
- All areas recognized as “Slum” by State/Local Government and UT Administration, Housing and Slum Boards, which may have not been formally notified as slum under any act;
- A compact area of with a population of at least 300 or about 60-70 households of poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities.

2.5.2 Slum Population

Slum data was reported by 26 of the 35 States/UTs. The results (for the year 2001), released in December 2005, indicate that:

- A total of 42.6 million people live in slums in 2001. This constitutes 15 per cent of the total urban population of the country and 22.6 per cent of the urban population of the States/UTs reporting slums. 11.2 million of the total slum population are in Maharashtra followed by Andhra Pradesh 5.2, Uttar Pradesh 4.4 and West Bengal 4.1 million.
- The slum population in the 27 cities with a population of over 1 million is 17.7 million. The Greater Mumbai Municipal Corporation with 6.5 million slum dwellers has the highest slum population, followed by Delhi (1.9 million), Kolkata (1.5 million) and Chennai (0.8 million). Table 4 on the next page provides information on the slum population in the major cities.
- The literacy rate in slum areas is 73.1% (80.7% for male and 64.4% for females) compared to an overall non-slum urban literacy rates of 81.0% (87.2% for males and 74.2% for females).
- 32.9% of the slum population has been reported as workers. Male work participation rate is 51.3% and female work participation rate is 11.9%.

As would be expected, the largest cities tend to have more slums. There are issues in all of them regarding the treatment of slums and the approach to solving the problem. NGOs are plentiful and most active in the largest cities but are present in many more.

While some information is now available on the number of people living in slums in major Indian cities, there is very little information on the access to electricity for the slum dwellers. Taking the Mumbai metropolitan area as an example, the National Statistical Survey Organization's survey in 2002 recorded 52,000 slums. These contain only half the poor - the others live on the streets. It is estimated that about two-thirds of the slums were built on public land owned mostly by local bodies, state governments, etc. Infrastructure facilities are atrocious: only 15% of slum households have drinking water, electricity and latrines in their premises. Less than 25% of them have sanitation systems.

Table 4

SLUM POPULATION IN CITIES WITH POPULATION ABOVE ONE MILLION - 2001					
Sl.No.	Name of Million Plus Municipal Corporations	State/Union Territory*	Total population	Total Slum Population	Percentage of Slum Population
1	2	3	4	5	6
	TOTAL		73,345,775	17,696,950	24.1
1	Greater Mumbai	Maharashtra	11,978,450	6,475,440	54.1
2	Delhi	Delhi	9,879,172	1,851,231	18.7
3	Kolkata	West Bengal	4,572,876	1,485,309	32.5
4	Chennai	Tamil Nadu	4,343,645	819,873	18.9
5	Bangalore	Karnataka	4,301,326	430,501	10.0
6	Hyderabad	Andhra Pradesh	3,637,483	626,849	17.2
7	Ahmadabad	Gujarat	3,520,085	473,662	13.5
8	Surat	Gujarat	2,433,835	508,485	20.9
9	Kanpur	Uttar Pradesh	2,551,337	367,980	14.4
10	Pune	Maharashtra	2,538,473	492,179	19.4
11	Jaipur	Rajasthan	2,322,575	368,570	15.9
12	Lucknow	Uttar Pradesh	2,185,927	179,176	8.2
13	Nagpur	Maharashtra	2,052,066	737,219	35.9
14	Indore	Madhya Pradesh	1,474,968	260,975	17.7
15	Bhopal	Madhya Pradesh	1,437,354	125,720	8.7
16	Ludhiana	Punjab	1,398,467	314,904	22.5
17	Patna	Bihar	1,366,444	3,592	0.3
18	Vadodara	Gujarat	1,306,227	186,020	14.2
19	Agra	Uttar Pradesh	1,275,134	121,761	9.5
20	Thane	Maharashtra	1,262,551	351,065	27.8
21	Kalyan-Dombivli	Maharashtra	1,193,512	34,860	2.9
22	Varanasi	Uttar Pradesh	1,091,918	137,977	12.6
23	Nashik	Maharashtra	1,077,236	138,797	12.9
24	Meerut	Uttar Pradesh	1,068,772	471,581	44.1
25	Faridabad	Haryana	1,055,938	490,981	46.5
26	Pimpri Chinchwad	Maharashtra	1,012,472	123,957	12.2
27	Haora	West Bengal	1,007,532	118,286	11.7

Source: Census of India, 2001 Census Results - Slum Data, op cit

2.5.3 Characteristics of Slum Communities

Slum communities have been characterized in a recent study of Delhi slums by DfID²³ into three types from the perspective of understanding their reasons for stealing electricity and their likely interest in legal connection. These are:

- Spontaneous, illegal settlements, often well established over time - These tend to arise in developed areas.
- Resettlement/planned settlements - These tend to be on the outskirts of the city.
- Unauthorized settlements where people had bought plots of land from original landowners.

According to the DfID study, a high proportion (approaching a half) of households had illegal connections (stealing). Most households had an electric fan and many were using electricity for cooking – an anomaly, because they do not pay on a basis of amount of usage. Otherwise there is a universal desire to use gas for cooking and electricity for water heating. The priority uses of electricity are fans for cooling in hot seasons in order to control mosquitoes (health and good sleep), and lighting at other times of the year. The mean proportion of household expenditure (legal or not) spent on energy is 14%. An illegal connection is not necessarily a free connection; the cost can be similar to that for a metered connection. Safety and access are regarded as the most important characteristics of fuels – economy is near the bottom of the list. Willingness to pay for a legal connection is strongest amongst those with illegal connections. However, the upfront payment is a relatively large connection charge in which the customer carries the risk with a security deposit as an added cost. This clearly presents a barrier to access, as the cost of connection can be very high relative to income levels of most people living in unplanned settlements. In this example the cost of connection is 1555 Indian Rupees (equivalent to about US\$34.50).

According to the website, IndianNGOs²⁴, 60 per cent of the population are urban poor living in slums (in hutments), dilapidated chawls (apartment buildings or tenements) and other buildings. Of this 60 per cent, 40 per cent live in slums. While 30 per cent of the slums are regularized, 10 per cent slum dwellers are still illegally occupying their land in Mumbai. This means about 1.2 million out of Mumbai's 12 million people live in unauthorized slums. Even the so-called regularized slums need adequate infrastructure.²⁵

Just as an example, Bangalore's ten-yearly Revised Comprehensive Development Plan 2015 (CDP) was criticized by NGOs, such as one called Janaagraha, for not taking account of the needs of the inhabitants of the slums and the like. It was claimed that BESCO (the distribution utility) had not been consulted in developing the CDP.

In another example, in Mumbai a former textile mill area, called the Mill Lands, is being redeveloped (hotels, commercial buildings) under the municipal plan, Vision Mumbai (a radical

²³ Gamos Ltd., Energy in Low-Income Urban Communities, (Contract Number R8146 – Barriers to Access to Modern Energy in Slums), Final Technical Report, February 2005.

²⁴ <http://www.indianngos.com/issue/housing&slums/statistics/delhi.htm>

²⁵ Interview with Arputham Jockin, a respected community leader and President of the National Slum Dwellers Federation, as reported on www.indianngos.com.

\$40 billion makeover of the city: clearing slums, and building a new subway, providing public toilets, and eliminating shanties on the airport tarmac). Of the nearly 60 mills that once operated here, more than a dozen have been converted into office towers, shops and apartments. About 40 are left. The government's efforts to demolish slums earlier this year caused such a ruckus that it stopped after two months. Weekend tours of demolished slums have been organized. Mumbai is also finally relocating slum residents that are living on airport land after long wrangling with the community and its defenders.

Power theft in slums is rife though much reduced in some individual cases (mostly privatized discos); but it is also just as prevalent in other consumer segments. For example, even several years after privatization, in Mumbai such pilferage continues. The Pune-based PRAYAS NGO blames “silent political patronage” for the failure to appoint the inspectors empowered to investigate the premises of consumers suspected of pilfering power as provided for in the Electricity Act of 2003 when it mandated privatization.

Parivartan Delhi has been active in representing poor consumers and helping them to gain access to necessary public utilities, including electricity. It is critical of the way that privatization has taken place.

3.1 NATIONAL INITIATIVES**3.1.1 Introduction**

The Ministry of Power of India's Central Government oversees the Electricity Act, 2003, as well as the targeted programs, such as the APDRP, described below. According to Lucio Monari of the World Bank Delhi Office Mr.R.V. Shahi, Secretary - Power, and Ajay Shankar, Additional Secretary, are dealing with slum electrification issues.

3.1.2 The Kutir Jyoti Program

In 1998, the Central Government launched the Kutir Jyoti Yojna_(literally "lighting for small houses program") with a goal of having every household electrified by 2012. This program is primarily targeted at rural households.

Under this program, the SEBs were required to connect households under the poverty line. The government and the SEBs were to provide grants up to a maximum of 1,000 rupees per connection with the installation of a meter, or 800 rupees per connection without a meter. Implementation of the program has been hindered by difficulties in identifying eligible households and by the SEBs' severe financial problems.

3.1.3 National Urban Renewal Mission

The Indian government announced in early December 2005 a major program, called Jawaharlal Nehru National Urban Renewal Mission (NURM). The scheme -- projected to cost more than Rs 1 lakh crores (about US\$22.2 billion) -- will cover about 60 cities with a million-plus population, all state capitals, and several cities of religious, historical and tourist importance. It will entail investment partnerships among the national, state governments and urban local bodies. NURM has two components: one on urban infrastructure and governance and the other on provision of basic services to the urban poor -- including housing, water supply, sanitation, slum improvement, community toilets/baths, etc. While provision of access to electric power is not specifically mentioned in the NURM literature, it is anticipated that it will be a component that would be included in the "basic services". National assistance and grants for these schemes will be linked to necessary reforms at the local level.

3.1.4 APDRP

Besides introduction of the Electricity Act described earlier, one recent development in the Sector is a renewed focus on distribution reforms through the Accelerated Power Development Reforms Program (APDRP). The focus of ADPRP is on:

- Creation of distribution "Centers of Excellence" to meet short-term objectives, e.g., increasing revenues and reducing outages
- Improved metering and energy accounting on distribution feeders, e.g., providing useful information on consumption patterns for demand side management and making 11 kV Feeder "profit centers"
- Technical Loss reduction measures

- Improving customer satisfaction, e.g., better quality power in terms of voltage fluctuations and reliability by reducing outages
- Computerization and standardization of technical specifications of equipment used in the distribution sector
- Application of information technology and management information systems (MIS)
- Capacity Building within SEBs/Utilities

As of December 2005, 29 states had signed the Memorandum of Understanding (MOU) with the Ministry of Power to take various steps to undertake distribution reforms in a time bound manner, 24 states had constituted State Energy Regulatory Commissions (SERCs) and 18 had issued orders to start the process of rationalizing tariffs. According to Torrent Power's website, one provision of the Act of concern to distribution companies (Discoms) is the one relating to detection and assessment of theft. Per John Hammond²⁶, this Government funded metering program may be a source of funding for SE related metering efforts.

3.2 DISTRIBUTION COMPANY INITIATIVES

This section summarizes some of the known activities of Indian distribution companies relative to slum electrification.

Ahmedabad Electricity Company (AEC)

AEC/Ahmedabad conducted a pilot slum electrification program with partners SEWA and SAATH in cooperation with USAID in 2002-03. The objective of this program was to develop a private sector-civil society partnership to extend critical legal and reliable modern energy services to slum communities. The program used NGOs as intermediaries to prepare slum areas for service and to provide loans for consumer portion of the cost of upgrade. (Appendix A provides additional information on this program²⁷). The pilot was considered successful, and AEC appears to have extended it to a number of other slums in its service area.

North Delhi Power Limited (NDPL)

NDPL initiated a program in cooperation with the NGO INDCARE and USAID in 2003-04. INDCARE worked with NDPL in a campaign to legally connect slum consumers by informing the slum communities regarding the safety risks of illegal connections and the economic benefits of legal connections. (Appendix B provides additional information.)

BSES - Delhi

BSES had developed a policy of using local companies as sub-contractors to provide services to "low income communities" (slums). BSES provides power directly to established customers, but their general preference is to use a single point of delivery system whereby the sub-contractor buys power through a bulk meter. The subcontractor installed low voltage networks to dwellings, installed meters, issued bills and collected payments. A building company had experience of managing loans to house buyers, so they responded to an advert in the paper inviting tenders to

²⁶ Personal communication, John Hammond, U.S. Energy Association.

²⁷ Additional information can also be found in USAID, [Innovative approaches to Slum Electrification](#), December 2004.

supply the Banjara Camp slum area. They have installed the entire low voltage network including meters in each house for an average cost of 1,500Rs per connection (\$30), although people can buy on credit. The key to their success in reducing theft is regular spot checks. They read meters to check on the meter readers they employ, and they look for illegal connections. They also have a 3 phase supply to pole mounted distribution boxes, which makes it more difficult to steal. This is a slum area, and potentially subject to eviction; in this event the company would remove their equipment in the hope of using it in another location.²⁸

Recent conversations with BSES have indicated that the Company is not in favor of using this “contractor model” and is internalizing the activities previously contracted out.

Mumbai

The slum electrification activities in Mumbai (providing electricity to pavement dwellers) were primarily initiated by an NGO (SPARC) in collaboration with the municipally-owned BEST. These are described under Cross-Cutting Initiatives later in this section.

The privately-owned Reliance/BSES has initiated some slum electrification programs recently.

3.3 STATE AND MUNICIPAL INITIATIVES

Ahmedabad

The approach of the Ahmedabad Urban Development Authority (AUDA) in dealing with the slums surrounding Ahmedabad (peri-urban area) is in stark contrast to the AEC/Ahmedabad program as it operates a scheme where peri-urban slums are demolished and replaced with multi-use developments that can pay for the re-lodging of former slum residents in apartment buildings on part of the original property.

Andhra Pradesh

Sector reforms on Andhra Pradesh started in 1998 and resulted in a phased program to institute a new legal, regulatory and institutional framework for the sector, and as of 2004, the program had accomplished passage of an electricity reform law, unbundling of the utility into Generation, Transmission and 4 Discoms, and the establishment of an independent regulatory commission. Working with all of the stakeholders, the state government launched a stateside anti-theft campaign in 2000 where over 1.8 million connections were regularized.²⁹ “The initiative reduced losses, boosted revenues, and improved customer service through a series of actions including: strengthening laws covering theft, instituting customer data management systems to allow ‘detection before inspection’, and cracking down on collusion and theft within the company. The program involved purchasing of high quality tamper-proof meters and protective boxes installed on transformers. The utilities have institutionalized new business processes and made visible changes in their organizational culture.”³⁰

²⁸ Gamos limited, op cit

²⁹ The World Bank “India: Power Sector Reform in Andhra Pradesh, Case Study, Participation in Macroeconomic Policies”, 2003.

³⁰ The World Bank. “Reforming the Power Sector: Controlling Electricity Theft and Improving Revenue,” Public Policy for the Private Sector, Note Number 272, September 2004.

Chennai:

The Tamil Nadu Slum Clearance Board and the Tamil Nadu Urban Development Fund (TNUDF) have expressed interest in slum electrification activities in cooperation with the NGO SUSTAIN. The interesting aspect of this proposed program is to provide additional (legal) electricity to slum dwellers to allow them to engage in new economic activities. Additional discussion follows in the section on NGO initiatives below.

Mumbai:

The Mumbai Metropolitan Regional Authority: is responsible for the development of the Mumbai Metropolitan Region (MMR) which comprises the “Megacity” of Mumbai, the capital of Maharashtra State. The Brihanmumbai Municipal Corporation (BMC) is involved in a variety of initiatives to remove or upgrade slums within and around Mumbai, including the effort to eliminate slums (e.g., those crowded around the Mumbai airport, as noted earlier).

3.4 NGO INITIATIVES

SPARC

The Society for the Promotion of Area Resource Centres (SPARC), based in Mumbai, is one of the largest Indian NGOs working on housing and infrastructure issues for the urban poor. It collaborates with two people's movements, the National Slum Dwellers Federation (NSDF) and Mahila Milan (MM). NSDF was founded in the mid 1970s and is a national organization of community groups and leaders who live in slums/informal settlements across India. Its main aim is to mobilize the urban poor to come together, articulate their concerns and find solutions to the problems they face. Today the NSDF works with about half a million households in the country. In 2000, the President and Founder of NSDF, Arputham Jockin, was awarded the Ramon Magsaysay Award. Mahila Milan means "Women Together" in Hindi and is a decentralized network of poor women's collectives that manage credit and savings activities in their communities. Mahila Milan aims to provide a space for women to take on important decision making roles and be recognized for their critical contributions towards improving the lives of their communities. SPARC, NSDF and Mahila Milan are collectively known as “The Alliance”

SPARC was involved in the cross-cutting initiative in Byculla, Mumbai to electrify pavement dwellers³¹. SPARC began working with the most vulnerable and invisible of Mumbai's urban poor – the pavement dwellers – and was able to get legal and secure electricity service to one group of pavement dwellers in the Byculla neighborhood of Mumbai from the official power supplier, the Bombay Electric Supply and Transport Undertaking (BEST). This project involved negotiations and learning processes that both the pavement dwellers (and their support organizations), and the electricity supplier had to go through in order to come to a common understanding and overcome procedural constraints.

³¹ Sundar Burra and Liz Riley, “Electricity to Pavement Dwellers in Mumbai,” SPARC (Society for the Promotion of Area Resource Centres), September 1999.

SAATH

Saath is an NGO in Ahmedabad (in Gujarati, the word Saath means “Together, Co-operation, a Collective or Support”), established to facilitate participatory and sustainable development processes that would make human settlements equitable living environments, especially for the vulnerable groups. Saath initiated the Integrated Development Programme for the slums of Ahmedabad in 1989 to improve the quality of life for the slum residents and make slum areas in Ahmedabad more equitable living environments. In association with the Ahmedabad Electricity Company (AEC), Saath has been working for provision of legal electric meter connections under the Slum Electrification Project in the areas of Vasna and Juhapura since the year 2002³². More than 2000 meters have already been provided under this project.

Saath has worked closely with another NGO SEWA (Self Employed Women’s Association). SEWA is an organization of poor, self-employed women worker, who earn a living through their own labor or small businesses³³. SEWA’s main goals are to organize women workers so that they can achieve work security, income security, food security and social security (at least health care, child care and shelter).

SUSTAIN

SUSTAIN (Citizen’s Alliance for Sustainable Living) is an NGO devoted to the cause of advocating and advancing practices, methods and technologies for Sustainable Living, Livelihood and Development. SUSTAIN conceives, designs, plans and implements projects and programs that advocate and facilitate the efficient usage of energy, water and other natural/produced resources. Sustainable-energy projects contribute to efficient energy supply, better environment as well as social and economic well being of their users.

SUSTAIN has worked with the United Nations Center for Human Settlements (Habitat) on several initiatives in Chennai including energy efficiency and water supply and sanitation. SUSTAIN is also a key team member of the DfID study led by the Development Planning Unit of University College, London titled "Service Provision Governance in the Peri-Urban Interface of Metropolitan Areas".

SUSTAIN has expressed substantial interest in slum electrification in Chennai and management of SUSTAIN believe that slum electrification can be a contributor to economic development of slums. Contacts have been made with the Tamil Nadu Slum Clearance Board, Tamil Nadu Urban Development Fund and Tamil Nadu Electricity Board to explore slum electrification projects in two areas in Chennai³⁴.

INDCARE

The INDCARE Trust (Integrated National Development Centre for Advancements, Reform and Education) is a Delhi-based NGO whose objectives are to raise the standard of the living of the poor, needy and deprived residing in urban slums, rural and tribal areas. INDCARE specializes in

³² Saath, Annual Report, 2003-04, <http://www.saath.org/>.

³³ SEWA, Self Employed Women’s Association, <http://www.sewa.org/aboutus/index.asp>.

³⁴ Personal communication, Mr. Dattatri and Mr. Devasahayam of SUSTAIN.

working with women. INDCARE has worked with two clusters in north-west Delhi (Jaipur Golden and Bhalla Factory) in a slum electrification pilot project with NDPL, which was partially funded by USAID. INDCARE also conducted the field work with GAMOS Ltd. for the DFID study³⁵. Additional information is provided in Appendix C.

Parivartan

Parivartan is a Delhi based citizens' movement trying to ensure a just, transparent and accountable governance. It has been active in assisting the poor in dealing with municipal service providers including the former electric supplier Delhi Vidyut Board (now privatized as NDPL and BSES). Parivartan has also been involved in slum upgradation in Delhi.³⁶

Shelter Associates

Shelter Associates is a Pune-based NGO, comprising architects, planners, and social workers³⁷. Its prime area of activity is amongst the urban poor, particularly women, in informal settlements, to facilitate and provide technical support to slum rehabilitation and infrastructure projects working with (and training) collectives of men and women called Baandhani (which means 'building together' in Marathi) in slums and other informal settlements in cities of Maharashtra, primarily focusing on sanitation.

The Voltas Organization of Women

Voltas Limited is India's premier air-conditioning and engineering services provider offering engineering solutions for a wide spectrum of industries. The company has established the Voltas Organization for Women (VOW) to serve the poor for over three decades to provide them with medical relief, educational grants, nutrition to undernourished children and installation of electricity and water connection in slums³⁸. VOW's present member strength is around 300.

3.5 DONOR AGENCY INITIATIVES

USAID:

USAID India's Strategic Objective 4: "Improved Access to Clean Energy and Water in Selected States" is directly focused on improved power distribution in selected Indian states³⁹ and includes:

- Technical assistance, training, and investments in model metering, billing, and collection systems;

³⁵ Gamos Ltd., op cit.

³⁶ <http://www.parivartan.com/home.asp>

³⁷ <http://www.shelter-associates.org/>

³⁸ Confederation of Indian Industries (CII), Compilation of Company Social Initiatives - 2003

³⁹ USAID India, Strategic Framework, http://www.usaid.gov/in/our_work/strategy/strategy3.htm.

- Investments in infrastructure upgrades, such as transformers, more efficient pump sets, and high tension power lines as part of a demonstration distribution model;
- Technology verification for and investment in clean, distributed generation technologies as part of a demonstration distribution model;
- Matchmaking and technical assistance to private utilities, village electricity committees, franchises, and NGOs to manage the "last mile" (connections to final consumers) distribution system and improve consumer relations; and
- Documentation and dissemination of lessons learned from pilot demonstration projects.

USAID assisted the implementation of the slum electrification program in Ahmedabad. USAID has also cosponsored and co-funded technical assistance and training events, in cooperation with the Cities Alliance, to support urban slum improvement projects and preparation of city development strategies.

The World Bank

While the World Bank has sponsored a number of programs related to infrastructure development and poverty reduction in a number of India States, e.g. Karnataka, Andhra Pradesh and Tamil Nadu, these have not directly addressed issues related to slum electrification. Form example in 2005, the World Bank approved the Third Tamil Nadu urban Development Project targeted at improving the delivery of urban services through enhancing the quality of urban infrastructure and strengthening the institutional and financial framework. The bank has provided funds to the Tamil Nadu Urban Development Fund (TNUDF). Some of these funds may be available for slum electrification.

U.K. Department for International Development (DfID)

The U.K. DfID is involved in two major "Urban Basic Services Projects" one in Andhra Pradesh and the other in West Bengal (Kolkata). The Andhra Pradesh Urban Services for the Poor (APUSP) is a partnership between the government of Andhra Pradesh and DfID aimed at achieving a sustained reduction in the vulnerability and poverty of the urban poor in Andhra Pradesh. The program, which is expected to be a long-term initiative, began in April 1999 with financial commitment from DfID for a period of 7 years⁴⁰. The only energy-related component of APUSP involves improvement of energy efficiency in municipal water systems.

The Kolkata Urban Services for the Poor (KUSP) program, with a budget of £102 million, is aimed at improving urban planning and governance; access to basic services for the poor; and promoting economic growth, and is expected to benefit 4.2 million people over a period of 8 years. However, energy does not appear to be a major part in this program⁴¹.

There is a large new program that DfID is supporting in India, "Madhya Pradesh Power Phase II." This is £18.5 million Technical and Financial Assistance effort for extending support for power sector reform from 2005/06 to 2009/10. Since 2002, DFID has provided £10 million of

⁴⁰ Andhra Pradesh Urban Services for the Poor, <http://www.apusp.org/>

⁴¹ Personal communication, Dick Jones, DfID.

Technical Assistance towards 'Support for the Reform of the Power Sector in Madhya Pradesh', which ended in August 2005. The Goal is to promote economic and social development of Madhya Pradesh and contribute to poverty reduction. The Purpose is to create an efficient, accountable and financially viable power sector that ceases to be a burden on state finances. The project is focused on fiscal and institutional reform and improved sector governance. While this does not concentrate on slum electrification, it is likely to be an element⁴².

A three-year project, Service provision governance in the peri-urban interface of metropolitan areas, run by the London College University Development Planning Unit in collaboration with several other institutions, seeks to improve urban governance and management for the benefit of the poor and to increase the access of low income households to improved urban services through better guidance on governance and management of water and sanitation in the peri-urban interface of metropolitan areas. The project examines the cases of five metropolitan areas in the developing world, of which one is Chennai, each with different and changing service management regime influencing the governance of basic service provision:

⁴² Personal communication, Jeremy Doyle, DfID.

4.1 INTRODUCTION

With the electricity reform and restructuring currently underway, most of the distribution utilities (Discoms) in India are concerned about a number of pressing issues such as developing new management structures, operating as a profit-making entity, tariff reform, dealing with the new regulatory commissions, and meeting increasing demands for power with limited delivery capability. While loss reduction (both technical and non-technical) is a very high priority for all Discoms, the focus of loss reduction appears to be in the rural areas and in the agriculture sector, where the losses are very high. Therefore, urban slum electrification does not usually appear as a high priority item. However, it has been demonstrated in the few programs for slum electrification implemented in India that slum electrification may provide benefits to the Discom in terms of reduced losses, increased revenue collection, and improved community relations.

Increasing pressures from NGOs, community organizations and local government agencies is leading Discoms to take an interest in slum electrification and it is likely that a pilot project under the USAID/ICA SELR Program could be launched in a city where the NGOs and local government organizations are seriously promoting this concept as a part of improving the quality of life of the urban poor. An interesting opportunity may also arise with the potential linkage of slum electrification to economic development of the slum areas, which may provide benefits to the Discom.

The opportunities identified below are based on the above premise and identify the most active and aggressive NGOs who are working with local government organizations (and, in some cases, with the relevant Discom).

4.2 POTENTIAL PILOT PROJECTS

Based on the findings of this report, it appears that the potential candidates for a pilot project under the USAID/ICA SELR Program are the following:

Surat Electricity Company

Surat Electricity Company is a sister company of Ahmedabad Electricity Company and is owned by Torrent. It appears that the management of Torrent is interested in initiating a project in Surat along the lines of the project already being implemented in Ahmedabad⁴³. Since the initial pilot project in Ahmedabad was deemed to be successful and the Ahmedabad electricity company is expanding this project to other areas within its service territories, a new pilot in Surat may be useful as a demonstration under the USAID/ICA Program.

The NGOs SAATH and SEWA have expressed interest in cooperating with USAID if a pilot is implemented in Surat.

⁴³ Personal communication, Milind Wangikar, ICA-India.

Chennai

SUSTAIN, the NGO in Chennai, has informally proposed a very interesting slum electrification project in Chennai in slum areas close to information technology (IT) parks undergoing expansion. The slum dwellers can participate in the IT growth if they were able to have access to affordable, safe and reliable electricity supply. By increasing use of electricity, the Discom would benefit as not only would the illegal connections be changed to legal ones (thereby reducing the “losses”) but also the users would move up from the “low-tier” low-price electricity tariff class (wherein the Discom is losing money on every kWh sold) to a medium-tier tariff where the utility will not only receive additional revenues but will have a positive margin. SUSTAIN appears to have generated interest in this idea with the Tamil Nadu (TN) Slum Clearance Board and the TN Urban Development Fund, and is in the process of exploring this with the TN Electricity Board. The potential linkage of slum electrification and loss reduction with economic development in the slum areas is an innovative feature of this proposed concept.

Delhi

The NGO INDCARE has expressed interest in cooperating with the USAID/ICA SELR Program.⁴⁴ Since INDCARE has some experience working with NDPL (one of the two Discoms in Delhi), it may be possible to consider a pilot SELR project in Delhi.

Mumbai

Preliminary discussions with BSES in Mumbai (one of the two Discoms serving much of Mumbai) have indicated that BSES feels that most of the slums in its service area already have connections (at least 50% illegal?), and the utility is losing substantial revenue. Their interest in increasing revenue collection has led to some new initiatives to regularize slum electricity connections. The experience of the other Discom BEST in providing electricity to pavement dwellers in Byculla⁴⁵ (also see Appendix D), points out the possibilities of a pilot in Mumbai, which has the largest number of slum dwellers among all the urban areas in India.

NURM

The National Urban Renewal Mission (NURM) may offer some potential for a slum electrification initiative.⁴⁶ However, the NURM initiative (as currently defined) does not emphasize electricity as a basic infrastructure need. Also the NURM initiative is very new and it is unclear how rapidly project decisions may be made. The USAID project team should monitor the progress of NURM and determine if slum electrification initiatives may be added to NURM projects that may involve organizations such as the Cities Alliance.

⁴⁴ Personal communication, Sanjeev Arora, Deputy Director, INDCARE, New Delhi.

⁴⁵ Sunder Burra and Liz Riley, “Electricity to Pavement Dwellers in Mumbai”, SPARC, September 1999.

⁴⁶ Personal communication, Billy Cobbett, Cities Alliance, Washington D.C.

5.1 CONCLUSIONS

Rapid urbanization of Indian cities is creating serious problems relative to providing infrastructure services to the urban poor living in slums. The slum population of India's large cities is over 17.6 million and is rising. Large numbers of slum dwellers do not have legal electricity connections. They either have illegal connections or have no electricity at all. Technical and non-technical losses of electricity are quite high in slums. Therefore, it would appear that the provision of safe, reliable and affordable electricity to slum dwellers should be a high priority.

Unfortunately, due to the rapid pace of reform and restructuring of the electricity sector in India, the electric distribution utilities are facing a large number of challenging issues. Their biggest concerns with respect to losses appear to be in the rural areas and in the agriculture sector. Also national priorities have emphasized rural electrification in the attempts to provide electricity access to all Indian citizens. As a result Discoms have not given much attention to slum electrification.

A number of NGOs, in major cities such as Mumbai, Delhi, Ahmedabad, and Chennai have recognized the need for, the challenges of, and the benefit from slum electrification, and have undertaken initiatives in which they have convinced the Discoms to participate in slum electrification. While very few pilot projects have been implemented, the experience to date indicates that Discoms may have significant benefits from slum electrification. Also the NGOs have had some success in getting the attention of local and State government agencies responsible for urban development and infrastructure issues.

National initiatives such as the NURM and State level urban development funds such as the TNUDF may offer innovative financing opportunities for slum electrification. What is needed is a concerted effort to design and implement one or more pilot projects that will effectively demonstrate the benefits of slum electrification to the slum dwellers, to the Discoms and to the State and local economy.

5.2 RECOMMENDATIONS

- Work closely with the leading NGOs that have initiated activities to implement slum electrification projects and define how these initiatives can be compatible with the objectives of the USAID/ICA SELR Program.
- Establish contacts with the relevant Discoms to gauge their interest in slum electrification and educate and inform them on the potential benefits.
- Engage relevant State (and as appropriate local) agencies in the discussions regarding slum electrification, and define their appropriate roles and responsibilities in a pilot project.
- Conduct face to face meetings with the active NGOs, relevant Discoms, and other agencies in a "pre-scoping mission" to assess the potential for a meaningful pilot project and to identify and screen potential projects in some of India's largest cities.

Appendix A

SUMMARY TABLE ON INDIAN CITIES

Table A-1 on the following page presents a summary of relevant information.

Summary Table on Indian Pilot Prospects

Major City/Urban Area	Population (000)	State	Discom	No. of Customers	Public/Private	Power Adequacy	Degree of problem	Programs
Mumbai (Bombay)	16,368	Maharashtra	BEST		Municipal	Inadequate	Very Large	Pilot project for providing electricity to pavement dwellers (with SPARC and other NGOs). See Appendix D.
			Reliance/BSES		Private	Inadequate	Moderate Tech losses: 12.0%	Concerned with large number of illegal connections and loss of revenue.
			MAHADISCOM (Formerly MSEB)		State	Inadequate	Moderate	None.
Delhi	12,791	Delhi	North Delhi Power & Light (NDPL)		Private - Tata	Inadequate	Large	INDCARE/USAID project completed. See Appendix C.
		Delhi	BSES Yamuna		Private - BSES	Inadequate	Large	Initiating major program for slum electrification
			BSES Rajdhani		Private - BSES	Inadequate	Large	
Kolkata (Calcutta)	13,217	West Bengal	CESC		Private (RPG Group)	Inadequate	Very large	Unknown
Chennai (Madras)	6,425	Tamil Nadu	TNEB		State	Inadequate	Large	SUSTAIN is attempting to initiate a project with the TN Slum Clearance Board
Bangalore	5,687	Karnataka	BESCOM		State	Inadequate		Unknown

Major City/Urban Area	Population (000)	State	Discom	No. of Customers	Public/Private	Power Adequacy	Degree of problem	Programs
Hyderabad/ Secunderabad	5,534	Andhra Pradesh	APCPDCL			Inadequate	?	All slums legally electrified in major GOAP initiative in 2000.
			APEPDCL APNPDCL APSPDCL		Corporatized state entities	Inadequate	?	
Ahmedabad	4,519	Gujarat	Torrent Power/AEC	1.03 million	Private - Torrent	Inadequate	Large	AEC/USAID/SEWA/SAATH completed. Involved electrification in situ with NGO providing microcredit for connection costs. See Appendix B.
			AUDA		Public	Inadequate	Large	Urban redevelopment and relocation with cross subsidy from commercial development
Pune (Poona)	3,756	Maharashtra			State	Inadequate		NGOs active but not in SE
Surat	2,811	Gujarat	Torrent Power/SEC		Private - Torrent	Inadequate		No programs yet
Kanpur	2,690	Uttar Pradesh			State	Inadequate		Unknown

Appendix B SUMMARY OF AHMEDABAD PILOT PROJECT

Program description

The U.S. Agency for International Development (USAID) partially funded a pilot Slum Electrification Project with the Ahmedabad Electricity Company (AEC) to develop a private sector–civil society partnership to extend critical legal and reliable modern energy services to slum communities. The project used NGOs as intermediaries to prepare slum areas for service and to provide loans for consumer portion of the cost of upgrading.

AEC is currently implementing a scaled-up project with some changes to the structure and operation of the initial project.

Achievements:

Subsidized electric connections were provided for 820 households and each household received a legal individual meter and a compact fluorescent light bulb.

Duration of the program:

Less than two years (between late 2001 and mid 2003).

Financing

Households, with assistance from community-based organizations, paid almost half of the connection fee and provided certified interior wiring. That amount was supplemented by funds from USAID (about 25%) and from the Ahmedabad Electricity Company (about 25%) to cover the balance of the costs of providing that connection.

Sources of Information

- Siddharth Oza, Ahmedabad Electricity Company, s_r_oza@yahoo.com

Public Understanding and Participation – New Delhi, India.

Safe and legal connections for consumers in slum communities

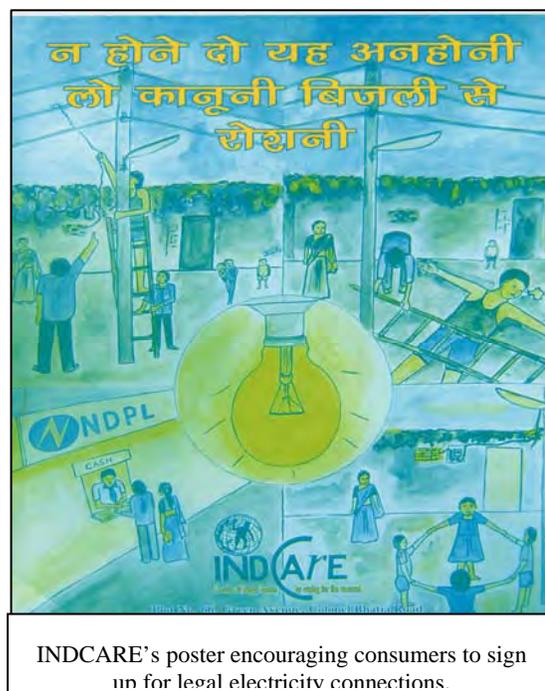
It was a January afternoon and people were busy with their daily activities. Sanju was taking rest with her two children (a year old son and a daughter aged 5), when their illegal access to electricity was disconnected. Sanju went to the toilet leaving her two children inside the room. They had lived there for the past 20 years. Her husband had gone out to his clothing shop from which he earned only Rs. 2000 per month (about \$45) - the family's only source of income. The children, who were alone in the room, started playing and came down from the cot. The younger one came near to the iron door which was also close to a live electric wire. The power came back on and the child was burned, particularly his upper body and face. By the time his mother and people from the surrounding houses heard the screams and ran to save him, the child was unconscious. He was immediately taken to the hospital but died soon after arrival. Most people in the slum saw his death as fate and bad luck rather than a result of unsafe and illegal practices to get access to power. Because slum residents remember this terrible accident, INDCARE provided counselling to them about electricity and motivated them to get legal connections with proper wiring to avoid such accidents in the future.

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When USAID's Energy Team and the Academy for Educational Development (AED) began working with North Delhi Power Limited (NDPL) in late 2003, NDPL indicated that slum areas presented its biggest challenge in terms of reaching out to consumers.

In the spring, INDCARE Trust, a Delhi-based NGO that specializes in working with women, worked with two clusters in north-west Delhi (Jaipur Golden and Bhalla Factory) to urge community residents to opt for legal connections for electricity. INDCARE took a two-pronged approach to the project. While NDPL had originally envisioned an outreach campaign around the issues of the legal and safety issues of electricity usage, INDCARE persuaded them to take a more proactive approach, by offering legal connections as an alternative to theft. At the same time, INDCARE worked with the communities to communicate both the safety risks of illegal connections and the economic benefits of a legal connection.

These efforts involved brokering a new relationship between the utility and the cluster residents. To do this, INDCARE worked carefully to change the perceptions the community and the utility had towards each other. For the residents, the lived experience of marginalization had meant that legal access was an alien concept. The practice of applying and paying for service was one that



INDCARE could facilitate. At the same time NDPL was beginning to view the community as potential customers within their service area, INDCARE worked with the utility to respond to the needs of the extremely poor.

By being the bridge between the utility and residents, the project was able to show results on the ground. Within a few months of implementation over four hundred of the 850 households in one community requested legal connections for electricity. Toward the end of the project, consumers faced a final hurdle before they could have legal connections: they had to come up with an additional \$10 each to pay for the cable that would connect them to the grid. USAID helped them overcome that hurdle by paying the cable costs.

NDPL has committed to continue to working with INDCARE and has asked INDCARE to begin work in three new areas in addition to continuing to work in the two original clusters.

Introduction

This project provided legal electricity connections to pavement dwellers of the Byculla neighborhood of Mumbai. Pavement dwellers are amongst the very poorest income groups in urban India. In 1985, for example, it was found that in the island city of Mumbai over 74 per cent of wage earning pavement dwellers received less than Rs. 18 (approximately US\$ 0.42) per day well below the official minimum wage. Pavement dwellers are generally unable to obtain electricity from the local utility Bombay Electric Supply and Transport Undertaking (BEST). Those that did have electricity were dependent upon illegal supplies, often obtained through middlemen at great expense, though an estimated 80 per cent of pavement dwellers had no electricity at all. The BEST policy with respect to pavement dwellers was thus to fine them for the illegal theft of electricity and to cut their connections. Despite recognizing that such a policy could never stop the illegal theft of electricity by pavement dwellers, BEST failed to change its approach.

In contrast, the company began in the 1970s to allow the slum settlements of Mumbai to receive legal BEST supplies for the first time. It was in this context of need for legal, reliable and cheap electricity, coupled with the changing government stance toward pavement dwellers in Mumbai, that in 1995 the Alliance of Mahila Milan, National Slum Dwellers Federation and the Society for the Promotion of Area Resource Centres (SPARC) started their initiative to obtain electricity for the pavement dwellers of Byculla in central Mumbai.

Project Objectives

1. To secure an official, reliable, cheap and safe supply of electricity from BEST to the homes of pavement dwellers in the Byculla area of central Mumbai.
2. To set a precedent in order that pavement dwellers throughout the city could approach BEST for electricity, and lobby other service providers for civic amenities.

Project Summary

In 1995, upon the demolition of several pavement dwellings in the Byculla area, the women of Mahila Milan held a number of meetings where the issues of electricity supply and costs were raised for the first time. One method of supply was the purchase of 12-volt batteries that would last just a few days before needing to be recharged. Alternatively, electricity for lighting and domestic appliances could be bought illegally from the residents of *chawls* in Byculla. Such supplies would cost up to Rs. 300 (US\$ 7) per month and were sufficient to run a television, one tube light and a fan. Alternatively, residents would buy wire to steal electricity direct from streetlights, thus giving them a power supply only at night. Even this proved impossible in some streets where middlemen would intervene and charge up to Rs. 350 (US\$ 8.3) per month for the illegal night-time supply. Some residents would be asked to pay deposits to receive their illegal connection, while the occasional provision of extra wires to run an additional light or fan could cost up to Rs. 100 (US\$ 2.4) per day. Electricity touts also had the practice of cutting their illegal connections to the streetlights every month and, claiming the wires had failed, they would charge residents yet more for their replacement. Thus, the money spent by pavement dwellers every month for electricity would range between Rs. 250 (US\$ 6) and Rs. 350 (US\$ 8.3), and should

payments be late, electricity supplies would simply be cut off. Such expenditure on electricity, in the context of monthly household incomes of under Rs. 1,625 (US\$ 38.7) for two-fifths of pavement households, thus constituted a very expensive, as well as unreliable and illegal service.

The women of Mahila Milan began to realize the extent to which they were being exploited, and to discuss ways in which the situation could be resolved. Faced with the conclusion that only BEST could provide them with the legal electricity supply they wanted, the women had little hope that their request would be granted and it took them over two months and a number of meetings to agree to try to obtain BEST connections. Mahila Milan sought the help of NSDF and SPARC in arranging meetings with senior officials in BEST, to whom they could apply directly. Such officials were already known to SPARC and the President of the NSDF through their attempts to get electricity to supply one of SPARC's night shelters for street children.

The initial reaction of BEST was one of skepticism as they viewed the pavement dwellers as temporary migrants. However, after a number of meetings involving intense negotiations, BEST agreed to consider providing legal electric connections to the pavement dwellers in a pilot area. This pilot area involved the pavement shacks in the immediate vicinity of SPARC's Byculla Area Resource Centre.

With the first houses receiving BEST electricity in mid-1997, by 1999 around 125 shacks in the Byculla area are connected, and this number continues to increase. Although the process of obtaining the electricity proved to be long and complex, the establishment of precedent and a procedure through which pavement dwellers can now apply for electricity should ensure that future connections can be obtained more quickly. Indeed, the Mahila Milan electricity committee is regularly approached by other pavement communities who ask advice on how to approach BEST.

Much of the expense of installing connections was born by the pavement dwellers themselves. For building of shared meter cabinets, purchasing of cable and safe building materials, each family was asked to pay Rs. 1,000 (US\$ 24), and for the internal wiring in the house another Rs. 500 (US\$ 12) was requested by the Mahila Milan committee. Indeed, for the internal wiring, cheaper cable could have been purchased but it was decided that for reasons of safety, the more expensive option should be bought. To pay these costs the savings and credit scheme of Mahila Milan was employed.

Lessons Learned

During the campaign to secure an official electricity supply for the pavement dwellers, the municipal electricity company BEST had to learn about pavement dwelling families, their source of income, way of life and the dangerous and expensive informal suppliers of power they had to rely on. Similarly, the pavement dwellers, Mahila Milan, NSDF and SPARC also had to learn that the company had to adhere to some standards and procedures that could not be changed. Thus, in this project both sides learned to trust and accommodate each other.

This Byculla experience reveals the importance of taking advantage of shifts in policy to open up new communication channels through which to secure new rights or set precedents. The importance of senior and sympathetic officials working within the public sector also emerged as a lesson, revealing that even in institutions straight-jacketed by rules and regulations, individuals of sufficiently high rank can make room for creative interpretations of policies and procedures. The electricity initiative also shows that given the opportunity to learn the procedures of public sector institutions or of the circumstances and needs of the poor, both the poor and bureaucrats have the potential to develop a level of co-understanding upon which solutions can be negotiated.

Additional Information

See Sunder Burra and Liz Riley, “Electricity to Pavement Dwellers in Mumbai”, SPARC, September 1999.

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