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A COMPARATIVE STUDY ON MODERN STRATEGIES TO SLUM ELECTRIFICATION

A Comparative Study on Modern Strategies to Slum Electrification

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Abstract - Improvement endeavors of the previous numerous decades have centered practically only on the vigor needs of the country underprivileged while impressively overlooking those of to a great degree oppressed families in urban slums.¹ About 40% of the planet's oppressed living in urban zones need access to cutting edge vigor benefits that could enhance living conditions and unfold monetary chances. Quickly developing slums have overpowered by and large regions in improving nations, and numerous have stopped attempting to address the issue of giving lawful and safe associations with the aforementioned territories.

All things considered, even inside the poorest slums, power is generally all around available.² A more critical look uncovers that this power is normally taken (vastly by third-parties), which brings about unfortunate quality benefit furnished at exceptionally heightened costs and amazingly hazardous conditions. Flawed (and likely wrongful) wiring or utilization of combustible vigor choices when the force is cut off can cause destroying blazes, decimating homes and relocating, executing, or harming several many individuals.

INTRODUCTION

An expected 40 percent of number of inhabitants in 300 urban areas in extremely underprivileged nations all through the planet lives in slums.⁷ Increasing in-relocation from country territories into urban areas in advancing nations has made the aforementioned exceptionally thick casual settlements. Granted that it is practically difficult to gauge faultlessly the span of slum populaces due to their dynamic and transient nature, it is evaluated that:

- close to 1 billion individuals are right now living in slums in urban areas all through the advancing planet;
- populations in slums are developing at 2-5% a year on normal, relying on the area;
- the development rate is five times higher at all improved area (Africa) contrasted and the most quite advanced; and
- almost the greater part of the planet's populace development for the foreseeable future will happen in the urban areas and towns of Africa, Asia, and Latin America.⁸

Such wild urban development, especially in casual slum zones, has outpaced for the most part advancing nation governments' capacities to give conventional

open administrations (e.g., water, sanitation, streets, and other open administrations). Universally, urban populaces in improving nations are starting to dwarf country populaces (reflecting movement and improvement designs in industrialized nations), and in a few locales the dominant part of a nation's populace now exist in or on the fringe of urban communities in casual settlements. Regardless of the profits of being closer to potential business and social administrations, the aforementioned neighborhood ranges are tormented with unfortunate health, dangerous situations, and wrongdoing. Where they exist, slum-redesigning endeavors as a rule give upgrades in water supply and sanitation a higher necessity than power, as there are options (i.e., burglary) or substitutes for power regardless of the possibility that the administration is unfortunate and lacking for the most fancied employments.

Being simple to take, power is very nearly generally accessible in slums. Slum inhabitants are eager to hazard the cohorted physical peril and conceivable indictment and take power or enter into concurrences with illicit administration suppliers and pay more than they might in legitimate transactions to get power for crucial administrations and enhanced personal satisfaction. Unmistakably, slum inhabitants greatly esteem power for the profits it carries their lives and regularly pay for it at a higher for every unit cost than do individuals in formal and lawfully served regions.

Slum electrification is additionally hindered by inhabitants' powerlessness to pay for the towering association sets back the ol' finances. Oppressed family units are not capable, or usual, to making extensive in advance installments and putting something aside for such installments is especially troublesome. Contending wrongful administration suppliers regularly succeed where utilities founder on the grounds that they are acquainted with slum neighborhoods and can bundle their administrations in ways that underprivileged family units find more moderate, for example a monthly charge for every apparatus or adaptable installment terms for association and reconnection. As they don't need to pay the expense of handling and transmission of the power to the area where they get the "circulation" movement, they have much more stupendous adaptability in their terms of installment.

Some may contend that this temporary plan is a generally effortless path for publicly accepted norms to sponsor the vigor needs of the urban unfortunate, however they disregard:

- the exceptionally constrained and downtrodden nature of the force accepted;
- the towering for every unit cost to the precise downtrodden;
- the compelling dangers that are postured by wrongful and stopgap associations;
- degradation of the power conveyance framework created by unforeseen stacks on undersized gear;
- the absence of transparency of the "subsidy" paid for by different ratepayers, the utilities' shareholders, and social order in question to blanket non-specialized misfortunes; and
- the wasteful cost "indicate" illicit and casual associations give to the oppressed customer about their energy utilization.

METHODS

Swearing up and down to approaches to Slum Electrification

This study was led in two stages. Stage 1 included informative data assembling on slum electrification, recognizable proof of potential detailed analyses for Phase 2, and arrangement of a break report. Meetings were directed with nexus infrastructure laborers included with vigor benefits for the urban abject (e.g., World Bank, Us Agency for International Development, United Kingdom Department for International Development, Shell Foundation, and nearby nation specialists included in slum electrification ventures). In Phase 2, site visits to five slum electrification systems

were directed and careful investigations ready for each.

Of the starting dozen potential detailed analyses revealed in Phase 1, five dissimilar cases that differed by venture approach, execution and geographic locale were chosen for further study. Cases were chosen utilizing the accompanying criteria:

- relevance. Cases needed to have a towering level of significance and appropriateness to unfortunate urban populaces and solid potential for realizing a noteworthy entrance in a generally short time.
- replication. Cases would have been wise to show solid potential for replication and tolerability, especially where the area was being improved to push commercialization or privatization.
- innovativeness. Creative methodologies incorporate a remarkable blending of measures esteemed indispensable to extend access to power in slums in a generally untenable scenario.
- sufficient experience. Ventures for research endeavors must be more than three and in a perfect world five years of age to be surveyed for practicality. The system might as well have energized a generous number of homes. Informative data on how the task was imagined, accomplished, and assessed ought to be ready.
- good nearby accomplices. The potential case ought to be later or continuous with the goal that the full extend of stakeholders included might be distinguished.
- potential advancement target. Projects may as well offer some potential focus for future infrastructure and contributor exertions, not just for ranges focused by the system and yet as potential models for mediation and underpin.

The five systems picked and the essential purposes behind selecting them to be incorporated in this report are quickly skimmed over in Table.

Program	Location	Primary Reasons for Inclusion
MERALCO's Depressed Area Electrification Program	Manila, Philippines	Phased electrification of slums with low-cost, easily implemented individual meter walls at the perimeter of slums, as a solution that can work with a variety of slum upgrading efforts. Driven from the top by the government and the electricity company.
PN Energy's Khayelitsha Electrification Project	Cape Town, South Africa	Community-distribution company approach and use of prepayment technologies to ease payments for consumers and ensure them for the distribution company.
LIGHT's Program for Normalization of Informal Areas	Rio de Janeiro, Brazil	Model for the more recent Salvador, Brazil project. Program is being restructured based on lessons learned in the first attempt.
COELBA's Community Agent Program	Salvador, Brazil	Incorporated lessons learned from two prior programs (Rio and Sao Paulo) with added strong end-user focus (e.g., on efficient use of energy and citizen's rights)
Ahmedabad Electric Company's Slum Electrification Program	Ahmedabad, India	A promising project that faces the challenge of scale-up with reduced subsidization.

Table : Primary Reasons for Program Choices

Throughout Phase 2, groups of Usaid slum electrification masters directed in-profundity, on location examinations (for the most part a week in every nation) throughout the final quarter of 2003. In-nation specialists were distinguished to expedite gatherings with an extent of members in the chose nations. The crew directed meetings, assessed the tasks, assembled applicable materials, and recorded their discoveries. Members in gatherings incorporated administration suppliers, delegates of administration beneficiaries (both men and ladies), grassroots coordinators, mediators included in the administration procurement, and government arrangement producers. The examination group worked nearly with the Usaid missions in the research endeavor nations to guarantee coordination with their broader targets. The research endeavor groups were made up of both men and ladies in Ahmedabad and Salvador and of ladies just in Manila (with a male interpreter/local contact) and Cape Town (all ladies aside from when went with by Pn Energy work force).

To guarantee that sex contemplations were mainstreamed in the study discoveries, a sex and vigor authority was named to the venture. Instructions papers were ready tending to sexual orientation and vigor issues and furnished to the examination crew throughout Phase 1. Throughout Phase 2, inquiries were postured throughout the on location visits, incorporating both impromptu and ready inquiries tended to ladies and men. In Ahmedabad and Salvador, a structured set of inquiries was utilized throughout family unit visits and a center assembly held with ladies in Khayelitsha.

Underlying the particular inquiries were the accompanying general inquiries, which were planned to give a structure for sexual orientation identified issues:

- What is the official position and real scenario observing occupation of ladies in the vigor area?
- What is the real scenario seeing ladies as a body electorate of clients in slum electrification?
- How are ladies stood for in the undertaking being considered and what's happening with they in connection to men?

OBJECTIVE OF THE STUDY

More specifically, its objectives were to:

- Identify barriers to increasing access to legal electricity services in slums, such as high connections

costs for consumers, lack of land tenure, ease of theft, low revenue streams for the utility, etc.;

- Examine global experience with expanding access to electricity in slums and identify innovative approaches that have been, or are being, tried to achieve such expansion. The study will focus on those that forge public/private partnerships, were undertaken during periods of sector reform, or that grassroots movements have spearheaded; and
- Assess the relative effectiveness of the different approaches identified, analyze the role of women, and provide lessons learned and recommendations for use in the development of slum electrification programs.

LOWERING COSTS FOR THE ELECTRICITY COMPANY

Power associations are spurred to undertake slum electrification ventures by the plausibility of lessening non-specialized misfortunes and possibly making a benefit. In a few cases (e.g., Meralco and Aec), a feeling of social authority assisted tip the scales energetic about running ahead with a project that turned minor toward most fittingly on paper. In any case, without the later updates in administrative medicine of non-specialized misfortunes and prerequisites in concession contracts to serve all potential clients, power associations might not be exceptionally roused to address the power needs of slum occupants. Hence, government arrangements are demanded to guarantee that the power associations give necessity to serving this troublesome area. Now and again, the administrative medication of the substantial non-specialized misfortunes (or refusal to continue raising tariffs to blanket heightening expenses) can give the catalyst to improve unique projects and decrease misfortunes. Once the aforementioned arrangements and regulations are set up, the power supplier can approach slum electrification in ways that minimize budgetary misfortunes to the association, regardless of the fact that it doesn't succeed in furnishing a quantifiable profit.

In improving slum electrification projects, the power associations endeavored to lessen their non-specialized misfortunes (which, in the research endeavors, went from 3-5% of horrible incomes) in this route, to the point that expanded incomes might blanket the expenses of the slum electrification arrangement. Notwithstanding, Meralco and Aec stated that the expanded incomes from zapping slums did not blanket their expanded expenses of supplying the aforementioned ranges. A fiscal detailed analysis of the Meralco project reasoned that, even with its utilization of advance supports with exceptionally positive terms, the project might at the

very most scarcely break even.¹⁸ Aec needed to build the association expense paid by the customer to enhance the money making concerns of its system; in any case, this expansion was opposed by their non-legislative conglomeration friends, who contended that the association was accepting the wanted measure dependent upon the definitive money related arrangement, and an increment might make a sensational diminishment in support.

Moreover, two of the associations showed positive profits for their speculations. Pn Energy stated that it was equaling the initial investment (yet it was vague if the beginning capital speculation by Eskom and its friends was incorporated in the estimation). Coelba was the most sure about foreseeing a make back the initial investment or an unobtrusive quantifiable profit. Be that as it may, it was not by any means clear how it was acknowledging the definitive subsidies accessible from the alleged 1% vigor productivity fund¹⁹. Assuming that the aforementioned were explained as sunk expenses not attributable to the project (on the grounds that the association was instructed to use the cash in any case), then a huge wellspring of stores was not acknowledged in its monetary assessment.

The associations emphasized in the careful investigations approximated association sets back the ol' finances for every family. The sum of the associations kept tabs on developments (and institutionalization) in their supply and metering gear to decrease the expense for every family served notwithstanding bringing down the straightforwardness and probability of burglary of force. Coelba's "metallic" administration drop units (standard, minimal effort meter and post) and shielded links were ordinary. Lower expenses were likewise accomplished by zapping a whole region around then. Then again, we were unable to acquire proportionate qualified data on working expenses once a customer was joined. For instance, some stated that expenses of policing and separating unlawful associations had diminished, yet none had assessed what the genuine reserve funds were. Coelba reported that its association expenses were climbing as time passes as they arrived at additional peripheral ranges, more distant from existing circulation lines. Given the extensive distinctions in methodologies and operational modes, we were unable to get great relative information on begin up and working expenses of the systems contemplated; in this way, such information might be a great region for future investigate.

RESULTS

Families Electrified : Four of the projects examined zapped between 75% and 1 million family units in 10 years or less¹⁵. One quantitative measure of the execution viability of slum electrification projects is the amount of electrifications or regularizations finished versus the number arranged. The aforementioned statistics are accessible for a few of the projects,

however for others, just qualified data on the amount of electrifications finished was ready. Most systems met or surpassed their objectives.

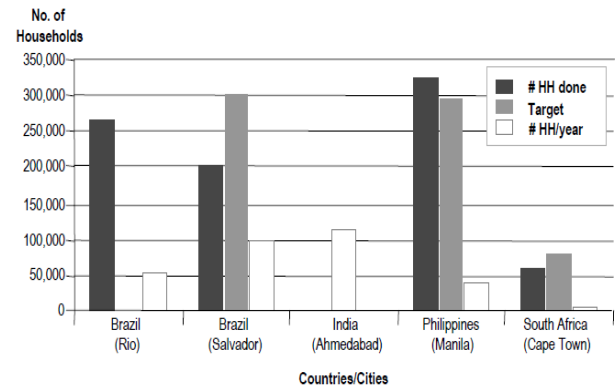


Figure : Comparison of the Number of Households Targeted vs. the Number Electrified

A different pointer of project viability is the amount of family units energized as a rate of the sum number requiring electrification in the region focused by the system. Throughout our site visits, a couple of systems reported having finished in the reach of 75% to 90% of the qualified slum families in the project range, however the aforementioned rates require some illustration. First and foremost, the amount of family units requiring administration is a moving target and, second, a considerable divide of the unserved populaces may be ineligible for electrification as they may be along right-of-ways or arrive designated for different purposes. Slum populaces are famously unsteady and challenging to tally dependably. Notwithstanding introductory research to figure out the numbers to be incorporated in the system, in all cases, in-movement was obviously adding to the interest.

Expenses Of Electrification : The expense for every family unit for regularization or electrification will be imperative for different associations recognizing beginning a comparable project. As indicated in Figure the reach of expenses varies by very nearly a variable of four, with the Ahmedabad system reporting the most minimal expenses for every family (not standardized for buying power equality) at \$114 for every family, while Cape Town reported over \$400 for every family. On the other hand, it ought to be advised that the expense components incorporated in the aforementioned reported for every family unit figures were not dependably furnished. Case in point, one association may be incorporating the expense of amplifying overhead lines and redesigning framework gear while a different may just be reporting the expense of the true administration drop. Additionally, trade rates have vacillated considerably over the vast majority of the projects' lives. In this manner, the aforementioned figures furnish just an unpleasant experience. More careful examination of the genuine

expenses and the expense components incorporated in the evaluations might be helpful.

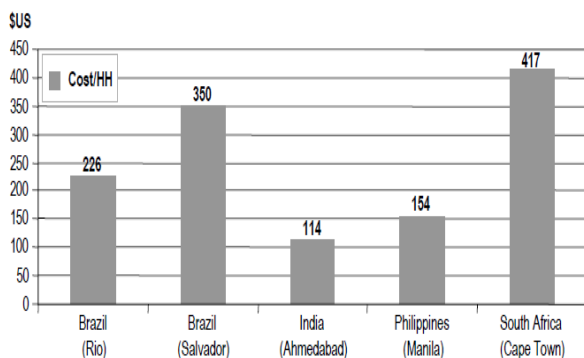


Figure : Comparison of Connection Costs per Household

CUSTOMER ACCEPTANCE OF PROGRAM: *Effectiveness can also be measured in terms of consumer acceptance. In our informal discussions with slum program participants, we found that most were pleased with the new or restored service, and satisfaction surveys, such as those conducted by COELBA, confirmed this view. That so many households readily switched from an illegal service provider to the electricity company service is in itself a testament to the effectiveness of the efforts. Note that all of the programs provided a number of inducements: a subsidy for, or financing of, connection fees; amnesty or very favorable financial terms for prior unpaid bills or reconnection in the case of theft; lifeline tariffs or, in South Africa, a minimal level of free energy; and assistance to control consumption (rewiring and efficient devices and/or prepayment). However, how much incentive and/or subsidy to offer requires a case-by-case analysis, particularly for a commodity that seems to be in such high demand.*

RECOMMENDATION

The requirements of all stakeholders—power association, slum customers, governments, groups, and middle people must be recognized in the outline of viable systems for the sheltered conveyance of power in slum groups. The matters in profit making of slum electrification must bode well for the power association. As this is an exceptionally challenging territory to get a rate of profitability, consideration must be paid to bringing down the expenses of such projects and diminishing chances for burglary. Access to power is lacking in itself for slum buyers; rather, the power should be moderate, safe, and dependable, and paying for the administration must be simple. Making it more alluring and simpler for oppressed family units to pay and enhancing neighborhood interest was central to all the projects investigated. Training about vigor benefits and vigor productivity is fundamental and was discovered to be effortlessly tended to in the slum

electrification arrangements inspected. Governments whatsoever levels have a critical part, especially in managing adequately with area tenure and right-of-way issues. Delegate conglomerations are requested to play the paramount part of expediting correspondence right around the different stakeholders, particularly the association and customers. To advance adequate future ventures, more methodical qualified information is required about ladies as crux clients and leaders in power utilization.

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