

## Recognizing the energy access challenges of informal urban communities in Africa

Over [one billion people globally are now estimated to live in slums or informal settlements](#).<sup>1</sup> This population is growing as conflicts, natural disasters, and climate change fuel further displacement from rural areas.<sup>2</sup> In sub-Saharan Africa, somewhere from [50-60%](#) of the urban population of 200 million lives in informal communities that face [structural barriers to securing legal access to the electricity grid](#).

For residents of informal communities who cannot afford the connection fee or provide required tenancy documents (among other barriers), the only viable alternative is to connect informally through a local electrician. Though an informal connection provides a marginal level of access to the grid, it engenders new vulnerabilities. Electricians and landlords, acting as de facto electricity retailers, can set their tariffs, physically restrict the time of day during which power is available, or limit the number and type of appliances used. Periodic enforcement raids from local authorities can mean hefty fines or jail time for those found with illegal connections.

Despite the enormous scale of un and under-served informal urban communities worldwide - and accelerating urbanization rates - their access challenges have remained outside the mainstream view of the [Sustainable Development Goal 7](#) community working to “ensure access to affordable, reliable, sustainable and modern energy for all.” A poor understanding of how people connect to the grid and the limitations and drivers involved in their decision-making hinders efforts to improve access. The following insights are based on preliminary work by Spotlight Kampala - a research initiative aiming to offer actionable insight into access challenges in informal communities in Kampala.<sup>3</sup>

### A Kampala case study: Five unique energy access challenges of informal communities

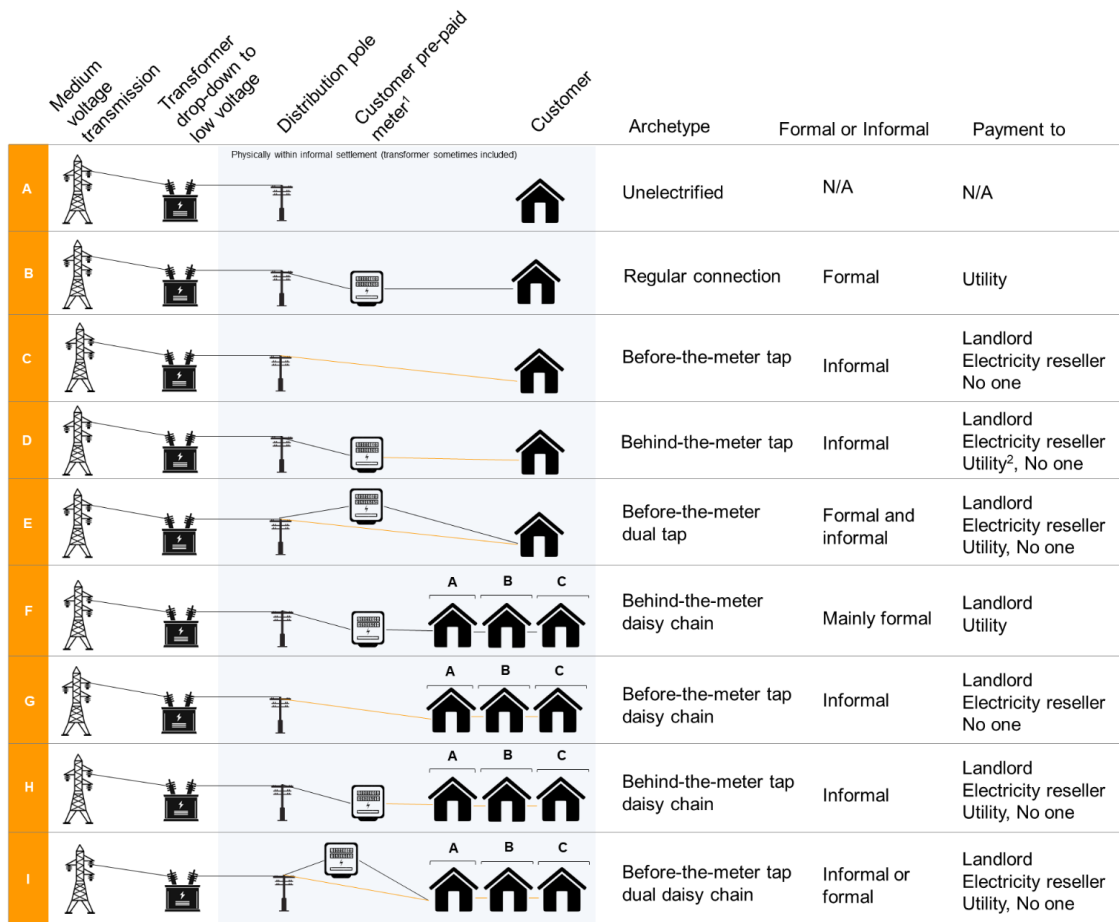
60% of Kampala’s population of 1.6 million are estimated to live in informal communities.<sup>4,5,6</sup> Of these, recent fieldwork suggests that the vast majority are underserved in electricity availability, capacity, reliability, quality, connection legality, or, most commonly, some combination of these factors. And as much as 10-20% - some 100,000-200,000 people within Kampala - are unconnected to the electricity grid.<sup>7</sup> Yet, persistent knowledge gaps prevent the utilities, governments, and their partners from designing effective interventions to expand access and improve service.

- **Demand suppression.** For some customers, informal resellers limit the number of appliances used or the time of day use due to the unaffordable cost of power and/or weak grid infrastructure. Understanding the drivers of suppression and the extent to which demand is suppressed could guide the design of appropriate stimulation strategies and tariff reforms.
- **Landlord/tenant power asymmetry.** Most residents of informal communities rent, as they cannot afford to own. Landlords commonly rent housing on informal and unregulated “take it or leave it” terms which typically include a flat monthly electricity rate, limits on the number of

appliances, or “nighttime only” arrangements where tenants may only use electricity in evening hours. Further, there is anecdotal evidence that the regularization of electricity connections enables landlords to raise rental prices and price out lower-income tenants - which feeds into broader gentrification trends. Therefore, better [tenancy regulation](#) will be crucial to effective public service provision.

- **Unvirtuous cycle of service quality and power theft.** Poor reliability in Kampala is perceived to be more prevalent within informal communities due to the abundant informal connections that overload circuits and distribution transformers. It is important to note that the extent to which informal connections drive grid disruptions compared to broader system failures ([or informal connections from wealthier, higher-use customers](#)) has yet to be fully substantiated. The utility has little incentive to improve infrastructure in high-theft areas, creating an unvirtuous cycle of poor electricity infrastructure maintenance and service delivery and discouraging legal connection in informal communities. There is a need for further research to model the grid impacts of informal connections to inform policies aimed at improving technology selections, maintenance practices, and service quality.
- **Economics of connection informality.** A deeper analysis is needed to understand how to create tariff and incentive structures appropriate for these communities while respecting the utility's cost-recovery needs. Could rehabilitating and intensifying the grid in informal communities – which are low-cost to connect, whose demand is increasing, and whose regularization displaces illegal electricity consumption – prove to be an economic opportunity for utilities?
- **Grid connection pathways.** It is well understood that many connections in informal communities are unmetered. However, the modalities by which community members informally connect are complex, creative, and diverse (see Figure 1). Depending on social networks, perceptions, realities of the cost of formally connecting, and tenancy status, at least nine distinct connection modalities exist in Kampala's informal communities. Differentiating these modalities beyond a binary of legal/illegal is critical to understanding the barriers and constraints that influence decision-making and, thus, designing practicable and realistic interventions.

**FIGURE 1:** Nine most prevalent connection modalities used in informal communities in Kampala. This list is not exhaustive—graphic by Jess Kersey.



<sup>1</sup>The majority of pre-paid meters are physically located on the distribution pole

<sup>2</sup>With some types of behind-the-meter taps or tampering, though uncommon, it is possible to limit the consumption sensed by the meter

There exist many more barriers to safe, affordable, reliable, and high-quality electricity supply for informal communities beyond the ones presented here. Most are context-specific, rooted in colonial-era planning practices, and require more dedicated attention and research than they have to date received.<sup>8</sup> The unique challenges of these communities must be more widely recognized as we move into an increasingly urban future [fueled by climate displacement](#).

## SDG 7 and Africa’s urban poor: A call to action

The strategies necessary to address the challenges of informal urban communities will differ markedly from those of remote or rural places and formal urban communities. Potential solutions must navigate a much more politicized and layered institutional landscape involving local community leadership, advocacy groups, government ministries, the municipal urban planning body, and the utility.<sup>9</sup> They must focus heavily on outreach and relationship-building to overcome distrust and resentment entrenched by decades of marginalization by governments and infrastructure service providers.

In recognizing the unique access challenges of low-income urban communities, we call for the following:

- **Development of programs that engage the informal electricity resale market.** Informal electricians are valuable human resources whose skills could be leveraged by providing training, certification courses, and other pathways to the formal labor force. Experience has shown that [their collaboration or resistance can either accelerate or derail](#) efforts to improve services.
- **Demonstration of renewable and decentralized technologies and business models in informal urban contexts.** Approaches involving small-scale decentralized technologies like solar home systems or [mesh-grids](#) may be well-suited for [under-grid](#) applications in an urban environment where solar technology and low-cost financing are available and formal channels to grid access remain prohibitively expensive. Localized solar generation could be a promising grassroots alternative that could give communities ownership of their energy future while partially relieving the burden of non-technical losses on utilities.
- **Development of funding mechanisms to improve affordability in informal settlements.** Affordability is a significant barrier to persuading informal customers to become metered. Governments and utilities must establish innovative funding mechanisms that make connections affordable for informal communities, paired with sustainable tariff reform programs.<sup>10</sup> For example, low-income social tariff programs like those successfully implemented in [Brazil](#) and connection subsidy and financing programs like those in [Kenya's slum electrification program](#). Further, governments and other relevant stakeholders should increase resourcing for granular data collection to enable properly targeted subsidies, effective interventions, and successful energy access projects in these communities.
- **Movement away from a punitive approach.** Most communities have for decades associated the utility with neglect and/or criminal enforcement, making them less willing to trust and participate in improvement programs. Utilities should leverage the experience and relationships of advocacy partners (such as [ACTogether Uganda](#) in Kampala) to facilitate meaningful engagement between the community, the utility, and the local government in designing interventions. For example, [concerted efforts by Brazil's public utility to improve relations with São Paulo's urban poor](#) drastically improved energy services in informal communities. Similarly, [Kenya Power moved from a punitive approach to informal connections to a community-based approach](#) of sensitizing the informal communities to the benefits of legal connections.
- **Protection of marginalized tenants from exploitation.** Displaced people disproportionately live in informal communities and rented accommodations. This demographic is vulnerable to asymmetrical power dynamics between landlords and tenants and is less likely to participate in utility and government-led programs. The urban institutional landscape could provide legal mechanisms to regulate and enforce a minimum standard of electricity service within landlord-tenant agreements.
- **Recognition of the unique challenges of informal communities within the mainstream SDG 7 discourse and agenda.** Rural spaces remain the focus of the SDG 7 community of action, given the relatively high electrification rates of urban zones. However, this binary framing invisibilizes the persistent inequities faced by (rapidly growing) low-income urban

communities worldwide. Governments and development partners should champion the disaggregation of urban statistics, such as electricity access rates, economic indicators, access to essential services, and more, to enable better measurement, goal-setting, and tracking of electrification progress in informal communities.

Though more sustained and widespread engagement will be needed in the months and years to come, these principles can better guide efforts to understand energy poverty in low-income urban communities and ultimately ensure equitable progress toward universal electrification.

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## Endnotes

1. The terms informal settlements and slums are closely related but not necessarily interchangeable. Informal settlement refers to a community developed outside of sanctioned urban planning regulations, while slum refers to an urban area [characterized by poverty and poor living standards](#).
2. United Nations, "Report of the UN Economist Network for the UN 75th Anniversary: Shaping the Trends of Our Time," 2020.
3. An academic consortium led by the University of California, Berkeley, includes Arizona State University, University of Massachusetts Amherst, University College London, and Makerere University, with NGO partners ACTogether Uganda.
4. Several programs have provided vital experience, such as the Slum Electrification Program
5. Tumwebaze I. et al. (2013) Sanitation facilities in Kampala slums, Uganda: users' satisfaction and determinant factors, *International Journal of Environmental Health Research*, 23:3, 191-204, DOI: [10.1080/09603123.2012.713095](https://doi.org/10.1080/09603123.2012.713095)
6. Muchadenyika et al. (2018) Policy, politics, and leadership in slum upgrading: A comparative analysis of Harare and Kampala Cities, 82, 58-67, <https://doi.org/10.1016/j.cities.2018.05.005>.
7. Estimates are derived from community focus groups and expert interviews.
8. Ambe J. Njoh (2009) Urban planning as a tool of power and social control in colonial Africa, *Planning Perspectives*, 24:3, 301-317, DOI: [10.1080/02665430902933960](https://doi.org/10.1080/02665430902933960)
9. Rémi de Bercegol, Jochen Monstadt. The Kenya Slum Electrification Program. Local politics of electricity networks in Kibera. *Energy Research & Social Science*, Elsevier, 2018, (10.1016/j.erss.2018.04.007)
10. USAID. Innovative Approaches to Slum Electrification, 2004.