AFRICAN CITIES RESEARCH CONSORTIUM

Research Report

Understanding the polemics around streetlighting in Lagos

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About the African Cities Research Consortium and this report

The African Cities Research Consortium (ACRC) is funded by FCDO to explore and develop new modalities for urban programming in the African continent.

Foundational scoping research across city politics, systems and domains identified entry points for action research interventions designed to address complex problems.

For Lagos, this research can be accessed at: www.african-cities.org/lagos

In Lagos, team members identified streetlighting as a potential solution to help improve livelihoods as well safety and security in cities. The following research report documents their scoping project, which looked at the condition of urban infrastructure (in the form of streetlighting) in Lagos, along with the challenges and opportunities of streetlighting systems in cities experiencing rapid urbanisation, high crime incidences and extreme poverty.

It is based on ACRC's conceptual framework and theory of change and contributes to our broader learning process. We recognise the organisations that we support as co-researchers in this endeavour.

For more information, please visit: www.african-cities.org

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Contents

Key findings

1 **Multiple stakeholders are involved in the provision of streetlighting.**
These actors operate across varying levels and include governments, the private sector, community groups and civil society organisations.

2 **Streetlighting takes various forms.**
It varies from more conventional, grid-based lights, powered by fossil fuels, to solar streetlights using LEDs. Interventions have included both community-wide and major road-focused approaches, with a recent push towards more sustainable infrastructure.

3 **Decisive state action is needed to power streetlighting interventions in informal settlements.**
To date, streetlighting provision by the state has favoured elite neighbourhoods on Lagos Island, but left informal settlements in the dark. These areas stand to benefit from improved streetlighting, with businesses on illuminated streets reporting increased revenue through extended operating hours and residents feeling safer after dark.

4 **Financial barriers and politically driven procurement are key challenges.**
Reduced budgets, inadequate funding, politically driven procurement, deficient technology, material shortages and infrastructural vandalism are all barriers to overcome in efforts to improve streetlighting provision. A lack of technical capacity also hampers the procurement process.

5 **Low-income communities across the city have come together to drive progress.**
The creation of community development associations (CDAs) in Lagos has meant that residents have been able to achieve some level of streetlight infrastructure in their neighbourhoods – co-producing solutions with the state and NGOs.

Executive summary

The new Urban Agenda emphasises the provision of inclusive and safe streets that are free from all form of crime, including gender-based violence. Similarly, the seventh Sustainable Development Goal focuses on ensuring access to affordable, reliable, sustainable and modern energy for all. Streetlights can help achieve these targets by improving livelihood, safety and security in cities. This research report presents the findings of research into the condition of urban infrastructure (in the form of streetlighting) in Lagos, Nigeria. It offers an empirical analytical framework for examining the challenges and opportunities of streetlighting systems, especially their accessibility and impacts, in cities experiencing rapid urbanisation, high crime incidences and extreme poverty.

Local context

Lagos serves as the centre of business, finance and trade for Nigeria. Its population of around 26 million makes it Africa's largest city in terms of population size, and many ordinary residents experience significant levels of insecurity. Lagos state has been poorly managed in a context of everyday crime, extreme poverty and decaying public infrastructure.

Considerable efforts have been made in the provision of streetlights in Lagos. Nigeria’s grid power transmission system began operating in 1966, linking Lagos with Kainji. Since then, streetlighting infrastructures in Lagos were connected to national grid power. Currently, Lagos has an estimated 4,405,902 household electricity connections, replacing diesel/grid systems with efficient smart LED technology to enhance security, improve visibility and boost economic activity. These projects work with the private sector companies (for supply and installation of equipment), such as LEDCo Limited and Consistent Energy Limited, to accelerate infrastructure development.

Study objectives and methods

We conducted an in-depth assessment of Lagos streetlighting, to generate an evidence-based understanding of streetlights provision, quality and impact. The study further sought to understand the challenges of streetlight provisioning in informal settlements. The study seeks to answer the following research questions: 1) Who are the key stakeholders and how do they interact to advance access to streetlights? 2) What are the operative policies, programmes and practices regarding streetlighting? 3) How has streetlighting infrastructure been deployed in low-income neighbourhoods? 4) What are the perspectives of residents of low-income neighbourhoods that have benefitted from streetlight provision?

To answer these questions, we undertook a literature review, focus group discussions (FGDs) and key informant interviews (KIIs). The desk review facilitated the mapping of critical stakeholders, summarised existing literature on streetlighting, and analysed policies on public lighting in the context of Lagos. Key informant interviews (17) were

conducted with five groups of providers, including the state government agencies (two); private sector companies contracted by the state government (one); NGOs funded by international development assistance (three); community groups and individuals funded by self-help, NGOs and/or philanthropy (five); and private sector companies providing commercially to communities in Lagos (six). FGDs were conducted with residents/beneficiaries of streetlight projects in three selected communities. The data generated from the desk review, FGDs and KIIs was categorised into various thematic areas and analysed through content analysis.

Key findings

The research findings highlight successful initiatives to build local-level streetlight infrastructures and drive improvement in Lagos communities. This underlines the potential for action research to pilot and validate new models to catalyse reform and underpin private sector investment in informal settlements and low-income areas.

These key findings are:

- There are multiple stakeholders across horizontal and vertical engagements. These include governments, private sector, community groups and civil society organisations funded through self-help, public budget, philanthropy and international development assistance.
- Streetlighting in Lagos varies, from more conventional grid-based fossil fuel lights to solar streetlights using LEDs. Lagos employs both community-wide and major road-focused streetlight interventions, with a significant recent push towards replacing traditional, unreliable grid-based lighting with more sustainable solar-powered infrastructure.
- The state has the power to act decisively on streetlight development issues. To date, streetlight provision by the state has been orientated towards elite neighbourhoods on Lagos Island, while households in informal settlements have less access. This is because procurement is often highly political, involving significant public interest and substantial budgets, often creating complex links involving economic incentives, political patronage and lobbying. Lagos “area boys” and criminals frequently sabotage streetlights by stealing armoured cables and other infrastructure, sometimes for scrap. Businesses on illuminated streets have seen increased revenue as a result of being able to operate for longer hours after sunset. Residents feel safer going out after dark, commuting to and from work places.
- Challenges include reduced budgets, due to corruption, inadequate funding, politically driven procurement – such as the need to gain political support, secure campaign funding, or favour cronies on the selection, awarding and implementation of streetlight infrastructure – deficient technology, material shortages and infrastructural vandalism. Lack of technical capacity hampers the procurement process. While the economic case for choosing solar over conventional streetlights is obvious, there is still a lack of adequate capital in the short term and a high risk that maintenance of lights could be unaffordable if budgeting and community engagement are not improved.
- Across Lagos, low-income communities have come together to create community development associations (CDAs). Some CDAs (such as

Oshorun CDA in Ikosi-Isheri, Ilaje CDA in Bariga, Ilupeju Community CDA in Ojo and Ajegunle CDA in Ikorodu, among others) have been able to achieve some level of streetlight infrastructure, co-producing with the state, NGOs funded by international development assistance and individual philanthropy.

Going forward

It is obvious that existing streetlighting infrastructure is insufficient to meet the scale of the challenge in Lagos. It is also clear that solutions will only be found through inclusive engagements that push against established approaches to infrastructure development. We therefore make the following recommendations:

- Local communities need to be involved in planning and delivering urban infrastructures to ensure the equitable distribution of benefits, with neighbourhoods shaped by the people and for the people.
- Responding to the issues of multiple stakeholders in streetlighting requires a proactive, transparent and collaborative management strategy that addresses conflicting priorities while working towards shared goals of energy efficiency and improved public services. Streetlight providers in Lagos must ensure local communities and other appropriate stakeholders are involved in the planning and implementation of streetlighting projects to maximise the social returns and realise multiple co-benefits for the general public, the economy and the environment. For instance, strong community mobilisation, private sector buy-in and flexible urban planning strategies are needed to make streetlighting development a viable and attractive investment in low-income communities.
- More generally, the state should create an enabling environment for investment in sustainable urban infrastructure by: providing adequate and reliable investment funding to subsidise access for the lowest income groups; creating a more robust regulatory framework to grow and control domestic energy production and solar markets; and helping to enhance local livelihoods.
- The state should transit from broad, untargeted energy subsidies to targeted support for vulnerable households and informal communities, while actively promoting private-sector-led renewable energy solutions, especially for streetlighting and off-grid communities.

Introduction

Urban centres across Africa are growing rapidly, with increasing populations, socioeconomic development, infrastructure expansion and land use change being fundamental factors resulting from the rapid growth of cities. It is estimated that 68% of the global population will be living in urban centres by 2050, with the vast majority of this growth to take place in Africa (UN-DESA, 2018). According to the UN-DESA projections, Lagos's population will reach 30 million people by 2030.

There are several specific urban development challenges that are typical of the African context, including increasing poverty, rising inequality within cities and extreme shortfalls in infrastructure provision as well as investment at the local community level (Dodman et al., 2017; Ugwoke et al., 2025). These are even more obvious in sub-Saharan cities, where poverty is often deep-rooted and local authorities' capacity to provide public goods and services, as well as risk-reducing amenities, is poor (Satterthwaite, 2016). Inadequate urban infrastructure means failures to meet the growing demand for basic public services, and can put considerable stress on local finances, capacities and the general environment (World Economic Forum, 2016). This is particularly problematic in sub-Saharan African countries, where annual municipal budgets for some countries (for example, Côte d'Ivoire, South Sudan and DR Congo, among others) can be as low as USD 0.03 per capita (Cartwright et al., 2018; Adeyemi et al., 2025).

The World Bank's Global Infrastructure Outlook dataset shows a growing investment gap, more than 50% of which is due to a considerable shortfall in investment in the roads (approximately USD 9 trillion) and electricity (about USD 3 trillion) sectors in developing countries (OECD, 2025). In order to fill this gap, Floater et al. (2017) argued that key state and non-state stakeholders need to marshal and deploy finances in the most effective, efficient and equitable ways possible. Opportunities for public investment or private sector financing and donor funding are often prioritised towards elite areas, business districts and other parts of the city that are seen to be the engines of economic growth and where tax might repay investments in infrastructure (Gillard et al., 2019). This has marginalised informal settlements in African cities. While investments in infrastructure in parts of the city that generate returns have been justified on rational economic grounds, this risks intensifying already unsustainable levels of social, economic and political inequality in African cities.

Despite providing accommodation for more than 56% of the urban population in African cities (Ouma et al., 2024), informal settlements and low-income neighbourhoods tend to have multiple sources of insecurity, insufficient or insecure employment opportunities, and are often disconnected from the rest of the city in terms of spatial planning, transportation, electricity and lighting provisions, among others, creating an uneven infrastructure landscape (Castán-Broto, 2018; Ouma et al., 2024). More than 60% of urban dwellers in African countries have been victims of crime, typically gender-based violence, burglary and assault (Adzande et al., 2024). Those working in the informal economy, particularly street vendors and small-scale household entrepreneurs

in sub-Saharan Africa, do so in unprotected environments, particularly in poorly lit areas that threaten their safety and impose limits on their security and livelihoods (Toutain et al., 2017; Rosário and Figueiredo, 2024). The provision of streetlights and well-lit environments is crucial to creating a more even infrastructure landscape and enhancing safety and security within the city. This study explores streetlight provision and analyses the challenges and opportunities that streetlights pose to security and socioeconomic development, and potential ways forward for the city.

Defining the research boundaries

Based on in-depth-interviews with residents/beneficiaries and suppliers of streetlight infrastructure, this research evaluates past and ongoing streetlighting projects in selected Lagos communities, so as to identify challenges and opportunities. Past and ongoing streetlighting projects were assessed in terms of multiple dimensions of sponsors, political economy, performance, functionality and response to crime prevention and other benefits to households and businesses. This study also analyses providers' experiences, in order to understand the current practices, innovations and factors that contribute to success, and the challenges faced by streetlight projects in Lagos, particularly in low-income communities. The study identifies the knowledge and innovation gap that captures existing opportunities and challenges. Furthermore, this study analyses experiences to date to identify ways to catalyse streetlighting reform processes, partnerships or scaling efforts that will improve current policies, programming approaches and practices.

Key research issues aim to gain an understanding of the experience of residents and beneficiaries of streetlight projects, including the identification of challenges in coordinating streetlight setting-up and maintenance response. We also examine the impact of streetlights in terms of crime, transportation and business enterprises. We enquire into the additional support or services that residents think are needed to support effective functioning of streetlights in Lagos communities, and whether there are any specific cultural and/or social factors that are influencing how people or groups of people (such as area boys, street traders, and so on) perceive and respond to streetlights in Lagos.

With respect to the supply and delivery of streetlights, we ask about the suppliers' experience with streetlights provision, particularly in low-income neighbourhoods. We enquire into their experience with new technologies, and the challenges (political, financial, among others) that they face in expanding provision of streetlighting in low-income areas. We ask suppliers to define the innovation gap that might be useful to address if streetlight provision is to expand to the scale required and we ask how they have engaged community planning and mobilisation while providing and maintaining streetlighting. We examine, with providers, why streetlighting expansion programmes have not really worked or got stuck, especially in informal settlements. We also ask about maintenance issues and major budgetary issues. We ask about the measures they have taken to integrate renewable energy (for example, solar-powered streetlights) into streetlighting systems, and how they handle complaints and feedback

from residents. Grounded in knowledge of the prevailing conditions in Lagos, answers to these questions are aimed to provoke new thinking on the options available to improve public streetlighting in the city. However, there was no financial analysis, due to commercial issues.

The first section presents the introduction, which describes the nexus of crime, socioeconomic development, streetlighting and urban infrastructure in the context of rapidly urbanising cities. The second section focuses on streetlight infrastructures in cities as well as the governance of the public lighting sector and also provides a key inventory of streetlights in Lagos. The third section describes the study area. The fourth section describes the methodology used to gather information and data in this report, while the fifth section presents findings from the literature review, focus group discussions (FGDs) and key informant interviews (KIIs). The sixth section summarises what was learnt in this research and extracts various lessons for strategic and policy implications, while the seventh section concludes.

Streetlight infrastructure

Streetlighting is a key public service provided by state and non-state groups, and an important indicator of city growth and economic development. There are several motives for streetlight provisions, which could at times be related to political interest or client politics as well protecting human lives. In addition, streetlighting helps to improve the city's night-time activity (Kang et al., 2024). Adequate streetlighting improves the character of space in a city and has been associated with convenience, promoting economic development as well as increasing a city's aesthetic appeal (Gillard et al., 2019). Proper and well-designed streetlighting contributes to safe roads, reduction of vehicle accidents and an increase in drivers' and pedestrians' levels of comfort (Al-Haji, 2014; Struyf et al., 2019) and also helps to increase the value of adjacent public and private properties (Perkins et al., 2015; Svechkina, et al., 2020). Quality streetlighting also improves the general urban atmosphere, making cities' commercial and cultural centres more appealing (Kang et al., 2024).

The positive impact of adequately lit streets is evident in the transformation of urban space, encouraging increased pedestrian activity and extended operating hours for local businesses, thereby enhancing livelihoods and prosperity (Burattini et al., 2024). It also fosters a sense of belonging and identity among residents, ultimately achieving extensive communication and serving as an encouragement to social interactions. According to Clark (2018), improved streetlighting is considered an effective means of crime prevention, second only to increased police presence. Well-lit streets not only deter crime but also enhance residents' perception of safety (Fotios et al., 2019), thereby increasing the likelihood of individuals engaging in social and economic activities after dark. At night and early morning, adequate lighting plays a crucial role in improving visibility and reducing concealment opportunities, which not only increases actual safety but also fosters a stronger sense of security among residents and visitors (Svechkina et al., 2020).

In cities across the world, poorly lit environments have been linked with increased vulnerability to crime, reduced sociocultural interaction after dark and limited night mobility, especially for women and girls (Struyf et al., 2019; Welsh and Farrington, 2008; Badiora, 2023). A number of studies have shown crime to mostly occur at night, often in areas with insufficient lighting infrastructure (Balemba and Beauregard, 2013; Tabrizi and Madanipour, 2006; Deakin et al., 2007; Painter, 1994). In contrast, well-illuminated cities and public spaces not only reduce opportunities for criminal behaviour but also contribute to a stronger sense of safety and community cohesiveness (Boyce et al., 2000; Fotios et al., 2019; Welsh and Farrington, 2008).

While improved streetlighting can reduce crime, there is a risk of crime displacement, whereby crime is deflected from one location, time or target to another (Clarke, 2018; Chalfin et al., 2021; Nieto et al., 2024). This may be minimised through a comprehensive approach, focusing on strategic placement of streetlights; consideration of a combination of systems (that is, streetlights with other crime prevention approaches); and an all-inclusive community involvement (Ceccato et al., 2025).

Streetlighting can also be seen as situational crime prevention. This approach stresses increasing the likelihood of detection through provision of more or better guardianship (Smith and Clarke, 2012; Wen et al., 2024). Besides, this approach is supported by theories that emphasise natural, informal surveillance as a key to crime prevention (Clarke, 2018). Streetlighting may inspire increased street usage, which strengthens natural surveillance. An increase in routine activity patterns may reduce crime because it increases the flow of potentially capable guardians who can intervene to prevent crime (Wallace, 2015; Wen et al., 2024). From a potential offender's perspective, the proximity of other pedestrians acts as a deterrent because the risks of being recognised or interrupted when attacking personal or property targets are increased.

Another perspective emphasises the importance of investment to improve neighbourhood conditions as a means of strengthening community confidence, cohesion and social control (Ellis et al., 2020; Ceccato et al., 2024). Visible signs of community negligence or disorder (such as poorly lit streets) create an urban environment that promotes crime, including serious crimes (Weisburd et al., 2023; Ceccato, 2024). As a highly visible sign of investment, streetlighting interventions might reduce crime if they were perceived to improve civility in the environment and signal to residents and criminals that efforts were being made to invest in and improve the neighbourhood. In turn, this might lead to residents having a more positive image of their area and thus to increased community pride, optimism and cohesion. This might lead residents to exert greater informal social control over potential offenders in an area, even going so far as to intervene on behalf of their neighbours or for the common good (Ward et al., 2017; Vilalta et al., 2020).

Despite their importance to the urban environment, many areas in today's African cities remain inadequately illuminated (Nduhura et al., 2023). Where they have been provided, many public streetlighting systems are obsolete, inadequate and inefficient, as many of them are not operative (Gillard et al., 2023). Post-delivery evidence shows

that commitment to infrastructure maintenance is low (Fleishman, 2023; Okyere et al., 2024). Streetlight equipment in many African cities is impaired by maintenance requirements that are beyond the budget limits of the local authorities (Gillard et al., 2023), who are generally responsible for the maintenance of streetlights on public streets, roads and parks. In Nigeria and other African countries, unmanned streetlighting facilities have also suffered from theft and vandalism (Nduhura et al., 2023). Elsewhere, streetlighting facilities are mismanaged and outdated and thus highly inefficient, which increases operating and maintenance costs (Mbonga, 2020)). Second-order effects include greater greenhouse-gas emissions and reduced service quality. All these inefficiencies persist in Nigeria, despite the availability of new lighting technologies that greatly reduce cost, greenhouse-gas emissions and energy consumption.

Political and governance context of streetlighting

Nigeria is a federal state with three levels of government: federal, state and local. Political power is majorly divided between the federal and sub-national (state) governments, of which Lagos is one, with local governments also playing a role in governance. While the federal government (through the Nigerian Electricity Regulatory Commission – NERC) has power over electricity generation, transmission and distribution for the entire federation, the Nigerian constitution also allows states to legislate on these matters within their respective states in areas not covered by the national grid. Hence, beyond the colonial era, earlier streetlight provisions (1962-1970) in Lagos were mainly implemented by the federal government and were heavily reliant on the national grid to function. The maintenance was done by both the Lagos state and the federal government.

A recent constitutional amendment[1] has removed this restriction, allowing state governments to legislate on electricity generation, transmission and distribution within their entire state (for example, Lagos), including areas covered by the national grid, while NERC retains oversight and sets national standards. Therefore, the more recent public lighting provisions in Lagos are jointly provided and managed by the federal and Lagos state governments, with local authorities also playing a role through the decentralisation of energy service delivery. However, in practice, these local governments are subjected to Lagos state government involvement in local politics and restricted funding. The recent Supreme Court ruling[2] is expected, however, to have significant implications for infrastructure governance and local development, as it prevents state governors from interfering with local government funds and operations,

[1] See Alliance Law Firm (2023). "The Electricity Act 2023 Amendment: Implications for the power sector". *Lexology*, 25 August.

[2] In the case number SC/CV/343/2024, the Supreme Court declared that state governments cannot illegally withhold or use money meant for local governments (LG) from the federal allocation. It also made it unconstitutional for governors to dissolve democratically elected LG councils and replace them with caretaker committees. The Court ruled that local governments are entitled to financial independence and can manage their funds directly to ensure they can effectively provide services (such as streetlights) at the grassroots level.

promoting greater independence and potentially leading to increased infrastructure development at the grassroots level. Nevertheless, the local authorities remain heavily dependent on financial transfers from federal government that can be unreliable, or for lower amounts than is needed.

Nigeria's Electricity Act of 2023 formally empowers private entities and individuals to generate electricity, including through renewable energy sources, and to distribute it within their jurisdictions. This decentralisation allows states and non-state actors to develop their own renewable energy projects (such as distributed solar-powered streetlights) and encourages the development of off-grid and mini-grid systems. This approach to energy and lighting infrastructure delivery has enhanced individual, community group, NGO and private sector participation, market-based solutions, and led to a reduced role for the state in direct provision and regulation, potentially leading to efficiency gains and reduced public spending.

Furthermore, the Act introduces the Power Consumer Assistance Fund (PCAF) to provide subsidies for low-income households and underprivileged electricity consumers. This fund is to be financed by contributions from eligible customers and other consumers, as well as subsidies from the federal government. NERC manages and disburses the funds according to policy directions from the minister of power, with the goal of ensuring access to affordable electricity for vulnerable populations.

Nigeria's Electricity Act of 2023 (in accordance with which Lagos state government is expected to function) emphasises collaborations between various stakeholders for effective power sector and public lighting reform, in that:

- It promotes close collaboration and encourages partnerships between federal government, Lagos state, and local government to ensure coordinated oversight and consistent regulatory standards.
- It seeks to foster state and non-state (public–private) partnerships across the energy and electricity market value chain to attract investment and drive innovation. This can drive efficiency in electricity generation and distribution and could lead to more reliable and cost-effective streetlighting solutions.
- It highlights the need for broad-based consultation and collaboration with Lagos state government and other stakeholders for implementation of related projects.
- It incentivises renewable energy projects and pushes for more sustainable and efficient solutions, like solar-powered LED streetlights, driven by concerns about cost and environmental impact.
- It encourages individuals, community groups, NGOs and private sector companies to participate in streetlighting and other areas of the electricity industry previously under federal and/or state, local government purview, promoting a more diverse and sustainable energy mix.
- There is a targeted assistance fund (the PCAF) specifically designed to support underprivileged consumers, ensuring that they can access electricity affordably. The PCAF proposal suggests a minimum of ₦5,000 (USD 3.5)

monthly support per poor household, covering around 25kWh. However, the proposal is yet to be implemented.

- While there are major funding gaps, the context of the Electricity Act of 2023 demonstrates political will to address Nigeria's energy and public lighting crisis, by enabling significant reforms and decentralisation within the power sector through liberalising the electricity market and promoting renewable energy. Specifically, the context which empowers Lagos to establish its own electricity markets will foster a more competitive and responsive environment for reform around streetlighting. This shift away from a fully centralised system is seen as a positive step towards addressing long-standing streetlighting and power challenges. While there remains an elite orientation, the Act shows willingness from the Nigerian political class to confront long-standing bottlenecks around public lighting. This is needed for more regular engagements between the state, private sector and local communities to catalyse a reform coalition process, aimed at addressing streetlighting issues by fostering collaboration and leveraging diverse perspectives.

Contextual scope: Streetlighting in Lagos

There have been several attempts at ensuring that Lagos streets were well lit for proper visibility at night. According to Olukoju (2003), the first attempt was in 1890 during the colonial era, when gasoline lanterns were placed at certain points on the streets of Lagos. The second significant attempt was made by Governor Carter in December 1893. The governor proposed the installation of 120 lamps across the city of Lagos at intervals of 220 feet to 220 yards.

Five years later (1898), electric streetlighting was introduced in Lagos. However, this was limited mostly to the European Reservation Area (ERA). Even so, the service was not fully operated, as the number of staff was insufficient to keep it running throughout the night, and the running cost was also high (almost £2,000 per annum). In 1893, the Lagos Chamber of Commerce (LCC) intervened and improved the lighting of the town, especially the back streets of “Isale-Eko”, where the indigenes resided.

The Nigerian Electricity Supply Company was established in 1923 to manage the electricity power station in Ijora, Lagos, and, in 1950, the Electricity Corporation of Nigeria (ECN) was established to manage the generation and distribution of electricity for domestic and public lighting in Lagos and other parts of the country. In 1962, following independence, the Niger Dams Authority (NDA) was formed to construct and maintain dams in the River Niger, with one of its main purposes being to generate electricity from the River Niger (Yusuf et al., 2017). The country grid power transmission system began operating in 1966, linking Lagos with Kainji. Since then, streetlighting infrastructures in Lagos have been connected to national grid power. However, grid electricity supply has been insufficient to meet demand in Lagos.

Currently, Lagos has an estimated population of over 26 million people (26,435,408 and 4,405,902 household electricity connections).[3] Total electricity demand in Lagos is

[3] Lagos State Off-Grid Electrification Strategy and Action Plan. See Courteville Business Solutions (2022). “Lagos unveils off-grid electrification strategy“, 25 May.

estimated at about 5GW, with grid supply meeting only 0.9GW (World Bank, 2021). Only 8% of households (mostly in elite communities) receive over 16 hours of electricity daily, with 60% receiving zero to eight hours daily. For non-residential users (such as commercial, industrial and public buildings), these figures are 12% and 42%, respectively (World Bank, 2021). Thus, there is a high population of unserved and underserved residents and users who are either off grid or currently utilising self-owned electricity generators, and other fossil-fuel-based energy sources. It would take an estimated 20 years for unserved areas and households to be connected to the grid based on current estimates and the Lagos state's grid electrification rate.[4]

The high costs (in terms of both time and capital) of lighting up the city have resulted in two major challenges: first, the inability of some communities (particularly informal settlements) to pay the costs of electricity; and, second, the need to identify and deploy more energy-efficient lighting systems, due to global concern about climate change. The high cost of streetlighting has led Lagos city planners to consider LED lighting systems using solar cells for power, since this is cheaper (Babatunde et al., 2019). For example, a previous case study (Gillard et al., 2019), focused on the impacts of solar-powered lighting in Kampala and Jinja, Uganda, established that installation costs are reasonable, electricity consumption will be reduced and maintenance costs are cheap and sustainable. Across Uganda, the average cost has been around USD 1,600 per solar streetlight pole, compared to USD 2,150 for a conventional streetlight pole. For a total of 1,800 units of solar streetlights installed in the Uganda case, they were USD 950,000 cheaper than conventional streetlights. It was USD 21 million cheaper than conventional lights to install solar poles throughout Kampala (Gillard et al., 2019).

In 2015, a USD 6.9 million project contract was signed by the Lagos state government with a UK-based energy firm to supply and install energy-efficient streetlights across the city. This was tagged the "Light Up Lagos Project" and was conceived to light up major streets in the Lagos metropolis, with the goal of boosting commercial activities, enhancing security, improving the citizenry's standard of living as well as boosting the aesthetics of the state. This plan incorporated energy-efficient LED lighting and intelligent control systems combined with state-of-the-art HESS (hybrid energy storage system), which was to cover around 31% of the city's entire streetlight infrastructure and improve environmental sustainability, provide energy savings and reduce maintenance costs. The plan also included retrofitting old lighting with new intelligent LED lighting solutions, as well as replacing currently damaged lighting poles and cables. The plan to install 46,000 streetlights across Lagos began with a first phase of 36,000 streetlights (Tijani, 2016). The plan was to supply 12 hours of electricity to provide illumination and safety for pedestrians and vehicles during the night and early morning. From May to December 2015, the Lagos state government reactivated hitherto moribund streetlighting infrastructure in 99 roads, covering an initial distance of 345km. The project aimed to cover 600km of roads and streets, including a

[4] Lagos State Off-Grid Electrification Strategy and Action Plan. See Courteville Business Solutions (2022). "Lagos unveils off-grid electrification strategy". 25 May.

section of the Third Mainland Bridge by May 2016. As of late 2018, the Lagos state government had installed streetlighting infrastructure along approximately 1,300km of roads

With lighting manufacturers virtually non-existent in Nigeria, a skills training programme was introduced. A local established company (LEDCo Ltd) was contracted in partnership with Low Energy Designs in the UK to manufacture the components for intelligent lighting systems HESS, which has revolutionised the Lagos energy market and increased environmental and financial sustainability in Lagos. LEDCo is a major supplier and the company offers the most technically advanced, energy-efficient and effective LED light products for all applications on the Lagos market (see Box 1 for further details about LEDCo).

Box 1: LEDCo Limited

This is a private infrastructure service provider of reliable, efficient, safe and sustainable public lighting and power management technologies. In Lagos and, perhaps, Nigeria, the organisation offers the most technically advanced, energy efficient and effective LED light products. The organisation designs, manufactures and delivers specific smart LED lights to support all kinds of projects. The organisation provides streetlight infrastructure managed services, with clearly defined service-level expectations; retrofitting and upgrading of existing streetlight infrastructure; provision of alternative power to ensure all-night availability when there are power outages; and deployment of renewable power solutions, where ideal.

For streetlight infrastructures, LEDCo SMART infrastructure is offered on the following basis:

- Build, Operate and Transfer: a payment plan of a minimum of 84 months for the deployment of infrastructure; or
- Build, Own and Operate: a pay-as-you-go model, where the client pays an agreed daily rate per LED fitting deployed.

LEDCo has a partnership with Lagos state, which began in 2018. LEDCo has supported the government's energy-neutral ambitions through the deployment of innovative energy efficiency solutions. The most recent collaboration is to deploy 20,000 units of state-of-the-art Night-SUN across Lagos. Each unit integrates advanced technology, inclu ding smart monitoring systems, GPS tracking, and a robust ten-year warranty, ensuring reliability and efficient operation. The project will deliver 6MW of renewable solar power and 24.5MWh of energy storage, further enhancing public safety, urban mobility and the sustainability of Lagos state's energy infrastructure, while reducing carbon footprint.

Major projects and milestones

- **Lagos Smart Solar Project (2024-2025):** LEDCo partnered with the Lagos state government to deploy 20,000 units of its "NightSUN" smart solar streetlights across the state. The project includes smart monitoring, GPS

tracking, and is estimated to deliver 6MW of renewable power and 24.5MWh of energy storage.

- **Light Up Oyo Project:** The company was awarded the contract for the "Light Up Oyo" project, which involved installing over 15,000 LED streetlights across more than 300km of roads. The project reportedly achieved significant energy savings and was praised for its smart technology.
- **Ogun State Infrastructure:** LEDCo has installed over 4,000 LED streetlights covering 60km of roads in major towns within Ogun State.
- **Streetlight Retrofitting in Lagos (2018-2021):** Early partnerships with Lagos state included the supply and installation of 10,000 energy-efficient streetlights through a deal with UK-based Low Energy Designs.

Local investment and job creation

Through its partnership with UK-based Low Energy Designs, LEDCo is involved in a significant investment for the construction of an LED lighting and hybrid energy power assembly plant in Nigeria, creating hundreds of local jobs.

Source: Agency documentation and key informant interviews with external stakeholders.

The second phase of the Light Up Lagos project began in 2018, with the aim of installing over 10,000 streetlights, covering 300km of roads in Lagos metropolitan area. The project mainly covered major roads such as Kara Bridge to Berger, Third Mainland Bridge, Akin Adesola Street and Ahmadu Bello Way in Victoria Island, Lagos.[5] The long-term plan is to extend streetlights to residential areas. The project has also been active in the Brazilian Quarters on the Lagos Island, although the streetlights are currently not working as expected or as compared to those in Lekki, Victoria Island and Ikoyi in Lagos.[6]

In terms of units, our research discovered that 36,000 units had been deployed under the "Light Up Lagos" initiative in 2016, with a target to add another 10,000 units, bringing the projected total to 46,000 units at the time. As of 2018, Lagos state had installed streetlighting infrastructure along approximately 1,300 km of roads, up from 345km in May 2015. In 2025, the target is to install 40,000 solar-powered streetlights across Lagos state. Of these 40,000 units, a total of 22,000 solar-powered streetlights is currently being installed under "Light Up Lagos Solar Streetlight Initiative" across major roads in Lagos.[7]

In Lagos, several communities (such as Ikoyi, Victoria Island) have been retrofitted or are currently in the process of retrofitting their high energy consumption streetlighting with high efficiency LED streetlights. Implementation is by private consultants, Consistent Energy Limited. Like LEDCo, the company, which is the brand owner of SolarDirect, is a major supplier and offers the most technically advanced, energy-

[5] Light Up Lagos, Nigeria. See Low Energy Designs website.
[6] Precise figures for the exact number of streetlights required to light up all of Lagos's streets are not available. The Lagos state government has focused on kilometre-based installation targets rather than a total number of units for complete coverage.
[7] Interview with state government agencies, 16 June 2025.

efficient and effective LED light products for all applications on the Lagos market. Consistent Energy Limited has an estimated annual revenue of USD 6 million and between 11 and 50 employees. Beyond consultancy for the state government, the company also offers lease-to-own and pay-as-you-go solar systems with flexible payment plans for communities in Lagos (see Box 2 for further information about Consistent Energy).

Box 2: Consistent Energy Limited

Established in 2015, Consistent Energy Ltd was incorporated to deploy alternative energies for productive use. The organisation focuses on commercial solar installations, mini-grids and other renewable energy projects in Lagos and other parts of Nigeria. It specialises in solar solutions for institutions like schools and hospitals, as well as off-grid communities with mini-grids. Its projects aim to reduce energy costs and provide sustainable power solutions. The organisation is one of the leading energy consultants for Lagos state government and local community groups.

From interviews with key informants, the organisation has deployed well over 2.5MWp of cumulative energy – primarily through stand-alone rooftop solar systems. It offers lease-to-own and pay-as-you-go (PAYG) business models, requiring minimal down payments and allowing repayment over two to three years on an equal weekly or monthly basis.

Some of its contact with the government and local communities includes solar-powered streetlighting offered on major roads, and selected residential estates offered on the basis of either the Build, Operate and Transfer (a payment plan spread over a period of time for the deployment of infrastructure) or the Build, Own and Operate model, where beneficiaries or clients pay an agreed daily or monthly rate per unit used.

The state government has also included streetlight plans as a requirement for any street-level infrastructure proposal approved by the state physical planning and development agencies. Beyond the state efforts, community groups and NGOs have been able to secure lighting infrastructure through philanthropic contributions from individuals and international organisations and community self-help.

There are some NGOs working at the neighbourhood scale on streetlight projects in Lagos. These include the Shanty Town Empowerment Foundation (SHEF), the SDI-Go-Green Initiatives and the Nigerian Slum and Informal Settlement Federation (NSISF). These organisations focus specifically on developing infrastructure in underserved communities. They access technical assistance, international development funding and other resources. For instance, the Bode Edun Foundation (BEF) (BusinessDay, 2015) installed 100 streetlights in the inner streets of Oshodi Local Government Area (See Box 3 for further details on this project).

Box 3: Bode Edun Foundation Light Up Oshodi

Bode Edun Foundation (BEF) is a socioeconomic development foundation with over 500 volunteer and staff. From interviews with key informants, the foundation has embarked on several projects around Oshodi to improve the area. The installation of the 100-unit solar streetlights was managed by the Foundation team and implemented by one of the private energy vendors in Lagos. The installation process was a collaborative effort involving the vendor, the staff of Bode Edun Foundation and Oshodi community members. Some of the streetlights cover the main road, while others were located on the community roads and other areas, so the power ranges from 35 to 120w.

After completing the installation of 100-unit solar streetlights, BEF handed over the 100-unit streetlight support apparatus to the CDA and the community head. A knowledge-sharing session with the community was organised to ensure long-term sustainability and empowerment. This session covered the basics of solar photovoltaic technology, explaining how solar panels convert sunlight into electricity and the importance of regular maintenance for optimal performance. Routine tasks, such as cleaning the panels, checking battery health and troubleshooting common issues, were demonstrated. Additionally, informational materials and contact details for technical support were also provided. These efforts are to foster self-reliance and ensure that the benefits of the project are sustained for years to come.

CDAs in Lagos have also embarked on many self-help projects, including the installation of streetlights and the supply of energy transformers. In Lagos, CDAs are voluntary, community-based organisations formed to assist in the upkeep and development of residential areas by providing services, addressing problems and acting as a link between residents and the government for community projects and social development. For instance, within four years of its existence, a CDA (named “New Dawn”) in Ikorodu area (Independent, 2019) singlehandedly constructed and commissioned a 390m road and also installed 20 streetlight poles to all areas covered and powered with a high voltage generator to enhance power, security and other social amenities in the area (Box 4 provides further details on this project and the CDA).

Box 4: Ikorodu CDA road construction and streetlight project

The CDA was constituted by residents of Bello Solebo and Jokodola streets in Ikorodu. The construction of the road and installation of the 20-unit streetlighting was made possible through donations made by some philanthropists, residents and money contributed by landlords and tenants, who saw the importance of the projects. The planning and execution of the projects was made easy with the collaborative understanding between the residents and the donors, who resolved to help themselves, as the state seemed to have forgotten their areas. The project cost about USD 32,000 (approximately ₦50 million) with the road project price of about ₦N32 million, while the installation of streetlight poles, wiring and purchase of a high-grade generator to power the streetlights swallowed up the remaining amount. While they

received state authorisation to implement the project, neither financial nor professional consultation support was received from the state. The streetlights are automated systems using light-dependent resistors (LDRs) that turn them on at dusk and off at dawn.

The project started with a site assessment to determine optimal locations for the lights, prioritising high-traffic junctions and business areas on the streets as well as previously under-lit areas. Community meetings were held to inform and engage residents, ensuring their input and support. The installation team, which included technical experts in the private sector and trained local volunteers, began by setting up poles and mounting the solar panels. Wiring and connections were carefully managed to ensure safety and efficiency. Local volunteers received hands-on training for basic maintenance and troubleshooting, fostering a sense of ownership and sustainability. The project concluded with a community event and uptake activities to celebrate the new lighting, emphasising the importance of ongoing maintenance and community involvement. The CDA has also engaged the service of Vigilante Group of Nigeria (VGN) to provide security to the facilities both day and night, with the personnel running cost covered by CDA members' contributions.

Despite some progress made in streetlights across the city, major roads occasionally remain pitch dark at night, partly due to cost, technicality and social issues (Olurode et al., 2018). High costs of installation and maintenance compromise power supply and equipment in Lagos. But, for about a decade now, the government has been making efforts to provide financing. Although with weak transparency, the state budget has consistently considered streetlighting. This was further recognised in 2022, when there was a legislative order to address the "perpetual darkness" on roads through the motion moved by Honourable Agunsoye of Kosofe constituency (Itido, 2018). Hence, streetlighting was chosen as one of the pillars of the current government. In 2020, the state executive council unanimously approved the expansion of the Light Up Lagos programme, dubbed: "Streetlight Retrofit Project".[8] Since 2021, streetlighting has received a budgetary allocation from both the federal and Lagos state governments. While the specific amount for Lagos is not known, the federal government allocated a total of ₦81.7 billion for the construction of solar streetlights in the 2023 FG Capital and Constituency projects, with most of these public projects aligning to political interest (Manjo, 2023), client's politics (Manjo, 2020) and uneven infrastructure development .

In order to enhance the maintenance of these infrastructures, the government launched an enlightenment campaign with the residents in 2021 to take ownership of streetlights in their communities (PMNews, 2021). This is part of state government's efforts to curtail the challenges of vandalism and theft of streetlight infrastructure. The

[8] As earlier mentioned, public lighting has political undertones and each government names their projects differently even when they are similar or a continuation. Streetlight retrofitting involves replacing components of an existing fixture, like upgrading a high-pressure sodium bulb to an LED, which is faster and less costly. Streetlight installation involves replacing the entire pole and fixture, which is more expensive and time-consuming, but allows for greater customisation and a completely new system.

movement, which is tagged “Own the Streetlight”, is geared towards galvanising citizens’ interest in safeguarding streetlights from vandalism. The approach builds affiliations with grassroots communities through state engagement with residents and a formal handing-over of streetlight apparatus to CDAs, with a mutual commitment to safeguard, maintain and utilise the facility. Furthermore, a collaboration was reached between the Lagos State Electricity Board (LSEB) and the Lagos State Neighbourhood Safety Corps (LNSC) to address the pervasive issues of theft and vandalism of streetlights.[9]

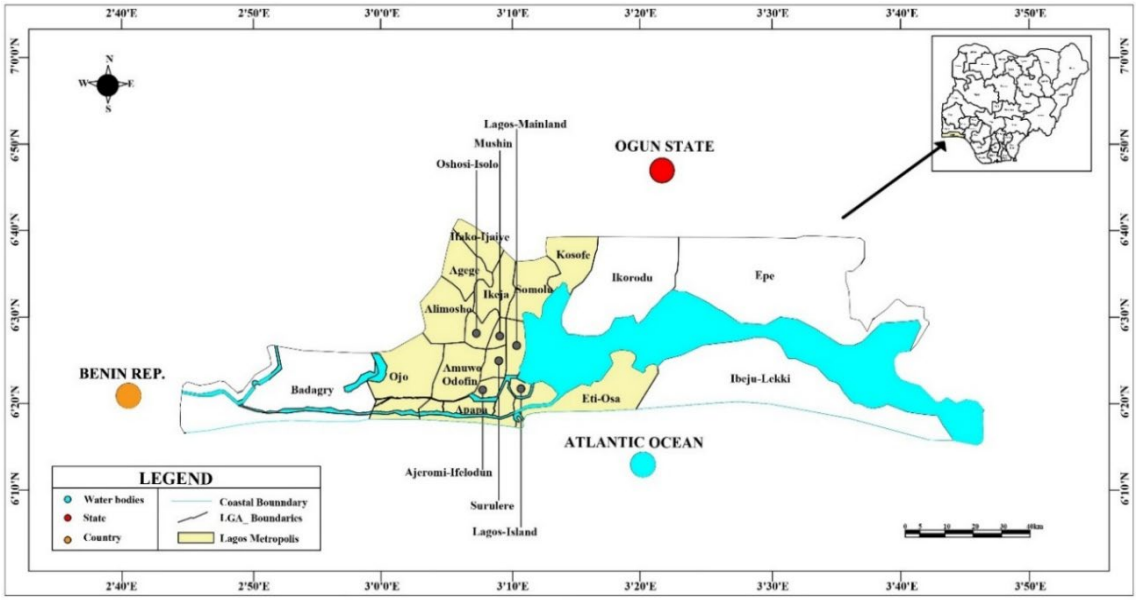
This study analyses lived experiences to date and identifies ways to catalyse streetlighting reform processes, partnerships or scaling efforts that will change policies, approaches and practices, such that challenges are addressed. The next section discusses the study-area-specific characteristics, including geographical, physical and social factors relevant to the research.

Description of the city researched

Lagos was the former administrative capital of Nigeria and is currently referred to as the centre of business, finance and trade for the nation. It is one of the fastest-growing cities in the world and is by far the most populous and progressive city in Nigeria, as well as being Africa's largest city in terms of population size, with about 26 million people. The majority (60%) of this population are concentrated within the city metropolitan areas (see Figure 1). With the recent waves of migration, Lagos is projected to become the most populous city in Africa within the next 50 years[10]. More than half of those who live in Lagos experience insecurity, including traffic robberies, assaults, gang violence, home break-ins, among others (Badiora, 2023; Adzande et al., 2024).

[9] “Electrical Infrastructure: LSEB Seeks Collaboration With LNSC To Combat Theft, Vandalism” (available online, accessed 23 December 2025).
[10] “The challenges of governing Lagos, the city that keeps growing” (available online, accessed 23 December 2025).

Figure 1: Map of Lagos, indicating the metropolitan and peri-urban areas[11]



Source: Badiora (2023).

The city's property tax or land use charge, through which the revenue for specific services such as public lighting and road maintenance is collected, generates relatively large sums each year. In 2024, the land use charge contributed over ₦14 billion to Lagos state's internally generated revenue (Ogunrinde, 2025). But these funds are not well accounted for in the overall tax revenue, nor are they assigned for the public services which they are meant to provide and maintain. Budgeting practices and structural challenges (such as energy costs and infrastructure lock-in) threaten to further undermine these financial gains. While Lagos state received one of the largest federal allocations among all Nigerian states, transfers from central government can be unreliable and are insufficient (Abiru, 2020). In part as a result of these fiscal constraints, the state has encouraged the installation and maintenance of streetlighting collaborating with private sectors, NGOs and community groups, while providing financial and technical assistance as well as policy regulations for these stakeholders to operate.

Methodology

This study prioritised a bottom-up approach, recognising that it is the lived experiences of beneficiaries and providers of streetlights that matters. This approach puts informal settlements and underserved areas of the city as central to an understanding of streetlighting delivery and impacts in Lagos. The city research team drew on a broad range of primarily qualitative methods (FGDs and KII) to determine a rich understanding of public lighting issues, how these are experienced by residents/beneficiaries and providers directly engaged in the installation, and supply of

[11] Peri-urban areas indicated in white.

streetlight systems, how these link to challenges of finance, technicality, maintenance and the city politics, as well as responses to crime, insecurity and socioeconomic development, among others.

The team began with reviews of academic materials, media reports, policy analyses and other grey literature. Based on this review, and consultations with research colleagues at the Centre for Housing and Sustainable Development (CHSD), University of Lagos, regarding neighbourhoods in which CHSD have been working, a range of streetlight beneficiary communities and providers were identified to understand the experiences of a variety of beneficiaries and providers to date.

Selection of beneficiaries communities/residents and data collection

For residents, focus group discussions (FGDs) were conducted in September 2024 in three selected communities in Lagos Mainland, Island and peri-urban interface – Ilaje-Bariga on the Mainland, Brazilian Quarters on the Island and Ajegunle-Ikorodu on the Hinterland. The three communities have either past or ongoing streetlight projects being delivered via sponsorship and/or collaboration between the CDAs, state or non-state institutions. Transect walks were carried out in the communities to determine the level of streetlight provision. Examples include Ilaje Bariga (Box 5) and Ajegunle Ikorodu (Box 6).

Box 5: Ilaje-Bariga community (Lagos Mainland)

Ilaje-Bariga community is in the Bariga local government area of Lagos state. The land area is about 22ha and 3km in perimeter. Ilaje-Bariga community is one of the least developed neighbourhoods on the coastline of Lagos state. Most of the houses are built on sandfilled wetlands. The community has an estimated population of 20,000 (Utchay et al., 2021).

Ilaje-Bariga is an urban village with residents from all Nigerian ethnic groups, although the Ilaje (from Ondo state) are the dominant tribes, which gives the community its name. The Ilaje-Bariga community has a traditional head, referred to as the “Baale”, who works with other appointed chiefs in the running of the community. The traditional leaders in Ilaje-Bariga serve as intermediaries between the community and government. The community has the presence of organisations such as SHEF, CDA and the Federation.

Like other informal settlements, the power supply in the community is erratic, as they are connected to the grid. Reports from residents and general information suggest that Ilaje-Bariga is often in Band C, meaning residents can expect an average of 12-16 hours of electricity daily, when supply is consistent and without faults.

However, the actual supply can fluctuate significantly, due to grid infrastructure issues, such as maintenance by the Transmission Company of Nigeria (TCN), or faults which can cause temporary partial blackouts across areas. Load shedding, where the distribution company (Ikeja Electric) manages the load allocation, means some areas

might receive less power during peak demand periods and shortage problems. Residents have reported issues like low voltage or inconsistent supply in specific parts of Ilaje-Bariga at different times.

SHEF and the Federation from SDI installed three solar streetlights. Furthermore, 25 streetlight units were installed along the streets leading to the Lagos state ferry jetty by the Lagos State Electricity Board. Certain areas in the community lack lighting uniformity because of the combination of different luminaire types along the same stretch of road. This generally involves using luminaires with different light distribution patterns (optic types) and sometimes different light sources or mounting heights.

Ilaje-Bariga is situated in the southern part of Lagos, bordering the Lagos Lagoon. Major economic activities include fishing and aquaculture, trade and small-scale industries. The Ilaje-Bariga community has a CDA comprising of 13 streets (for further details, see Box 5). Ajegunle-Ikorodu community is located in northern Lagos and comprises three CDAs and over 15 streets. Major economic activities include farming and small-scale business enterprises (for further details, see Box 6).

Box 6: Ajegunle-Ikorodu community (Lagos peri-urban)

Ajegunle-Ikorodu is an informal settlement situated along Ikorodu Road, under the Kosofe local government area of Lagos state. The community houses 18,000 residents with up to 3,000 additional people coming into the neigbourhood to work during the daytime. The community can be accessed by road and by water. Community affairs are managed by a traditional ruler (the Baale) and community leaders drawn from the CDAs.

The majority of residents of Ajegunle-Ikorodu community are migrants from different parts of Nigeria. Around 80% of households are not decent dwellings, and there is a high level of unemployment as well as significant disparities in access to public services, such as streetlighting.

About 80% of residents in Ajegunle-Ikorodu are employed in the informal sector. As is common in similar communities, the neighbourhood is made up of small retail shops and home-based enterprises. Approximately 98% of the community's road is untarred and in poor condition; residents connect with surrounding communities and the rest of Lagos via the Ikorodu Road closest to them.

The power supply in the community is erratic, as only two streets have transformers. Finding a way to return lighting to the streets was identified as a top priority by the CDA. In 2018, the SHEF and Federation secured funding from SDI to install three solar streetlights. The community also benefitted from projects undertaken by the government of Lagos, with implementation being done by the Lagos State Electricity Board. A total of five gas-powered streetlights were installed in the community. There is only one telecommunication mast in the community.

Similar to many other communities in Lagos, the local government is the administrative jurisdiction at the local level, with traditional community heads playing a role in administration and governance. Development issues and other affairs of the community are overseen by these two institutions. However, both the local government and the Baale are subject to the administrative authority of the state government.

Brazilian Quarters is located at the heart of Lagos. The economy of this community is run on business activities and professional administrative services (see Box 7 for further details). Together with the community leaders from each selected community, representatives of leaders, technical staff, households, male and female business operators, youth groups, women's groups, practitioners and policymakers were interviewed.

Box 7: Brazilian Quarter (Lagos Island)

Stretching from the east of Tinubu Square, Brazilian Quarter houses memories of the Afro-Brazilian returnees enslaved in Brazil, Cuba and El Salvador, among other Portuguese-speaking countries. Brazilian Quarter is known for the assemblage of people who returned from those countries. It is a notable commercial area but also has a mixture of residential and institutional land uses. The quarter itself has a population of 85,000, with up to 50,000 additional people coming into the neighbourhood to work in the daytime. The community is located within Lagos Island – the principal and central local government area in Lagos metropolitan area.

Lagos Island is connected to the mainland by three large bridges, which cross Lagos Lagoon to the district of Ebute Metta. It is also linked to neighbouring Ikoyi and to Victoria Island. Forming the main commercial district of Lagos, Lagos Island plays host to the main government buildings, shops and offices. The poorer eastern side of the island contains the main markets and the poorer housing. The island is extremely crowded and congested and attempts have been made to build new roads over the Lagoon, in order to improve traffic flows.

There is a concerted effort by the Lagos government to ensure that Lagos Island, which is home to many of the people who move in and out of the city on a daily basis, is developed in an integrated way. Much of this effort focuses on improving the road network to better connect different areas of the city and to reduce congestion within the central business district. Thus, most of the streets in this area are lit. The number of streetlights is about 120 units, ranging from conventional ones to solar-powered streetlighting. The majority of the lights are being installed on new and renovated roads, with only a few being used to upgrade or replace damaged existing conventional lights.

Most of the projects are undertaken by the government of Lagos, with implementation undertaken in partnership with Lagos Island local government, Lagos State Electricity Board and a number of private firms, particularly LEDCo. Because of its location within the Central Business District (CBD), several projects have also been installed by

private sector banks on the streets surrounding the Brazilian Quarters. The maintenance of streetlights is performed by dedicated streetlight crews. Both LSEB and private contractors perform this function. Streetlight fixtures, poles and wiring are only replaced upon failure.

FGDs in the three communities comprised three sessions of one to two hours, two of which were parallel. In the first of these parallel sessions, youth participants were split by gender, focusing on specific gender experiences with streetlights. For the second pair, participants (comprising adults of both genders) were divided into households, on one hand, and businesspersons, on the other. The third session was a general session, where all participants were brought together. In each of the selected communities, the number of participants was 12, comprising four adults, four business entrepreneurs and four young people.

In October 2024, key actors in these three communities and the city officers in the relevant Ministries, Departments and Agencies (MDAs) (for example, Lagos State Resilience Office, Ministry of Energy and Mineral Resources, Lagos State Electricity Board, and so on), security agencies and CSOs were brought together for the research validation session at the University of Lagos National Information Technology Development Agency Research Hub. This collaborative approach was undertaken to maximise the likelihood that the perspectives and experiences of those most affected by crime and lighting issues are incorporated into this assessment.

Selection of providers and data collection

A thematic mapping of critical stakeholders in the streetlighting value chain was carried out. Five groups were identified, including: two state government agencies; one private sector firm contracted by the state government; three NGOs funded by international development assistance; five community groups and individuals funded by self-help, NGOs and/or philanthropy; and six private sector companies providing on a commercial basis to communities in Lagos. These groupings indicate an energy sector with strong private participation or free market economy, rather than a state-owned and controlled economy.

Data was collected through in-depth interviews with these 17 respondents, each selected based on their active involvement in streetlighting projects within Lagos over the past five years. The selection was purposive, aimed at including providers with hands-on field experience, particularly in the underserved communities. The providers selected and their representatives have been involved in the provision, installation and maintenance of streetlights in Lagos for more than five years. Hence, respondents possess adequate knowledge and experiences about the subject matter.

Based on respondents' availability and preferences, interviews were conducted both virtually and physically in the months of April, May and June 2025. A semi-structured questionnaire was used, allowing for open-ended responses, while covering key areas,

such as service models, innovation and technology use, state and community engagement, funding and maintenance.

Data analysis and ethical consideration

During the interview, conversations were documented in abbreviated form. Some interviews were recorded (with consent) and transcribed. A narrative technique of reporting was used in analysing the views of providers, by extracting the underlying themes inherent in their reactions, behaviour and responses. Thematic analysis was used to identify key themes and patterns across responses. Quotations are included to reflect anonymised respondents' voices and illustrate major findings. Findings were discussed with individual respondents in a one-on-one scheduled conversation for validation.

This study upheld avoidance of harm, confidentiality and informed consent during the data collection. Prior to data collection, ethical clearance was obtained from health research ethics committee (HREC) of the University of Lagos. Participants in this study were 18 years old and above and had spent at least five years living in Lagos. This is to ensure that they possess adequate knowledge and experience about streetlighting impacts in the study area.

Findings

Results are discussed under various sub-sections, as follows. Unless otherwise stated, discussions in this section emanate from the in-depth interviews conducted in April, May and June 2025 in Lagos.

Provision of streetlighting

Findings show that Lagos communities have been able to provide streetlight infrastructure through concerted efforts of the state government, private actors, individual philanthropic organisations, NGOs, CDAs and other community groups. The state government agencies (for example, Ministry of Energy and Mineral Resources and Lagos State Electricity Agency) provide general policies and an operational framework for public lighting in Lagos. The agencies also engage in supply and maintenance of streetlighting provided by the state. There are private sector organisations contracted by the state government (for example, LEDCo and Consistent Energy) to execute state-initiated projects or to co-produce and deliver services. There are also NGOs (such as SHEF, SDI-Go-green Initiatives) funded by international development assistance (see Box 8 for more information on Go-Green Initiatives).

Box 8: SDI Nigeria Go-Green Initiatives

The SDI-Nigeria Go-Green team works to promote sustainable development in informal settlement carbon markets. The team focuses on sustainable urban development, environmental conservation and community-led solutions in the following areas:

Environmental initiatives:

- Waste management: Implementing waste collection, recycling and composting programmes.
- Urban agriculture: Promoting compound gardening, community farms and green spaces.
- Energy efficiency: Installing solar-powered lighting, energy-efficient appliances.

Community-led initiatives:

- Community clean-up: Organising regular clean-up events, mobilising residents.
- Climate change awareness: Educating residents on climate change impacts, adaptations.
- Disaster risk reduction: Conducting disaster preparedness, response training.

Innovative solutions:

- Renewable energy: Exploring solar, biogas, wind energy for community power.
- Waste-to-wealth: Converting waste into valuable resources (such as compost, biofuels).

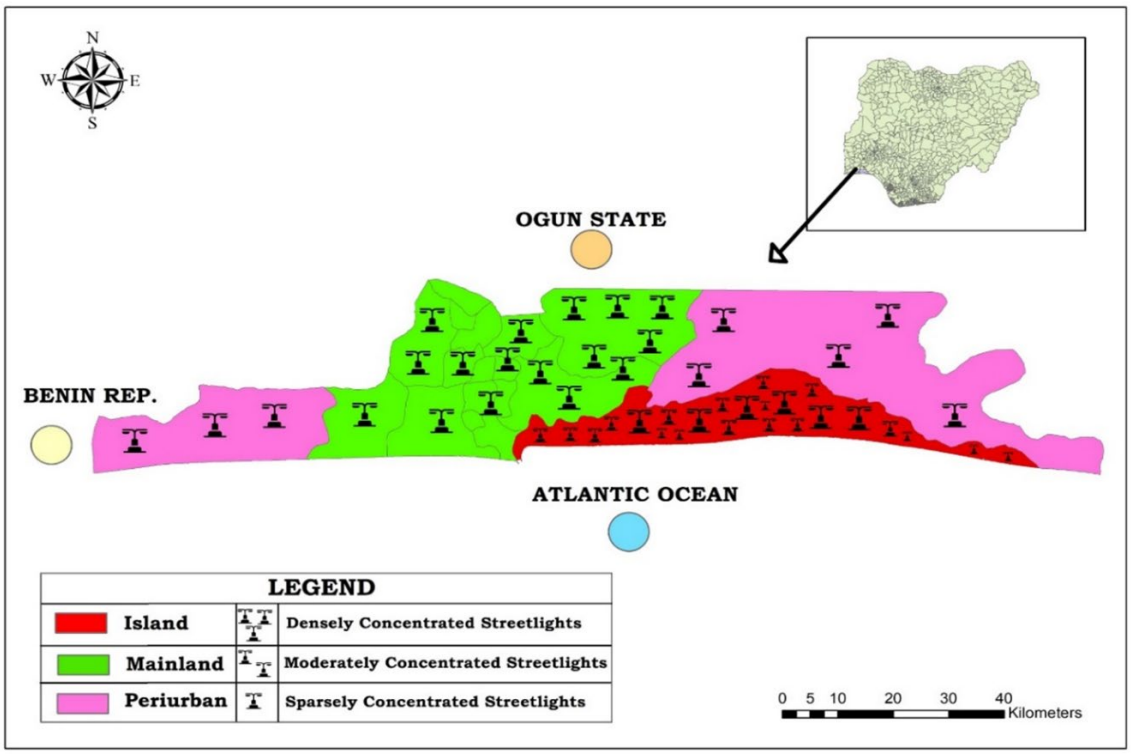
Capacity building:

- Training and workshops: Enhancing community capacity on sustainable practices.
- Leadership development: Empowering community leaders, entrepreneurs.
- Partnerships: Collaborating with government, NGOs, private sector.
- Research and advocacy: Informing policy, advocating for pro-poor urban planning.

The Go-Green Initiatives work directly with the grassroots and community groups, which makes them unique. Although the initiatives have been marginal to date, by deploying cutting-edge renewable energy solutions, they provide an important demonstration of the potential of these solutions. There are very few solar streetlights installed through the Go-Green Initiative of SDI in Lagos communities, due to a lack of funds.

Findings also reveal some CDAs and individuals that are funded by self-help, NGOs and/or philanthropy. Lagos is a commercial nerve centre of Nigeria, and findings show that there are private organisations providing public lighting and streetlights on a commercial basis to Lagos communities. This model is noticeable in high-income neighbourhoods. Some examples of projects in each case of provisions are highlighted later in this report.

Figure 2: Spatial concentration of streetlight provision in Lagos



Source: Badiora (2025).

Findings show that streetlight provision by the state may be related to patronage politics and used to garner political support and/or reward voters' patronage.[12] Much state provision to date is for elite neighbourhoods on the Island, as shown in Figure 2. Recent installations even include streetlights equipped with cameras to enhance surveillance. There is disparity between streetlights provision even on the Lagos Island. Lagos Island is older and planned, hence the access to more government infrastructure compared to the other communities – for instance, streetlights on certain roads are functional but on other roads remain largely neglected. This situation was explained by a resident:

> "… the people in power only fix streetlights where it benefits them. When you are in opposition, you get nothing from them. The criterion of distribution that the people in power use is simply: did you or will you support me?"[13]

Cost of streetlighting

The initial provision cost in Ilaje-Bariga that has been financed through philanthropy has mainly provided conventional lights, powered through connection to the national grid. The individual is a trained "electrician" who willingly uses his skills to benefit his community through subsidising the capital costs, with residents paying for services.

[12] Interview with an enterprise run by a resident of Lagos Island, 26 September 2024.
[13] Interview with residents (entrepreneurs) of Lagos Island, 26 September 2024.

The day-to-day maintenance cost is billed on the community electricity transformer and shared on residents' monthly electricity bills. Thus, when streetlights are not working, residents are still charged for them, as if they were operational. The individual providing the streetlights gave an estimated sum for the investment of at least ₦25,000 (around USD 20) to provide ten bulbs with cable, as at 2022. For solar streetlights installed through the Go-Green Initiative of SDI, a member of the implementation team estimated the solar streetlight installation cost to be between ₦85,000 (equivalent of USD 60[14]) and ₦120,000 (equivalent of USD 90), as at 2022. On Lagos Island, an interviewee who is also an early-career energy technician and resident of Brazilian Quarters noted that streetlight quality varies and installation costs vary from ₦250,000 to ₦100,0000 (equivalent of USD 200-800). Further facts on the installation and maintenance costs of streetlighting in Lagos are provided in Box 9.

Box 9: Cost implications of streetlighting

On new roads, or where no streetlights have been previously installed, findings from the interviews and FGDs show that the upfront capital cost of a solar streetlight is generally cheaper than for a conventional one. The exact costs and savings vary, depending not only on the technology used (for example, which type of lighting or battery) but also on the physical planning particularities of where they are being installed. For instance, in lower-income areas, where new cables and transformers would need to be installed to supply conventional lights, solar is considerably cheaper.

Across the three communities, the average cost of installation of one streetlight is USD 200-800 per solar streetlight pole, compared to USD 1,150 for a conventional grid-powered streetlight. The difference in operating costs is where the economics of solar-powered, compared to conventional, streetlighting becomes most compelling. In the case of solar, there are almost zero operating costs, whereas the cost of power supply (energy charge) for conventional lights adds to already unsustainable utility bills. Nevertheless, there is greater risk of theft compared to grid-power.

Maintenance costs are also an important consideration, as the costs of repairing damaged lights and replacing faulty or worn-out technology differ. The estimated annual maintenance cost per streetlight, as reported, varies greatly, from a low of USD 10 to a high of USD 40 for solar and USD 100-400 for conventional grid-powered streetlighting. This is in addition to potential costs for the electricity bill, which would be the highest variable cost. Although most new solar lights have an estimated lifetime of up to 15 years, poor maintenance can mean they need replacing within five to ten years. Planned maintenance itself is low cost, amounting to regular cleaning of panels during summer months and routine checks and servicing of electrical components. Arguably, conventional poles require more specialist and costly maintenance, due to their grid connectivity, although this may be partly covered by utility companies.

[14] The official exchange rate is the Nigerian Foreign Exchange Market (NFEM) rate, managed by the Central Bank of Nigeria (CBN). See: www.cbn.gov.ng/intops/FXMarket.html.

For low-income communities in Lagos, the primary barrier to solar lighting is the large initial investment. However, the long-term financial model is highly favourable for solar, as it provides predictable, low operational costs and is immune to rising energy prices. Grid lights may struggle in informal settlements, where extensive, reliable grid infrastructure is non-existent, expensive to install, or prone to frequent failures, making the “lower” initial cost irrelevant if the service is unreliable. Ultimately, the lower total cost of ownership and independence from the grid make solar streetlighting an economically superior choice in the long run, provided initial funding can be secured (potentially through state or collaboration initiatives).

Source: Interviews and FGDs with the providers and residents.

Some streetlighting infrastructure in Ajegunle-Ikorodu community has been installed by the state government along certain streets (see Figure 3 [left] for facilities installed at Zion Street). Like Ilaje-Bariga community, streetlighting is mainly conventional (Figure 3 [right]), initially powered by diesel before transitioning to gas in 2018. The state continues to supply the gas used to power these facilities, but with maintenance issues and technical hitches at times. Ajegunle-Ikorodu is also a beneficiary of a few solar streetlights installed through the Go-Green Initiative. The estimated cost of installation is as obtained in Ilaje-Bariga.

Figure 3: Streetlighting in Ajegunle-Ikorodu (left) and Ilaje-Bariga (right)

Source: Authors

Brazilian Quarters reported having a number of streetlights and most of these (over 60%) are solar-powered (see some samples in Figure 4). These lighting fixtures come from the federal, state and local government, as well as CDAs, and philanthropic gestures by individual and commercial establishments (like commercial banks) in the area as part of their corporate social investment programme. For most of the state-sponsored projects, implementation is done through Lagos State Electricity Board by private contractors and vendors, such as LEDCo. As observed by respondents, streetlight provision in Lagos is grossly insufficient.

Figure 4: Streetlight infrastructure (solar-powered) on Lagos Island

Source: Authors

The state policy regarding installation of streetlight facilities is permissive. A provider in the state highlighted steps that need to be taken. These include: engagement and consultation; project identification; project assessment; fundraising and setting up an installation committee.[15] To encourage individuals and groups to develop their community, the stakeholder noted an important bureaucratic exemption, in that, to provide public lighting in Lagos, the burdensome state approval process is not needed in a community-led installation, except when there is a need to retrofit the existing streetlight installed by the state. Furthermore, there was no example of subsidies from the state – the exemption of the state approval process was considered a reasonable partnership or relief from the state.

Essentially, there is very little investment by the state in streetlighting because of the cost. Similarly, NGOs have very little access to resources for streetlighting projects. The private sector has little interest in significant investment. In addition to cost, a further problem for those using conventional technologies is the irregular supply of electricity from the grid. The next section therefore examines the operation and maintenance of streetlighting.

Operation and maintenance of streetlighting

In accordance with the Lagos State Electricity Law, 2024 (LSEL), the general management of streetlighting is with the Lagos State Electricity Board (LEDB) (see Box 19 for more information on this agency). Nevertheless, every streetlight facility has its own security and maintenance arrangement. Those installed by the state are assigned to contractors (private organisations) and jointly monitored by the state and the host communities, while those installed by non-state/communities are usually monitored by

[15] Interview with state providers, 16 May 2025.

the community. For the available streetlight facilities, the provision of gas, diesel, electricity and solar light gadgets is achieved through efforts of the state and CDAs (the community). For those that are powered by electricity supply from the national grid, whenever there is no supply of electricity, the streetlights are non-functional, as there is also no available generator to power them. Nevertheless, in the case of Ilaje-Bariga community on Lagos Mainland, on the few occasions when the generator that powers the state jetty is turned on, the streetlights would come alive.

Box 10: Lagos State Electricity Board (LSEB)

The Lagos State Electricity Board (LSEB) was established by law No 15 of 5 July 1980 of the State House of Assembly Gazette No 53 Vol 13 of 24 July 1980, to perform the following function: establish in-state electric power stations; generate, transmit and distribute electricity to areas not covered by the national grid system within Lagos; control and manage any electrical installation vested in the Board under the provision of this law; and establish, control, manage, extend and develop new electrical networks as well as develop or extend existing ones, as the Board deems necessary for the purpose of accomplishing its mission.

The Lagos State Electricity Board (LSEB) is the implementing agency under the Lagos State Ministry of Energy and Mineral Resources responsible for energy development, independent power projects and public lighting in Lagos state.

Lagos state government currently has the most aggressive energy development plan in Nigeria. It is the only state with a dedicated Ministry for Energy Development (Ministry of Energy and Mineral Resources) as well as an agency (Lagos State Electricity Board). LSEB's strategic plans are to provide underserved Lagos districts with access to reliable power supply via independent power plants (IPPs) as well as enhance public safety and security through the use of public lighting schemes. To efficiently accomplish these goals, LSEB is effectively making use of four vehicles:

- **Establishment of independent power projects:** LSEB has successfully commissioned four IPPs (Island, Alausa, Mainland and Peninsula Power) and one transformer factory, using a sustainable and standardised framework for power supply.
- **Public lighting projects:** LSEB has developed a framework for public lighting in Lagos state, which includes best practices for operation and maintenance in existing and new installations.
- **Integration:** LSEB's integration plans include incorporating IPPs with public lighting schemes, as well as implementing innovative strategies to ensure cost-effective public lighting projects. LSEB is also developing a comprehensive database for energy consumption and public lighting requirements.
- **Power sector reform:** In the last decade, LSEB has been an instrumental part of the federal government's power sector reform agenda.

By partnering with private sector companies and communities, LEDB and the Lagos State Ministry of Energy and Mineral Resources have been able to implement many

public lighting projects, including the Light Up Lagos Project; slight retrofitting project; Own the Streetlight Campaign; LEDCo's NightSUN project, among others.

To ensure better monitoring, a resident in Ajegunle-Ikorodu has been designated to oversee the running of the streetlight facility. This person is to notify the authorities when gas supplies are depleted. However, residents of Ajegunle-Ikorodu mentioned the difficulties of getting the gas restock through the local and/or state government. This might take weeks, limiting their effectiveness in improving the area's safety and aesthetics. On many occasions, the responsibility of running the gas-powered streetlights is shouldered by the residents, through modest contributions.

A community provider participant said:

> "… during the tenure of Governor Ambode (Light Up Lagos project), most of Lagos streets were illuminated. These streetlights were powered by national grid in served areas and generators for unserved areas, but this seems to no longer exist. Major roads no longer enjoy the facility and the attendant effect is darkness enveloping those areas, turning them to crime zones …"[16]

He admitted that though some areas on the Lagos Island (such as Iru-Victoria Island) still use these facilities, other areas on the Lagos Mainland and along the city periphery no longer enjoy the facilities, due to lack of maintenance effort from the provider (state) and non-involvement of community members at the project inception.

Whenever the state effort is delayed, the community in Ajegunle-Ikorodu usually imposes levies on residents to assist in maintaining the gas supply. Unlike property-specific charges like the land use charge, there is no direct, mandatory resident payment for the maintenance of general streetlights. But residents are encouraged to contribute through community self-help and philanthropic efforts. Although not every resident pays the levy, findings show that sufficient funds are always realised to cater for the infrastructure. A respondent mentioned vandalisation by hoodlums and street urchins, and destruction of poles through collision by vehicles, as other challenges. Corroborating the view of the security expert on the issue of vandalisation, another respondent[17] suggested several reasons for vandalisation, including: selling; to facilitate crime, using the cover of darkness; and political frustration (as the streetlights are associated with the current government).

A key provider argued that the cost of installation and maintenance of streetlights is no longer sustainable in the state, due to galloping inflation and limited public finance. Running costs have been high because the state was using high pressure sodium (HPS) streetlights with high energy consumption. The provider highlighted that the state has since changed to LED and now plans to change to solar. Furthermore, a security personnel participant noted that providing diesel or gas to power streetlights is no longer viable in the current economy.

[16] Interview with community group providers, 13 June 2025.
[17] Interview with city stakeholders (working with the state government), 3 October 2024.

Essentially, it is evident that streetlights may not be operational because of the non-availability of the grid and because of the high cost of grid electricity and maintenance costs. Residents may have to cover these costs but this is obviously challenging for those on low incomes. Theft and vandalism are also problems and there are several reasons for this. For example, there were also some sociocultural issues regarding streetlights. One respondent[18] raised the issue of misconception about the streetlight sensor. Because these streetlights come on when approached by humans and go off as soon as the individual moves some distance away from them, some community members develop the belief that these streetlights are powered using "human blood". Hence, they are petrified that their blood is being used to power the lights. Furthermore, some traditional worshippers sometimes oppose the installation of streetlights, as this may hinder their religious practices.

The impact of streetlights on safety and security, as well as business and socioeconomic life, is discussed in the next section.

Impact of streetlights on crime, business and socioeconomic life

Streetlights have impacted Lagos communities in many positive ways. In Ilaje-Bariga, residents attest to the fact that they can now stay longer to carry out business transactions compared to the past. A resident said:

> "… As a person who plies the Ilaje Road, the streetlight has helped a lot because at night, we see passengers from a distance and the road is well lit. We can see the good side and bad side of the road at night, so it helps us drive properly…"[19]

Furthermore, one resident explained:

> "… nightlife was very challenging here before, we used torchlight to find our way at night. But after the installation of the streetlights, we now do things with ease. My children can do their school homework at night while we are outside …"[20]

The presence of streetlights in Ajegunle-Ikorodu has significantly benefitted local businesses and socioeconomic activities. As one respondent pointed out, "… the streetlight has been beneficial for sales. I can remain outdoors longer to sell my goods …."[21] This extended operating time has increased sales for local vendors, who can now stay open later into the evening. Beyond economic benefits, streetlights have also boosted social interactions. Streetlights also provide an opportunity for young people on Lagos Island to attend local government-backed skills acquisition programmes (see Box 11 for the project summary). The local government has expanded these initiatives by providing financial and material support to young people after their training, helping them establish livelihoods around solar lighting and reducing their involvement in criminal activities. Across the three communities, respondents

[18] Interview with residents (community leaders) of Ilaje-Bariga, 23 September 2024.
[19] Interview with residents (business operators) of Ilaje-Bariga, 23 September 2024.
[20] Interview with residents (youth group) of Ilaje-Bariga, 23 September 2024.
[18] Interview with residents (youth group) of Ilaje-Bariga, 23 September 2024.

asserted that streetlight provided better lighting at night, therefore disenabling criminals and gangsters. A youth respondent added "… Before the installation of streetlight, we used to have cases of robbery, but the streetlight makes everywhere lit like daytime, as such the hoodlums are no longer able to perpetrate their act. It has also enhanced our livelihood."[22] Another young person spoke about the difficulty she had had going out at night, for fear of being robbed or molested by criminals, but with streetlights she is now more confident to move around in the night and early morning. Thus, streetlighting is strongly associated with higher perceptions of safety.

Prior to the installation of streetlights in Ajegunle-Ikorodu, the community faced significant security challenges. One young male stated, "… Before the streetlight, it was very difficult to move around at night, and because of the narrow roads, there were cases of hit-and-run…"[23] However, respondents also mentioned that criminal activity has shifted to neighbouring unlit streets, where residents report higher levels of thefts and burglary, including the removal of house lightbulbs to facilitate criminal activity, such as shoplifting.

Based on residents' perception, streetlights have also had a significant impact on reducing crime in certain areas of Brazilian Quarters, but areas without adequate lighting remain vulnerable. One respondent noted, "… if the streetlights were better distributed, crime in Eko would have been reduced drastically..."[24] This sentiment was echoed by residents.

Box 11: Lagos Island local government youth empowerment

Known for his drive for grassroots development in Lagos Island, the Honourable Tijani Adetoyese Olusi, local government chairman of Lagos Island, has initiated a number of development projects, particularly in Brazilian Quarters. Principally, his streetlight projects serve as an avenue to train Lagos Island youth, reduce youth gangsterism and promote technical vocational education.

The beneficiaries, both females and males, are from diverse socioeconomic backgrounds. Each has learned practical skills in designing, installing, operating and maintaining solar streetlight systems. Some of the participants are now actively involved in the maintenance of community streetlight accessories.

The specialised training is usually delivered in partnership with already established entrepreneurs and vocational schools on Lagos Island, who are ready to provide entrepreneurship instruction and equip participants with toolboxes to jumpstart their solar energy careers. Thus, it is a mentor–mentee form of training. The fund for the training is provided by Tijani to the mentor only, not the participants. In addition, all participants at the end of the training register vocational names and receive access to market support, ensuring they are well-positioned to establish sustainable ventures.

[22] Interview with residents of Ilaje-Bariga (youth group), 23 September 2024.
[23] Interview with residents of Ajegunle-Ikorodu (youth group), 23 September 2024.
[24] Interview with residents (youth group) of Lagos Island, 26 September 2024.

In addition to technical expertise, the programme emphasises entrepreneurship, enabling participants to establish small businesses in solar energy and other services. This programme is an essential part of the Lagos government's broader efforts to create jobs. As Nigeria prioritises sustainable development, enterprises like this position Lagos Island as a frontrunner in addressing both environmental and economic challenges.

According to the residents, the programmes have a significant positive impact on reducing youth thuggery on Lagos Island, by providing productive alternatives to idleness and criminal activities. By addressing root causes, such as unemployment and poverty, these initiatives redirect youthful energy towards self-reliance and community development.

The absence of adequate streetlighting on some roads in the study area appears to have a significant impact on the street local economy. Business representatives shared that poor streetlighting affects the safety and operating hours of businesses. One respondent explained that: "… many businesses are forced to close early, as customers and employees feel unsafe after dark…"[25] Another business respondent shared that: "… Streetlights in commercial zones and market areas encourage customers to stay longer, increasing foot traffic and sales".[26] A respondent shared that: "… since the installation of these streetlights, I have been able to trade for an additional five hours per day and have many more customers. I have roughly ₦30,000 (USD 20) income added to my daily sales…"[27] However, the inconsistency in streetlight operations has created an unstable business environment, deterring customers from frequenting poorly lit areas.

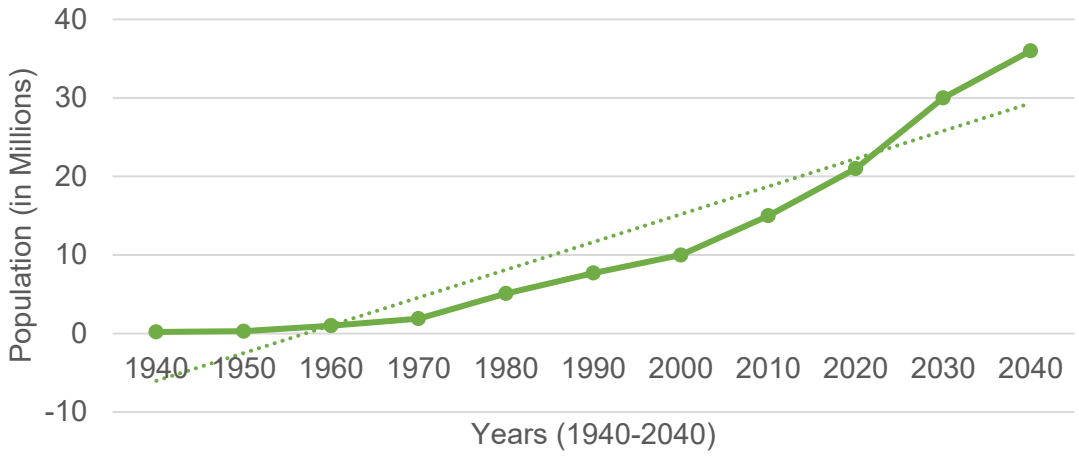
Essentially, households in Lagos experience positive impact of streetlights, contributing to an overall sense of security. With better lighting, residents feel more comfortable leaving their homes for work and business in the early morning, thus improving the overall safety perception in the area. Nevertheless, there are challenges. The next section therefore examines challenges to streetlight provisions in Lagos.

Challenges to streetlight provisions

Providers gave many reasons as to why streetlight projects are not long-lasting or are unsuccessful, including rapid urbanisation, finance, partisan politics and use of inefficient light technologies, maintenance and limited technical capacity. One provider said "… Rapid urbanisation has created unique challenges, straining urban infrastructure. It is a multitude of issues, including streetlight and transportation being severely overstretched…"[28]

[25] Interview with residents of Lagos Island, 26 September 2024.
[26] Interview with residents (business operators) of Lagos Island, 26 September2024.
[27] Interview with residents (business operators) of Lagos Island, 26 September 2024.
[28] Interview with NGO provider, 15 April 2025.

Figure 5: Population trajectory of Lagos



Source: Compiled by the authors from the UN Population Division Estimate.

Providers highlighted technology challenges during the development of some initial streetlighting projects in Lagos.[29] The lack of grid connectivity, and the costs of power generation and gas-powered lights are no longer viable. Moreover, respondents suggested that traditional streetlights rely on fossil-fuel-generated electricity, contribute to carbon emissions, and can be costly to maintain. One of the providers explained:

> "… one major problem with Light Up Lagos project was the use of diesel generators and gas to power streetlight facilities. Imagine spending about ₦12 billion to power streetlights in one year, as at 2018. That could have put mini solar power station in not less than ten communities that same year. It was just not sustainable and we have to consider solar alternative…"[30]

Hence the popularity of solar streetlights. Respondents also noted that the initial solar equipment installed was of lower quality and inefficient[31] and many projects did not last as expected. Examples cited include "Light Up Lagos projects" by the state government along the Oshodi-Apapa Expressway and in areas like Ojodu-Berger, among others. One of the providers said:

> "… many early solar streetlights were of lesser quality, leading to issues such as short illumination times, frequent failures and reduced lifespans. These problems were often due to the use of inferior components and poor design choices by some manufacturers. Today, the solar industry in Lagos has matured significantly. Innovations such as N-type cell technology, advanced monitoring systems and robust quality standards have led to higher efficiency, lower degradation rates, longer warranties and greater reliability and safety, due to better components and standardised installation procedures…"[32]

[29] Interview with private sector providing commercially to communities, 3 May 2025.
[30] Interview with the state government agencies, 16 June 2025.
[31] Interview with state government agencies, 16 June 2025.
[32] Interview with private sector contracted by the state government, 3 June 2025.

There was also an acknowledged lack of expertise by some providers related to contracting and procurement.[33] And the procurement process was hindered by an insufficient allocation of funds. There were also corrupt practices, leading to poor procurement decisions and inefficient use of resources. This is in addition to bureaucratic bottlenecks and slow procurement processes due to lengthy approval procedures and red tape. In the Light Up Lagos projects in Lagos, initial phases of contracting streetlighting proved expensive compared to subsequent ones, as the technology improved, experts were involved and public officials became better accustomed to the energy market and procurement. Furthermore, providers[34] highlighted that streetlight projects get stuck or were not well implemented prior to 2021, when the Lagos state government released the policy framework for the sector. There were many cases of obsolete or low-quality equipment being supplied in the earlier phase of the Light Up Lagos projects. One respondent explained: "… We have had cases of technology dumping and costly inefficiencies as recognised standards were not in place…"[35]

For both solar and grid-connectivity, findings show that the high cost of the initial installation is a significant challenge. There was little political interest until 2015, when Governor Akinwunmi Ambode launched his Light Up Lagos project, powering many major roads and communities across the entire state. Notable was the ₦2.52 billion Memorandum of Understanding (MoU) on the construction of 36,000 streetlights signed by the Lagos state government and a UK firm (Low Energy Designs), which helped to improve coverage of streetlights in previously unlit areas, enhancing safety and security. While there is a lack of recent, detailed figures for streetlight provision increases from that of Ambode administration, investment in streetlight development has been on the increase, with some sources highlighting budget allocations for streetlights rather than installation numbers.

Providers[36] argue that the high costs and limited state budgets mean that the central business districts and other parts of the city that are seen as the engines of economic growth are prioritised and other areas neglected. It is claimed by providers in the state government agencies that the consequential increase in tax revenues repays investments speedily. Providers[37] also mentioned that state-financed projects, such as Light Up Lagos and streetlight retrofitting projects, were overly centralised between 2015 and 2019. The projects lacked community involvement and faced problems because of this.

There is also the challenge of vandalism and theft involving streetlight equipment in Lagos. There are situations where "area boys" – Lagos street gangs – restricted streetlight installation and where suppliers/providers experienced theft of equipment parts, some of which are costly. A respondent complained that: "… if we are to go back

[33] Interview with private sector contracted by the state government, 3 June 2025.
[34] Interview with private sector providing commercially to communities, 3 May 2025.
[35] Interview with private sector providing commercially to communities, 3 May 2025.
[36] Interview with state government agencies, 16 June 2025.
[37] Interview with NGOs funded by international development assistance, 10 May 2025.

to fix some of the projects, the area boys won't let us. So they are better abandoned than risking the lives of my personnel…"[38] Perhaps strong community involvement could have reduced this vandalism by increasing informal social control, fostering community pride and cohesiveness (Nduhura et al., 2023).

Corroborating the views of respondents discussed in the section on challenges to streetlight provisions, providers claimed that maintenance is inadequately planned for in terms of funding and management systems. Many projects (for example, the use of fossil fuel for Light Up Lagos projects) find themselves in the situation of having built infrastructure that cannot be serviced or used in the long term because of servicing costs. A respondents said: "… Go to communities in the night, you will see streetlight poles that do not light roads at night. This is a huge departure from what it used to be between 2015 and 2019, when the Light Up project was launched…"[39]

Providers also mentioned the challenge of clientelism or client politics, where streetlight contracts are awarded in favour of individuals (usually political party members and not necessarily an expert) in exchange for political support (Barrett and Fazekas, 2016). In most cases, these individuals (who may sub-contract to energy firm/experts) lack technical expertise to manage the projects, leading to poor implementation and short-lived projects. Experts noted that contractors rarely receive the full value of project budgets, due to corruption that often involves collusion and abuse of power by both politicians and top civil servants. For instance, the Light Up Lagos project has faced scrutiny in recent time regarding the cost and implementation of streetlights. As one respondent explained: *"…* in most cases, the money allocated for projects does not get to us. There are bottlenecks here and there that will drain off most of the project fund…"[40] Project fund siphoning leaves providers with limited capital to deliver quality infrastructure and, in most cases, streetlight projects are poorly delivered or abandoned before completion, for want of funds.

Other projects are abandoned because succeeding governments refuse to continue predecessor projects, on political enmity grounds. In his experience, a respondent shared that: "… the state is not ready to revamp or maintain some lighting projects of the previous regime, and that is why they are stuck and not moving anywhere…"[41] Overcoming this challenge requires more effective governance.

Findings also indicate that land is a challenge, particularly with conventional streetlighting that generally requires more land, or at least significant disruption to land, for the laying of underground cables and extensive trenching to connect to the power grid. While suppliers have implemented lighting projects in some informal settlements, they noted that, without titles, residents could be evicted. This was the case with

[38] Interview with private sector providing commercially to communities, 3 May 2025.
[39] Interview with community groups and individual funded by self-help, 12 May 2025.
[40] Interview with private sector contracted by the state government, 3 June 2025.
[41] Interview with community groups and individual funded by self-help, 12 May 2025.

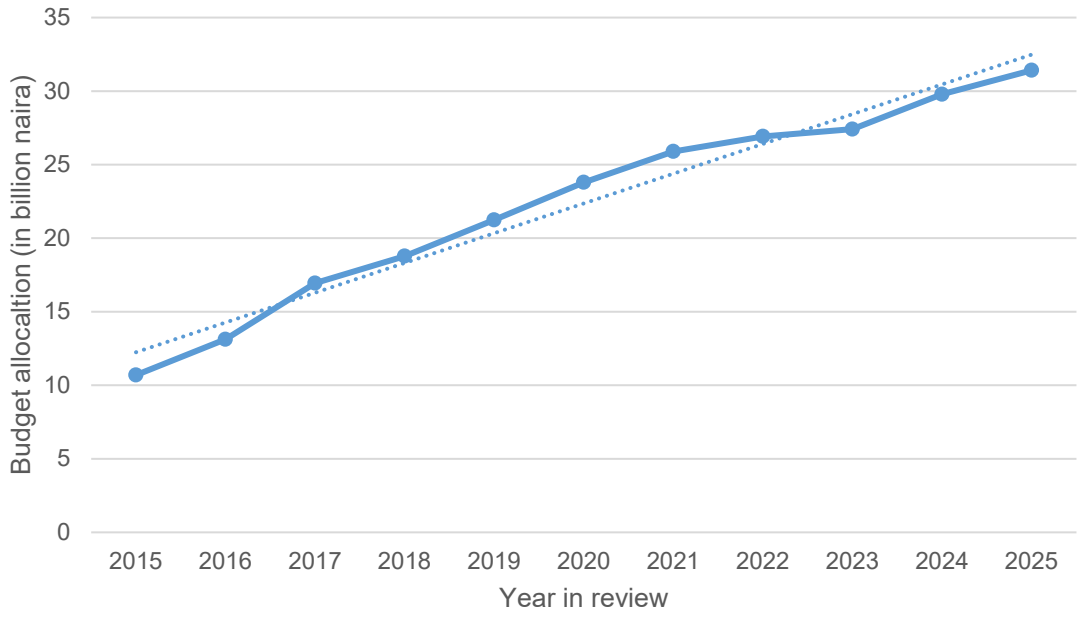
Otodo-Gbame, a community of 30,000 people in 2017, Tarkwa Bay in 2020 and, more recently, Ilaje-Otumara in March 2025.

Essentially, key obstacles to streetlight provisions are related to the lack of public funds for installation and maintenance in low-income neighbourhoods, lack of expertise, especially in contracting and fitting new technologies, lack of community ownership, politicisation of projects, leading to their abandonment when the political administration changes, and the corrupt allocation of contracts, leading to sub-standard installation.

How providers and beneficiaries navigate various challenges

Enterprises and community leaders have sought to address the challenges and ensure successful installation and management. Concerning funding, a provider said: "… streetlighting facilities are being budgeted for just like any other public goods…"[42] In 2017, the Lagos state government allocated ₦20.934 billion for advancement of Light Up Lagos projects. Since then, the inclusion of streetlights has been consistently on the increase with the Lagos budget (see Figure 6). Three years later, provision was made for the sum of ₦23.795 billion for the improvement and maintenance of streetlighting in the state to encourage a 24-hour economy. These funds come from both the national government and state-generated revenue.

Figure 6: Lagos budget allocation for streetlighting in the last ten years



Source: Compiled by the authors from Lagos Ministry of Economic Planning and Budget short policy documents (MEPB, 2025).

[42] Interview with community groups and individual funded by self-help, 12 May 2025.

In 2024, the federal government allocated over ₦22.7 billion (USD 13.8 million[43] @ 1,660.55) to solar streetlight installations across multiple states, including Lagos. Streetlights accounted for the largest share of public utilities investment in the 2025 federal government budget, with a total allocation of ₦393.29 billion (USD 253.7 million @ 1550.50) out of ₦54.99 trillion (representing 0.7%) – more than education projects (₦179.96 billion). Only road construction projects (at ₦1.44 trillion), ICT projects (₦505.79 billion) and health projects (₦420.09 billion) were allocated more than streetlights.[44] This suggests that public investment is now prioritised and investments in streetlighting now compete with other vital public services. This can be a key enabler for scaling of the streetlighting project and the implementation of new projects in informal settlements and underserved areas of Lagos.

Lagos senators and members of the House of Representatives have been involved in facilitating federal streetlighting projects in their various constituencies as part of their zonal intervention projects (ZIP) using federal budget allocations. Some notable ones include: Odi-Olowo/Ojuwoye communities in Mushin 1 federal constituency, where ₦100 million was allocated for solar streetlights in the 2024 FG budget. As part of this projects, 20 lights were installed along Oloruntosin and Aromire communities, as of September 2025. Besides, Ikeja Federal Constituency has been widely noted for extensive streetlight installations as part of Abiodun Faleke's Light Up Ikeja project using federal budgetary allocation. The project has installed over 50,000 solar lights in public schools, health centres, markets, parks and major streets within Ikeja federal constituency.

State providers and community groups explore private sector and donor financing. This involves state providers and community groups partnering with NGOs and international organisations to co-create streetlighting solutions. State-initiated and state-financed projects contract well-trained private sector experts. In a recent project, Lagos state government has contracted LEDCo to provide 20,000 solar streetlights in selected areas in 2024. This will extend to other areas in 2025. Consistent Energy has been involved as lead consultant in various Lagos public lighting projects (up to 500 units), often in collaboration with the Ministry of Energy and Mineral Resources. Strong CDAs in Lagos have been able to secure donor sponsorship to install lighting in their neighbourhoods, such as in Ajegunle-Ikorodu (three units installed) and Ilaje-Bariga (three units installed) (see Boxes 5 and 6 above). Besides, private sector and donor

[43] As at 2024, using the Nigerian Foreign Exchange Market (NFEM) rate, managed by the Central Bank of Nigeria (CBN). See: www.cbn.gov.ng/intops/FXMarket.html.
[44] 2025 Federal Government approved Budget Analysis, available online (accessed 22 December 2025).

financing can play a crucial role in scaling streetlighting projects to new communities by providing additional resources, expertise and innovative approaches.[45]

To ease the cost of energy provision (including streetlighting), the National Renewable Energy and Energy Efficiency Policy has measures to reduce the cost of clean energy adoption.[46] The policy removes custom duty on the importation of equipment and materials used in renewable energy and energy efficiency projects (including streetlighting), along with tax holidays and low-interest financing. The federal government granted VAT exemptions on renewable energy equipment (under the 2020/2021 VAT Modification Order) to make solar technology less expensive. Providers[47] confirmed that they have benefitted from this policy and that it has helped to roll out solar-powered streetlighting (of about 100 units) and solar-powered borehole (about 30 units). In 2024, the Federal Government of Nigeria issued the Value Added Tax (Modification) Order in its Official Gazette No 149, Vol 111, extending VAT exemptions to equipment and services associated with renewable energy technologies (see Muritala et al., 2024).

Many providers have progressed from conventional lighting to solar alternatives. In 2021, the state began a streetlight retrofitting project to replace existing conventional streetlights with solar lights. The initiative was part of the state agenda to improve public lighting, enhance security and promote a 24-hour economy. The goal is to replace over 22,000 solar-powered streetlights across the state in three years. However, the exact number replaced as of June 2025 is unknown, but the project is ongoing. Lower cost and a renewable, low carbon power source make solar lights more attractive to recipients than those reliant on national grid and fossil fuels. Providers[48] argued that the upfront capital required and the operation and planned maintenance costs are often lower for solar-powered lights compared to conventional ones (see Box 9 for cost implications of streetlighting).[49]

Providers also mentioned that regular maintenance expenses may be conveniently borne by the residents[50] but also noted that unplanned maintenance requirements, like

[45] The private sector often pre-finances streetlight projects and then charges communities through mechanisms like public–private partnerships (PPPs) or community–private partnerships (CPPs), though affordability depends on project specifics, community ability to pay, and potential subsidies or efficiency gains from private involvement. The process involves a private entity securing debt and equity financing for the project and recovering costs and generating profit through user fees, which can be adjusted through pricing decisions and regulatory frameworks, potentially with government support to ensure affordability for low-income groups.
[46] National Renewable Energy and Energy Efficiency Policy (pdf) (accessed 15 December 2025).
[47] Interview with private sector providing commercially to communities, 3 May 2025.
[48] Interview with private sector providing commercially to communities, 3 May 2025.
[49] Across the three communities selected for this study, the average cost of installation of one streetlight is between USD 200-800 per solar streetlight pole, compared to USD 1,150 for a conventional streetlight pole. Arguably, conventional poles require more specialist and costly maintenance, due to their grid connectivity. The estimated annual maintenance cost per streetlight as reported varies greatly from a low of USD 10 to a high of USD 40 for solar and USD 100-400 for conventional.
[50] Interview with private sector providing commercially to communities, 3 May 2025.

the repair of faulty lamps, can be costly. This is not too burdensome for a community with greater resources, wealthier residents or with external support. Findings show that the transition to solar lighting has not been smooth. That said, there has been notable progress, such as improvement in equipment designs. One respondent said:

> "… the quality of service has improved. Today, we install all-in-one solar streetlight where the solar panel, LED bulb, the lithium battery, integrated charged controller are all integrated in the lighting system. When we started, it was not so. In those days, we barely offered six months warrant..."[51]

A further improvement is the use of mini-grid solar systems as an alternative to standalone units. This system provides electricity, typically serving a group of customers independently from the main electricity grid. These grids are often used in remote or underserved areas, where extending the main grid is not cost-effective. A provider explained:

> "… we now adopt a centralised system that powers multiple streetlights. In this new technology, the solar power source is centralised and powers only the bulbs on each streetlight. This is more economical compared to the standalone equipment..."[52]

Some specific examples mentioned include a 0.88MW interconnected solar mini-grid (scalable to 2MW) developed by A4&T Power Solutions, initially serving five communities in Epe – a town outside Lagos metropolitan area. Enaro Energy has also developed a mini-grid to serve over 1,000 households in Ayobo – a suburban community in Lagos. All these were done in partnership with Ikeja Electricity Distribution Company (Ikeja Electric) – a corporation jointly owned by the Nigerian government (40%) and a consortium of private investors (60%).[53]

Providers have observed that streetlight poles are prone to rust, due to the city coastal area. Accordingly, providers now use strong galvanisation to ensure durability. Findings show that successful adoption of solar alternatives depends on more than just the introduction of new technology. What the Lagos state government was also able to do was to develop a domestic solar market by training solar technicians and local manufacturers of equipment through organisations like LEDCo, Consistent Energy and Asteven Institute. While some components are still being imported, Lagos currently has a blossoming solar market with a trade in streetlighting components and skills training to local people (see Box 11). Similarly, local welding businesses have been contracted to produce the poles used for the streetlighting projects in Ajegunle-Ikorodu and Ilaje-Bariga. The risk of poor projects contracting and procuring inferior equipment is

[51] Interview with private sector providing commercially to communities, 15 May 2025.
[52] Interview with private sector providing commercially to communities, 23 May 2025.
[53] Ikeja Electric (IE) is jointly owned by a private consortium, the Sahara Group and the Korea Electric Power Corporation (KEPCO), which holds a 60% stake, and the Nigerian government, which holds a combined 32% (Bureau of Public Enterprises) and 8% (Ministry of Finance Incorporated) stake, for a total of 40%. The consortium acquired the stake in the company, which was privatised by the Federal Government of Nigeria in 2013, with KEPCO serving as the technical partner.

decreasing as trained experts now work with the state and non-state groups in these technical areas.

While political interest and/or connections with powerful elites allow some individuals or providers to often undermine due process, there is no doubt that Lagos now has better standardisation for streetlight technology (whether being imported and/or manufactured locally). A provider explained:

> "… we now have policy frameworks in the state we must work from procurement to construction by the Lagos State Infrastructure Maintenance and Regulatory Agency. This regulation is often focused on ensuring quality, safety and proper integration with existing infrastructure…"[54]

For projects to be certified, providers have to comply with procurement rules and this has helped to reduce the issues of poor quality and technology dumping in Lagos. A provider explained:

> "… the minimum standard streetlight specifications for communities typically involve solar-powered LED systems with 10-12m galvanised steel poles. These systems often include features like automatic switch-on mechanisms, 32-watt or 150-watt panels, and vented steel enclosures for batteries and charge controllers…"[55]

This is also helping to implement the recent (2022) State Off-Grid Electrification Strategy and Action Plan, the Electricity Act 2023 and to support the execution of the State Electricity Policy specific to Off-Grid Solution. All these are regulations that came up only recently, due to a weak regulatory environment and corruption.

Most providers now adopt a community mobilisation strategy. This approach, whether formal or informal, plays a pivotal role in streetlight project maintenance and sustainability. A provider elaborated:

> "… it was the shortcoming that was discovered in the Light Up Lagos project. Most decisions were made without proper consultations, particularly with the community people, and for that reason, many equipment were stolen while some were vandalised…"[56]

For this reason, the state inaugurated an awareness tagged "Own-Your-Street-Light" initiative – a citizen mobilisation approach to streetlighting supervision. The initiative encourages residents to participate in reporting faulty lights and advocating for repairs. It also trains community members to take on maintenance responsibilities, while the government provides technical, administrative and financial assistance. This approach appears to address the issues of vandalism by the "area boys". Moreover, the Lagos State Neighbourhood Safety Corps has partnered with the Lagos State Electricity

[54] Interview with private sector contracted by the state government, 13 June 2025.
[55] Interview with private sector providing commercially to communities, 15 May 2025.
[56] Interview with community groups and individual funded by self-help, 12 May 2025.

Board to protect streetlights and electrical cables from theft, thereby strengthening the security of public lighting infrastructure. [57]

The extent of community mobilisation varies among the providers. The common approach to this mobilisation is "specific-to-general" principle. This means first meeting the community leaders (or gatekeepers) to get their buy-in and, then, the general community. An NGO provider explained:

> "… to begin, we engage the Baale,[58] then we train youth in the communities on the recommendation of the Baale. Afterwards, we then pick the best out of them and make them climate warriors to be in charge of the streetlights. In case anything goes wrong, they are the ones to repair and provide first aid. They will be the one to contact us for any advanced faults. The communities are the ones providing these individuals, so it is always community-led engagement…"[59]

This form of local monitoring ensures that issues are attended to speedily and creates a basic layer of accountability that helps maintain installations. Other community engagement strategies used involve the media (social media and radio were specifically mentioned), community influencers, and online platforms for the project.

Many underserved neighbourhoods are recognised as being unable to afford privately provided services. However, private sector providers are gradually introducing interventions with different service levels in these areas. One private sector provider explained how his firm was able to provide a service to a middle-income neighbourhood:

> "... we explored a model called 'Energy-as-a-service'. How does this work? We identify an area with need, conduct a viability study of the project and take responsibility to install the streetlight. We raise the fund, install and sign an agreement with the residents. We take responsibility for the equipment, ensure they are working, do the after-sale service and charge the community every month. In the agreement, there is a clause that if the streetlights do not work, the community would not pay. Hence, we always ensure that the equipment function well…"[60]

This operational project site, on the Lagos Island, is becoming a learning centre for other communities and city officials interested in replication. By involving diverse community groups (such as the CDAs) and collaborating with various stakeholders, more sustainable and equitable projects are created, empowering communities to take control of their development and address local deficits effectively.

Proposal for action research

Based on findings in this study, we are proposing a community-led solution to streetlighting deficits. In this action research, we explore the potential of citizen

[57] "Electrical infrastructure: LASG to combat theft, vandalism". *Progressive News,* 12 July 2024.
[58] In Lagos, a Baale is a traditional ruler of a community, who oversees the welfare, peace and preservation of traditions within their domain.
[59] Interview with private sector contracted by the state government, 13 June 2025.
[60] Interview with private sector contracted by the state government,13 June 2025.

mobilisation; a catalytic reform process; and strengthening (in)formal reform coalitions as well as the capabilities of state/regulatory agencies and elite commitments in developing a model for streetlight supply in underserved areas: solar powered through private sector delivery. This project is to catalyse private investment in informal settlements and provide a basis for collective action in low-income settlements. We are aiming to co-develop practical, low-cost solutions with community members, leveraging on existing community associations to devise a holistic streetlighting system, and support and strengthen its implementation in the action research area. Once established, the initiative will offer a tried-and-tested model and become learning hub to replicate and scale in Lagos and potentially to other cities.

Hence the following research questions emerge from this study for the learning component of the action research project to address:

1. How do politics, policies, practices and processes impact streetlight provisions – including an analysis of the scale and design of subsidy support, such that the lowest-income neighbourhoods have access to streetlights?
2. What are the broader implications of streetlighting for the continual growth of crime as well as safety and security in a 24-hour city model?
3. What support do the community require to effectively make streets functional and safer in the night-time, and for women? Would residents in various income brackets be willing to pay an additional amount in their current monthly/annual utility bill or land-use taxes to fund a specific streetlighting improvement programme?
4. How can communities (that is, informal settlements) relate to and influence elites and policies for streetlighting development?
5. What are the challenges of expanding streetlighting programmes in low-income communities and informal settlements?
6. What are the ways through which streetlights can be managed and maintained? What is the residents' willingness and ability to pay for this service?
7. What are potential models for private sector application in streetlighting for informal settlements?
8. What incentive frameworks can be applied for maintenance and repairs of streetlighting systems in informal settlements of Lagos?
9. What would be the impacts of the project on the viability of businesses and on perceived safety in the project site?
10. How can the reform coalition process that co-produced streetlighting between state, private sector and citizens be sustained?

Conclusion

In Africa, Lagos is one of the cities most affected by population explosion. This rapid urbanisation, coupled with extreme poverty and poor public finances, is putting pressure on energy provision and other public goods and services. This study has uncovered the nuanced experiences of residents and providers of streetlights in Lagos.

Essentially, there is very little investment in streetlighting because of the cost. NGOs have very limited access to resources, while the private sector has little interest in significant investment. For those using conventional technologies, there is the irregular and high cost of grid electricity. Vandalism of equipment is also a problem. However, households experience the positive impact of streetlights, contributing to an overall sense of security and livelihood. Key obstacles to streetlight provisions are related to the lack of public funds, absence of community ownership and politicisation of projects. There have been concerted efforts to address these challenges as the state has sought to increase funding, while the shift to solar equipment has been incentivised through fiscal measures. Community engagement is found to have reduced problems of vandalism.

Lagos residents did mention additional supports to make streetlight facilities more sustainable, including a viable solution to support bottom-up project planning and maintenance. To this end, the state must continue to improve on its budgeting, both by providing adequate and reliable funding for innovative streetlighting projects and by helping to develop revenue and livelihoods at the local level. More importantly, the state should create an enabling environment for investment in solar streetlights by ensuring that wide range of stakeholders – including private sector and community groups – are involved in the planning of streetlight projects. This is the approach that our action research is intending to develop – working with state agencies, community groups and the private sector to offer a tried-and-tested model for improved streetlight provision in low-income communities.

It is expected that this action research will catalyse the urban reform process, ensuring that streetlighting services are affordable, accessible and economically sustainable for low-income households, especially when linked to structured financing options. It is hoped that this kind of collaboration will garner interest that can be scaled to new communities and also maximise the social returns.

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