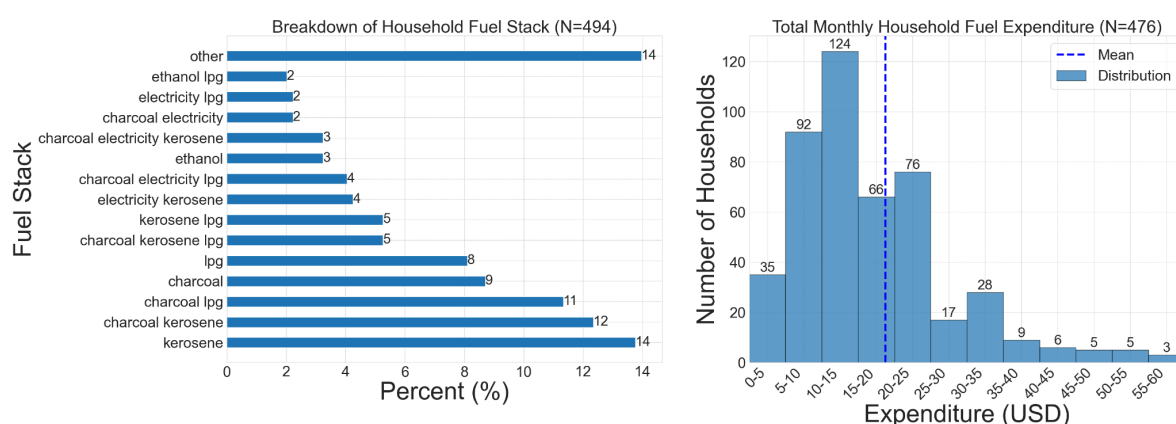


# Standard Fuel Use and Uptake of e-cooking and e-boiling in Nairobi's Informal Settlements

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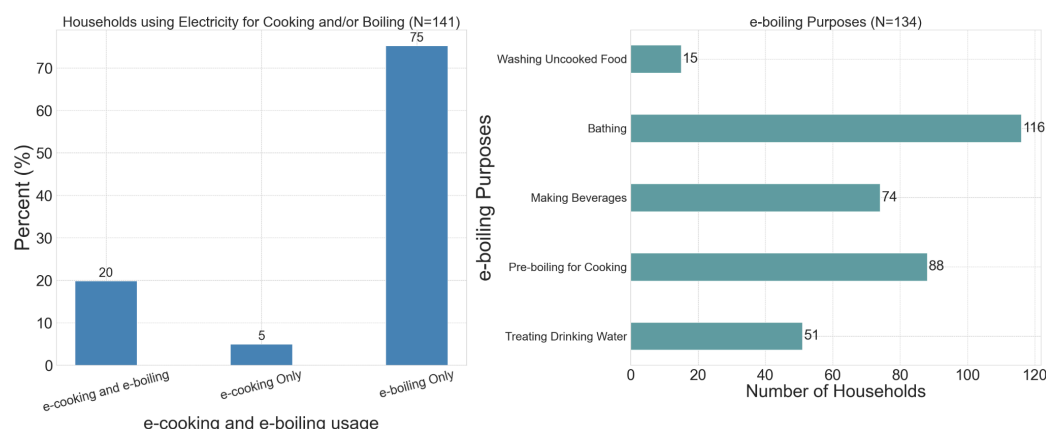
Over half of Sub-Saharan Africa's (SSA) approximately 540 million urban residents live in informal settlements, where reliance on polluting fuels for cooking remains widespread [1] [2]. Therefore, to meet SDG 7, it is critical to include this vulnerable population in the clean cooking transition. This study aims to understand current standard fuel (charcoal, kerosene, LPG, ethanol, firewood, briquettes) use and the uptake of electric cooking (e-cooking) and water boiling (e-boiling) among households in Nairobi's settlements. Nairobi is an ideal study area, because informal settlements make up approximately 66% of the 4.4 million urban residents, consistent with general SSA breakdown [3].

We surveyed 500 households across five settlements—Kibera, Mukuru Kwa Njenga, Kayole-Soweto, Korogocho, and Kiambiu—to understand fuel use patterns. In SSA, households typically engage in “fuel stacking,” using multiple fuels based on dish type and price. In our study, 82% of households reported using a mix of charcoal, kerosene, and LPG, with exclusive kerosene use being the most common fuel stack and the average monthly household standard fuel expenditure being 18.7 USD as shown in **Figure 1**.



**Figure 1. a)** Breakdown of fuel stacks with “Other” being fuel stacks with a makeup of  $\leq 2\%$  of households and excludes households using no standard fuel. **b)** Distribution of standard fuel monthly expenditure. Excluding households with missing aggregate expenditure data and expenditures above \$50

Without any outside intervention, we observed 28.3% (N=141) of total households reported engaging in e-cooking and/or e-boiling with 95% (N=134) of these households engaging in e-boiling as shown in **Fig. 2a**. Notably, 67% (N=88) of e-boiling households pre-boiled water for cooking, second only to boiling for bathing as shown in **Fig. 2b**. Pre-boiling is significant because it may reduce total cooking time and fuel use, enhancing the benefits of e-boiling.



**Figure 2. a)** Breakdown of households using electricity for cooking and/or boiling water **b)** e-boiling purposes

[1] Ouma, S., Beltrame, DC, Mitlin, D and Chitekwe-Biti, B (2024). “Informal settlements: Domain report”. ACRC Working Paper 2024-09. Manchester: African Cities Research Consortium, The University of Manchester.

[2] [https://data.worldbank.org/indicator/SP.URB.TOTL?locations=ZG&units=1960&locations=ZG&units=1960](https://data.worldbank.org/indicator/SP.URB.TOTL?locations=ZG&units=1960&locations=ZG&units=1960&locations=ZG&units=1960)

[3] Saligari, S., Nabukwangwa, W., Mwitari, J., Anderson de Cuevas, R., Clayton, S., Nyongesa, M., Puzolo, E., Pope, D., & Nix, E. (2025). Whose pollution, whose problem? Understanding perceptions of air pollution and implications for clean cooking (for health) in Nairobi schools. *Health & Place*, 91, 103398. <https://doi.org/https://doi.org/10.1016/j.healthplace.2024.103398>