
POWER FOR ALL RESEARCH SUMMARY

Access to energy will result in better human development outcomes

**POWER
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ALL**

439

TOTAL NUMBER OF FARMS SURVEYED TO UNDERSTAND THE IMPACT OF ENERGY

13%

COLLEGE ATTENDANCE RATE IN AN ELECTRIFIED VILLAGE, COMPARED TO 3% IN THE VILLAGE WITH NO ENERGY ACCESS

36%

HIGHER AVERAGE FARMGATE PRICE OF MAIZE IN VILLAGES WITH ENERGY ACCESS

We conducted a survey of farmers to understand how energy access can impact livelihoods. In particular, we compared three sites in the Mukono district of Uganda - Kiwumu, Nyenje, and Kyampisi. Kiwumu is a village without access to the electrical grid, and no energy access at all at the time of the survey. In contrast, Nyenje and Kyampisi have been grid-connected for several years and serve as a counterfactual.

Our survey found that villages with energy access have better human development outcomes including education and living standards.

- » Kyampisi and Nyenje have a better college attendance rate than Kiwumu. Specifically, 10% and 13% of the village residents are college educated in Kyampisi and Nyenje, respectively, while only 3% went to college in Kiwumu.
- » Residents in villages with electricity access reported they were more resilient to the economic shocks of COVID-19. In Kyampisi, 60% of farms reported the pandemic had no impact on their income sources. On the other hand, only 40% of the farms in Kiwumu indicated the pandemic had little impact.
- » There are also important differences across villages regarding the main use of electricity. In addition to lighting, Kiwumu farmers are more interested in entertainment than Nyenje farmers, who are more concerned about increasing their income.

Our survey also sheds light on the different ways that energy access can increase farm productivity. Farmers in Nyenje and Kyampisi, the villages with grid access, are on average more productive and sell their products at higher prices.

- » Villages with energy access fare better in agricultural productivity than Kiwumu. For maize, the most common crop in the three villages, there is a significant difference in harvest seasons per year: Nyenje had 1.82 harvest seasons while Kiwumu only had 1.75.
- » The differences in productivity are more pronounced for sweet potatoes. Both in Nyenje and Kyampisi farms, output per acre of land is double that of the farms in Kiwumu. In addition, in cassava and matooke, Kiwumu farms also had less output per acre of land.
- » It takes fewer days in villages with electricity access to dry the harvest. In Nyenje and Kyampisi, drying the harvest takes on average 10 and 9 days, respectively, while in Kiwumu it takes 12 days.
- » There are significant differences in average prices of crops between farms with and without energy. Outliers aside, prices in Nyenje are always higher than in Kiwumu. For example, the average farmgate maize price is 36% higher in Nyenje than in Kiwumu (750 UGX/kg vs 551 UGX/kg).

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By the Numbers:

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The literature suggests that the agricultural sector has the potential to become a game-changer in Sub-Saharan Africa (SSA), where 80% of the agricultural production is from smallholder farmers and less than one in three have electricity access.² In addition, 26% of the SSA population, aged 15 or older, suffers from food insecurity.³

- » There is a low degree of mechanization in the agricultural sector which, combined with unpredictable and erratic rainfall, is a major contributor to low productivity.⁴ Electricity is crucial to enable artificial irrigation and mechanical crop processing, which can add a lot of economic value and increase farm income and profitability.
- » In addition, electricity access can reduce the vulnerability to multiple shocks, such as COVID-19, protect farmers from impacts of climate change, fuel prices variations and fluctuations in market prices for agricultural products.⁵
- » Banerjee et al (2017) estimate that by 2030 electricity demand from agriculture for both irrigation and milling in SSA could increase 100% if rainfed areas with economic potential would be equipped for irrigation, reaching about 9 GW.
- » Energy access is required for boosting agricultural productivity and changing the labor sector structure together with the socio-economic outcomes from rural poor communities.⁶ Information access, a by-product of energy access, is strongly related to children's school attendance and better decisions in terms of life quality and business profitability (crops and clients).

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- » There are important differences in farm productivity between villages with and without energy access. The former sell at higher prices, produce more per acre of land, and take less time to dry the harvest.
- » Energy access also correlates with better human development indicators such as college attendance. Powered villages show higher levels of education achieved and increased resilience to the economic shocks like COVID-19.
- » The grid-connected villages still have a great opportunity to amplify the impact of electricity access on productivity and development. The key to making this happen is to increase the use of electrical machinery in the production process which will also have a significant impact on electricity consumption.

Sources:

1. Power for all farmers' survey, October 2021.
2. G. Falchetta 2021 Energy access investment, agricultural profitability, and rural development: time for an integrated approach.
3. International Finance Corporation 2019 The Market Opportunity for Productive Use Leveraging Solar Energy (PULSE) in Sub-Saharan Africa.
4. Gumbe L. O 2020 Agricultural mechanization for modernization of African agriculture 2020 ASABE Annu. Int. Virtual Meet. (American Society of Agricultural and Biological Engineers).
5. Ibid
6. Ibid