Access to energy improves households' food security and children's nutrition

August 2022

This brief is based on results from the study *Impact of energy access on food security and child nutrition: panel data evidence from rural Ethiopia*, EfD Discussion Paper 22-11, June 2022, by Tagel Gebrehiwot and Sied Hassen.

Does access to electricity improve households' food security and children's nutrition over time? We provide insights from the Electricity Access and Food Security Project in Ethiopia, based on the World Bank's Socio-Economic Survey data.

KEY MESSAGES

From the study, we found that:

- Connection to grid electricity increased households' calorie intake by 153 kcal per day in 2013-2014 and by 187 kcal in 2016.
- Children in households with electricity are less likely to be stunted than those in households without electricity.
- The overall results show that the convenience that electricity provides for cooking frequently and storing food is likely to be the reason for these findings.
- Since grid electricity may take time to obtain and also may require substantial investment, off-grid high-power electric sources should be considered as a short-term intervention to achieve the desired results.

Background and Methodology

Universal access to energy is one of the targets of the Sustainable Development Goals (Goal 7). Access to electricity may have impacts on various dimensions of development and sustainability. It may also affect food security and child nutrition in many ways. One is the convenience of food availability, cooking, and preservation. It is more convenient to cook frequently with electricity than with fuelwood(Roster, 2021)[1]. Further, access to electricity may affect the nutritional status of household members through households obtaining information via TV or radio, or through improved health care services. Access to electricity may also affect access to food through increased household income, including increases in productivity and the creation of new economic activities that generate income. However, there scant research on the effect of access to electricity on food security and children's nutritional status in rural Ethiopian households. The purpose of this study is therefore to investigate whether access to electricity helps households improve the food security and nutritional status of children under the age of five.

This study is based on three waves (2011-2012, 2013-2014, and 2015-2016) of the World Bank's Socio-Economic Survey which collects data on around 3,000 households each year on multiple topics, including energy and home-based business activities.

Both descriptive and quantitative data analysis methods were used to analyze the data. In what follows, we present the results in brief.

Descriptive(qualitative) Result

The change in households' access to electricity and dietary diversity is shown in figure 1. The World Bank's Socio-Economic Survey collected data on households' food consumption and connectivity to electricity over the previous 12 months. The results are presented in Figure 1.

[1] Max Roster (2021). Energy poverty and indoor air pollution: a problem as old as humanity that we can end within our lifetime. Our World in Data.

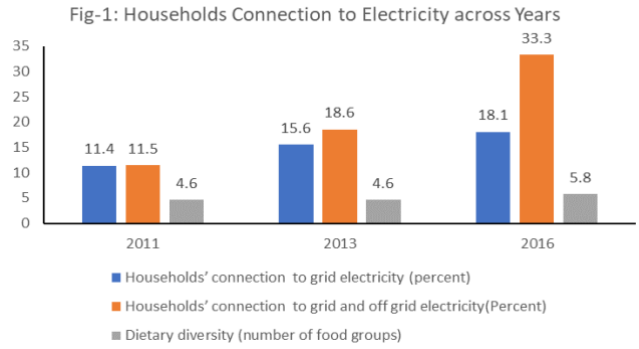

Figure 1 shows the trend in access to grid and off-grid electricity in rural areas. Access to grid electricity increased from 11.5% of households in 2011 to 18.1% in 2016. Access and connection to off-grid electricity, mainly through solar technologies, increased from 0.1% of households in 2011 to 15.2% in 2016. The expansion of off-grid sources of electricity increased total access to electricity to about 33% of households in 2016.

The graph also shows an increase in the variety of foods consumed by households between wave 1 (2011) and wave 3 (2016) of the survey. The mean dietary diversity increased from 4.6 in 2011to 5.8 in 2016, indicating a transition from medium dietary diversity to the edge of high dietary diversity between the periods, based on the Food and Agriculture Organization's classification of food consumption. Access to electricity may have played a role in improving these households' food diversity.

However, the calorie intake of households declined across the three waves to below the national average daily per capita calorie requirement needed to maintain a healthy life set by the Ethiopian government. In 2011-2012, 53% of households consumed more than the recommended average daily per capita calorie requirement. However, this declined to 44% in 2013-2014 and 45% in 2015-2016. This is mainly attributable to the worst drought in decades in 2015-2016, which was a year marked by a strong El Niño phase, with localized droughts occurring in the preceding years.

Furthermore, the study shows that children in households that do not have access to electricity are more likely to be stunted (32.3%) than children in households with access to electricity (10 %) in2016.

The quantitative analysis enables us to disentangle the role of electricity from other effects such as the shocks (drought) on food diversity and children's nutritional status.

Result

To examine whether the improvement in household food security and children's nutritional status are the result of access to electricity or other factors, we built a model to separate the effect of access to electricity. Our findings show that households that are connected to electricity consumed 153 kcal more per day in 2013-2014 and 187 kcal more in 2015-2016 compared to households that were not connected. The findings further indicate that children in households connected to electricity are less undernourished than those in households without access to electricity. This shows that the impact of access to electricity may be the role it plays in increasing the convenience of cooking more frequently.

Policy implications

Expanding access to electricity, in addition to providing lighting and other end-use services, may also improve household food security and reduce childhood undernutrition in Ethiopia. Since increasing access to grid electricity may take time and may require substantial investment, off-grid high-power electric sources should be used as a short-term intervention for these added benefits to be realized.

About the authors

Tagel Gebrehiwot is a senior researcher and Director of Environment and Climate Research Centre, at the Policy Studies Institute, Ethiopia.

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