

Policy Brief: Fuel and appliance adoption in Ethiopia: Heterogeneities and prioritization

August 2022

How do households in urban areas choose among fuels and electric home appliances for cooking? We provide insights from a nationally representative study carried out by the International Food Policy Research Institute in Ethiopia.

Key messages and recommendations

- Households in Ethiopia's urban areas continue to rely predominantly on firewood and crop residuals for cooking.
- Key constraints to adopting cleaner fuels and appliances are privately metered electricity access and voltage issues.
- Meanwhile, households with more female adults have a higher chance of choosing electric baking appliances as women are the ones actively engaged in baking and cooking duties.
- Policy makers should focus on reducing gaps in electricity access, resolving voltage issues, and promoting educational campaigns in the adoption of electronic home appliances.

Background

Ethiopia has a vast renewable energy potential, where only a fraction of it has been harnessed. The under-exploitation of the abundant energy resources in Ethiopia resulted in the dominance of traditional biomass in the country's energy mix for household uses. Hence, the household sector is using about 92 percent of the final energy in the country mainly for lighting, cooking, and heating (Hailu and Kumsa, 2021). The level of dependence on traditional biomass fuel is notably high for cooking both in urban and rural areas. Given the high share of energy consumption in the household sector, evidence on the uses, preferences, and adoption decisions of equipment for cooking could provide important policy-relevant insights to gear the household energy sector from a system primarily based on biomass combustion to one that uses more electric appliances.

We investigated urban households' fuel choices and their prioritization on the adoption of electric home appliances using nationally representative two-round data from small and large towns.¹ The study focused on urban areas because the application of electricity for cooking is negligible in rural areas.

Fuel choices

The result shows that the principal cooking fuels for more than half (57 percent) of the urban dwellers are firewood and crop residues. Firewood is usually used in its

traditional form and consumed in the conventional three-stone open fire stoves. This trend continues to pose environmental, social (the burden of firewood collection on the time use of women and girls), indoor air pollution, and economic problems (preventing women from engaging in income-generating and more rewarding activities). In addition, charcoal's contribution to energy needs for cooking in urban areas is almost equal to that of electricity, at about 20 percent. Households' choices for cooking fuel were determined by factors such as family composition, educational attendance, types of cooking spaces, proximity to roads, and electric power outages.

Limited role of price in determining cooking appliance acquisition

Income and prices are generally key parameters that determine acquisition of household equipment. However, in our study, price did not play a big role in the acquisition of an electric *mitad*² (injera baking stove). Comparison of the adoption of an electric *mitad* in relation to the adoption of television sets and refrigerators sheds light on this issue (see Figure 1 below). For instance, in 2016, the adoption rate of an electric *mitad* was 31 percent, and of a television 64 percent, indicating that the adoption rate of a television was twice higher than that of an electric *mitad*. However, the average price of an electric *mitad* and television was Ethiopian Birr 1396 and 4694 in 2016, respectively. The price of an electric *mitad* was thus one-third the price of the smallest size television. We also did

¹ A full version of this study report has been published on the Social Sciences Research Network and can be accessed [here](#).

² Injera is the common staple food in Ethiopia made from an indigenous grain called 'teff'. Traditionally this 60cm sourdough pancake is baked on a clay griddle, called a '*mitad*' placed on three stones above an open fire.

not find a statistically significant difference in the adoption of an electric *mitad* between middle income and lower income households, though a difference is observed between higher and lower income households³. This implies that some people are not adopting an electric *mitad* for reasons other than price and income. For these households, an electric *mitad* is not in the top list of households' prioritized choices, at least compared to televisions.

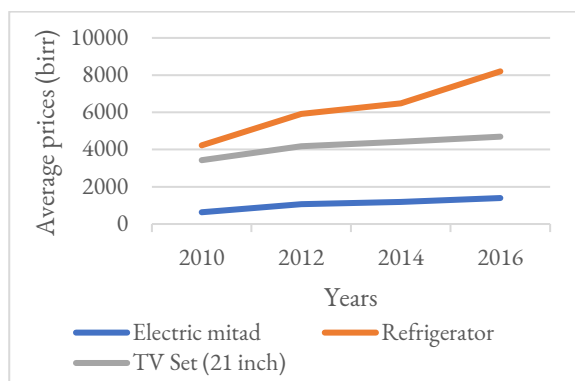


Figure 1: Prices of electric *mitad*, television sets, and refrigerators



Figure 2: An electric injera *mitad*.

Photo source: Rocky Mountain Institute

Electricity quality and access constraints

Low voltage supply (voltage below that required for normal operation) affects appliance adoption decisions for households connected to the grid. The issue of low voltages varies geographically and is worse in small towns and the outskirts of big towns. Even when there are no voltage issues, the type of connection (with or without private metering) determines whether the household can use high-energy-using appliances. Access to privately metered electricity supports the adoption of electric *mitad* compared to shared metering. However, only about half of the urban households have privately metered electricity access. Many landlords restrict their tenants from using electricity for such productive purposes due to the difficulty of properly assigning the amount of electric usage in the absence of private metering for the tenants.

Gender aspects

Gender balance and position in household decision-making played a role in the choice and adoption of kitchen appliances. In this regard, female decision-makers favour the adoption of electric kitchen appliances. A household with more female adults has a higher chance of choosing electric baking appliances. This is partly because adult females are the ones actively engaged in baking and cooking duties.

Policy recommendations

Three major recommendations for the electric utility company emerge from the results of the study to help improve the adoption of electric appliances such as an electric *mitad*. They are: (i) improving the quality and reliability of electricity access (by reducing frequent power interruptions and reducing the problem of lower voltage supply); (ii) undertaking an intervention that can provide access to private metering to households currently using electricity but without private metering; and (iii) expanding connectivity to the grid in the country. The study also reaffirms the importance of investments in improving access to education, and educational campaigns and extension programs focused on creating awareness about electric stoves and *mitads*.

³ Low, middle-, and upper-income households here are defined by the first, second, and third terciles of the income distribution in the data.

References:

Hailu, A.D., and D.K. Kumsa. 2021. "Ethiopia renewable energy potentials and current state." AIMS Energy 9:1–14.

About the authors

Dawit Mekonnen is a Research Fellow in Environment and Production Technology Division of the International Food Policy Research Institute (IFPRI) based in IFPRI's Washington DC office. Email: d.mekonnen@cgiar.org

Tiruwork Arega is a Research Officer in Environment and Production Technology Division of the International Food Policy Research Institute (IFPRI) based in IFPRI's office in Addis Ababa. Email: t.arega@cgiar.org.

This project was funded with UK Aid from the UK government under the Applied Research Programme on Energy and Economic Growth (EEG), managed by Oxford Policy Management.

The views expressed in this Policy Brief do not necessarily reflect the UK government's official policies.