



# Empirical analysis of fuelwood consumptions and its environmental implications in rural sub-city, Southern Ethiopia



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## Introduction

- In Ethiopia, only 7.20% of the population has primary access to clean cooking facilities.
- In the country, fuelwood accounts 77–78% of energy sources.
- Fuelwood consumptions contribute for forest degradations and greenhouse gases emission

## Materials and Methods

- The study was conducted in rural sub-city of Sothern Ethiopia.
- Household survey (152 in number)
- Estimation of firewood consumption and greenhouse gas emission
- Stove performance test

## Results

### 1. Household energy sources and expenditure.

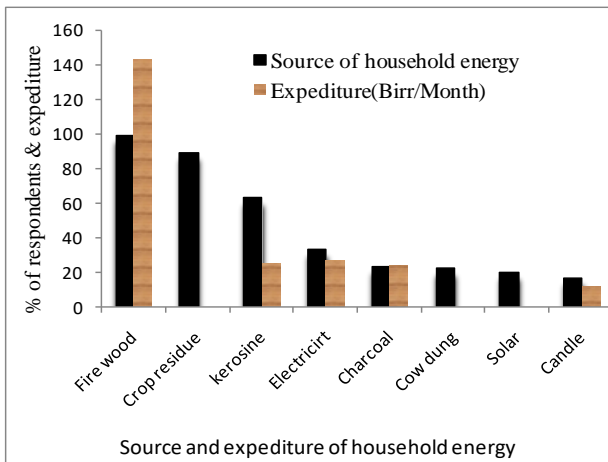


Figure 1: Main energy sources for households and expenditure per month.

\*ETB, 1USD= 53 ETB

## Conclusion

- Average annual firewood consumption per household was 2781.30 kg (2.78 t).
- The amount of firewood consumed per household could emit 337.62 kg CO<sub>2</sub>e/yr.
- Use of improved stove could help to save 1.05 tones of firewood and protect 4 × 10<sup>-3</sup> ha of forest degradation per year per household.

## Results

2. Average daily household firewood consumption by wealth status.

Wealth status	Firewood consumption in kg		
	Mean ± SD	t-value	P-value
Rich	6.30±1.15	31.67	P <0.000
Medium	9.47±0.79		
Poor	7.08±0.61		
Overall	7.2		

3. Cooking stoves used by households

- 16.40% of households used improved stoves while 83.60% depend on traditional three-stone open fire stoves for cooking food.



Figure 2. Baking Injera on traditional open fire (a) and improved (b) stoves.

4. Average firewood consumption of traditional and improved stoves.

Type of food	Stove type	Average firewood consumption in kg/	Firewood saved/ (kg/yr)	CO <sub>2</sub> e reduce (kg/yr)
Injera	Traditional	2.15 ± 0.11	425.90	51.30
	Improved	1.24 ± 0.11		
Non-Injera	Traditional	2.45 ± 0.08	616.20	74.80
	Improved	1.66 ± 0.03		

5. Annual GHG emission from firewood consumption by households

Wealth status	Average daily household firewood consumption (kg)	Annual GHG emission for firewood consumption (kg CO <sub>2</sub> e/kg)
Rich	6.30	279.30
Medium	9.47	419.83
Poor	7.08	313.88
Average	7.62	337.62