Beyond Electricity Access: Understanding Energy Transition in the Majhi Community

Like many countries globally, Nepal is experiencing an ongoing energy transition characterized by a shift from carbon-based energy sources (such as coal and oil) to lower-carbon sources (predominantly hydropower and solar). Nepal has made significant progress in expanding electricity access, largely through hydropower.

Out of the country's 753 local levels, 539 have been fully electrified and 196 are partially connected to the national grid, while the remaining 18 are served through local hydropower or solar systems (Nepal Electricity Authority, 2025)

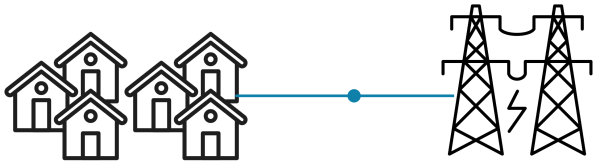
As of fiscal year 2023/2024, approximately 99% of Nepal's population has access to electricity.

(Nepal Electricity Authority, 2024)

However, energy access does not always translate into energy transition.

As per Nepal's energy consumption profile, traditional fuels account for 63.87% of total consumption, followed by commercial fuels at 25.80%, grid electricity at 7.23%, and renewable energy sources at 3.10% (GoN, Water and Energy Commission Secretariat, 2024). This indicates that despite a relatively high electricity supply, energy consumption remains heavily dependent on biomass and fossil fuels.

A baseline study conducted by PRC among the **Majhi community** in Melamchi Municipality, one of the key beneficiary groups under the BEACON *(Bridging Engagement Across Community and National Actions for Climate and Energy Resilience)* project, reflects a similar pattern: despite energy access, energy transition remains at a glacial pace.



All Majhi households are connected to the national grid. However, electricity use is extremely limited and monthly electricity consumption is very low often below 20kWh, compared to the national per capita data - 465 kWh (Nepal Electricity Authority, 2025).

Electricity is only used for basic end uses:

Phone charging

LED lighting

Small fans, occasional TV, radio

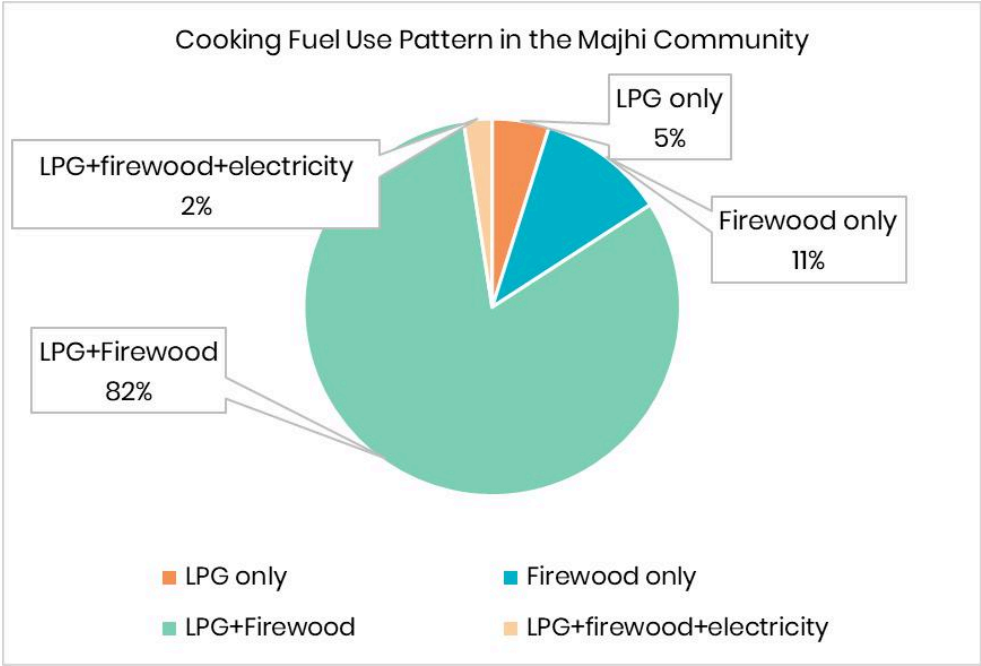
Use of electricity for productive or modern applications is extremely limited.

Furthermore, cooking energy remains dominated by traditional fuels.

Cooking energy use per household:

Firewood : 600 kg/ month

LPG: 0.78 cylinders/ month.



Energy Transition in the Majhi Community

Generally, energy transition is commonly understood as a fundamental change in the energy mix, including increased use of renewable energy, improved efficiency, and the gradual phase-out of fossil fuels (UNDP 2025) or a process of shifting from one energy combination to another.

In more quantitative terms, transition begins when a new energy source reaches 5% of total energy use, and is considered complete when it exceeds 50% (Smil, 2010; Yang et al., 2024).

In the Majhi community, cooking energy use reflects an early stage of energy transition, marked by a gradual shift from firewood to LPG. However, this transition is not linear. Instead, it occurs through fuel stacking, where most households use multiple fuels simultaneously.

These patterns indicate that cleaner fuels (compared to firewood) are being adopted but not replacing traditional biomass.

Thus, there is a need to move toward cleaner fuel-stacking approaches that reduce exposure to pollutants, keep both upfront and recurring cooking costs manageable, address potential challenges related to affordability and access, while also addressing local contexts, needs, and user experiences (Shankar et al., 2020).

The above data represents explicit dimensions of energy transition, or those captured through measurable data (Yang et al., 2024).

Other explicit indicators and evidence from the Majhi community are:

Infrastructure:
Grid-connected households (5A single phase)

Energy Consumption:
Low electricity use (~ 20 kWh/ month); Low load factor (demand concentrated in evening hours)

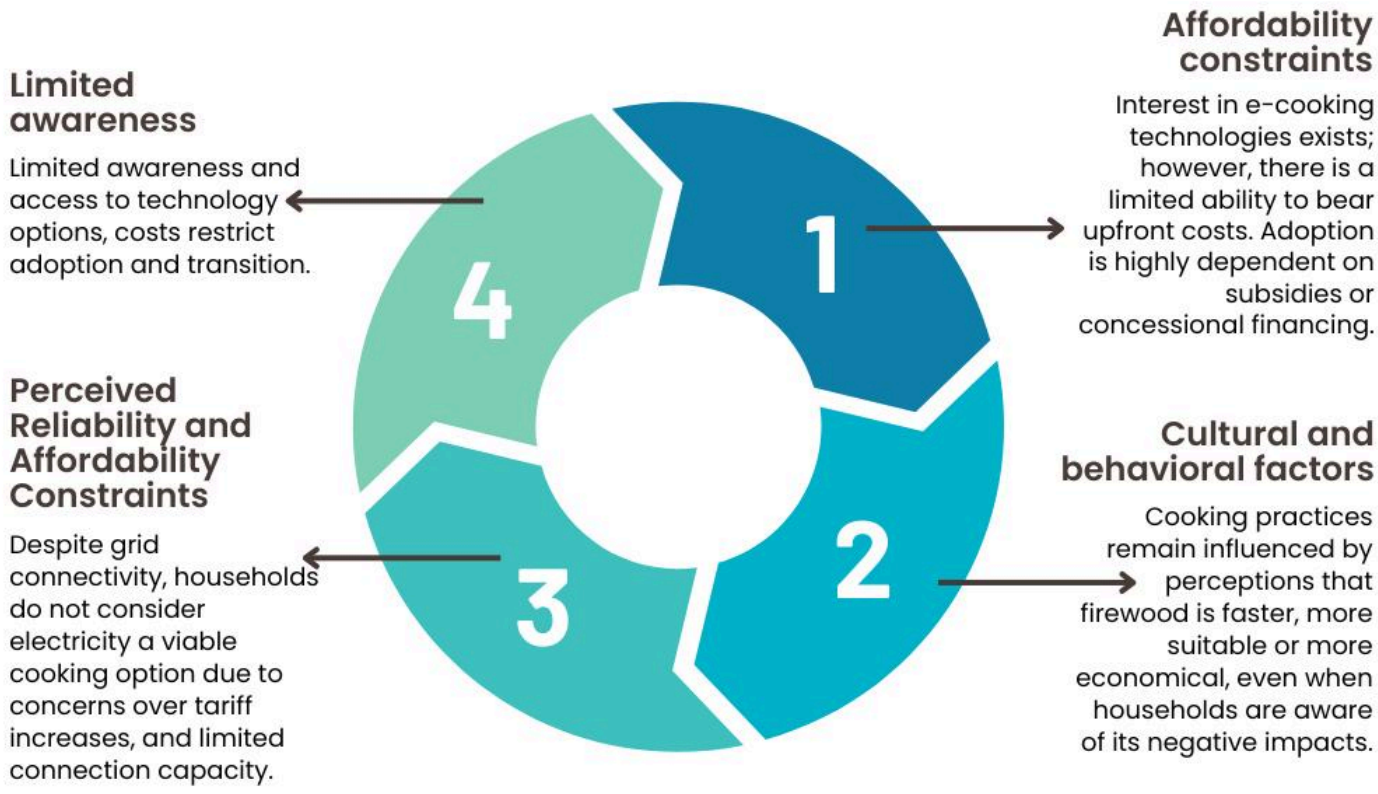
Quantitative indicators offer important evidence on energy use. While the 5A single-phase system provides limited load capacity, baseline findings suggest that even this limited capacity is not being fully utilized. This reflects additional barriers beyond infrastructure.

Therefore, energy transition must also be understood as a social process, which is shaped by behavioral, economic, and institutional conditions.

Apart from a shift in fuels, there are a complex set of underlying conditions that shape how, why and whether households adopt new energy systems. Factors beyond infrastructure and availability, such as affordability, perceptions, cultural practices, and institutional support, play a decisive role in shaping energy use (Pereira et al., 2025).

The baseline findings indicate that the slow pace of energy transition in the Majhi community is not due to a lack of access alone, but also due to interconnected economic, technical, and social barriers.

At the household level, energy transition is shaped by the following interconnected barriers:



These barriers do not operate in isolation. They reinforce each other, creating a self-reinforcing vicious cycle that slows the energy transition process. This vicious cycle at the household level contributes to broader systemic challenges, linking poverty, energy access, and climate impacts.

At a broader level, this reflects a reinforcing cycle: the poverty trap becomes an energy trap, which then becomes a climate trap (World Bank, 2023).

These barriers hinder just energy transition while disproportionately impacting women:

Women carry the primary burden of cooking and fuel wood collection. Biomass dependency drives time poverty and physical strain.

81%

households reported high smoke exposure due to firewood use.

84%

households experience related health symptoms (coughing, eye irritation, respiratory issues).

Addressing the energy transition in the Majhi community requires infrastructural interventions alongside measures to overcome deep-rooted economic, behavioral, and institutional barriers shaping energy use. Without addressing these underlying constraints, improved access alone will not result in sustained adoption of clean cooking solutions.

The BEACON project responds to these challenges through direct community-level interventions, including capacity building, awareness generation, and infrastructural support to enable the transition to clean cooking. By supporting this transition and building community skills in renewable energy, the project also addresses the negative gender and health impacts caused by dependence on traditional energy sources. This is complemented by policy engagement at local and national levels, aiming to bridge the gap between national commitments, such as NDCs, and their effective implementation on the ground.

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