

Shifting from Firewood to LP Gas: Tadi Rural Municipality, Nuwakot, Nepal Case Study

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Abstract- Firewood, a traditional cooking method, has historically been prevalent in rural areas. However, with the progress of modern technologies and increased awareness among the populace, there has been a noticeable shift from firewood to liquefied petroleum (LP) gas for cooking purposes. In Tadi Rural Municipality (TRM), Nepal, a study was conducted using stratified sampling and questionnaires to investigate the typical usage of cooking fuels among rural residents. The findings revealed a significant preference for LP gas among the majority of households over other cooking fuels. Respondents indicated health reasons and the convenience of LP gas as primary factors influencing their choice. Despite the ready availability of firewood, considerations related to health, environmental cleanliness, convenience, and time management strongly inclined people towards LP gas. The research corroborates existing knowledge suggesting the safety and advantages of LP gas over firewood across multiple aspects. Notably, the study's results underscore the population's awareness of these advantages, leading to a deliberate selection of LP gas as the preferred cooking fuel over other available options. This shift in preference signals a transformation in cooking practices in rural areas, aligning with the adoption of modern technologies and a heightened consciousness regarding health and environmental considerations in household cooking choices.

Keywords: Firewood, Cooking fuels, LP gas, Public awareness, Rural area

INTRODUCTION

Firewood has served as a traditional and effective method of cooking for centuries, spanning various cultures and regions, including Nepal. It holds significant cultural, social, and practical value for many communities. In rural areas, such as those in Nepal, firewood is often readily available and abundant, sourced from nearby forests or fallen branches. Furthermore, the majority of people in rural areas are engaged in farming ^[1,2], allowing them to create firewood from leftover wooden parts of livestock diets and agricultural crops. This accessibility makes it a convenient and low-cost cooking fuel for many households.

However, with the progression of modern technologies, the practice of cooking with firewood is gradually being replaced by LP gas. In rural areas, cooking methods vary widely based on factors like accessibility, affordability, cultural practices, and resource availability. Both firewood and LP gas are commonly used for cooking in different rural settings, each method having its own advantages and disadvantages. Despite the easy accessibility of firewood, LP gas is the preferred choice for many people due to concerns about health hazards linked to indoor air pollution from firewood burning ^[3,4]. Additionally, LP gas burns cleaner and emits fewer pollutants, contributing to improved respiratory health for households. Simultaneously, using LP gas saves time and effort that would otherwise be spent on collecting, chopping, and storing firewood ^[5]. This convenience is particularly valuable for households with multiple responsibilities and limited time. Furthermore, LP gas offers consistent heat, making it more efficient for cooking compared to firewood. It allows better control of cooking temperatures and reduces cooking time ^[6]. Moreover, changing lifestyles among modern people encourage them to adopt modern conveniences, such as using LP gas instead of the traditional method of cooking with firewood.

Nepal is primarily an agricultural country, and the majority of people in rural areas still live in poverty ^[2,7]. Affording LP gas for cooking might be challenging for families in the low-income groups residing in these rural areas. However, during our preliminary field survey, we observed that even people in low-income groups were using LP gas, despite the ready availability of firewood in rural areas. The present study was conducted in TRM, Nuwakot, Nepal. Data indicates that more than 53% of the municipality's land is covered by agricultural land, and approximately 13% is covered by forests ^[2,8]. These areas provide ample opportunities for gathering firewood. Moreover, nearly 23% of the municipality's population is involved in agriculture and livestock ^[2,8]. Therefore, they have the option to collect firewood from the remaining branches of the cattle's grass and diet. Despite the easy accessibility of firewood in TRM, our survey revealed

people carrying LP gas, prompting us to investigate the reasons behind this choice. We collected data through questionnaire surveys and direct interviews with the inhabitants of the municipality regarding their preference for using LP gas over firewood.

METHODOLOGY

STUDY AREA

TRM is situated in the Nuwakot district of Bagmati province, covering an area of 69.80 km². Geographically, it is positioned at 27°55'16"N latitude and 85°18'27"E longitude in the northern part of the district. The population of this municipality is 15,933, resulting in a population density of 228.3/km² [2]. It shares borders with Suryagadhi Rural Municipality to the west, Dupcheswor Rural Municipality to the east, Panchakanya Rural Municipality to the south, and Naukunda Rural Municipality in the Rasuwa district to the north (Figure 1). TRM consists of 6 wards, with ward no. 3 having the highest population and serving as the location for Kharanitar, the administrative center of the municipality [2]. TRM is connected to highway, facilitating easy access to and from urban areas of the country.

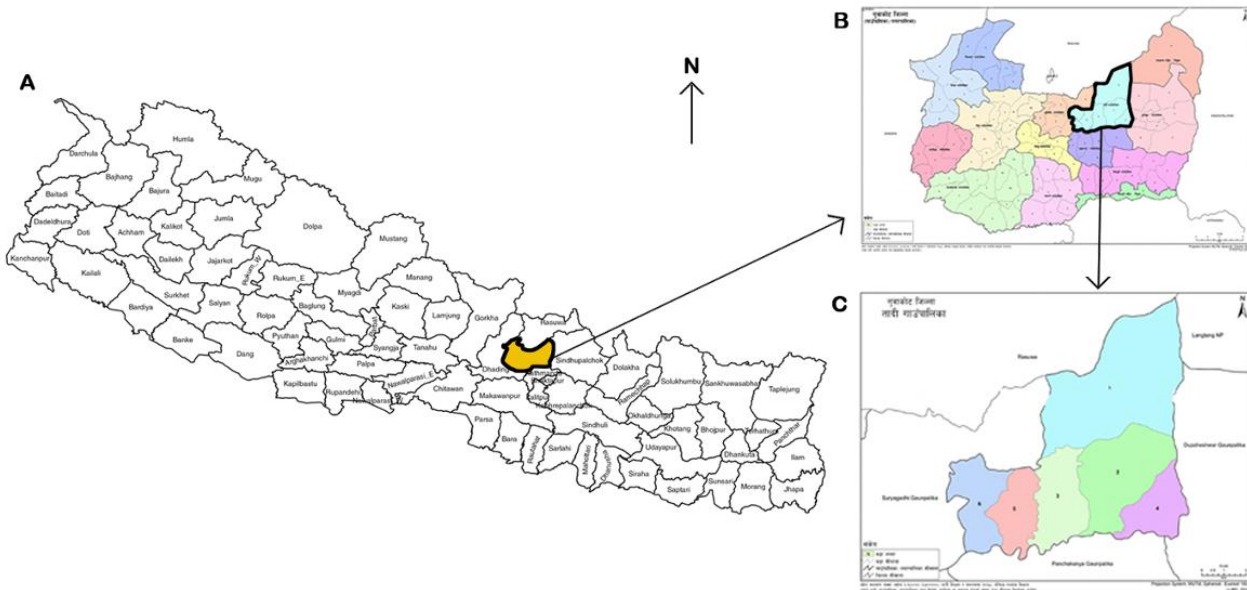


Figure 1. Map showing study area (A-C). Nepal map (A), Nuwakot district (B) and study area, TRM (C). Source: google.com.

STUDY DESIGN AND DATA COLLECTION

This study involves stratified random sampling. Fifty households from each ward were randomly selected for data collection. Both primary and secondary data were used in this study. For primary data collection, we prepared structured questionnaires for semi-structured or unstructured interviews, as well as group discussions with the local people of TRM. A checklist was prepared for qualitative data collection, consisting of questionnaires for interviews prior to data collection. Similarly, for quantitative data collection, a close-ended structured questionnaire survey was conducted. Finally, statistical tools in Excel were used to analyze both the qualitative and quantitative data.

RESULTS AND DISCUSSION

During data collection, we inquired about the frequency of respondents using the same cooking fuel at least twice daily. To ensure a more scientific approach, households that utilize same cooking fuels at least twice a day—specifically, for preparing both lunch and dinner—are categorized as users of the respective fuel. The results are illustrated in the tabulated form and bar diagram.

Table 1. Number of households using various cooking fuels.

Ward	Firewood	LP gas	Electrical devices	Others	Total
1	17	32	-	1	50
2	6	41	-	3	50
3	2	45	2	1	50
4	8	40	-	2	50
5	6	44	-	-	50

6	9	41	-	-	50
Total	48	243	2	7	300
Percentage	16	81	0.7	2.3	

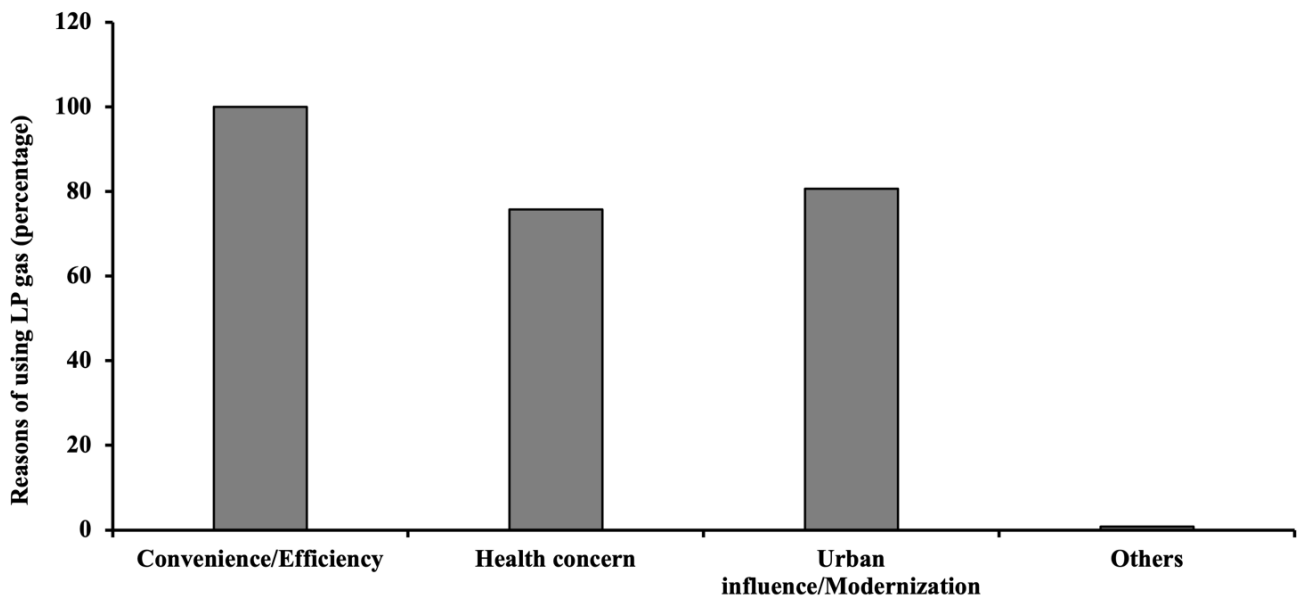


Figure 2. Bar diagram depicting the diverse factors influencing respondents' preference for LP gas over alternative cooking fuels. Every respondent cited convenience as the primary reason for choosing LP gas. Moreover, factors such as urban influence and health benefits also contribute to the preference for LP gas over other cooking alternatives.



Figure 3. Images showing firewood cords (AA'), cooking with firewood (BB'), and cooking with LP gas (CC') in the study area.

In our study, we discovered that over 80% households of TRM used LP gas for cooking (Table 1). Despite the numerous advantages of using LP gas, such as improvements in health, sanitation, and time management compared to firewood [3,4,5], the rapid shift from firewood to LP gas within a short time frame is noteworthy. Until five years ago, many households in TRM used firewood for cooking, but now they have switched to LP gas. The increased adoption of LP gas for cooking may be due to heightened awareness among rural residents. Data indicated an increase in the literacy rate of TRM in 2021 compared to previous census records [1,2,9]. Our findings suggest that rural communities are transitioning away from traditional cooking fuels toward modern alternatives like LP gas and electrical devices. While a study in TRM proposed biogas plants as a feasible option for cooking fuel [10], our study revealed that households with biogas plants are now also using LP gas in their kitchens, having moved away from biogas. Moreover, when asked about their choice of fuel for special occasions requiring bulk cooking, the majority of respondents favored LP gas over other cooking fuels. These results imply that rural residents are mindful of the negative impacts associated with firewood and prefer LP gas due to its convenience, environmental benefits, health advantages, and efficient time management [5,11].

The data indicates that some households in TRM still fall below the poverty line [2]. Therefore, implementing programs that offer financial assistance or subsidies for purchasing LP gas equipment can make it more accessible to low-income households. Educating communities about the health and environmental benefits of using LP gas may encourage more households to make the transition. Overall, the preference for LP gas over firewood in TRM despite the availability of firewood showcases a shift towards cleaner and more convenient cooking methods. The shift from firewood to LP gas for cooking in rural areas, despite the cultural significance of using firewood, reflects the changing priorities driven by health considerations, convenience, and evolving socio-economic factors (Figure 2). Efforts to make LP gas more affordable and accessible, while respecting cultural aspects, can further encourage this transition towards cleaner energy sources. Balancing modernization with cultural values is essential in navigating this transition towards cleaner cooking practices.

CONCLUSIONS

The preference for LP gas over firewood in TRM despite the availability of firewood showcases a shift towards cleaner and more convenient cooking methods. However, Nepal lacks adequate LP gas manufacturing companies, leading to the country's reliance on large imports of LP gas from India to meet its demand. There is concern that a fuel crisis might arise in the near future, similar to the recent case observed in Sri Lanka [12], where there was a resurgence in cooking with firewood. This situation emphasizes the necessity of manufacturing more LP gas inside the country, as well as considering diversification in cooking fuel sources as a precautionary measure.

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