# Non clean energy

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For decades, Indian households have faced a sustainability challenge due to overreliance on high carbon-emitting energy sources across various sections and sectors of society. The paper examines the likelihood of Indian households adopting clean energy and other non-clean energy using innovation system perspectives. By using logistic regression, the study found that households" characteristics and infrastructural variables significantly influence the likelihood of clean energy adoption.

The remainder of this paper is organized as follows: Following the introduction, section II focuses on the theoretical framework and some of the existing literature on the slow diffusion of clean energy. In section III, we discuss the data sources and methodology employed in the paper. This is followed by results and analysis in section IV. Section V concludes the discussion with a brief policy suggestion.

A descriptive approach has been deployed to dissect the variables of interest. To understand the dynamics of clean energy adoption for cooking, we have adopted logistic regression analysis. Since the dependent variable is in binary form, the logit model will be appropriate to understand the dynamics. The regression used in our analysis takes this form

$$\ln(Pi1-Pi)=a+v1X1+v2X2+v3X3+v4X4+v5X5+v6X6+v7X7+v8X8+v9X9+v10X10+v11X11+v12X12+v13X13+v14X14+v15X15$$

The first section discusses a comparative analysis of energy sources used for cooking across households.

Figures 1 A and B present households" preferences for clean energy sources over the years in rural and urban areas, respectively. The use of electricity and gobar gas for cooking is almost minimal in rural areas. An increasing trend of LPG adoption over the years has been observed. In 1983 and 1993-94, the percentage of households using LPG is minimal. This could be due to the lack of distributors in rural areas. In 1999-00, only 5.4 per cent of households reported using LPG, which increased to 15 per cent in 2011-12. The percentage of urban households using LPG was 10.29 per cent in 1983, which increased to 68.4 per cent in 2011-12.

The adoption of non-clean energy sources shows that rural households mostly use firewood and chips followed by dunk cake. The use of firewood and chips by rural households is almost stagnant till 2009-10. It only reduced in 2011-12

Note: *** Statistically significant at 1 percent

To capture the market and infrastructure perspective for clean energy adoption, we have included share of

LPG distributors per 10,000 population across states as an independent variable. This variable has the highest impact on clean energy adoption for cooking. The result shows that if the share of LPG distributors increases, then the chances of adoption increase by 51 per cent. This proves the importance of the infrastructure perspective of diffusion of any technology.

The Sustainable Development Goal (SDG) 7 aims to ensure affordable and clean energy. The SDG 7.1 aims to ensure universal access to affordable, reliable, and modern energy services by 2030. Prime Minister Ujwala Yojana"s objective is to make LPG, a clean cooking fuel, available to rural and deprived sections of India. In this context, we examine the transition of clean fuel adoption among Indian households.

In general, adopters" characteristics, such as the economic conditions of the households, members of the households, their social groups, and educational level, significantly affect the adoption of clean fuel. The ST households face significant disadvantages in adopting clean energy. However, the study found that the infrastructure variable has the highest influence over the adoption of clean energy.