LPG adoption correlates with higher green cover, finds study

- An increase in greening in Jharkhand coincided with the proliferation of LPG use in Jharkhand, researchers observed.
- While there are certain limitations to the study, it presents a state-wide snapshot of the potential ecological benefits from LPG use.
- Access to the gas continues to be challenging and ensuring gas refills are affordable is key to maintaining their use.
- Adequate funding is necessary for more research, as many ecological and behavioural impacts become evident only beyond typical project timelines.

SIMRIN SIRUR

In the forested state of Jharkhand, switching to liquified petroleum gas (LPG) could have inadvertently driven a trend of greening across the state, a new study based on satellite data, and ground surveys says.

LPG has long been touted as a tool to prevent deforestation by reducing dependence on firewood for fuel. The study from Jharkhand presents a state-wide snapshot of this potential benefit, showing that green cover rose significantly with the proliferation of LPG, despite environmental drivers remaining stable.

The study, published by researchers from the Indian Institute of Science, Bangalore and Birla Institute of Technology and Science, Pilani, suggests the Pradhan Mantri Ujjwala Yojana (PMUY) government scheme had a "noticeable effect at the provincial scale, emphasizing that such beneficial schemes are not only helpful to people but also promote responsible ecosystem stewardship." The scheme provides free LPG connections and subsidised refill cylinders for rural households below the poverty line.

Published in the peer-reviewed journal Trees, Forests and People in September, the study builds on other research that has found LPG use to decrease firewood dependence.

Correlations in green cover and LPG use

Jharkhand was chosen as the study site because of three main reasons: Most of its population lives in rural areas, it has a high percentage of forest cover (approximately 30%, according to the Forest Survey of India), and its rural population has low LPG use compared to other states.

"I've been in touch with the Jharkhand forest department since 2015, and what sparked my interest in studying the relationship between LPG and forest cover was a conversation with an IFS officer in 2020, who said he'd noticed an increase in greenery in the state," said Rajiv Kumar Chaturvedi, co-author of the study.

The study relies predominantly on satellite data from the Normalised Difference Vegetation Index (NDVI) to quantify green cover over Jharkhand, from 2000 onwards.

The NVDI captures infrared radiation to determine the density of green cover in an area. To investigate the results further, the researchers conducted field surveys in Hazaribagh district, which presents as a microcosm of Jharkhand's unique development landscape – hosting dense forest on the one hand, and large-scale coal mining on the other.

The field surveys were conducted in 20 villages across three clusters that fringed forest areas, in order to determine what factors drove greening in these areas. Between 2016 and 2020, the state saw a rapid increase in LPG adoption, rising from 25% in 2015 to 75%.

The same period saw a notable rise in green cover, which could not be explained by changes in temperature, rainfall, or forest fires, according to the study. In the sampled villages, where the adoption of LPG rose to 66%, firewood collection decreased by almost 210 kg per year during the implementation of the Ujjwala scheme.

The reduction was more pronounced in villages that saw greening, with reductions in firewood collection of up to 37%.

Assessing impact

According to Sanjay Gubbi, a conservation biologist and programme head at the Holematthi Nature Foundation, the increase in green cover visible in the NDVI isn't improbable if the solution is implemented at a large scale. However, NDVI is influenced by a number of factors, and such values don't always reflect the long-term changes in forests from short-term interventions, he said in an email to Mongabay-India.

"In my opinion, directly assessing per capita firewood usage provides a more reliable and immediate indicator of impact," he said.

A significant limitation to the Jharkhand study is the unavailability of greening data after 2020.

Gubbi led a project in the MM Hills of Karnataka in 2018, which similarly sought to understand the barriers to LPG access in forest dwelling households, and the impact of its use on firewood collection. A majority of those included in the project were landless agricultural workers, for whom affordability and physical access were major challenges in obtaining and sustaining an LPG connection.

When these challenges were addressed, households reduced their firewood collection by 65%. When LPG was combined with the use of fuel-efficient water heaters the reduction in firewood was observed to be 85 to 90%.

"Reliable information on firewood collection patterns and the tree species being harvested is essential to directly correlate household fuel use with impacts on forests and wildlife.

Quantitative evaluation of firewood use before and after the intervention is crucial to accurately assess its effectiveness," said Gubbi, adding, "Adequate funding is necessary, as many ecological and behavioural impacts become evident only beyond typical project timelines."

Challenges in long term implementation

Access to LPG continues to be a barrier even as states like Jharkhand see a rise in LPG adoption. "In Hazaribagh, we saw that despite being very close to each other, Patra Kalan village saw a greening trend while Niri village, which is deep in the forest, saw a browning trend. We realised that the highway, which is close to Patra Kalan, helps the village access LPG much more easily. In Niri, using LPG made no financial sense when getting access itself is so expensive," said Chaturvedi. Ensuring LPG refills are affordable is key to maintaining their access, both Gubbi and Chaturvedi said. The government recently announced it was extending the reach of PMUY to 25 lakh (2.5 million) more beneficiaries and providing a targeted subsidy of ₹300 per cylinder for up to nine refills per annum./*MONGABAY*