POLICY DIALOGUES

Does PFES endorse household energy transition in Vietnam?

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KEY FACTS

•This research examines the PFES (Payment for Forest Environmental Services) role in Vietnam's household energy transition.

•A case study in Lâm Đồng reveals that, while PFES enhances forest conservation, household incomes, and environmental awareness, many rural households still rely on traditional fuels.

•An energy consumption model shows that wealthier, educated, and female-headed households tend to use low-emission fuels, while poorer and ethnic minority households depend more on biomass.

•To address these challenges, we recommend to raise PFES patrol cap per household, support households' low-emission energy shifts, and raise awareness about them.

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Key words Payment for Forest Ecosystem Services, Fuel Stacking Theory

Geography Viet Nam

Themes Energy transition, Energy consumption

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CONTEXT & MOTIVATION

Vietnam aims at Net-Zero emission by 2050, promoting renewable energy through policies, including investment incentives and energy efficiency initiatives.

Yet, achieving a sustainable energy transition remains challenging. This transition requires not only technological and infrastructural changes, but also environmental policies that incentivize household shifts. Vietnam's PFES program boosts forest protection and beneficiaries' income, but its impact on rural household energy consumption is unclear. This research[i], based on a case study in Lam Dong province and data from Vietnam Living Standard Surveys (VHLSS), identifies the gap by examining: (1) PFES impact of on households' income; (2) its interaction with households' energy consumption trajectories; and (3) its influence on energy behavior.

METHODS

Interviews with officials from the Lâm Đồng Forest Protection and Development Fund (FPDF) and the Lâm Đồng Department of Industry and Trade were conducted to investigate the current status of the PFES program, provincial energy production and consumption patterns. Three focus group discussions explore whether PFES can help promote the transition toward low-carbon energy consumption in Lâm Đồng Province.

Theoretically, households' energy use and transition depend on energy stacking (multiple energy sources), including income and other factors such as age, gender, occupation. To complement the qualitative data, the VHLSS 2010 and 2020 are used to construct nation-wide regression models examining the factors influencing household energy use for the rural areas where most PFES recipients live.

RESULTS

PFES implementation. In 2023, the PFES program in Lâm Đồng covered 400,000 hectares, accounting for 75% of the province's forest area. The total PFES revenue was VND 347,786 million with 93.09% paid to forest owners and the rest 6.91% retained for management costs. The PFDF collaborated with Forest Rangers to monitor forest areas and oversee payment activities.

PFES and forest protection awareness. Interviews confirm that PFES has raised local awareness of forest conservation. Over the past decade, illegal logging and deforestation in Lâm Đồng have decreased, due to enhanced patrolling and community engagement. PFES provides payment to locals for forest protection and strengthening forest conservation efforts.

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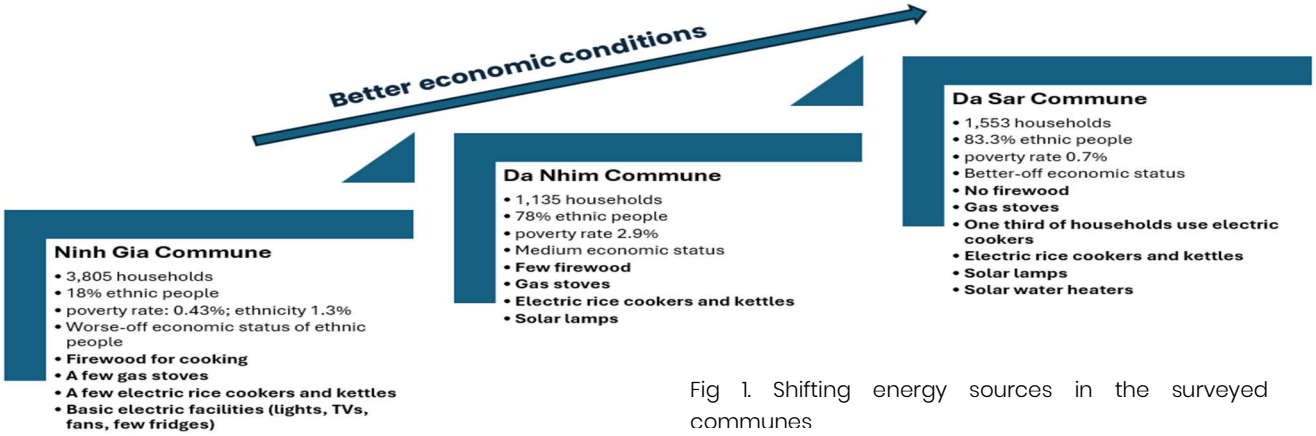

Fig 1. Shifting energy sources in the surveyed communes

Impact of PFES on income and livelihoods. PFES improves earnings, particularly for ethnic minorities in Lâm Đồng, with average annual income of 25 million VND per household in 2024, contributing 10% - 20% to their total income. However, its impact is limited by several factors, such as patrolling caps (30 hectares per household) and lack of focus on the poor. PFES payments range widely from 445,000 to 2,723,000 VND/ha. In low-rate areas, each family may earn less than 14 million dongs annually, offering minimal income support.

Impact of PFES on energy choices. Most surveyed households rely on firewood, gas, and grid electricity, with low adoption of renewable energy such as solar power due to high initial costs. Communities with better economic conditions are likelier to use less firewood and more LPG, grid electricity, and solar power for energy consumption (Fig 1).

Energy transition of rural households in Vietnam. Rural households shift toward low-emission energy between 2010 and 2020, consuming more petrol, LPG, and electricity, and less kerosene, firewood, and crop residues—following the fuel stacking theory. Wealthier, higher educated, female-headed households prefer modern energy while the poor and ethnic minorities rely more on biomass. Energy choices also depend on fuel availability, with agricultural and forestry households using more biomass. Though not directly modeled, PFES influences household energy transition by raising income.

Conclusions. The PFES program in Lâm Đồng has enhanced forest conservation and household incomes, though its impact is limited by low PFES rates in certain areas and limited patrol cap. Energy transition in rural areas follows a fuel stacking pattern: wealthier, more educated, and female-headed households utilize low-emission fuels, while poorer and ethnic minorities rely on biomass. Despite of good access to electricity and gas, biomass availability still affects fuel choice. Enhancing the long-term impact and ensuring a just energy transition require addressing patrol cap, improving access to renewable energy, and raising awareness about energy transition.

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RECOMMENDATIONS

- The Ministry of Agriculture and Environment (MAE) in coordination with provincial FPDFs should steadily increase the patrol cap to improve PFES income, a feasible option with expected impactful outcomes for provinces with a majority of state-run Protection Forest Management Boards among beneficiaries, like Lâm Đồng.
- Ministry of Industry and Trade (MOIT), Ministry of Finance (MOF) and Vietnam Electricity (EVN), with support from MAE and local authorities should offer preferential electricity prices to PFES households, especially in hydropower areas, to boost electricity use. Funding can come from hydropower, EVN cross-subsidies, and government or international climate funds.
- The MAE, MOIT, MOF, and Ministry of Construction (MOC), in coordination with Ministry of Foreign Affairs (MOFA), should provide training programs to raise awareness and promote low-emission energy with support from local authorities, NGOs, EVN, and the Ministry of Education and Training. Funding can come from government budget allocations, private CSR, and carbon credit revenues, and international climate finance like REDD+.

[i] Nguyen, T.V.H., Nguyen T.H.N., Nghiem P.T. (2025). Payment for Forest Environmental Services and Household Energy Consumption Trajectory: The case of Lâm Đồng Province, Vietnam, *AFD Research Paper* 362.

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