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FROM BIOMASS TO LPG: ENERGY TRANSITION IN RURAL COMMUNITIES OF PATAGONIA, ARGENTINA AND COVID-19 RISKS

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Problematic

The rural inhabitants of the northwest of Argentine Patagonia are affected by constant environmental and economic disturbances:

- 1) Extreme temperatures during prolonged winters and need for heating.
- 2) Lack of firewood, aggravated by drought and volcanic ashes from Puyehue-Cordón Caulle Volcanic Complex.
- 3) Intense snowfalls that cause great livestock losses.
- 4) Adjustments of their income to the global market parameters for the sale of wool.
- 5) Presence of COVID-19, consequently: a) insufficient access to internet at homes and lack of tools (computers) for the virtual classes; b) uncertainty about the health of their families and the provision of external goods, for example, fuel.

Background

In the rural communities of Patagonia, firewood is the only source of energy for heating; this makes them energy-vulnerable populations due to the scarcity of the resource, the price, the lack of other energies and the unfavorable environments for human life (Cardoso et al., 2012; 2013; 2015). It is necessary to address this issue from scientific research and propose local solutions.

The transition towards the use of other energies is not linear, but rather, families acquire multiple use strategies, in which they incorporate new resources and technologies or fuel stacking (Masera et al., 2000; van de Kroon et al., 2013). Fuel consumption is determined

by availability, its characteristics, by the end-use device and by socio-cultural and economic contexts.

In Argentina, near 60% of the urban population has a natural gas supply mainly in Patagonia (González et al., 2007). However, many communities depend on fuelwood for heating, which is scarce and expensive.

On the other hand, regional studies show that the lack of thermal insulation in housing envelopes leads to a high energy demand to maintain a comfortable temperature (González, 2014; Schueftan et al., 2016). Therefore, it is necessary to increase thermal efficiency and ensure the provision of fuels to reach a temperature for the wellness of families.

Through an analysis of the consumption of fuel, before and after an LPG installation government program in relation to the homes thermal quality of the Laguna Blanca community, relevant results were obtained.

Main Findings

Since 2014, a government program for the installation of LPG (100% subsidized + 1 device per home) was implemented in some rural communities to replace the use of firewood.

Before 2014, prior to the installation of LPG, a family consumed 13 kg of firewood per day in the summer season (3 months), 20 kg in an intermediate season (3 months), and 26 kg of firewood per day in a prolonged winter (6 months), totaling 107 GJ/year of firewood.

After the 2014 program, the estimate for current LPG consumption is 1,895 kg in 6 months of intense heating and 1,028 kg of LPG in the other half of the year. This consumption results in a gross calorific value of 144 GJ/year only from LPG.

Before 2014, the annual energy consumption per firewood was 110 GJ per household, while in 2017 it was 144 GJ of only LPG (not counting firewood as a supplement), which represents a 31% increase in energy units.

Inhabitants supplement LPG with firewood in accordance with the theory of “fuel stacking” for rural communities with traditional use of firewood.

The thermal quality of the houses is very low with significant air inlets through doors, windows, and ceilings.

By improving the thermal insulation with economic materials, the state would recover the investment in current LPG in 2 years.

Policies on fuel replacement contributed positively since they are a process of social assistance for a vulnerable sector that reduced its spending on fuel.

An outbreak of COVID-19 in any community would increase the use of health services and the uncertainty of the affected population.

General Recommendations

The 2019 Pandemic caused by the SARS-CoV-2 virus has exposed ingrained inequalities in our societies. In this sense, the rural communities of Patagonia are facing a new threat.

Based on these results it is recommended:

Thermal insulation of rural houses to maintain a comfortable and constant temperature of 18°C to 21°C (OMS).

Strengthen programs and ensure access to LPG and firewood. Place more devices per household.

Support the role of women in energy policy decisions. For this, it is necessary that they be able to participate in the design, implementation and monitoring of public policies, and energy programs.

Conduct monitoring of devices used for heating and cooking since devices that generate intramural emissions could increase people's susceptibility to viral infection.

Evaluate and monitor the health of the inhabitants and provide the necessary inputs and corresponding training.

Final Considerations

There is a need for a fair transition and affordability of energy services, in which vulnerabilities should be addressed within the socioecological context. This requires specific actions that include the provision of information, agile financing mechanisms, investment in energy infrastructure, targeted subsidies, and user co-participation.

It is necessary to consider access to energy as a human right. New rights mean new ways of conducting politics. In this way, access to energy, quality and security should be part of the concept of social justice and therefore of the concept of inequality.

The consideration of the energy efficiency of homes, production and consumption of local renewable energies, and their equitable distribution, is the main axis for other basic rights

such as access to education or health. By considering these factors, massive and unavoidable disturbances such as the COVID-19 pandemic would be cushioned by a state of resilience from the populations, understood in this case, as being prepared for possible unexpected events.

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