



CENTRO DE INVESTIGACIONES
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Promoting clean multiple-fuel cooking for improving rural livelihoods in Mexico

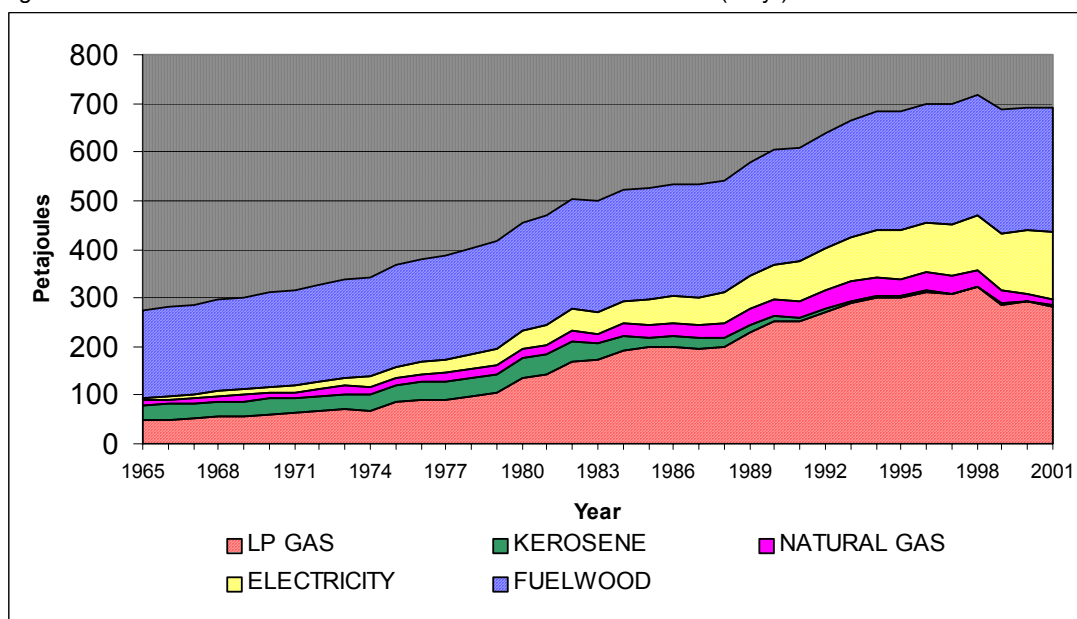
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An innovative, field-tested, participatory and replicable multiple-fuel cooking model is being developed by CIECO-GIRA in collaboration with the Energy and Resources Group of the University of California. It focuses on the improvement of rural livelihoods in Mexico and it will facilitate the transition of poor households and micro enterprises from the Central Mexican Highlands to a cleaner and more sustainable pattern of energy use.

Introduction

Currently, about 25 million people cook with fuelwood in rural Mexico. Most of them are located in the highlands of Central and Southern Mexico – such as the Purepecha Region in Michoacán State. This region shows an intensive pattern of fuelwood use, which dominates the energy use pattern both in households as well as in thousands of micro-enterprises devoted to hand-made tortilla making (Figure 1). Large quantities of fuelwood are used in traditional open fires, with negative consequences for local inhabitants. Particular concerns come from the practice of tortilla making, which accounts for about half of total fuelwood consumption, and requires women to spend 2-4 hr/day inhaling the smoke from the fires, and up to 8 hrs/day for those women devoted to tortilla-making for selling. Local forests are highly bio-diverse but increasingly degraded with negative local and global environmental impacts. During the past two decades, there has been an increasing penetration of LPG, particularly on the larger urban centers and the higher income levels. However, rather than switching completely to LPG, economic and cultural reasons favor a long-standing pattern of multiple fuel use, with very few savings in fuelwood and health benefits.

Figure 1: Fuelwood Use in the Residential Sector- Mexico 1965-2001 (PJ/yr)



GIRA, a local non-governmental organization, the Centro de Investigaciones en Ecosistemas, UNAM (CIECO-UNAM), and the Energy and Resources Group of the University of California, Berkeley (ERG) started 10 years ago a long-term partnership to promote a cleaner and more sustainable pattern of energy use in rural households, based in the concept of **multiple fuel cooking**. As a result of the partnership, detailed studies on the patterns of household energy use, and their social, cultural, economic, and environmental implications have been undertaken. Primary data on IAP exposure levels and associated health problems derived from the use of traditional devices and the mitigation associated to cleaner devices have been collected. A process of technology adaptation-innovation has led to the development of smoke-free Lorena-type cookstoves that are well adapted to the conditions of local cooking (Figures 2 and 3). Undertaking a user-centered approach, with strong emphasis on women's training on indoor air pollution (IAP) issues, an integrated multiple-fuel model has been promoted initially, which allows capturing the benefits derived from both modern fuels as well those from cleaner and efficient biomass devices. The resulting pattern of household energy use is highly resilient with tangible environmental, economic and health benefits.

Figure 2: Traditional Cookstoves in Michoacán, Mexico



Figure 3: Improved "Lorena" Cookstove



Objective

To tackle the above-mentioned problems CIECO-GIRA and ERG have launched a 3 year project funded by the Shell Foundation Household Energy and Health Program.

The project will set up an innovative, field-tested, participatory, and replicable multiple-fuel cooking model focussing on rural women to facilitate the transition of poor households and micro enterprises from the Central Mexican Highlands to a cleaner and more sustainable pattern of energy use. Specifically, the project will work simultaneously with end-users, small-entrepreneurs, tortilla-making micro-enterprises, local NGO's, research institutions, and local authorities to:

- a) facilitate the dissemination and adoption of clean and efficient biomass cookstoves, through self-replicating mechanisms;
- b) strengthen local tortilla-making micro-enterprises, with direct implications for local poor women;
- c) promote the adoption of LPG, which complements rather than substituting biomass fuels;

- d) reduce the environmental impacts of present fuelwood consumption and harvesting; and
- e) educate local women on the associated health problems of indoor air pollution.

Mechanism

The project team has developed an integrated biomass cookstove dissemination strategy that includes a participatory tailor-made training package on indoor air pollution (IAP) and stove O&M issues, reliable, field-tested and smokeless biomass cookstoves adapted to local conditions, a financial incentive program, management support for cookstoves builders and micro-enterprises, and an intensive promotional campaign with relevant stake holders. A financial incentive –based on a partial and decreasing subsidy on stoves front-costs- will be used to establish a market of efficient cookstoves of critical size that will allow local entrepreneurial stove builders to continue the dissemination process in the long-run.

Deliverables

The project will deliver a fully integrated model for improving the living conditions and sustainability of energy use in rural households and micro-enterprises. It will allow disseminating 1 500 clean and efficient cookstoves for household use and 70 cookstoves for tortilla-selling micro-enterprises. It will help establish at least 25 small entrepreneurs devoted to stove construction and will train local women in IAP problems and basic mitigation measures. Finally, the project will provide new primary data on GHG emission factors and IAP in the conditions of Latin-American households. The project will also document and promote the process in forms accessible to other project promoters, local and international institutions and governments. It will deliver a mechanism by which the model can be replicated throughout Mexico, and possibly to other countries of Latin America.