



CIECO

Small-Scale Bioenergy Technologies: the Case of Cookstoves

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Road Map

- The Context
- Rural Technology and Sustainable Development: The “Patsari” Cookstove Case Study in Mexico
- Lessons Learned

More than 2 billion people cook with biomass...



The need for alternatives ...



Between Conventional
Modernization..

not always a successful
or a one-way
story

Abandoned LPG stove in rural Mexico

and traditional technology



Versatile, cheap, adapted to cooking practices but high polluting and resource intensive...



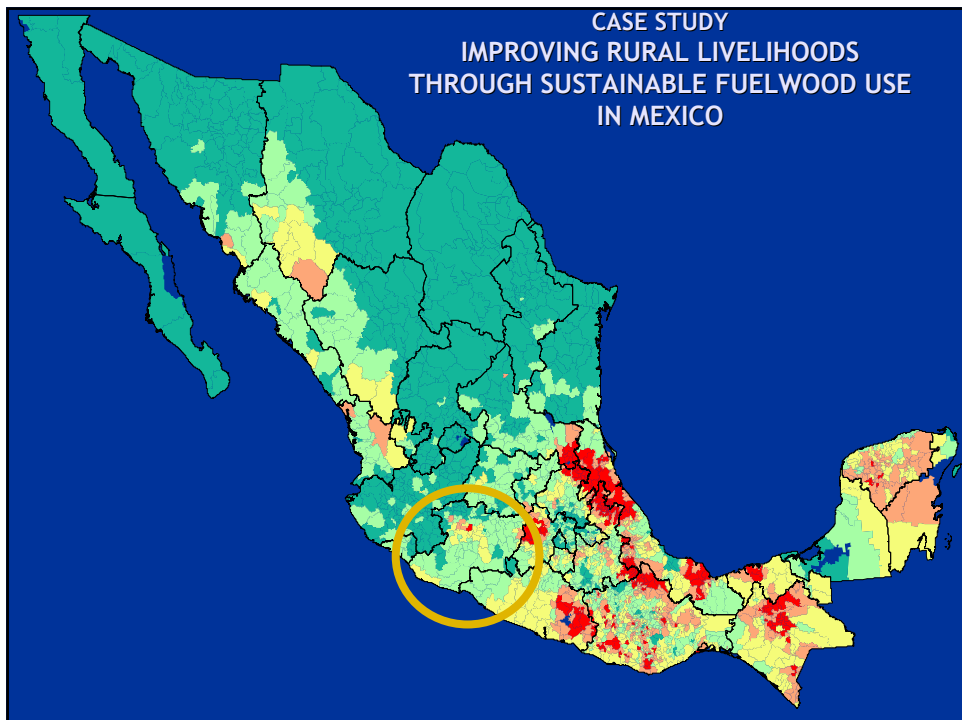
Increasing multiple fuel use, but health benefits not always accrued

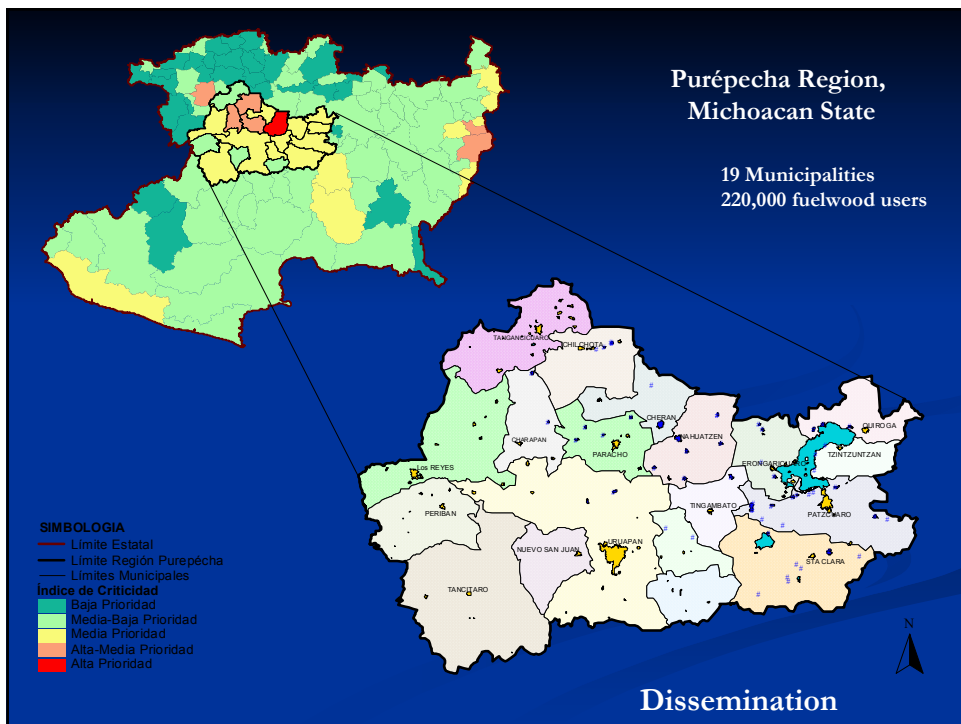
The Case for **Efficient Biomass Cookstoves**



A new generation of cookstove programs is being implemented around the world

- Integrated and Innovative Approaches
 - Technology innovation
 - Market Development
 - User Needs
 - Health and Environmental Benefits
- Strong links to Sustainable Development
 - Technology is only one component
 - Focus on improving livelihoods of local people (women)
- A global “crusade”
 - Global Partnership on Indoor Air Pollution (WHO, EPA..)
 - Shell Foundation Program on Household Energy





Project Goals

- 1,500 efficient fuelwood cookstoves in 30 villages disseminated
 - 9,000 people direct beneficiaries
 - 90,000 people indirect beneficiaries
- 30 independent stove builders micro-enterprises established
- 70 tortilla making small-industries supported
- 3 regional suppliers of stove parts (metal and ceramic)
- Generate a model for stove dissemination replicable in other regions

Project Components



Patsari Stove

- Optimized design of combustion chamber and tunnels
- Use of a mould (2 hr construction)
- Custom designed parts for durability
 - Ceramics Stove Entrance
 - Metal “comales”
 - Metal Chimney pieces made locally
- Stove cost (16 dlls materials plus 14 dlls labor)
- 60% fuelwood savings in tortilla making
- 80% reductions in IAP



Patsari Stove



Project Components



Technological Innovation Cookstove Laboratory



Design
mould / materials / dimensions



Stove Performance Tests



Participatory work
(users, technicians, researchers)



Measurements
(Combustion / temperature)

Design Materials



Local mixtures



Metal Parts



Ceramic Parts



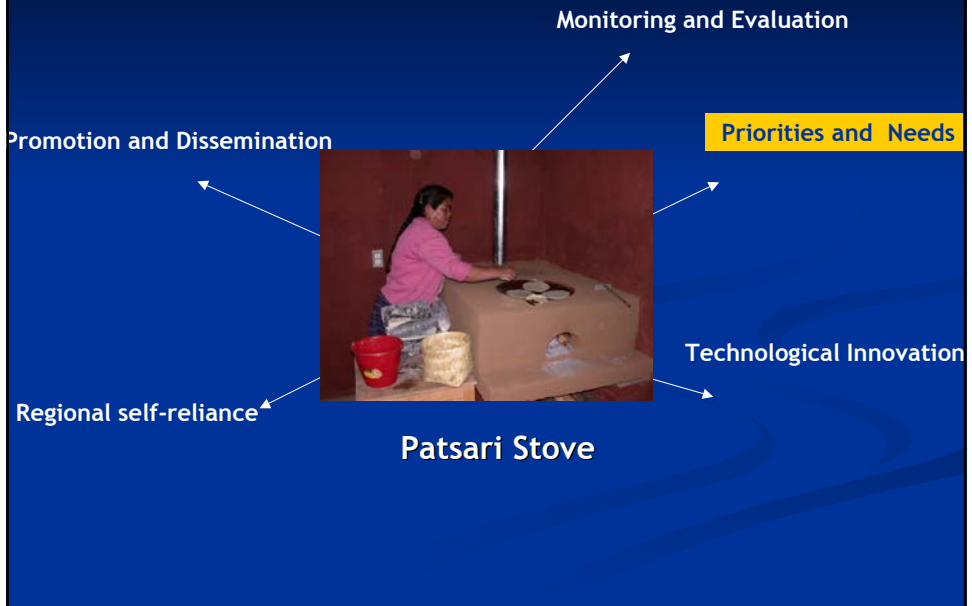
Stove Performance Tests



Emission and Efficiency Measurements



Project Components



Priorities and User Needs



Easy to fire



Multi-tasking



Cookstove able to cook tortillas



Clean Kitchen

User Adaptations



Bricks and Tiles Finishing



Project Components

Monitoring and Evaluation

Promotion and Dissemination

Priorities and Needs



Technological Innovation

Regional self-reliance

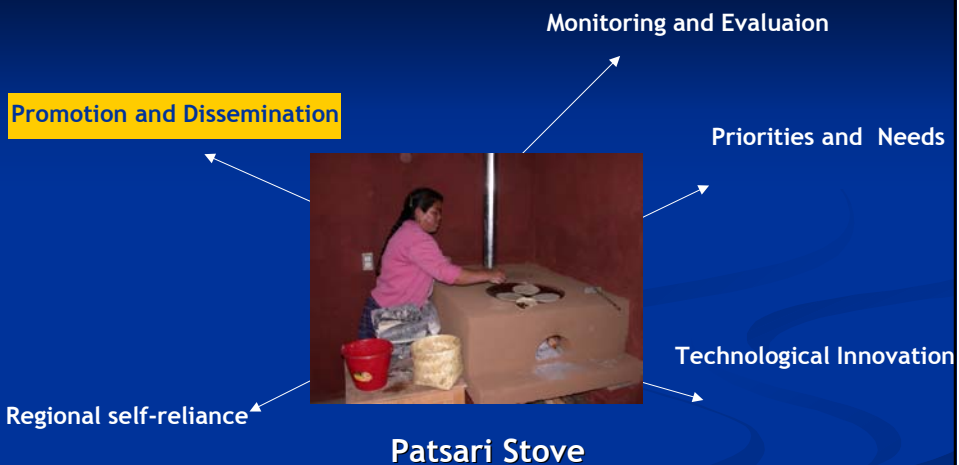
Patsari Stove

Monitoring and Evaluation Program

- Monitoring and Evaluation of the Dissemination Program
- Stoves Performance
- User Preferences and Attitudes
- Indoor Air Pollution
- Health Impacts



Project Components



Promotion and Dissemination

- Participatory schemes
 - Establishment of women groups (50 users)
 - Users Training:
 - Health issues
 - Fuelwood use
 - Stoves use and maintenance
- Micro-financing
 - Payment in installments
 - Peer-pressure schemes



Awareness Workshop



Micro-finance Workshop

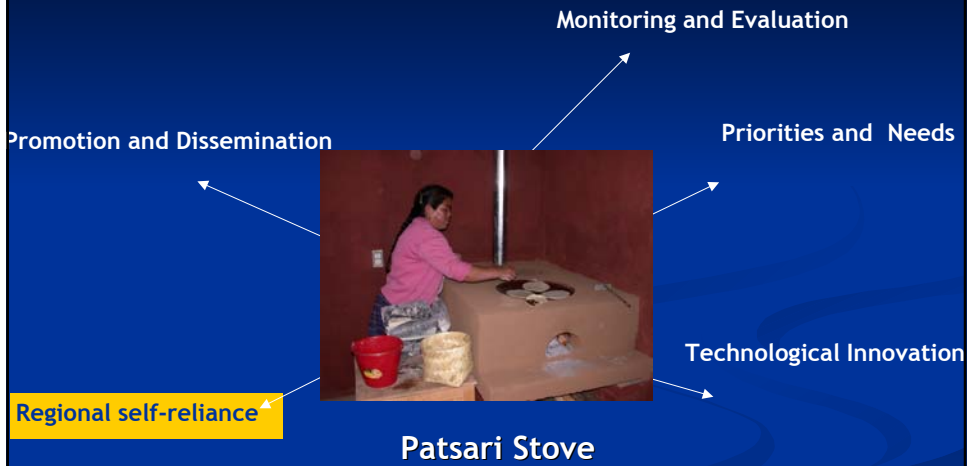


Community Promotion



Training and formation of user groups

Project Components



Regional self-reliance

“Tortilleras”



Cookstove Builders

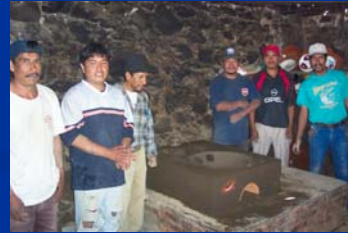


Suppliers of Stove Materials



Cookstove Builders

- Establishment of a village cookstove builder operation (30 in total)
- Training
 - Stoves construction, use and maintenance
 - Health and environment
- Financial Incentives:
 - A mould for free
 - Advise and support to market creation (50 cookstoves per village)
 - Users' receive 20% discount for the first 50 stoves



By the ending of the program, builders continue making stoves on their own

Lessons Learned

- **Technology**
 - Modernization is not a linear or simple process → from fuel switching to multiple cooking fuels
 - The “symbolic” value of technology is VERY important (having a “nice looking kitchen” vs “saving fuelwood”)
 - Energy or environmental concerns are seldom at the TOP priority for users
 - A continuous process of innovation/adaptation and strict monitoring is KEY to success
- **Approach**
 - The technical device itself is ONLY one piece in the puzzle... need to have a systemic view
 - Involvement of local users (women) and people in R&D and dissemination is critical
 - Locally based and operated micro-financing is key to adoption



International Seminar on Bioenergy and Sustainable Rural Development



160 participants from 30 countries, 5 working groups, CD available



- Launched at the Bioenergy Seminar
- Member of the National Solar Energy Association
- Collaboration with FAO/ LAMNET/ World Biomass Congress and others
- Facilitate exchange of experiences and promote bioenergy projects
- WEB page
<http://www.anes.org/bioenergia/index.html>