

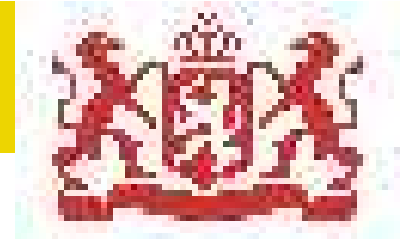


Energy research Centre of the Netherlands

Village electrification through renewable energy in India

Heleen de Coninck, COP 11, December 6th, 2005





The VERI project

Joint work of ECN and TERI

- Contributions from READ Foundation and BASIX

Inputs from Roundtable during the DSDS 2005 and discussions with Ministries and other stakeholders

Short survey in tribal villages in Orissa, India

Evaluate the current policy for sustainability

Develop implementation model



Village electrification in India

Household electrification:

- 2001 Census India: 44%
- Other sources: 30%

Village electrification number (Ministry of Power): 88%

- Number contested

New definition and new survey by TERI should give resolution

Village electrification in India

Indian government aim:

- In 2007, all villages electrified
- In 2012, all households electrified

25,000 villages identified under responsibility of the Ministry of Non-conventional Energy Sources (MNES) - renewable energy

Tribal villages: 11,000 of those 25,000 with quite common characteristics

Tribal villages in India

Subsistence farming (rice)

Remote from markets

Very low income

Additional sources of income after energy:

- Tamarind processing
- Mango processing, pickle making
- Leaf plate making

Strong community cohesiveness

Active Self Help Groups in place

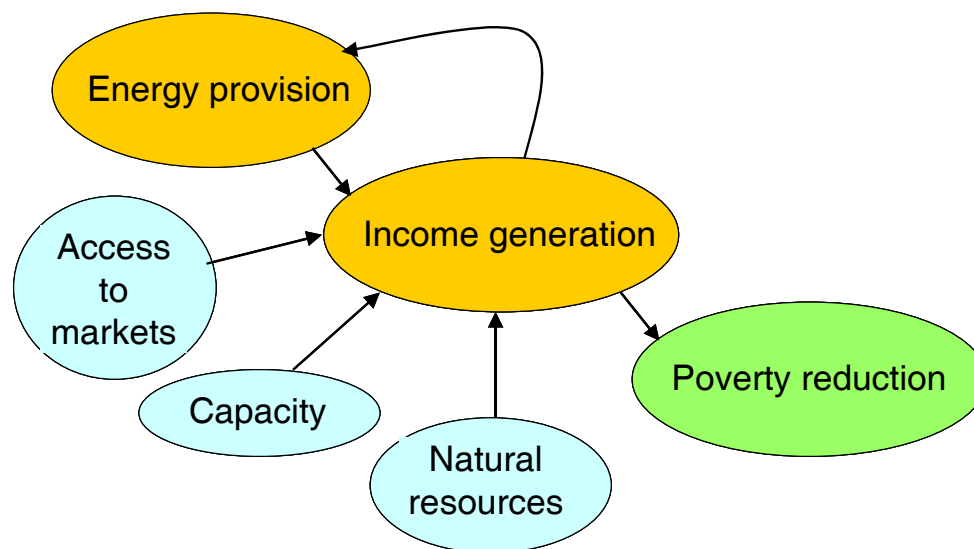


Income generation

Energy necessary for income generation and subsequent poverty reduction, but also:

- Access to markets
- Natural resources
- Capacity and entrepreneurship
-

Perspective for income generation villages:
Medium to low



Essential elements of "sustainable" energy provision

Usefulness - appropriate size, technology and energy

Ownership - sense of responsibility

- connected to usefulness

Affordability - relative term!

- sometimes lack of energy access is due to lack of income
- sometimes for lack of availability of services

Post-commissioning - Operation & Maintenance

- Capacity for simple repair
- Access to service and savings for more demanding repair

Policy: should take into account these factors!

MNES policy

Location-specific technology

Capital subsidy (up to 100%!)

Local capacity building

Fit?

- Ownership: Very high subsidy usually not productive
- Affordability: O&M costs too high?
- Post-commissioning: local capacity building. Costs unclear

**Oversubsidise many, and undersubsidise the most needy:
more tailor-made approach required**

Alternative implementation model

Upfront inquiry: identify income levels and income generation perspectives

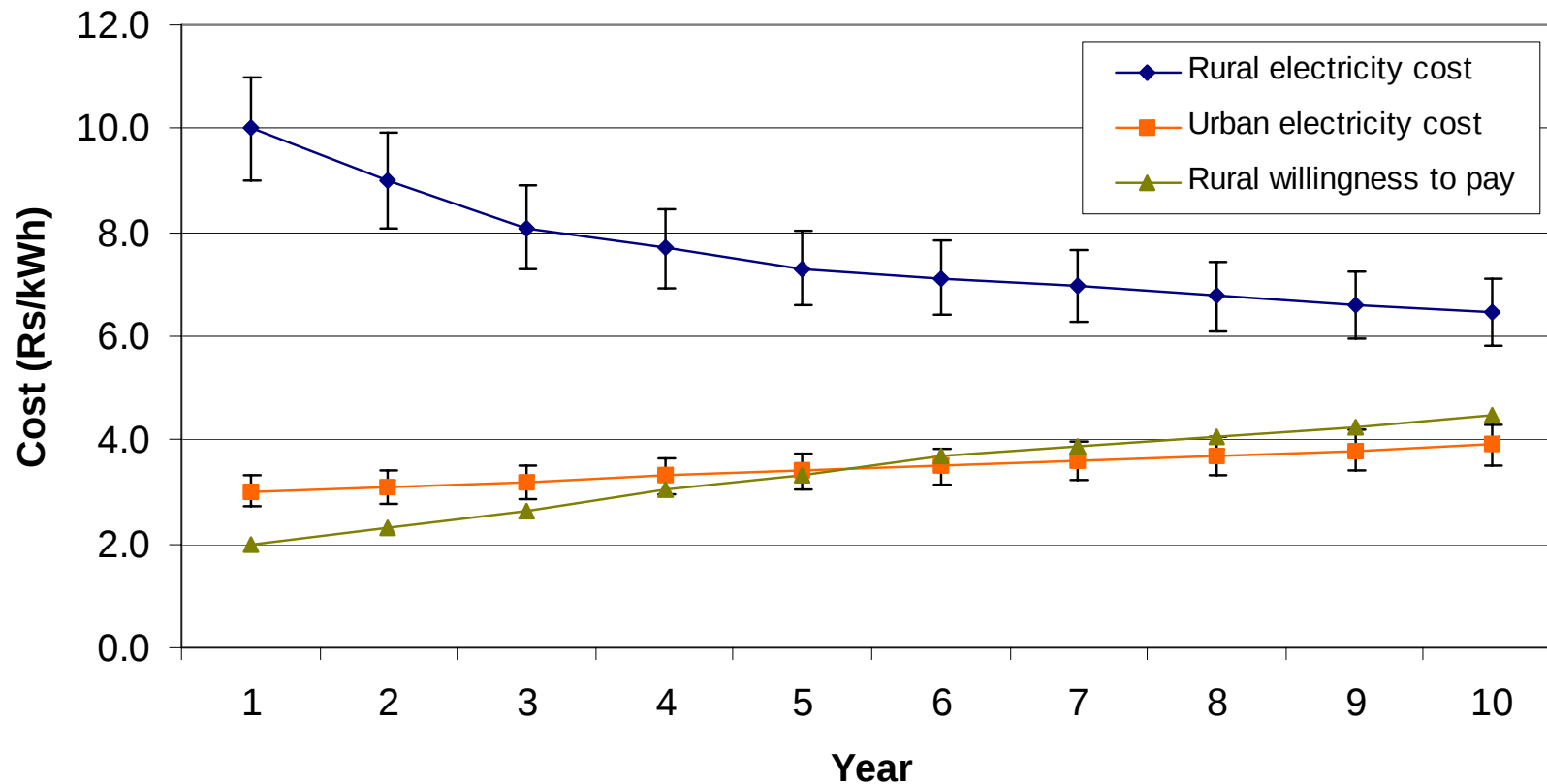
Costs of rural energy provision: decrease through learning

Government spending effective

- Middle income - able to pay, ESCO provision, per kWh initial subsidy
- Low income - high perspective: unable to pay capital costs and O&M costs at the start, but income generation expected shortly after energy provision
- Low income - low perspectives: unable to pay, even O&M

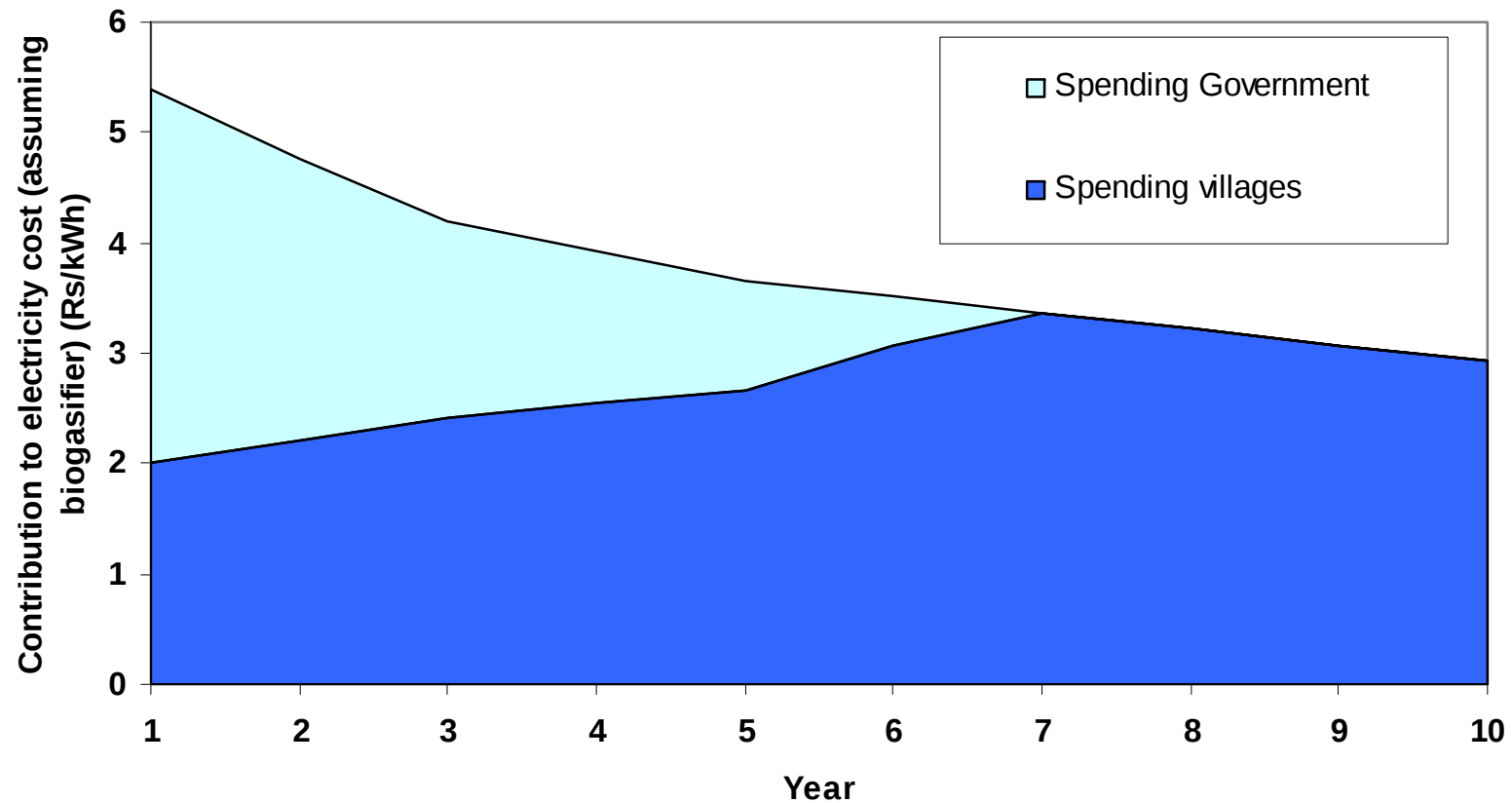
Assist business development

Development of electricity prices



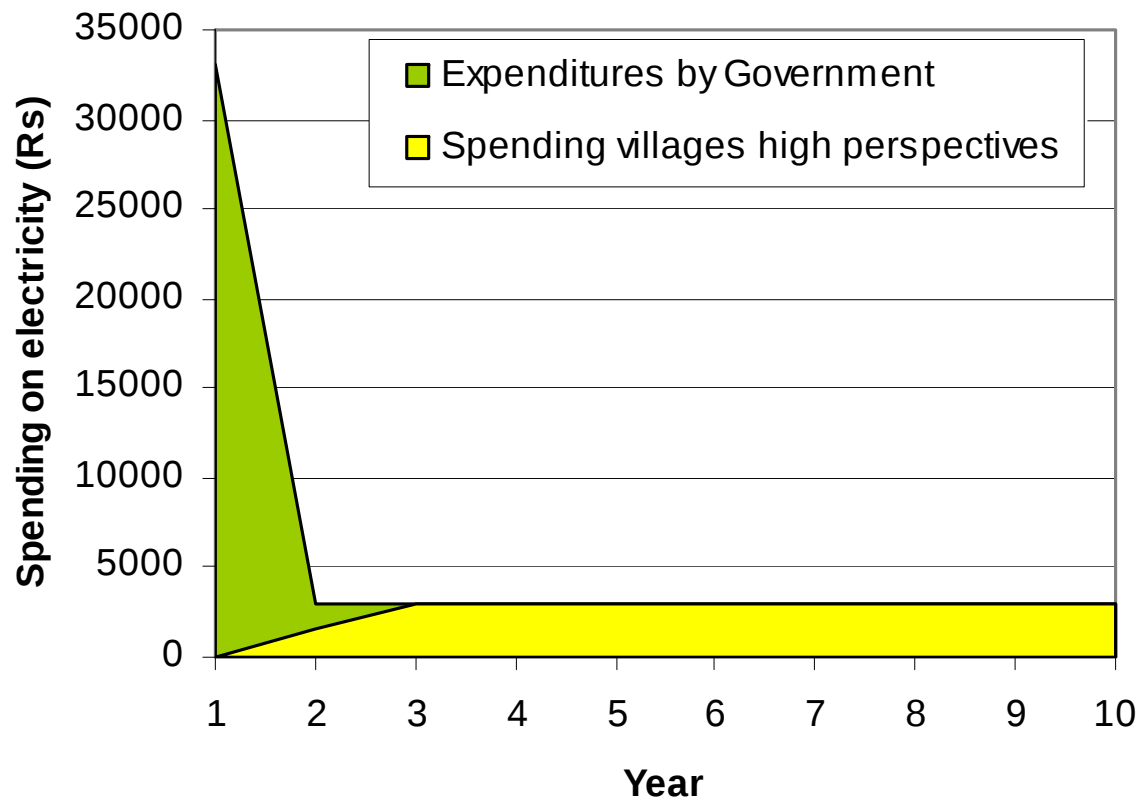
Rural electricity costs higher than urban

Implementation model - middle income



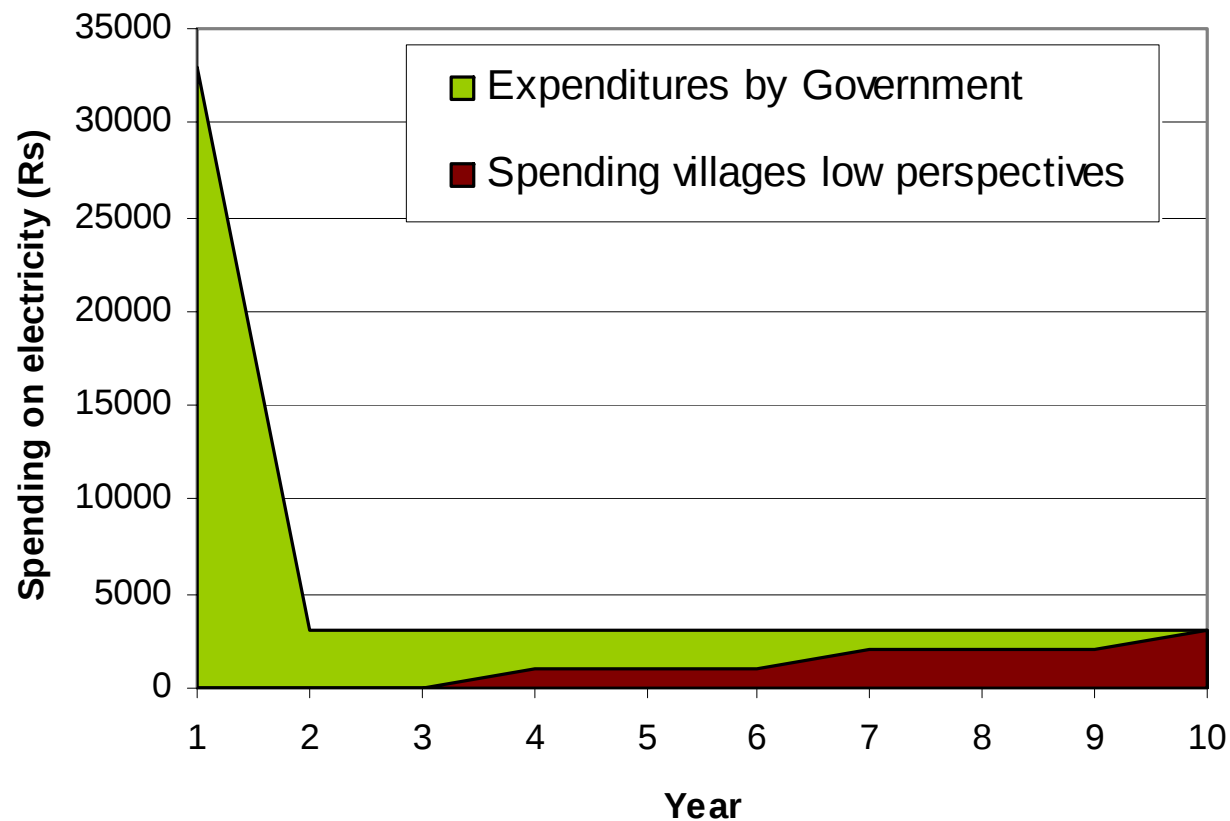
Public-private partnership: ESCO provides energy

Implementation model - low income, high perspectives



Combination with business development services

Implementation model - low income, low perspectives



Development path established upfront?

Main messages

Sustainable energy provision requires ownership, affordability, and post-commissioning arrangements

Capital subsidies alone oversubsidise many, undersubsidise most needy

More tailor-made model proposed, taking into account sustainability aspects and maximising effectiveness of government spending

Perspective for income generation is essential and should be evaluated upfront