Attaining universal energy access for social change:

Evaluating programs and policies to achieve energy transition for economic and social transformation

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Energy Access: Current Status

Electricity Access

- 7% of the AP region (325 million people) live without electricity access
- Current progress suggests this will reduce to 1.3% (66 million people) by 2030
- While progress is strong, greater action is needed to reach the last mile
- Issues remain in terms of electricity quality

Clean Cooking

- 45.4% of the AP region (2 billion people) live without electricity access
- Future projections suggest this will reduce to 32.3% by 2030
- Drastic policy action is needed to address this gap.

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Rural Electrification

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Questions we will explore:

What is the quantified impact of electricity access on socio-economic outcomes?

How do impacts vary based on electricity quality?

What specific programme elements result in change?

What are some of the unintended consequences of such programming?

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Insights from Development Literature

Electricity Access

Intermediate Outcomes

- Increased electricity use
- Information access
- Improved public resources

Long-term Impact

- Increased productivity
- Education gains
- Improved health

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So how do these benefits figure in real life?

Let's take a closer look based on evidence from impact evaluations in the region…

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Why impact evaluation?

- Informs on the **impact** of a policy, programme or other action. Impact may be:
  - Positive/negative
  - Direct/indirect
  - Intended/unintended
- Beyond measuring impact, seeks **causal attribution**: identifies how much of an impact was **caused by the policy/programme**.
- Uses rigorous experimental or quasi-experimental methodologies.

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Evaluation Findings: Who benefits most from rural electrification? *Evidence from India*

Author: Shahidur Khandker

Publication Year: 2012

Country: India

Programme: Rural electrification at the village level

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Results

Education

Girls with electricity attained 6 extra months schooling, boys attained 3.6 extra months

Income

38.6% increase in household income

Inequality

Richer households benefit more from electrification than poorer households

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Education

Electricity Access

Lights enable studying

Productivity increases free up time

Better Education

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Income

Electricity Access

Increased hours of productivity

Information

Better appliances for productive activity

Income Increase

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Inequality

Electricity Access

Income benefits reduce poverty

Wealthier households benefit more

Reduced Poverty with unequal growth

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Similar results were seen in other countries throughout the region

Based on studies from Bangladesh, Vietnam, Cambodia, and India, results were as follows:

Impact	Range
Increase in income	16 – 39%
Increase in children's education	1.5 – 8.5 months
Impact on inequality	Richer households benefit more from electrification than poorer households
Decrease on poverty	Evidence of poverty reduction in Bangladesh and India

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Clean Cooking

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Questions we will explore:

What is the adoption rate of different clean cooking fuels & technologies?

What specific programme elements result in change?

What are some of the research gaps that could help advance clean cooking?

What role can governments take in advancing clean cooking?

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Insights from Development Literature

Clean Cooking

Intermediate Outcomes

- Less air pollution
- Less time spent gathering fuel

Long-term Impact

- Increased productivity
- Women's empowerment
- Improved health
- Reduced deforestation

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Challenges of low adoption of Clean Cooking fuels & technologies

- Very little empirical evidence on how to boost adoption or impact
- Requires behavior change & cultural shift
- Fuel Stacking

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Technologies

Liquid Petroleum Gas (LPG)

Improved Cookstoves (ICS)

Biogas Digester

Source: myclimate Deutschland

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Evidence on ICS

Pros:

- Relatively cheap technology
- Easily deployed
- Doesn't require fuel change

Cons:

- Still requires fuelwood

Impact evaluations:

- Little evidence of impact on health and wellbeing
- Maintenance challenges led to low uptake
- Improper usage resulted in little reduction in emissions compared with traditional stoves
- Extensive training and follow-up activity can improve results

Source: NEXLEAF ANALYTICS

Source: The World Bank

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Evidence on Biogas Digesters

Pros:

- Relatively cheap technology
- Agriculture co-benefits

Cons:

- Requires livestock
- Cultural resistance
- Maintenance requirements

Evidence based on impact evaluation:

- High uptake
- Reduced expenditure on firewood
- Less time spent gathering fuelwood

Source: Soapboxie

Source: USAID

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Evidence from LPG

Pros:

- Culturally accepted/well-regarded

Cons:

- Regular distribution channels require strong infrastructure and transportation

Evidence based on impact evaluation:

- High uptake resulting in strong potential for improving health and reducing pollution
- The issue of fuel-stacking persists

Source: DownToEarth

Source: The Economic Times

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Policy Opportunities

Many countries lack a comprehensive approach. Initiatives are undertaken at the project level, often without coordination. Comprehensive government action could accelerate action and magnify impacts.

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Evidence Gaps for Future Research

Trends in fuel stacking & how to address it

Best practices in positive social influence & how to effect behavior change

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Conclusions

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Electricity Access Conclusions

Bundling electrification service with other amenities can magnify impacts. Public amenities (schools, hospitals, etc.)

Maintaining and continuing to improve electricity quality is critical to fully realizing potential benefits

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Clean Cooking Conclusions

"Make the clean available instead of trying to make the available clean" – Sagar and Smith (2014)

Gender-sensitive programming

Contextualize based on resources, costs, cooking practices etc.

Base technology selection on evidence and evaluation to boost uptake

Flexible pilot programmes with feedback loops & ability to evolve

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Upcoming Work of ESCAP

Systematic reviews with meta-analyses on electricity access and clean cooking

- Methodical review of all rigorous evidence
- Quantified impacts based on all evidence
- Comparison how impacts varied based on geography, technology selection, and other programme elements

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