Renewable Energy Projects in Rural China: A Systemic Capacity Approach

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SPREE, UNSW
Overview

1. What is capacity development?
2. Overview of case studies
3. Analysis of case studies
4. Lessons learned
‘Giving a fish’

1. The community may not be able to operate and maintain it
2. The community can’t do it themselves next time
3. The community may not value it
4. May take local jobs!
‘Teaching to fish’

Is this capacity development?
If you give me a fish
you have fed me for a day.
If you teach me to fish
then you have fed me until
the river is contaminated
or the shoreline seized
for development.
But if you teach me
to organize
then whatever the challenge
I can join together
with my peers
And we will fashion
our own solution.

- Ricardo Levins Morales
Approaches to Capacity Development

- Organisational approaches
- Institutional approaches
- Systems approaches
- Participatory processes approaches

Based on Lusthaus et al., 1999.
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## Background on Inner Mongolia Autonomous Region, China

<table>
<thead>
<tr>
<th></th>
<th>IMAR</th>
<th>China</th>
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</thead>
<tbody>
<tr>
<td>Population</td>
<td>24.22 million</td>
<td>1.33 billion</td>
</tr>
<tr>
<td>Area</td>
<td>1,183,000 km²</td>
<td>9,596,961 km²</td>
</tr>
<tr>
<td>Population density</td>
<td>20.2/ km²</td>
<td>139.6/km²</td>
</tr>
<tr>
<td>GDP</td>
<td>US$145.05 billion</td>
<td>US$4.909 trillion</td>
</tr>
<tr>
<td>GDP per person</td>
<td>US$5,561</td>
<td>US$6,600</td>
</tr>
<tr>
<td>HDI</td>
<td>0.803 (high)</td>
<td>0.772 (medium)</td>
</tr>
<tr>
<td>Electrification rate</td>
<td>-</td>
<td>98 %</td>
</tr>
</tbody>
</table>

## Brightness Program, China

<table>
<thead>
<tr>
<th>INSTITUTION</th>
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<th>SCALE</th>
<th>LOCATION</th>
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</thead>
<tbody>
<tr>
<td>State Development Planning Commission (now the NDRC)</td>
<td>1996 – 2010</td>
<td>100W/ person for 23 million people in remote areas using wind and PV</td>
<td>&gt; 106,000 people* for pilot projects</td>
<td>Gansu, Inner Mongolia, Tibet, Xinjiang &amp; Qinghai</td>
</tr>
</tbody>
</table>

* Assuming 4 people/ household
A typical solar PV / wind hybrid household system
Inverter and battery box for PV/ wind hybrid household system
Local PV/wind business:

1. retail shop
2. Installation
3. repairs
Township Electrification Program, China

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<tr>
<td>National Development &amp; Reform Commission (NDRC)</td>
<td>2001 – 2003</td>
<td>Provide electricity via renewable energy to 1061 townships that could not be feasibly reached by grid extension.</td>
<td>~ 1 million people</td>
<td>Xinjiang; Qinghai; Gansu; Inner Mongolia; Shaanxi; Sichuan; Hunan; Yunnan; Tibet</td>
</tr>
</tbody>
</table>
Township Electrification Program: Centralised System
1. Second-hand PV panels for sale
2. Supplementary power source at general store
3. Empty school buildings
## REDP, China

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<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Development &amp; Reform Commission/ World Bank/ Global Environment Facility</td>
<td>2001 – 2008</td>
<td>Reduce the cost of PV systems, improve PV product quality, develop the potential rural PV market and improve after-sale services for PV systems in remote rural areas.</td>
<td>1.61 million people*</td>
<td>Inner Mongolia; Gansu; Qinghai; Xinjiang; Tibet; Sichuan; Ningxia; Shan‘xi and Yunnan.</td>
</tr>
</tbody>
</table>

* Assuming 4 people/household
Timeline of Projects

- Brightness: 1995-2010
- Township: 2003
- REDP: 2000-2008
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Analytical Framework: The RE Capacity Pyramid

- Tools
- Skills & Knowledge
- Organisational Structures
- Sectoral Networks
- Institutional Environment
Tools

**Brightness Program**
- Household wind/PV hybrid systems
- Subsidy

**Township Program**
- Wind/ PV hybrid mini-grid
- Initial grant

**REDP**
- Household wind/PV hybrid systems
- Subsidy
Skills & Knowledge

**Brightness Program**
- End-users: excellent
- Technicians: excellent

**Township Program**
- End-users: poor
- Local technicians: poor
- Engineers: excellent

**REDP**
- End-users: excellent
- Technicians: excellent
Organisational Structures

Brightness Program
- Technicians located in townships
- Established ‘Brightness companies’ through grants

Township Program
- Operator located in township
- Engineers located in capital city

REDP
- Technicians located in townships
- Participation from ‘Brightness companies’
Sectoral Networks

**Brightness Program**
- Majority of supply chain located in IMAR
- Monopoly sales & service network by design

**Township Program**
- Majority of supply chain located in China

**REDP**
- Majority supply chain located in IMAR
- Monopoly sales & service network in practice
Institutional Environment

**Brightness Program**
- Long-term, coherent policies
- Linkages with other sectors through NDRC
- Favourable macro-economic environment

**Township Program**
- Good policy environment, but project did not fit with other RE in IMAR
- Needed more time for planning & consultation with other sectors
- Favourable macro-economic environment

**REDP**
- Flexible implementation meant that project fit with other RE in IMAR
- Long-term, coherent policies
- No linkages with other sectors
- Favourable macro-economic environment
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Conclusion: Success Factors

• Continuity, rather than individual projects, is most important.
• An incremental approach is useful.
• Capacity at the local, provincial and national levels.
• Resilience is an important property of capacity.
Take Home Message

1. It’s always better to assess and build on existing capacity.

2. Context matters!
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References

- China Data Center (2010). China Data Online, University of Michigan.
More References

• OECD, 2006. The Challenge of Capacity Development: Working Towards Good Practice. OECD.