Small-scale bioenergy initiatives in ASEAN +3: impact, barriers and opportunities

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Evidence from the ground
Small Scale Bioenergy Initiatives in ASEAN+3

- Revisited cases + new ones
- Analytical Framework
- Impact, barriers and opportunities for scaling up / replicating
Access to energy in six ASEAN +3 countries. Data taken from *Global Tracking Framework Report* (World Bank, 2013)
The Analytical Framework

• Stage 1: Market mapping
• Stage 2: Identification of sustainable livelihood outcomes
• Identification of bioenergy market system barriers, drivers and potential opportunities/interventions
Royal Government of Cambodia (National Strategic Development Plan)

MAFF

MEF

MIME

EAC

Demand for and access to electricity

Price of HFO/diesel

Feedstock

Rice husk

Generation

Gasification plant (REE)

Distribution

EDC

Retail

Battery charger service

Consumption

Businesses

Households

LEVEL 1 - MARKET CHAIN

Rice millers

Appliances/materials

Electrical appliances

LEVEL 2 – INPUTS, SERVICE & FINANCE

UNIDO, IED Invest Cambodia, REEEP, Total Cambodge, and SREP

MFIs/bank loans

LEVEL 3 - ENABLING ENVIRONMENT

PRACTICAL ACTION Consulting
<table>
<thead>
<tr>
<th>Improved Incomes by</th>
<th>HHs</th>
<th>Rice husk gasifier – Cambodia</th>
<th>Jatropha – Cambodia</th>
<th>BIOMA – China</th>
<th>BIRU – Indonesia</th>
<th>Lombok – Indonesia</th>
<th>Mangrove briquetting – Philippines</th>
<th>Rice mill – Philippines</th>
<th>Biogas chicken farm – Thailand</th>
<th>Jatropha – Thailand</th>
<th>VACVINA – Viet Nam</th>
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<td>Improved energy access to</td>
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Key:  
- **Primary**  
- **Secondary**
Market Chain
Market Chain

• A range of **business models**, from fully commercial to quasi-commercial and non-commercial management structures.
• **Cost** at different levels of the supply chain
• Development of **appropriate** technologies
• **Capacity** of the market actors to produce, distribute and retail their products
• Existence of **suitable demand** for bio-energy
Figure 2 Barriers, driver and interventions: inputs, services, finances and outputs
Supporting Services

- Access to **technical assistance**
- Access to appropriate **financial services**
- Access to **after-sale services** (including access to adequate spare parts)
- **R&D** to develop locally appropriate technologies
- Access to a sustainable and suitable supply of bioenergy resource **inputs**
Enabling Environment

Government-supported bioenergy targets of ASEAN +3 countries
(Adapted from: Bioenergy and Food Security in ASEAN, FAO 2013 and Philippine Biofuels Situation and Outlook, USDA 2013)
Enabling Environment

Level 3: Enabling environment

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(National Strategic Development Plan)

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Figure 3 Barriers, drivers and interventions: inputs, services, finance and output
Enabling environment

- **Infrastructure** for distribution of feedstock, appliances and spare parts
- **Cultural barrier**
- **Regulations** and standards (right equilibrium)
- **Rural development** strategies
- **Agriculture and energy sector synergies**
- **Bottom-up & top-down**
Sustainable Livelihoods

GBEP indicators + BEFS operator tool

Economic, social and environmental impact and sustainability
Land tenure rights: inadequate legal framework around land occupancy and ownership. Risk of scaling up!

Land Use: not yet, but in the future if scaling up without proper regulations?
Changes in income: improved incomes and fuel cost savings + new income sources.

Jobs and labour: Direct and indirect employment, + labour conditions
Energy access: + convenience, reliability, affordability and quality energy for end users (HHs and businesses)
# Food Security

<table>
<thead>
<tr>
<th>Availability</th>
<th>Cambodia - rice hull</th>
<th>Cambodia - Jatropha</th>
<th>Indonesia - biogas</th>
<th>Indonesia - Lombok</th>
<th>Phil - rice husk</th>
<th>Phil - mangrove</th>
<th>Thai - biogas</th>
<th>China - biogas</th>
<th>Viet - biogas</th>
<th>Thai - Jatropha</th>
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<tr>
<td>Access</td>
<td>Positive impact</td>
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**Key:**
- Positive impact
- No impact
How to identify the tipping point when small-scale initiatives replicate and scale-up to become unsustainable?
Impact of small-scale bioenergy initiatives

• Natural resource efficiency
• Benefits along the market chains
• Value of waste products
• New businesses
• Energy services have their own impact on socioeconomic development
• Increased affordability of food products
Lessons for scaling up

- Systemic approach
- Collaboration
- Long-term planning and business model development
- Contextual differences for sustainability
- Financial support + Economic viability
- Awareness-raising + demand-creating
- Synergies energy/agriculture
- Knowledge exchange
- Link to global initiatives
Recommendations for further work

• Country-level needs assessments
• Country-level bioenergy market system assessments
• Detailed economic analysis of initiatives
• National policy and regulation assessments
• Development of appropriate finance schemes
• National awareness-raising programmes
• Technical assistance and R&D support
• Regional policy-makers knowledge exchange
Thank you!

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http://practicalaction.org/consulting-uk