Towards sustainable modern wood energy development
Content

• Importance of wood energy
• Challenges
• Rationale for an increased involvement
• Lessons learned
• Recommendations
Wood energy is and will remain important

- Wood energy accounts for the largest share of household energy consumption in the LDCs from (50-95%)
- The demand for wood energy is growing at 1.9% (by 2030 about 2.7 billion people remain dependent) [IRENA 2014]
- Ongoing price increases of fossil fuels will impede wood fuel substitution efforts
- High urbanization rates increase the demand for charcoal
- More than half (1.8 bill. cbm) of the world's harvested roundwood is used for energy

Source: WHO

Uses of the annually worldwide logged volumes of roundwood

Challenges

- Lack of data
- Non-conducive image
- Several sectors involved
- Poor institutional settings
- Low enforcement capacities
- Low woodfuel producer prices
- Unsecure land tenure, user rights
- Corruption

Source: www4.ncsu.edu
Rationale for an increased involvement: Economics

- Wood energy is an important sources of household income, especially in Africa and Asia.
- Enormous potential to create jobs, more than any other fuel
- In many countries, wood energy displays the highest economic value compared to other land uses
- Substantial forgone tax revenues (between $1.5 billion and $3.9 billion annually) [UNEP 2014]

<table>
<thead>
<tr>
<th>Million USD</th>
<th>Charcoal (Market commodity)</th>
<th>Fuelwood (Only partially marketed)</th>
<th>Forgone taxes/bribes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ivory Coast</strong></td>
<td>301</td>
<td>760</td>
<td>8</td>
</tr>
<tr>
<td><strong>Kenya</strong></td>
<td>1,600</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td><strong>Tanzania</strong></td>
<td>650</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td><strong>Malawi</strong></td>
<td>41,3</td>
<td></td>
<td>5-8</td>
</tr>
<tr>
<td><strong>Mozambique</strong></td>
<td>250-300</td>
<td></td>
<td>50</td>
</tr>
<tr>
<td><strong>Burundi</strong></td>
<td>45</td>
<td>316</td>
<td></td>
</tr>
<tr>
<td><strong>Togo</strong></td>
<td>103</td>
<td>302</td>
<td></td>
</tr>
<tr>
<td><strong>Madagascar</strong></td>
<td>150</td>
<td>340</td>
<td></td>
</tr>
</tbody>
</table>
Rationale for an increased involvement: Public health

- Traditional cookstoves, highly inefficient, and strongly polluting
- Health risks effects of pollutants from biomass combustion include premature death, lung damage, chronic bronchitis, allergies, asthma and lung cancer.
- Significant damage to the health especially of women and children (about 1.5 million deaths caused by indoor pollution) [WHO 2006]
- Transition to charcoal would reduce the incidence of acute respiratory infections by 65% [World Bank 2009]
Rationale for an increased involvement: Gender equality

- Disproportionately high participation of women in the wood energy value chain (collection/production, transport, marketing and use of fuels)
- Heavy physical work (headloads up to 20 kg and more) ~120 times a year
- Ever increasing distances in search of fuelwood
- Children withdrawn from school to fetch firewood

Example from Mozambique

<table>
<thead>
<tr>
<th></th>
<th>Production</th>
<th>Transport</th>
<th>Wholesaling</th>
<th>Retailing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nbr. of people</td>
<td>95.092</td>
<td>5.660</td>
<td>11.482</td>
<td>101.885</td>
<td>214.119</td>
</tr>
<tr>
<td>Nbr. of women</td>
<td>17.461</td>
<td>57</td>
<td>3.202</td>
<td>91.697</td>
<td>112.416</td>
</tr>
<tr>
<td>Share</td>
<td>18%</td>
<td>1%</td>
<td>28%</td>
<td>90%</td>
<td>53%</td>
</tr>
</tbody>
</table>
Rationale for an increased involvement: Climate change mitigation – forest protection

<table>
<thead>
<tr>
<th></th>
<th>Consumption / pers./yr.</th>
<th>Charcoal demand (kg)</th>
<th>Raw wood demand (kg)</th>
<th>Wood savings (kg)</th>
<th>CO2 emission reductions (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>2400 MJ</td>
<td>80</td>
<td>667</td>
<td>467</td>
<td>856</td>
</tr>
<tr>
<td>Improved</td>
<td></td>
<td>48</td>
<td>200</td>
<td></td>
<td>~ 1 m³</td>
</tr>
</tbody>
</table>
Rationale for an increased involvement: Good prospects for implementation

Encouraging international policy arena

- GBEP Activity Group 4
- EnDev
- ESMAP
- WB

Large potential for technical improvements

- Charcoal
- ICS
- New wood based fuels and technologies
Lessons learned

- **On policy level:** little interest and the few national woodfuel (biomass) strategies lack real buy in from respective Governments ➞ little support from the international donor community

- **Institutional set-up:** good experience with an autonomous agency on national level, sector cooperation platforms, organised local user groups and local community structures

- Devolution of responsibility, **land tenure and/or user right security and good producer prices** are decisive for community and/or private investments in sustainable wood energy production

- As long as open access exploitation prevails and law enforcement is weak, more expensive sustainable woodfuel production competes with cheaper exploitation costs. These **price distortions** undermine sustainable production and make financial transfers for forest management and/or reforestation necessary

- Woodenergy measures could be **financed** to a large extend by tax collection (differential taxation system). However, for the transition phase from unsustainable, informal to a sustainable formal system are needed. International financing mechanisms are insufficiently tapped
Lessons learned

- Most wood energy projects intervene either on the supply or on demand side without applying a value chain approach and are designed on a too short timeline.

- **Production**: experience in participatory forest management and reforestation is available. Need for up-scaling and long time support. Potentials of agroforestry schemes and the use of wood residues warrant further development.

- **Improved charcoal** production has a high leverage effect to improve the woodfuel supply situation but requires regulatory measures, systematic training and additional research.

- **Interconnected rural and urban charcoal markets** offer excellent opportunities for channelling additional income to the producer and the Government.

- **ICS** most successful when targeted to specific areas where woodfuel prices or collection time are high.
Wood energy – highly interlinked
Changing „business as usual“ with a holistic approach
Elements of a structural change

Image

Policy framework

Regulatory framework

Value chain

Political willingness

Wood energy policies

Land tenure/user rights

Economic incentives

Law enforcement

Wood production

Conversion

Trade

Consumption
Image change

1. Linking modern wood energy promotion to high-level internationally recognized processes
2. Fostering practical experience and further dissemination of lessons learned
3. Promoting science and research
4. Supporting collection, processing and dissemination of reliable data
Policy and institutional framework

- Improve the information basis (IKM)
- Strengthen coordination among the sectors concerned
- Support adequate (inter-sectoral) institutional settings at all levels
- Support the establishment of national (sub-national) strategies (consultation, participation, and capacity-building at all levels) ➔ ownership
- Support capacity development and implementation of pilot interventions
Regulatory framework

- Support decentralisation and devolution of power for forest management
- Support allocation of secure tenure/user rights
- Foster economic benefits for sustainable producers ➔ differentiated taxation scheme
- Develop law enforcement and good sector governance
Giving trees a true value

Diagram:

1. Land tenure/use security - Differential taxation system – Law enforcement
   - Higher tax revenues
   - Public awareness

2. Woodfuel Producer
   - Investment
   - Sustainable Management
   - Motivation

3. Woodfuel Consumer
   - Parsimonious use
   - Price adjustment
   - Shift to substitution energies
   - Proliferation of ICS

Technical support through forest service
Taxation scheme to provide benefits

- Not just a taxation scheme – a differential taxation scheme

- Low tax for good behavior (sustainable production)
- High tax for business as usual
- Replaces archaic tax system + fraud
- Level reflects management & replacement costs
- Adds about 10%-20% to retail price
- Levied at source
- Verification & double check in town
- Only registered transporters

<table>
<thead>
<tr>
<th>Beneficiary</th>
<th>Village VERT</th>
<th>Other Zones</th>
<th>Caught avoiding payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>30</td>
<td>600</td>
<td>1200</td>
</tr>
<tr>
<td>Village</td>
<td>270</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>600</td>
<td>1200</td>
</tr>
</tbody>
</table>
Realise the full potential

- Climate protection
  - Increased wood supply
    - Regional value creation
  - Avoided deforestation
- Employment
  - Increased income
- Biodiversity conservation
  - Foreign exchange savings
- Energy supply
  - Sustainable supply
- Green economy
  - Regional value creation
  - Avoided deforestation
  - Increased income
  - Foreign exchange savings

Impact

- Realise the full potential
Thank you