Wood energy, ecosystem services and SDGs

A conceptual framework

Michael Brüntrup

International Workshop of the GBEP Task Force on Sustainability
Linkages between the Sustainable Development Goals (SDG) and the GBEP Sustainability Indictors for Bioenergy (GSI)
July 3-4, 2017 in Bonn, Germany
Regional shares of various primary energy carriers in total energy consumption (2009)

Source: Liyama et al. (2014)
Importance of wood energy in Subsaharan African countries

- Up to 3.5% of GDP (Zulu 2010 for Malawi)
- Up to 90% of primary energy use

<table>
<thead>
<tr>
<th></th>
<th>Rural</th>
<th>Urban</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firewood, dung, crop residues</td>
<td>94%</td>
<td>41%</td>
<td>75%</td>
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<tr>
<td>Charcoal</td>
<td>4%</td>
<td>34%</td>
<td>15%</td>
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</tbody>
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Source: Maes & Verbist (2012)

- About 13 million jobs in commercial biomass energy sector (Openshaw 2010)
- Strong role of women in sector (Ghana: 65%, Mombu and Ohemeng 2008)
- Almost exclusively women in consumption
- Poor may or may not be disproportionally implied in production
- Important stress production
- Contributes up to 30% of deforestation (Chidumayo & Gumbo 2013), but contested
- Most likely will increase further (urban and rural)
Generalised woodfuel value chains

Fuelwood chain

Fuelwood consumption in rural areas

Wood production and harvesting in rural and peri-urban areas
Generalised woodfuel value chains

Fuelwood consumption in rural areas → Wood production and harvesting in rural and peri-urban areas → Charcoal Production in rural or peri-urban areas → Wholesaler/Retailer → Transporter/Dealer → Urban consumption → Household → Small-scale industries → Commercial sector
The Charcoal value chain, ecosystem services and socio-economic linkages

**Environmental**
- **SOIL**
  - Carbon capture
  - Soil characteristics, Wind and water erosion
- **Biodiversity**
  - Plant + Wildlife in Soils, Forests, Agro-ecosystems, Landscapes
- **Food Production**
  - (availability, stability)
- **Water**
  - Run-off, variability + scarcity, Groundwater, Water quality

**Local Ecosystem Services**

**Socio-economic**
- **Income**
- **Employment**
- **National Taxes**
- **Regional / Local Taxes**
- **Regional / Local Empowerment**

**Global Goals**
- **No Poverty**
- **Zero Hunger**
- **Good Health and Well-being**
- **Clean Water and Sanitation**
- **Affordable and Clean Energy**
- **Decent Work and Economic Growth**
- **Responsible Consumption and Production**
- **Life on Land**
- **Climate Action**

**Value Chain**
- (Agro)forestry
- Harvesting
- Processing
- Distribution
- Use

**CLIMATE**
- Emissions (relative to alternative energy sources)

**ENERGY SECURITY**
- Food Security

**REGIONAL / LOCAL**
- Income
- Employment
- Food Production
- Local Ecosystem Services

**NATIONAL**
- National Taxes

**GLOBAL**
- Food Security
- Energy Security
- Health

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Thank you for your attention

Questions?

Deutsches Institut für Entwicklungspolitik (DIE)
Tulpenfeld 6
D-53113 Bonn
Telefon: +49 (0)228-949 27-0
E-Mail: Michael.Bruentrup@die-gdi.de
www.die-gdi.de
www.facebook.com/DIE.Bonn