



Contribution of a sustainable wood energy production approach to Forest Landscape Restoration (FLR) in Sub-Saharan Africa (SSA)

The role of Sustainable bioenergy and GBEP Sustainability Indicators to support Forest Landscape Conservation and Restoration in SSA

Dr. Tiziana Pirelli

Food and Agriculture Organization of the United Nations (FAO)

Traditional wood energy value chain in Togo

Woody biomass
production



Biomass
transformation



Bioenergy
production
and use



- 93% of population rely on wood energy for cooking and heating purposes;
- Woodfuel (fuelwood + charcoal) contribute for the 5.4% to GDP, but still the 90% of sector is informal;
- The current demand of woody biomass for energy is 2.5 times higher than the actual sustainable offer in the country. $(O-D) = (3.28 - 8.3) \text{ Mm}^3/\text{y} = -5.02 \text{ Mm}^3/\text{y}$

Unsustainable wood energy value chain

Social issues

1. Health problems (e.g. pulmonary diseases; blindness; risks of burns and scalds);
2. Women and children at risk of injury and violence during fuel gathering;
3. Time consuming practices: less time available for income generating activities, child care, schooling
4. Poverty
5. Migration



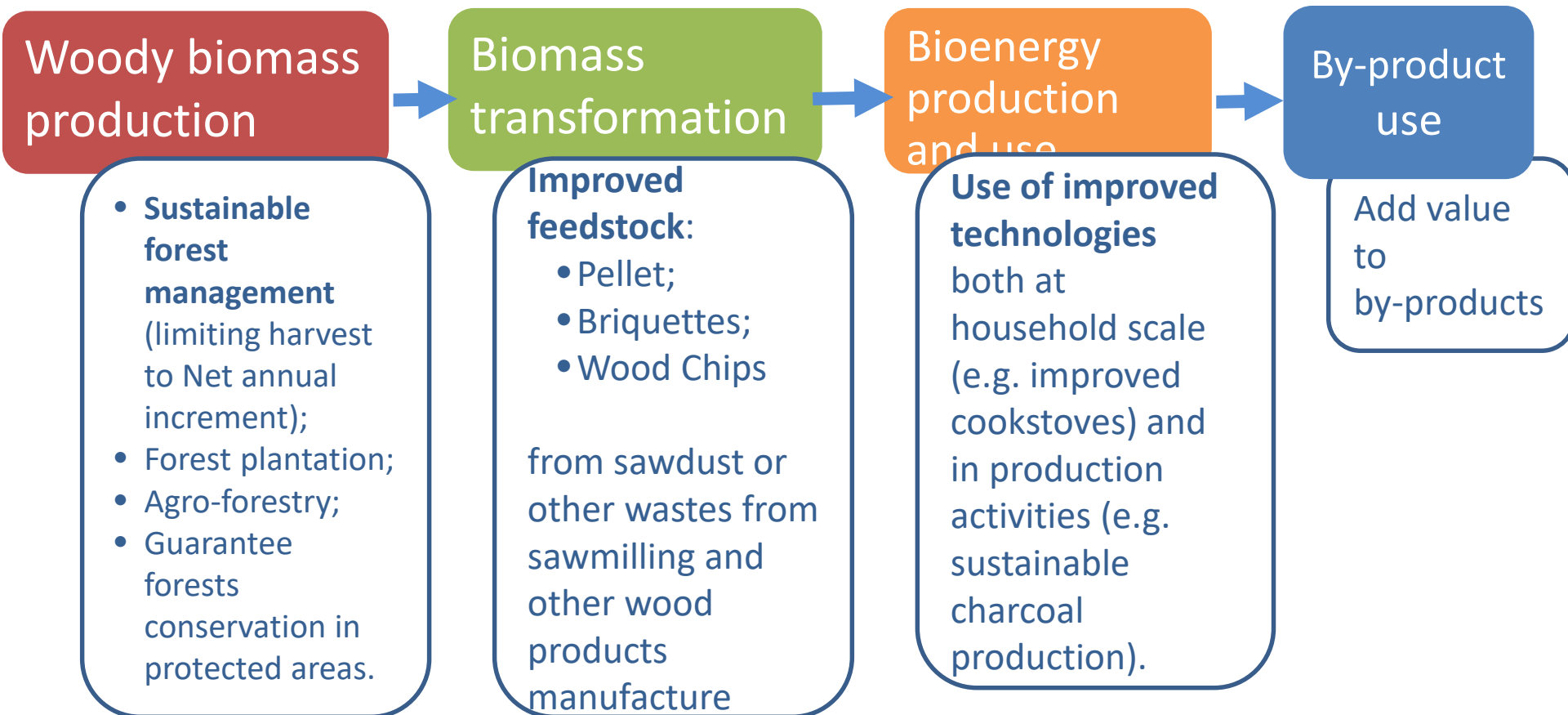
Environmental issues

1. Indoor and outdoor air pollution;
2. Global Warming;
3. Deforestation and lanscape degradation;
4. Reduced Biodiversity;
5. Soil degradation.

Economic issues

1. competition for limited resources;
2. increased costs for food and fuels;
3. Limited access to modern energy services.

Improve the sustainability of the wood energy value chain



Reduce pressure on forest resources and deforestation: use of alternatives biomass and technologies

Woody biomass
production

- **Waste and residues:**
 - Solid/liquid agricultural and agro-industrial;
 - livestock;
 - human

Biomass
transformation

- **Improved feedstock:**
 - Pellet;
 - Briquettes;easy to transport and store

Bioenergy
production
and use

- Biogas;
- Gasification;
- Pyrolyses; et
- Combined technologies);
- Syngas/biogas cookstoves
- Co-generation plants

By-products
use

- Digestate;
- Biochar





Add value to modern bioenergy by-products

Production technologies

Benefits from by-products

Bioenergy production and use

Gasification and pyrolysis

Biogas

By-products

Biochar

Digestate

...fuel

... soil amendment and soil fertilizer

... substrate for soilless cultivation

Source of additional energy

Increase SOC content

Nutrients recycle

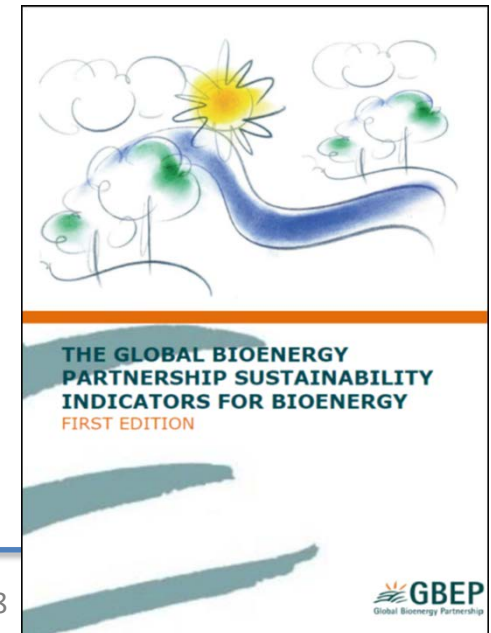
C-stock



**Bioenergy presents excellent OPPORTUNITIES
to contribute to a sustainable wood energy value chain and to forest
landscape conservation and restoration
not without CHALLENGES.**

SUSTAINABILITY IS KEY to take out the best of opportunities

GBEP has developed the most widely recognized and
agreed **set of indicators** for the **assessment and
monitoring of bioenergy sustainability.**





The Global Bioenergy Partnership (GBEP)

GBEP was established to implement the commitments taken by the **G8 in 2005**.
GBEP reports every year to the **G7 and G20**, and receives regular mandates
from them.



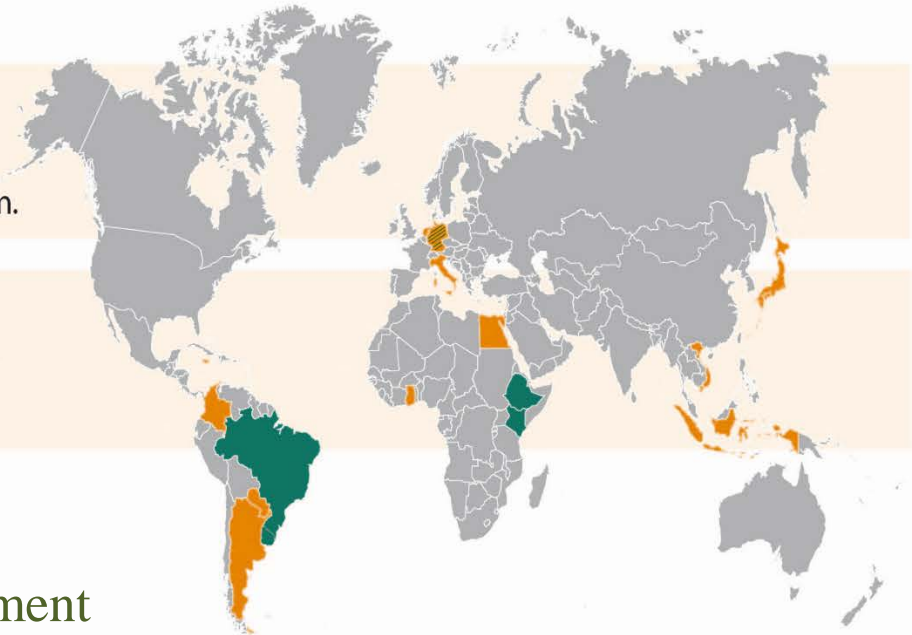
38 Partners and 41 Observers
(Governments and International Organizations)

Status of indicator implementation around the world

12 countries implemented the GBEP indicators
5 countries are in the process of implementation

● **IMPLEMENTED:** Argentina; Colombia; Egypt; Germany;
Ghana; Indonesia; Italy; Jamaica;
Japan; Netherlands; Paraguay; Viet Nam.

● **IMPLEMENTATION PHASE:** Brazil; Ethiopia; Germany;
Kenya; Uruguay.



Germany has recently completed its
2nd round of GBEP indicators measurement



Thanks for your attention!



Contact-us: GBEP-Secretariat@fao.org