

**Bioenergy & Sustainability: a SCOPE
series volume**

**OPPORTUNITIES AND CHALLENGES OF BIOENERGY
PRODUCTION FOR FOOD SECURITY AND THE
ENVIRONMENT IN LATIN AMERICA AND THE
CARIBBEAN**

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1. REMARKS ON BIOENERGY & BIOFUELS

2. HIGHLIGHT TOPICS ON

**DIMENSIONS OF FOOD SECURITY & BIOENERGY
GUIDELINES FOR ACTION IN LA & C**

3. KEY ISSUES TOWARDS AN AGENDA



REMARKS ON BIOENERGY & BIOFUELS

Bioenergy (BE) is a source of energy produced from biomass (wood, energy crops, organic waste & residues).

Biomass can be used to produce electricity, heat, solid, gaseous & liquid fuels for transport.

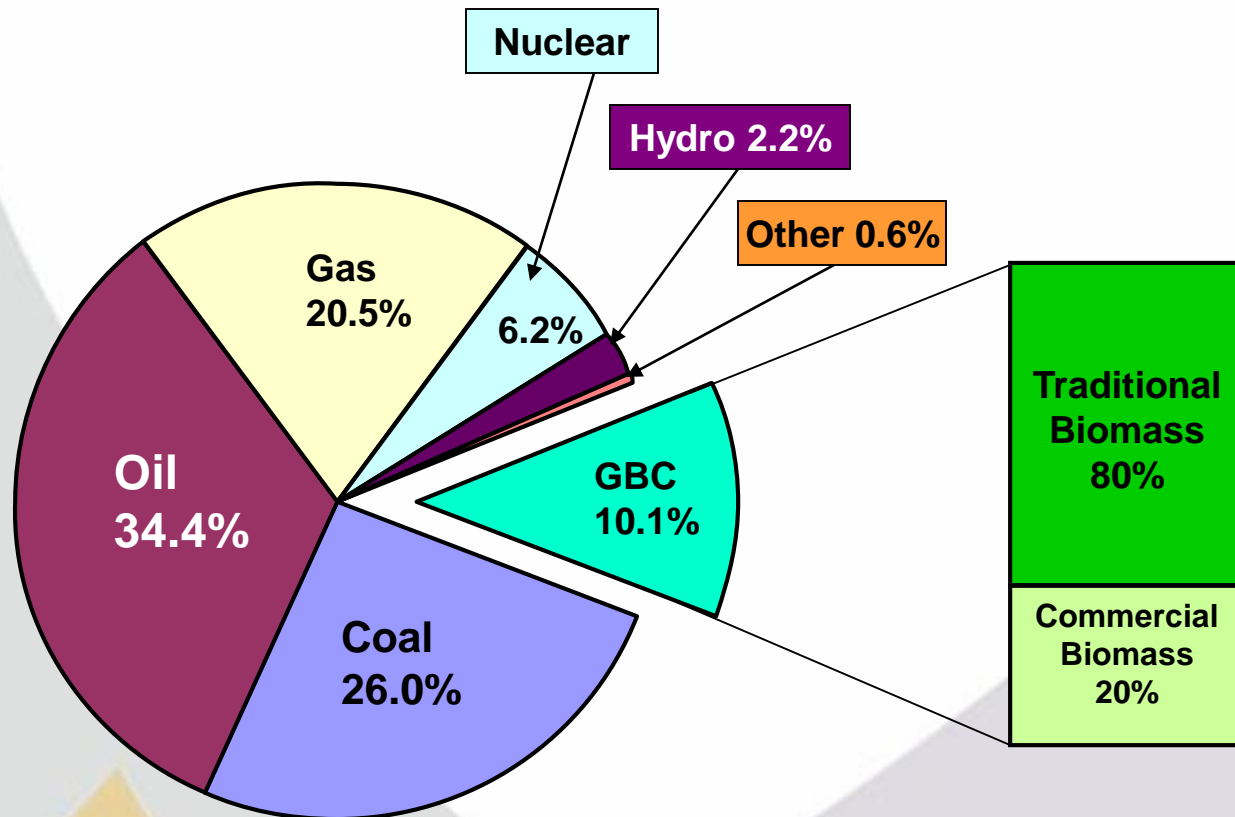
Majority of rural people in developing countries rely on BE (fuelwood & charcoal) for cooking & heating (2-3 billion people).

BE already accounts for 10% of total primary energy supply (47.2 EJ); 33% in developing countries (70% in Africa) but only 2-3% in industrial countries



REMARKS ON BIOENERGY & BIOFUELS

TOTAL PRIMARY ENERGY SUPPLY (TPES)



REMARKS ON BIOENERGY & BIOFUELS

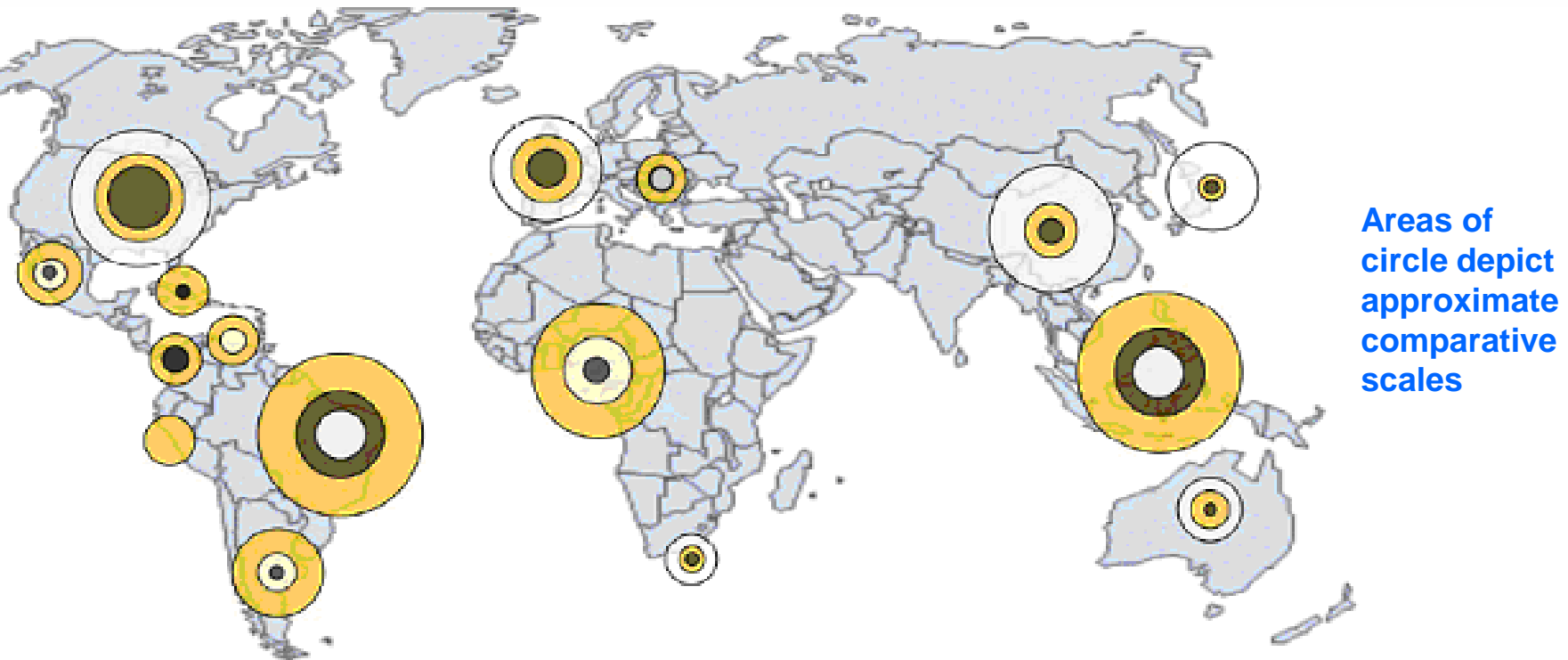
Liquid biofuels: account for approx. 2% of road transport fuels worldwide; 3-5% US & EU; exception Brazil 45%.

Current biofuels are bioethanol (sugars & starches) & biodiesel (oil seeds, animal fats).



REMARKS ON BIOENERGY & BIOFUELS

1st. generation BF feedstock potentials, theoretical BF demands & production capacities in place at the end of 2006 for selected world regions



Areas of circle depict approximate comparative scales

- Feedstock potential based on land available for devotion to first generation biofuel feedstocks.
- Theoretical biofuel demand, assessed to be ~30% of liquid transport fuel consumption in 2006.
- Biofuel production capacity in place at year end 2006.

- Feedstock potential exceeds biofuel demand and surplus production capacity - so export.
- Capacity less than biofuel demand so investment in infrastructure warranted to encourage export potential.
- Feedstock constrained and capacity less than demand - so import.

REMARKS ON BIOENERGY & BIOFUELS



Earth at Night
More information available at:
<http://seewp.gsfc.nasa.gov/spod/sp400117.html>

Astronomy Picture of the Day
2000 November 27
<http://seewp.gsfc.nasa.gov/spod/astro/a.html>

REMARKS ON BIOENERGY & BIOFUELS

Liquid biofuels: account for approx. 2% of road transport fuels worldwide; 3-5% US & EU; exception Brazil 40%.

Current biofuels are bioethanol (sugars & starches) & biodiesel (oil seeds, animal fats).

Significant differences on feedstocks (productivity, yields, characteristics, costs).

corn x sugarcane → 3500 x 6500 liters/ha (ethanol)

soy x palm → 550 x 4000 kg/ha (veg. oil)

Second-generation biofuels (based on cellulosic feedstocks) are in the development stage.



What is Food Security?

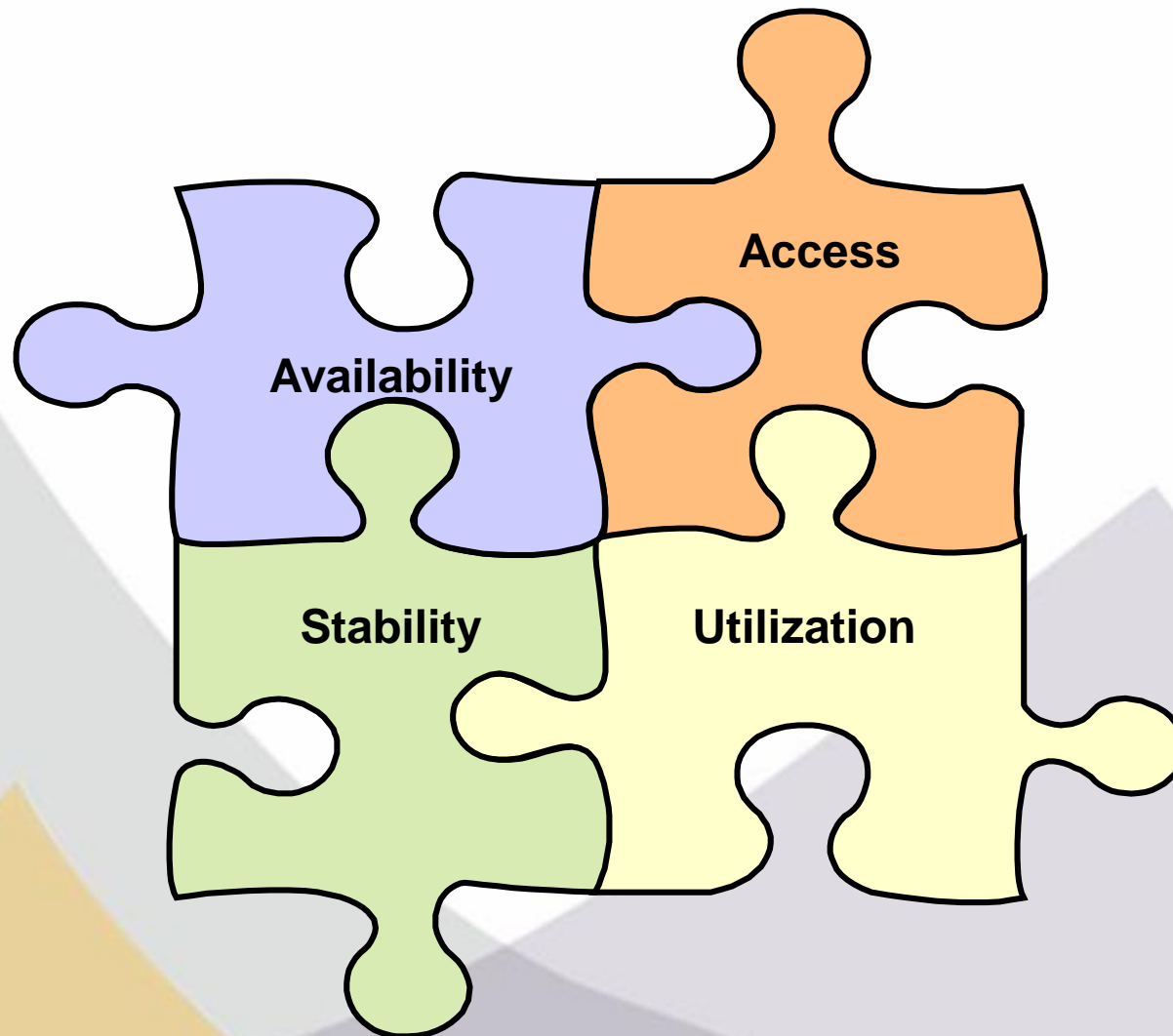
“Food Security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life”

The State of Food Insecurity, Rome, 2001

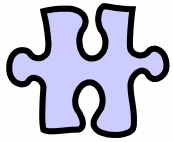


DIMENSIONS OF FOOD SECURITY & BIOFUELS

Biofuels can affect all four dimensions of food security



DIMENSIONS OF FOOD SECURITY & BIOFUELS



- **Availability of food**

- Region w/vast capacity production, export & import
- BF threat due to competition for inputs (land, water, fert.) & other factors diverted from food production.

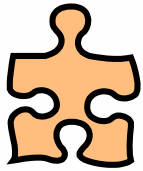


- **Stability: assurance production activities & remunerative prices will be long term maintained**

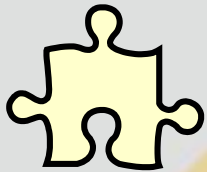
- Risk in LA&C due to lack of continuity in long term policies.
- One incentive of BF production is higher oil prices & this can impact in opposite ways:
 - Higher oil prices → increase agr.costs → lowers production
 - Higher oil prices → encourages production BF → raises demand for energy crops
- Increase in BF production will depend on which impact prevails.



DIMENSIONS OF FOOD SECURITY & BIOFUELS



- **Access is measured by under nutrition, poverty & extreme poverty & inequality**
- **Under nutrition & extreme poverty has fallen in the Region:**
- **BE programmes represent an opportunity if focused to smallholder sector w/ limited market access, contributing significantly to higher incomes for farmers & offering employment opportunities in rural areas.**
- **Competition between biofuels feedstock & foodstock can negatively affect food prices (first generation BF).**
- **Appropriate support policies & mechanisms (financial, technological & organizational).**



- **Utilization is closely linked to health status & access to clean water**
- **BF could make water less available for household use. Some production systems require considerable water.**



Potential Bioenergy/Agroenergy sector for reducing poverty & hunger depends to a large extent on the design & correct application of policies

(i) Territorial development and management policies

- **agro- ecological zoning**
- **incentives and penalties**

(ii) Technological policies

- **explore feedstock (small farmers & small-scale)**
- **technologies for chain stakeholders**



(iii) Policies to regulate markets in products and services

- **regulatory framework**
- **commercial rules**
- **incentives and taxes**

(iv) Policies to improve contractual relations

- **stakeholders in the production chain**
- **integration of small scale farming**
- **protection of labour rights**



KEY ISSUES TOWARDS AN AGENDA (1)

- Impacts BE policies not fully understood, **urgent need for further analysis & scenarios** (land use change, investment patterns, greenhouse gas (GHG) emissions, trade flows & food security).
- **Integration and coherence of policies**, (national & global levels, public & private sectors).
- **Common methodology for life cycle analysis of GHG emissions** (direct & indirect land use change).
- **Internationally-agreed standards** to address environmental implications of BE production.
- **Guidelines for countries on estimation & reporting of GHGs, WTO rules**, & avoidance of trade barriers (accidental or deliberate).
- **Issues of certification, compliance & the cost of their application.**



KEY ISSUES TOWARDS AN AGENDA (2)

- **Policies for food & fuel to be linked** so as not to compromise food security nor to deprive poor farmers of potential gains from biofuels development.
- **Expansion of the knowledge base**, which includes better analysis of data sets available, linking & integration of aggregated & disaggregated models.
- **Issues of certification, compliance & the cost of their application.**
- To consider **biofuels in the context of the total energy mix**, including other renewable energy sources & energy efficiency.
- Policymakers to provide for the **integration of local, regional or international policies** that affect the agricultural sector & the rural economy.
- To develop policies to **guide investments in food &/or biofuel**, considering differences in national needs & contexts.
- To develop policies to assist those adversely affected by climate change & the expansion of biofuels & their impacts.



INTERNATIONAL FRAMEWORK FOR BIOENERGY/BIOFUEL

Create an environment that allows you to take advantage of the opportunities represented by bioenergy, contributing to the reduction of greenhouse gas emissions, allowing the productive inclusion and the improvement of the incomes of small farmers, and enabling many developing countries to reduce their dependence on imported oil

http://www.fao.org/es/esa/index_es.htm

