



# **The Bioenergy and Food Security Project**

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**September 17/18, 2008**

**Bioenergy and Food Security (BEFS) Project  
Food and Agriculture Organization of the UN**



## Content of presentation

- The BEFS Project
- The BEFS Analytical Approach
- BEFS in Tanzania

## Objectives of BEFS

### Objective

Mainstreaming **food security concerns** into national and sub-national assessments of bioenergy potential

### Phases

1. Develop an **analytical framework** and give guidance to assess the bioenergy and food security nexus
2. Assess **bioenergy potential** and food security implications
3. Strengthen institutional capacities, exchange knowledge, pilot sustainable and food-secure bioenergy projects and **influence policies**



## Country driven approach

### Country teams

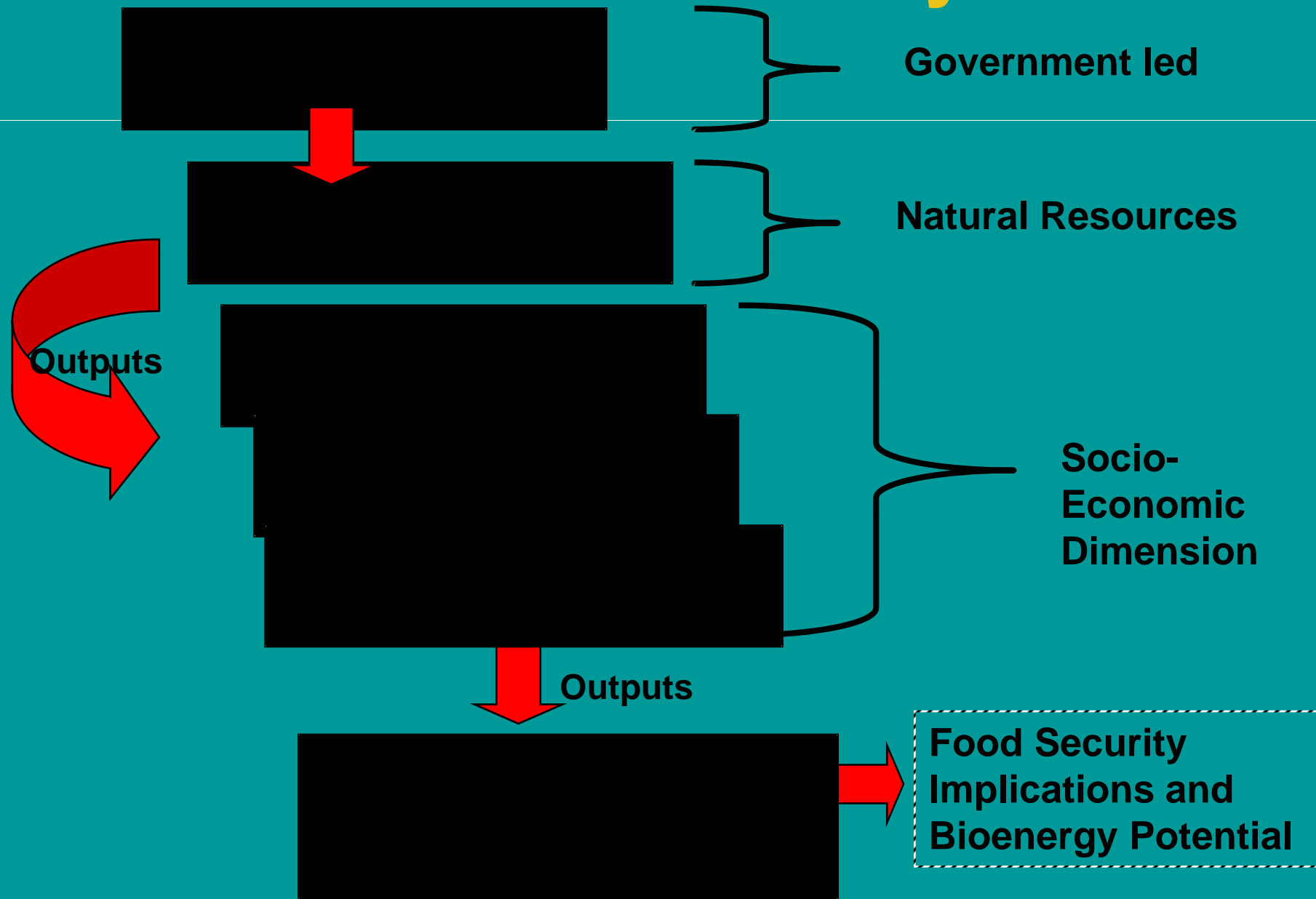
- Peru
- Tanzania
- Thailand and Cambodia

## BEFS Analytical Framework

- Currently phase 2: application of **country specific** data in Analytical Framework
- Country specific **scenario development**
- Scenario defines input of the **5 modules** of the Analytical Framework

# BIOENERGY AND FOOD SECURITY

## The Flow of the Analysis



## Country specific scenarios

- Selection of biomass chains
  - Crops
  - Farming systems (Large scale / small scale)
  - Markets (Local or export)
  - Specific regions (Depending on the crop)
- Policy instruments
  - Subsidies
  - Carbon and energy taxes
  - Trade tariffs
  - Fixed prices (e.g. food, energy)
  - Setting of targets on biofuel use

## Country specific scenario

### *Type of feedstock*

#### **Bioethanol**

- Sugarcane
- Sweet sorghum
- Cassava
- Sisal

#### **Biodiesel**

- Jatropha
- Palm oil
- Sunflower
- Castor bean

#### **Biogas**

- Organic and crop residue
- Woody biomass
- Sisal
- Fishing industry wastes

#### **Wood fuel**

- Indigenous species
- Wattle
- Eucalyptus



## Country specific scenario

### *Production / farming system*

#### **Bioethanol**

- Estate in combination with outgrower scheme
- 20-30.000 ha
- National / international

#### **Biodiesel**

- Estate in combination with outgrower scheme
- Smallholders only
- National / international

#### **Biogas**

- At municipality level
- At household level
- National

#### **Wood fuel**

- At community level
- At household level
- Estate in combination with outgrower scheme
- National / international

## Policy instruments

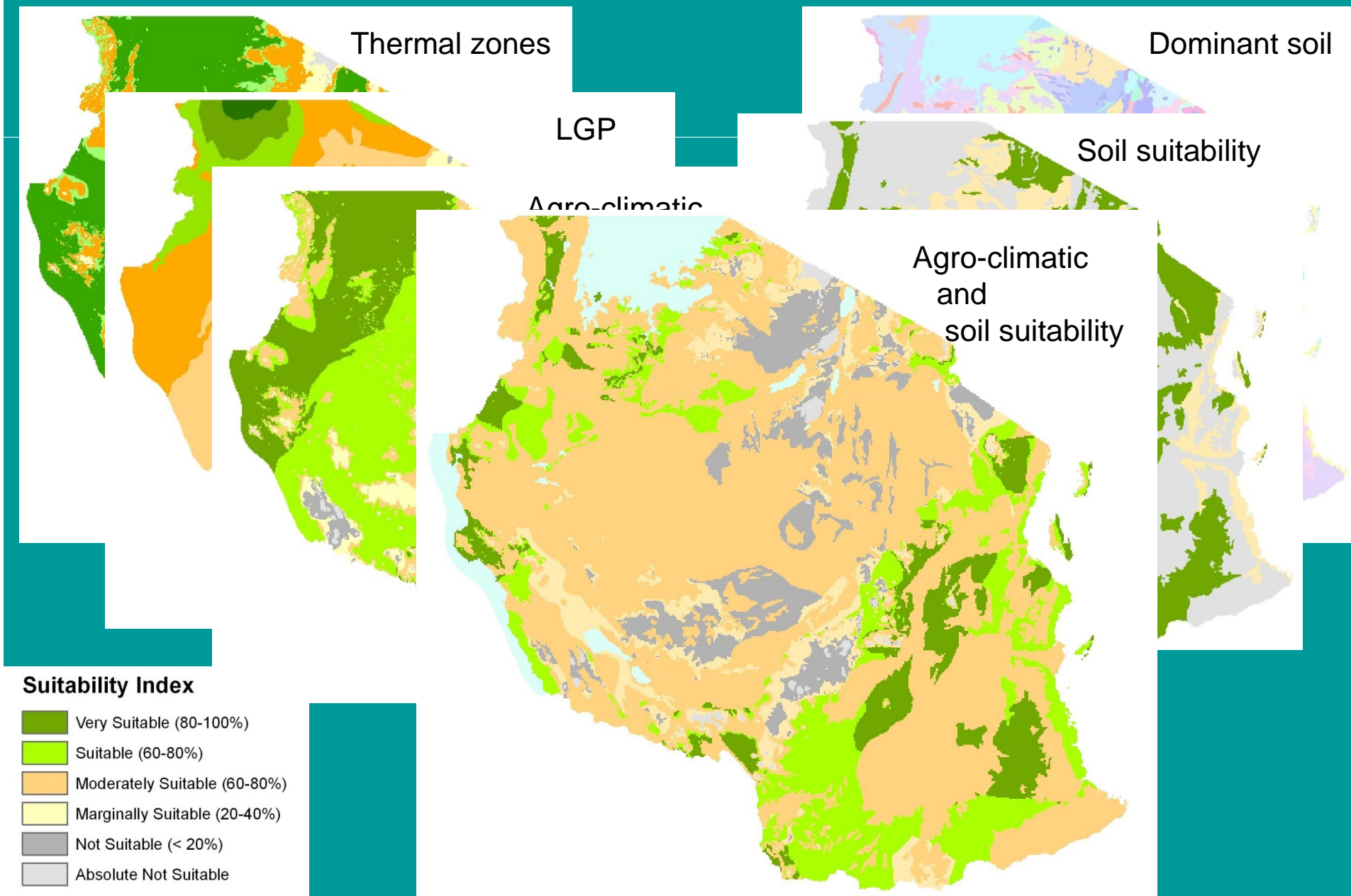
- Subsidies
  - Tax break on biofuels (e.g. reduction of excise duty on biofuels)
- Carbon and energy taxes
  - Increasing taxes on carbon emitting fuels
- Trade tariffs
  - Putting trade barriers in place to keep out cheaper biofuels to protect local developing industry
- Setting of targets on biofuel use
  - 5% blending target in 2010
  - 10% blending target in 2015

## Module 1: *Biomass Potential*

**Objective:** determination of potential biomass feedstock production given biophysical, environmental & agricultural management factors

- **Determine the land suitable** for production of a specified bioenergy feedstock under rain-fed and irrigated conditions (Agro-Ecological Zoning approach)
- Evaluate **optional production systems** in terms of inputs, practices, and technologies
- Estimate of **land available** for bioenergy production (by subtracting forest areas, protected areas, build-up areas, etc.)
- Assess **current land use** of suitable areas (to evaluate possible competition with food production)
- Analyse **land administration and governance** on suitable land

# BIOENERGY AND FOOD SECURITY



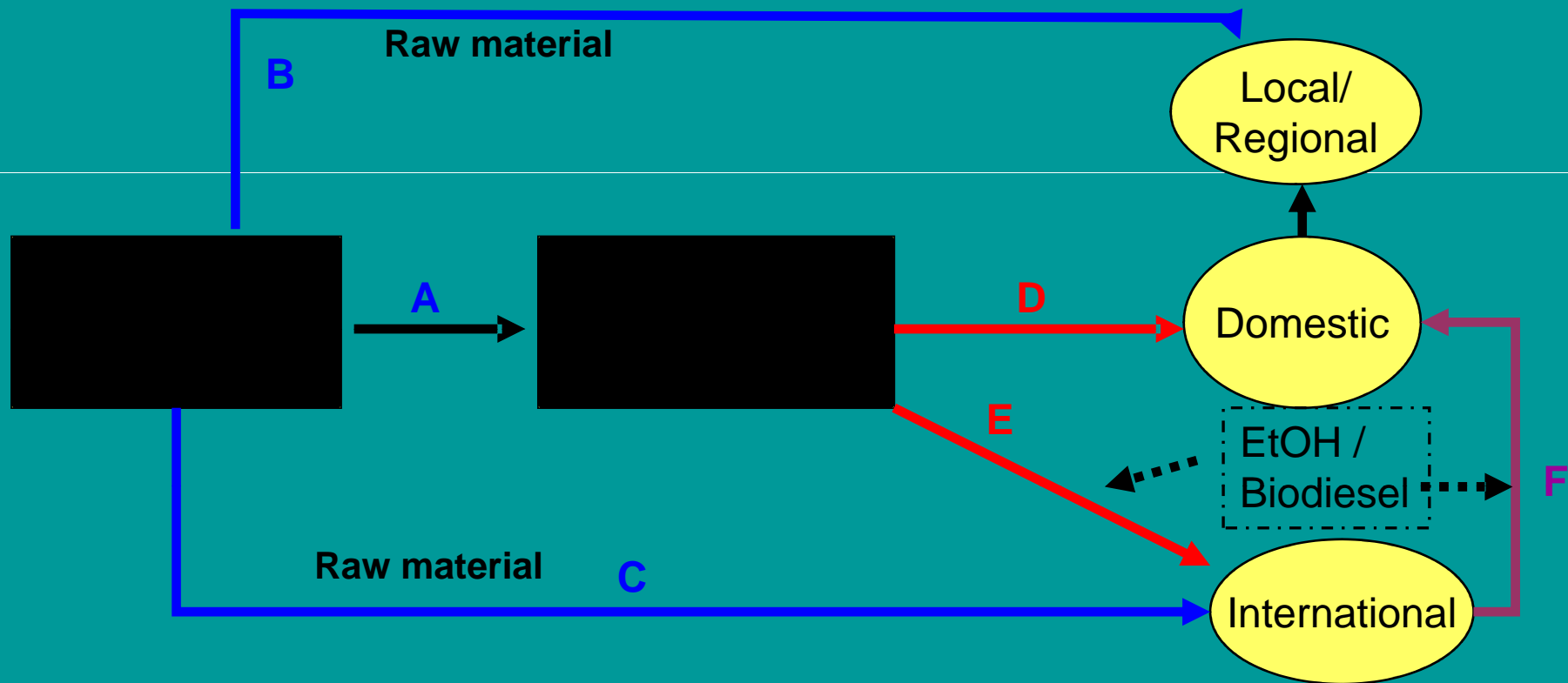
## **Module 2:** *Biomass Supply Chain Production Costs*

**Objective:** calculation of the biomass supply chain production cost

**Based on:**

- **Cost of biomass production** (USD per ton of crop) for the production that is biophysically and technically feasible, under the various production systems
- **Cost of the industrial processing** of 'biomass to biofuel' (USD per liter) based on existing and potential industrial technology efficiencies
- **Cost for logistics on handling**
  - Feedstock (infrastructure, equipment, labour, collection, storage, pre-processing and transportation from the field to processing centres)
  - Processed biofuel (pre-processing (blending), transportation, dispensing)

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- A) raw material taken to central processing center
- B) raw material process at local/regional -small holder- for local use
- C) raw material is shipped to international markets
- D) Centralized processed biofuel is distributed to domestic and regional areas
- E) Centralized processed biofuel is shipped to international markets
- F) Processed biofuel is shipped from international markets into country

## Module 3: *Agriculture Markets*

**Objective:** Projects biomass and bioenergy production under various economic and technological assumptions

Based on **OECD-FAO COSIMO** model, which:

- Provides mathematical representations of national and global **agricultural markets**
- Produces the **market outcomes** based on the supply and demand system
- Shows **changes in production** shares of different agricultural commodities resulting from biofuel demand
- Investigates the implications of **biofuel policies**, namely regulations, subsidies and taxes, and their impact on markets and biofuel production



## Module 4: *Economy-wide Effects*

**Objective:** evaluation of the implications of bioenergy production for all domestic sectors of the economy

Based on a country-specific **equilibrium model** which:

- **Assesses changes** in incomes, welfare, prices and output in all sectors of the economy as a result of the additional production of biomass
- Allows to analyze the links between agricultural and energy markets
- Examines the potential role of **subsidies**, carbon credit, fossil fuel tax, etc. on biomass use, **land use patterns**, and **inter-market effects** through prices domestically and (when cross-border trade occurs) internationally



## **Module 5:** *Household-level Food Security*

**Objective:** analysis of the effects of changes in domestic prices and income due to variation in bioenergy production, on national and household level food security

**Based on:**

- **Household level food security** (based on household level data of Household Budget Survey Tanzania)
- Other components:
  - **Labor** markets
  - **Price** transmission
  - **Cost-benefit** analysis

## Context in Tanzania

### Economy

- Dependant on **agriculture** (45 percent of GDP in 2005)

### Poverty

- **High poverty** level (44 percent undernourished 2001-2003)

### Energy

- **Energy supply mix** (IEA, 2004):
  - 90 percent from biomass, mostly wood (charcoal)
  - 7 percent imported petroleum and electricity supply (Hydro, gas, diesel and coal)
- **Access to electricity**
  - 10 percent of Tanzanian households
  - 2 percent of households in rural areas
- **Fuel price**
  - Increase of almost 100 % over the past two years
  - Impact on food prices due to transport over long distances

## Bioenergy context in Tanzania

### *Constraints and risks*

#### Bioenergy Regulation

- Not in place yet
- Draft **biofuel guidelines** have been presented end of August
- Guidelines should be **approved by Cabinet** in November 2008
- Bioenergy Task Force **developing biofuels policy** (Ministry of Agriculture, Ministry of Energy, Economic Planning and Empowerment, and other related ministries)

#### Constraints and Risks

- For investors: lack of infrastructure and clear guidelines in place
- For the poor: remoteness and geographic isolation, lack of rural infrastructure



**Thank you!**

**For further information**

BEFS website

[www.fao.org/nr/ben/befs](http://www.fao.org/nr/ben/befs)

2<sup>nd</sup> Technical Consultation Documentation

<ftp://ext-ftp.fao.org/nr/data/nrc>