



The Bioenergy and Food Security Project

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**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

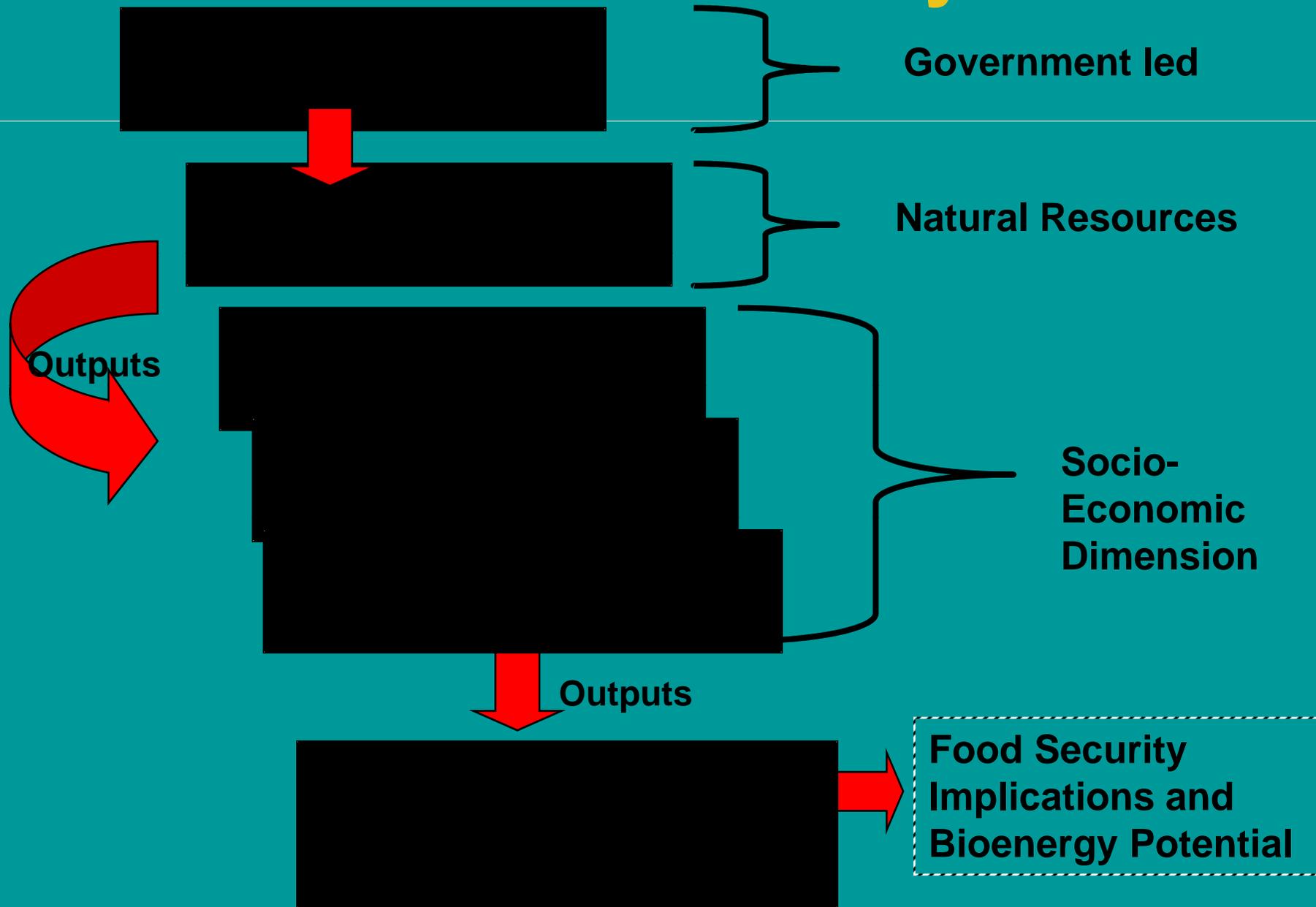


BEFS Analytical Framework

- 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

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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

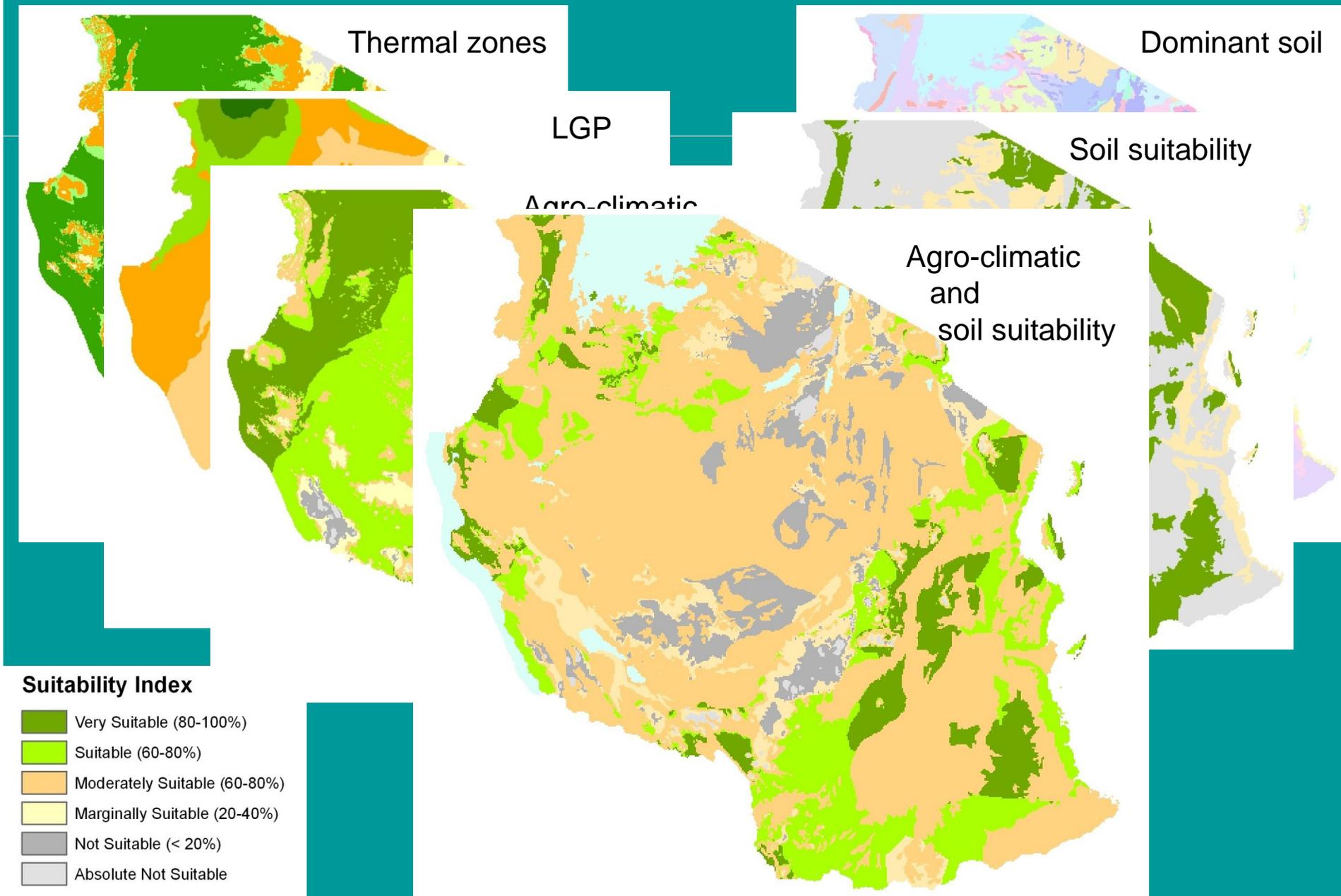
- Subsidies
 - Tax break on biofuels (e.g. reduction of excise duty on biofuels)
- Carbon and energy taxes
 - Increasing taxes on carbon emitting fuels
- Trade tariffs
 - Putting trade barriers in place to keep out cheaper biofuels to protect local developing industry
- Setting of targets on biofuel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

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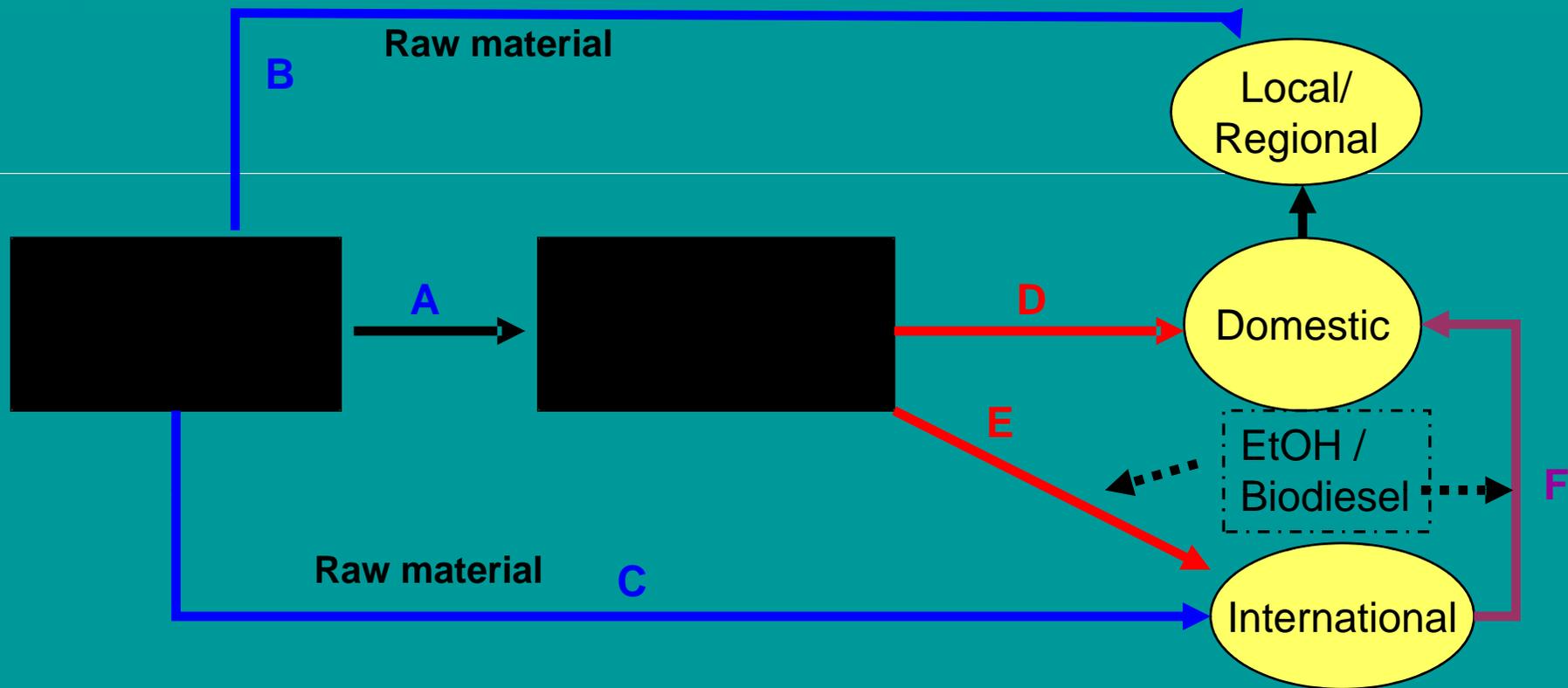
Module 2: *Biomass Supply Chain Production Costs*

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

2nd Technical Consultation Documentation

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