



Bioenergy and Food Security

# Sustainable Bioenergy Development

## FAO's toolkit

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# The FAO Sustainable Bioenergy Toolkit



BEFS

WHAT TO  
DO

**A Roadmap to Sustainable Bioenergy**  
FAO-UNEP Decision Support Tool (DST)

HOW TO DO IT

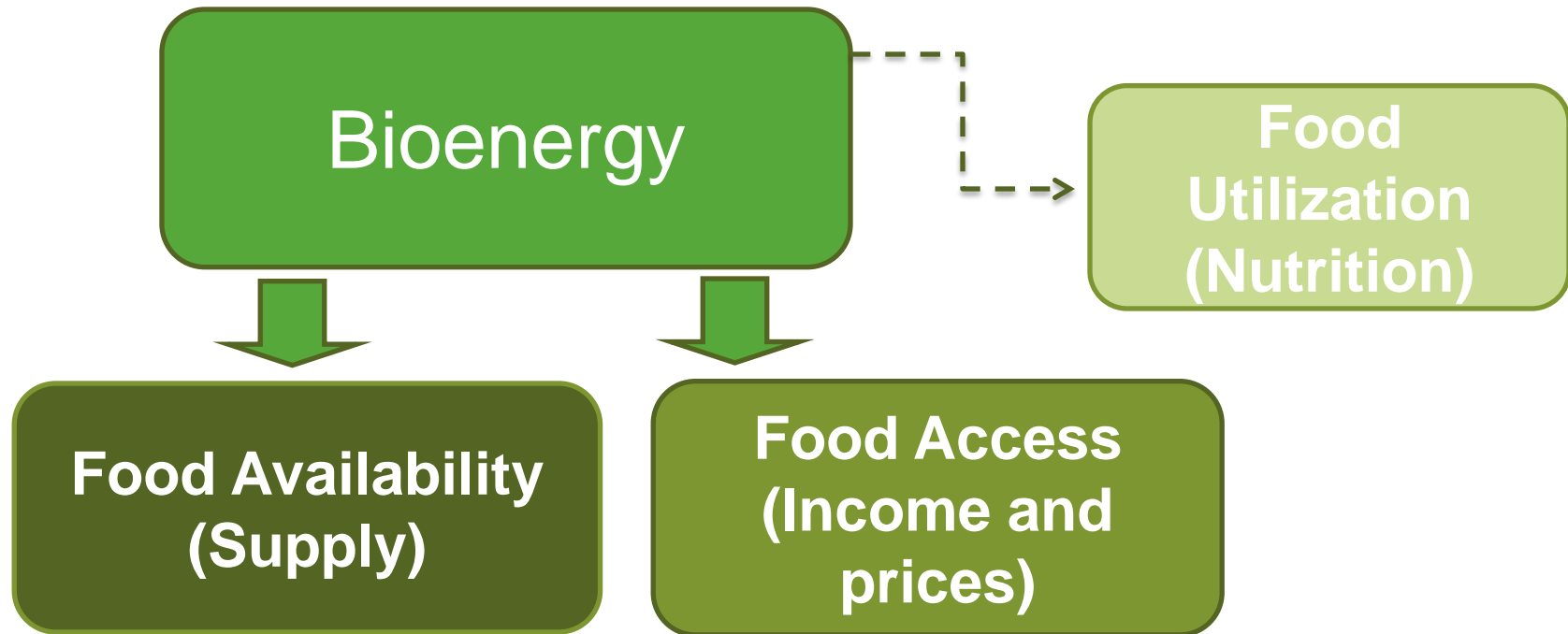
**Sustainable Bioenergy Assessment and Planning**

FAO Bioenergy and Food Security (BEFS) Approach

**Impact Monitoring, Evaluation and Response**

Global Bioenergy Partnership (GBEP) Sustainability Indicators

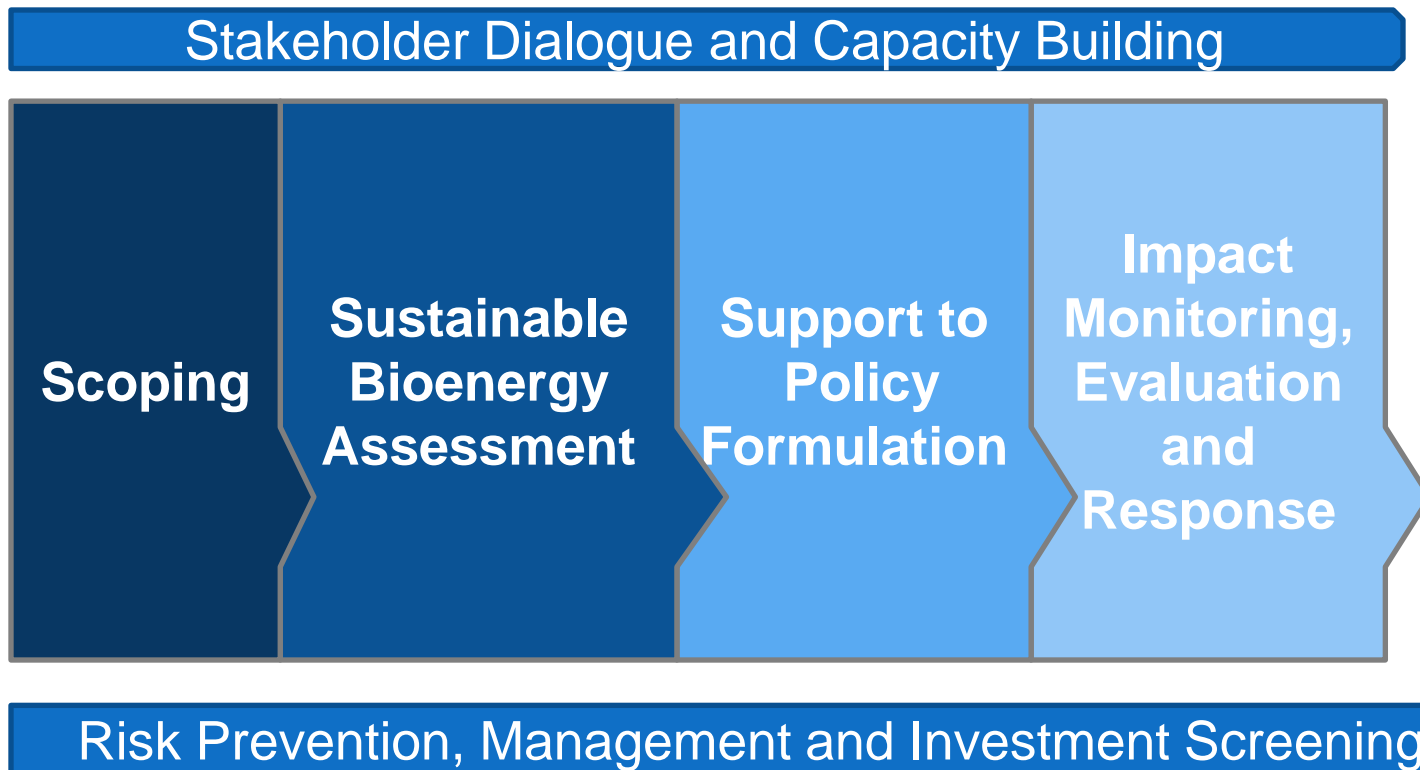
# Linkages: Bioenergy and Food Security



**Which options are viable?**

# Country level support and Evidence: The Bioenergy and Food Security (BEFS) Approach

- Six areas of support:



# Country level support and Evidence: BEFS Approach (contd.)

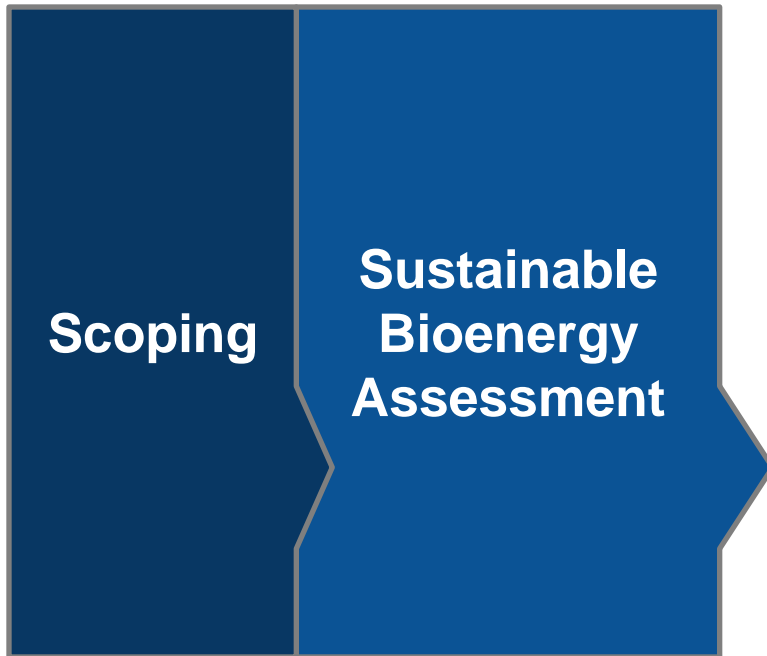
## Stakeholder Dialogue and Capacity Building

### Scoping

- Country review including stakeholder review, agriculture, energy, food security, environment context etc
- Establish or work with existing cross ministerial working group
- Identification and discussion of country needs, focus areas, concerns
- Train working group on bioenergy and food security linkages and on the BEFS Approach
- Definition and agreement of next steps

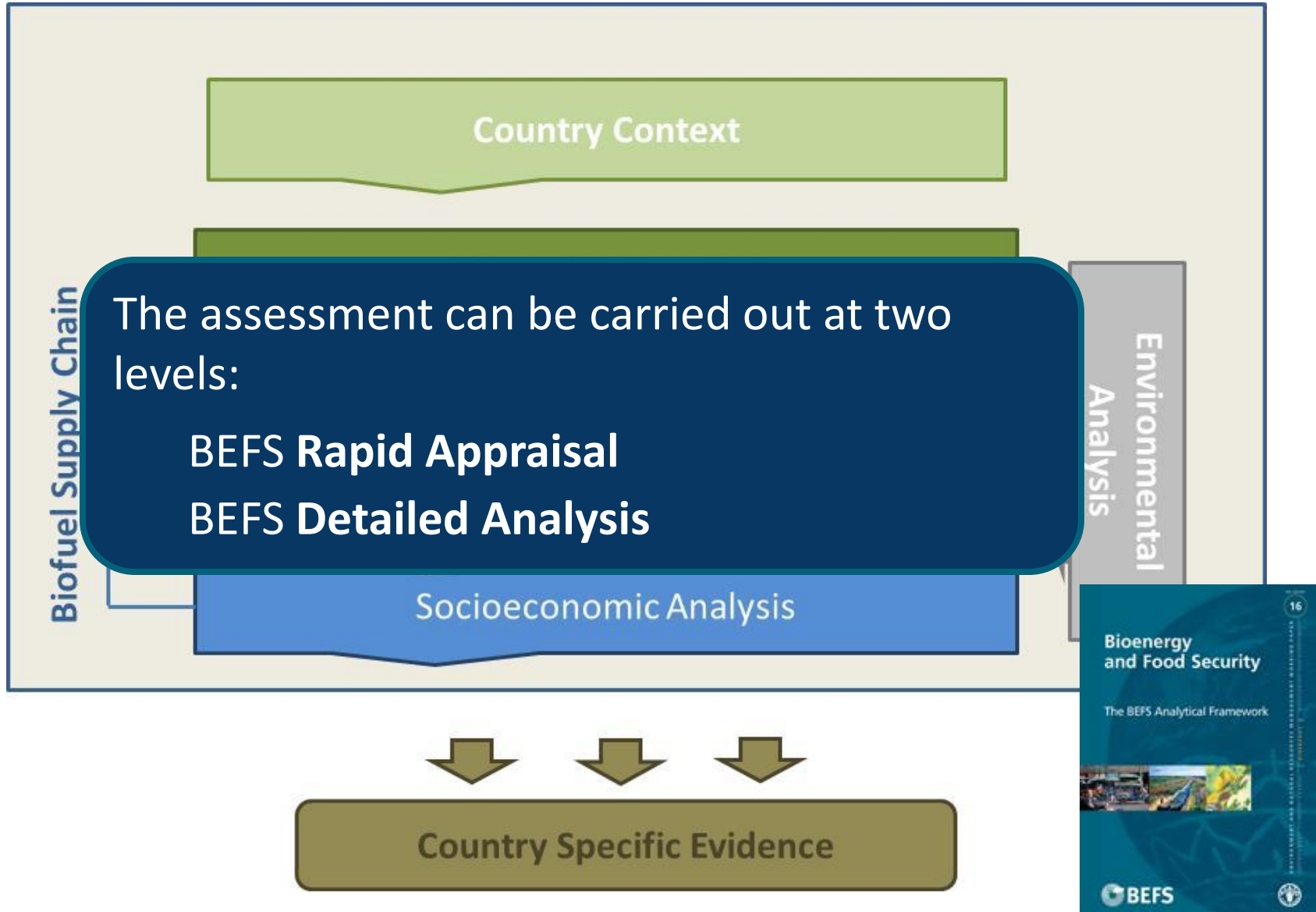
# Country level support and Evidence: BEFS Approach (contd.)

## Stakeholder Dialogue and Capacity Building



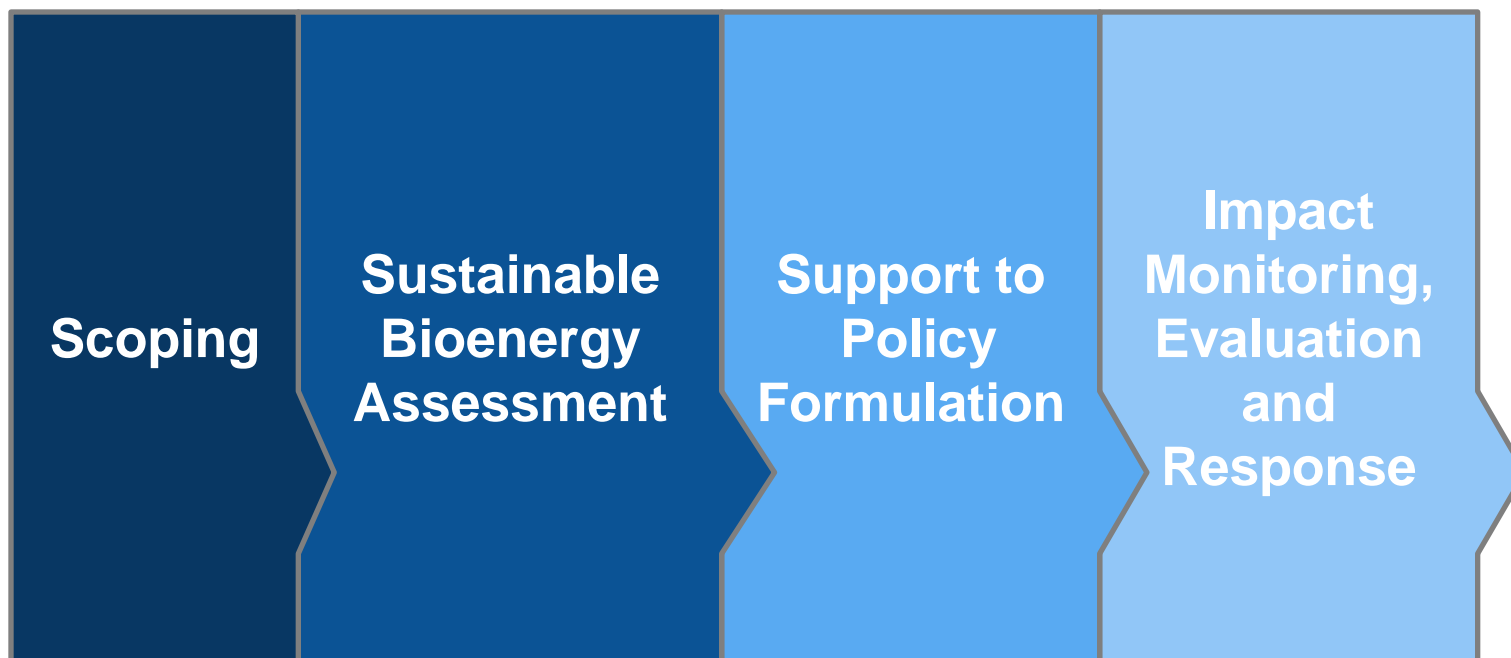
- Country level evidence as basis for policy formulation process
- Two levels of analysis: initial appraisal followed by in-depth analysis
- Training of assessment methodologies

# BEFS Sustainable Bioenergy Assessment



# Country level support and Evidence: BEFS Approach (contd.)

Stakeholder Dialogue and Capacity Building



Risk Prevention, Management and Investment Screening



# Some examples of implementation:

- **Africa**

- Tanzania: Training, potential assessment, multistakeholder dialogue
- Malawi: BEFS Working Group, Roadmap
- Sierra Leone: BEFS Working Group, Sustainable Investment Guidelines

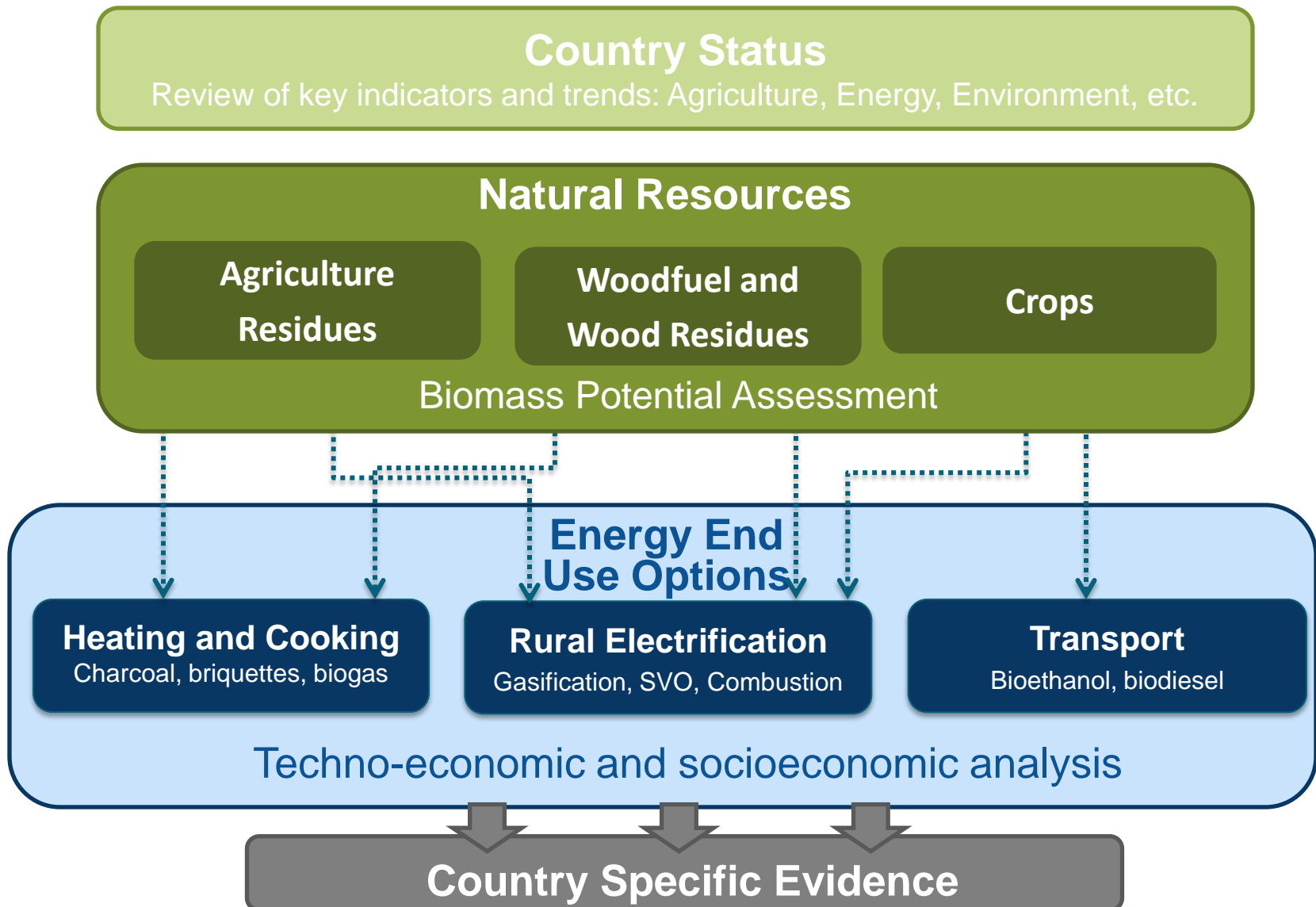
- **Latin America**

- Peru: Training, potential assessment, multistakeholder dialogue
- Colombia: GBEP indicator testing

- **Asia**

- ASEAN: Training, potential assessment, multistakeholder dialogue
- Indonesia: GBEP indicator testing

# The BEFS Rapid Appraisal



# How does the appraisal account for food security and sustainability?

- **Food Security**

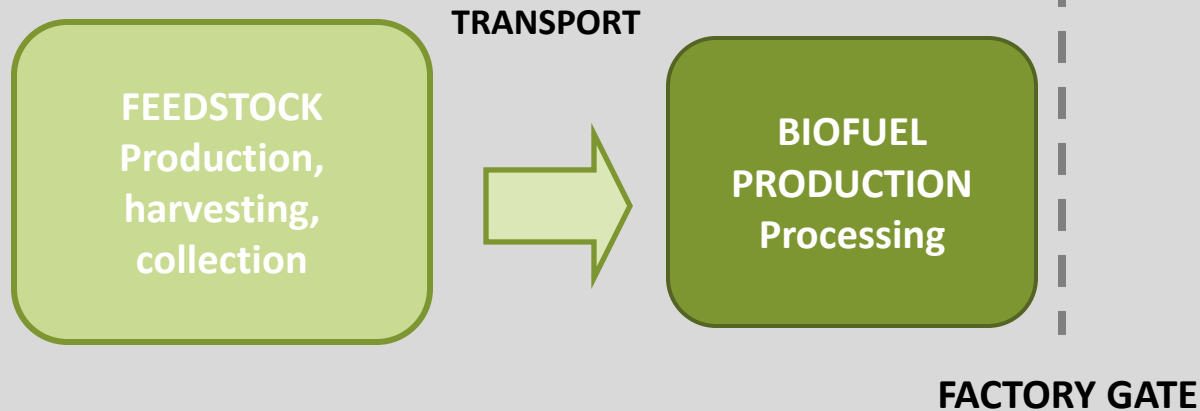
- Identify key food staples in the country
- Strive for feedstock production that is additional or minimizes competition with food, feed and other current uses
- Consider options for income generation, employment and potential tradeoffs
  - feedstock level, processing level

# How does the appraisal account for food security and sustainability? (contd.)

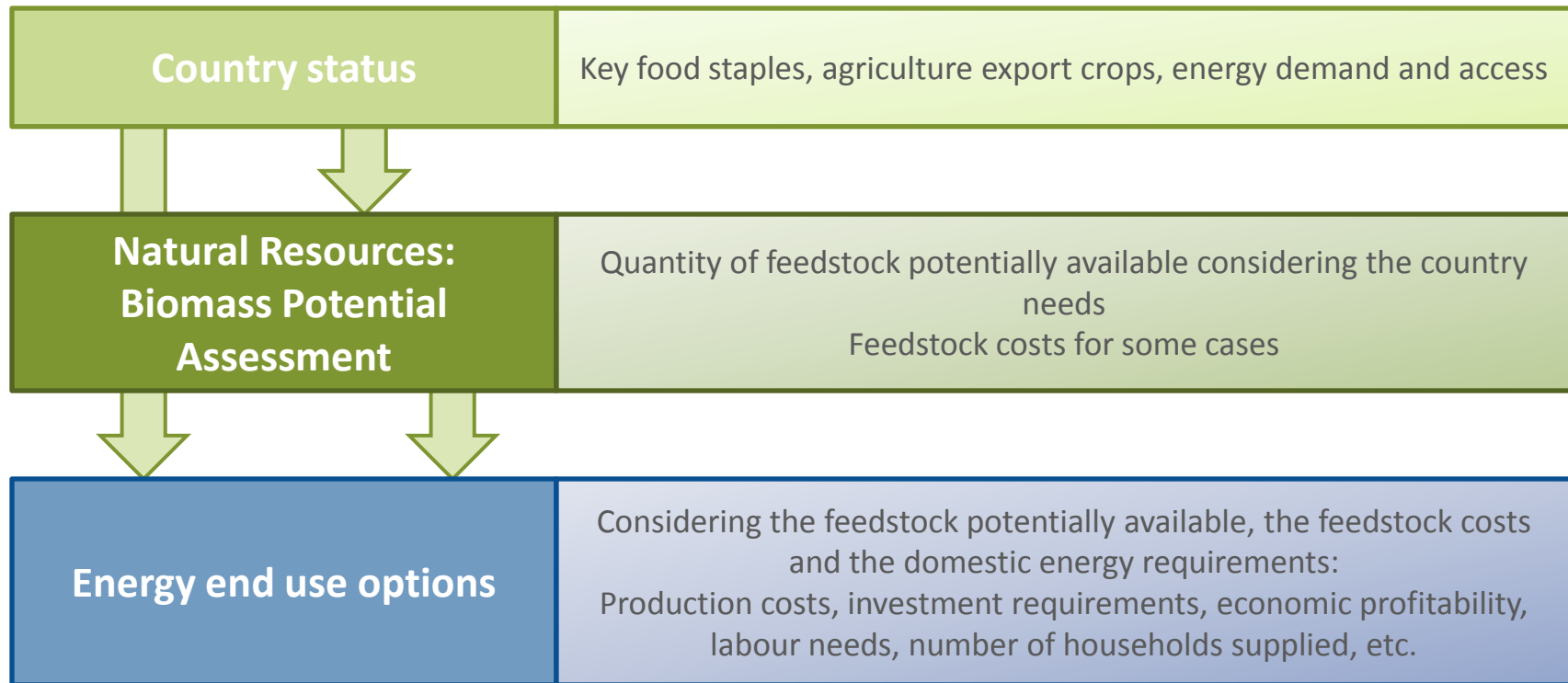
- **Sustainability**
  - **Sustainable use of natural resources**
    - intensification of agricultural production as preferred option
    - forestland and protected areas excluded
    - current/planned uses of residues excluded
    - importance of residues for soil fertility and structure considered
  - **Economic and social sustainability**
    - competitiveness
    - financial viability
    - outgrowers' inclusion

# Coverage of the BEFS Rapid Appraisal

The whole bioenergy supply chain



# BEFS RA: output and interlinkages



# Country support in Malawi

- **BEFS Working Group**

Ministries of Energy, Agriculture, Industry and Trade, Labour, Finance, Economic Development, Transport, Irrigation, etc.



# Malawi – country status



## NATURAL RESOURCES, LAND USE AND POPULATION

Parameter (unit)		Year
Country area (1000 ha)	11848	2009
Land area (1000 ha)	9428	2009
Agricultural area (1000 ha)	5572	2009
Arable land (1000 ha)	3600	2009
Permanent crops (1000 ha)	122	2009
Forest area (1000 ha)	3270	2009
Total population (1000 inhab)	15381	2011
Rural population (%)	79.71	2011
Population density (inhab/km2)	130	2011

Source: FAO, 2013: AQUASTAT

## ECONOMIC INDICATORS

Parameter (unit)		Year
GDP/capita, PPP (const. 2005, int. \$)	789	2011
GDP per capita, PPP (current int. \$)	465	2011
Agriculture, value added (% of GDP)	30	2011

## ENERGY CONSUMPTION AND ENERGY ACCESS

Energy use (kg of oil eq. per capita)	No data	2010
Electricity consumption (kWh/capita)	No data	2010
Access to electricity (% of population)	9	2009

Source: World bank, 2013: World Development Indicators

## FOOD SUPPLY AND KEY FOOD SECURITY CROPS

Rank	Food commodity	Food supply (kcal/capita/day)	Share in total food supply
1	maize	1158	50.0%
2	potato	195	8.4%
3	cassava	135	5.8%
Subtotal		1488.00	64.2%
Total food supply		2,318.00	

Source: Food Balance Sheets, FAOSTAT

Year: 2009

## AGRICULTURAL TRADE - KEY EXPORT CROPS

Rank	Trade commodity	Export quantity (t)	Export value (1000 US\$)	Export unit value (US\$/t)	Share in total value of exports
1	tobacco	144,676	874,904	6,047	69.6%
2	tea	45,999	120,787	2,416	9.6%
3	coffee	901	5,271	5,850	0.4%
Subtotal			1,000,962	14,313	79.7%
Total value of export of agricultural commodities			1,256,639		

Source: Trade, FAOSTAT

Year: 2010



# Energy Balance in Malawi

- IEA data generally used but in this case missing
- Malawi Energy Balance

Sector	Energy demand by fuel (TJ/year)				
	Biomass	Petroleum	Electricity*	Coal	Total (%)
Households	127,394	672	1,798	5	83.4
Industry	9,664	3,130	2,010	3,481	11.7
Transport	270	5,640	35	15	3.8
Service	452	558	477	174	1.1
Total (%)	88.5	6.4	2.8	2.4	

\* Hydro and thermal

Source: Malawi Biomass Energy Strategy (2009)



Biomass is the main energy source, including fuelwood, charcoal and crop residues: 89 % of total  
Households are the main energy consumers: 83 % of total

# The BEFS Rapid Appraisal

## Country Status

Review of key indicators and trends: Agriculture, Energy, Environment, etc.

- **Overview information**
  - Heavily dependent on agriculture, high poverty, low GDP/capita
- **Food security and agriculture**
  - Main food crop: **Maize**
  - Main ag export crop: **Tobacco**
- **Energy and energy access**
  - Heavily reliant on biomass for energy, household main consumers

# Concluding remarks

- Understand the context, needs, constraints and investigate, **based** on the local **evidence**, potential viable solutions
- Central role for **smallholder inclusion** to ensure targetting poverty reduction
- **What bioenergy option** against which energy need, considering a **broader energy mix**
- **Integration is key**: Integrate food and energy systems



Bioenergy and Food Security

# Thank You

<http://www.fao.org/energy/befs/en/>

PLEASE DO NOT HESITATE TO CONTACT US:

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