Sustainable Bioenergy
Making it Happen

Olivier Dubois, FAO

Press Event Brussels, March 2015

What is not true !

- **Sweeping statements on bioenergy sustainability** - Food crop feedstock always bad / Energy crops and residues always good - **Not that simple!**
- **Simple solutions to reconcile food and fuels are available - You must be joking!**

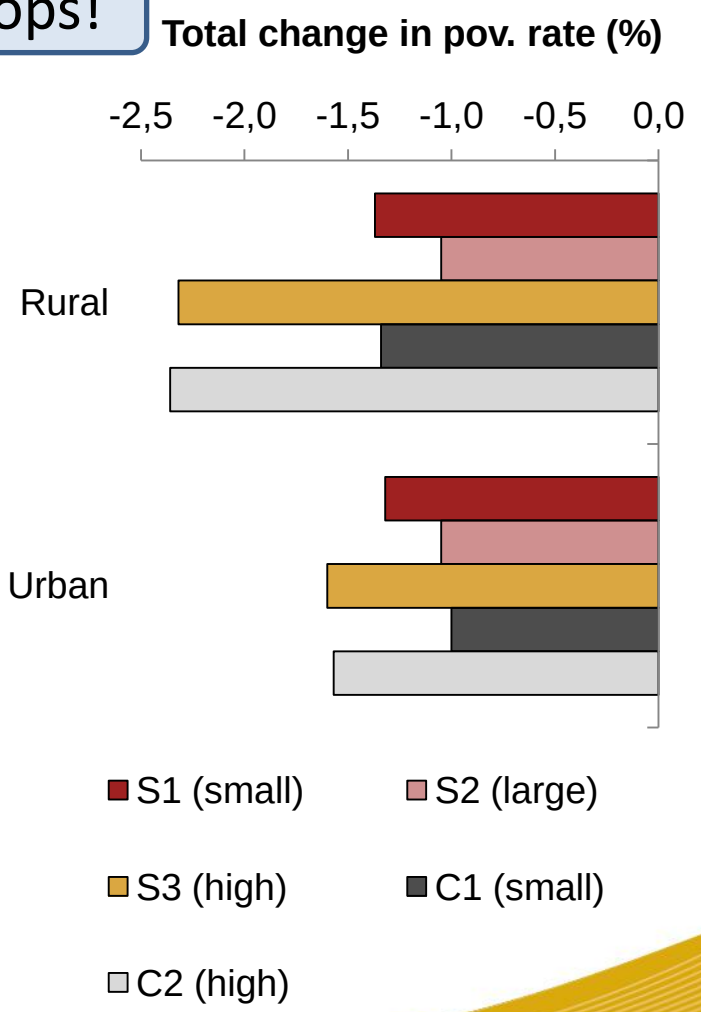
Food-based feedstocks always bad??

- **Not necessarily the case** (e.g. sugarcane ethanol in Brazil, outgrower palm oil biodiesel in Indonesia)
- **Flex crops (that produce food and fuel) do not compete with food if fuel adds to food** – Possible but challenging through:
  - **Yield increase** (e.g. sugarcane in Brazil)
  - **Substitution of export crops** (e.g.: cassava ethanol in Tanzania)
  - **Integrated food-energy systems** (IFES)
  - **Outgrower schemes**

BEFS Tanzania - Possible impacts of cassava and sugar cane ethanol on household incomes and poverty, 2007-2015

Food crops!

- Biofuels reduce the national poverty headcount rate by 1.1 - 2.4% depending on scenario
- This is about 1m people lifted out of poverty
- Outgrower schemes and cassava are more pro-poor
- Both rural and urban poverty decline



By-products/residues – Panacea??

- Agricultural/wood/fisheries by-products/ **residues becoming commodities as increasingly used** (IEA predicts residues 25-30% of biofuel feedstock energy by 2050)

- Use of by-products allows for 10-30% **reduction in land needs**

BUT

Watch out for:

- **competing use of agricultural residues** (soil management – feed – bioenergy)
  - Cheapest fertiliser and soil protection for small-scale farmers
  - Often more than 40% animal feed in developing countries
- **Handling costs !**

Energy crops/second generation - The silver bullet?

- **More conversion efficient** (uses all parts of the plant)
- **Less DIRECT competition** with edible feedstock

BUT

- **Less edible by -products** if all plant used for bioenergy
- **Possible negative environment effects**
- **Possible INDIRECT competition with food security**
  - Regarding land use
  - Regarding the use of agricultural residues (soil, feed, energy)
- **No flexibility between food and energy markets**
- **Not ready on large scale yet and for some more**

Certification is the silver bullet !????

Source: Dubois, 2008

5. Other elements

Only works if many other things are in place

4. Monitoring ,evaluation, verification
Audit, certification or participatory review

Most address poorly food security
+
Challenge for smallholders

3. Tools
Incentives and disincentives for policy implementation

2. Policies
Policies, standards, regulations for sustainable bioenergy

1. Actors' roles
Roles (Rights, Responsibilities,& Benefits) of concerned actors and institutions defined and agreed upon

BASIC CONDITIONS

- Secure and equitable tenure conditions
- Favourable market and investment
- Institutionalised participatory decision-making mechanisms
- Formal recognition of primary actors and institutions (government, private sector and civil society)

What is true

- **Sustainable bioenergy is complex**
- **One should embrace this complexity** rather than oversimplifying things
- **Assessment of bioenergy sustainability must be:**
  - **evidence-based,**
  - **contextualised, and**
  - **integrated**

Enough Land? Most people think Yes

- **Not so much about How much land**
  - Biofuels currently use only 2-3% of all arable land
  - Percentage could rise to 5-8% in the next decades.
  - It depends on many factors (intensification, use of by –products)

- Often more about **Whose and What Land**

WHOSE land

Source: Dubois, 2008

Land belongs to	Size of bionergy production unit	
	Large	Small/community type
Company (private or public)	A	C
Small producer or community	B	D

Outgrower schemes

And WHAT land

- **"No go areas"** (high carbon, high biodiversity) **– Relatively easy to define; more difficult to enforce**

- **"Best bet areas"** Often so-called degraded/marginal/abandoned land: But controversial/dynamic concepts that **need to be *locally* defined**

+

What is more Interesting for investors !?

Key messages on land

Often more about "Whose" and "What" Land

Bioenergy must be ADDITIONAL to food

A lot to do with land and natural resources governance

Voluntary guidelines on sustainable tenure governance of land, forests and fisheries

Biofuels and food prices

- Based on global studies, biofuels can cause increase of food prices – **But huge range of values!**

+

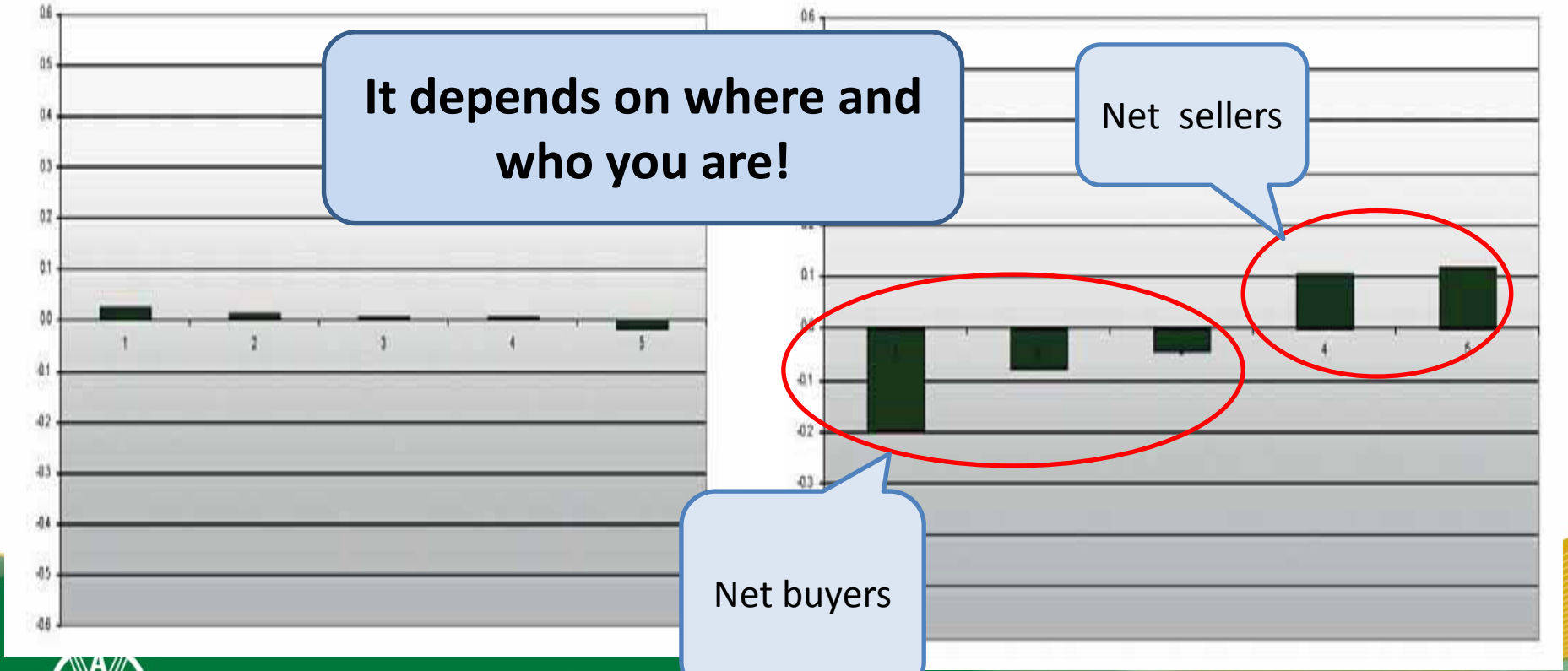
- Need to assess **price transmission** from commodity to food and from international to national and local levels

- Price changes **impact different people in different ways - net buyer or net seller of food**

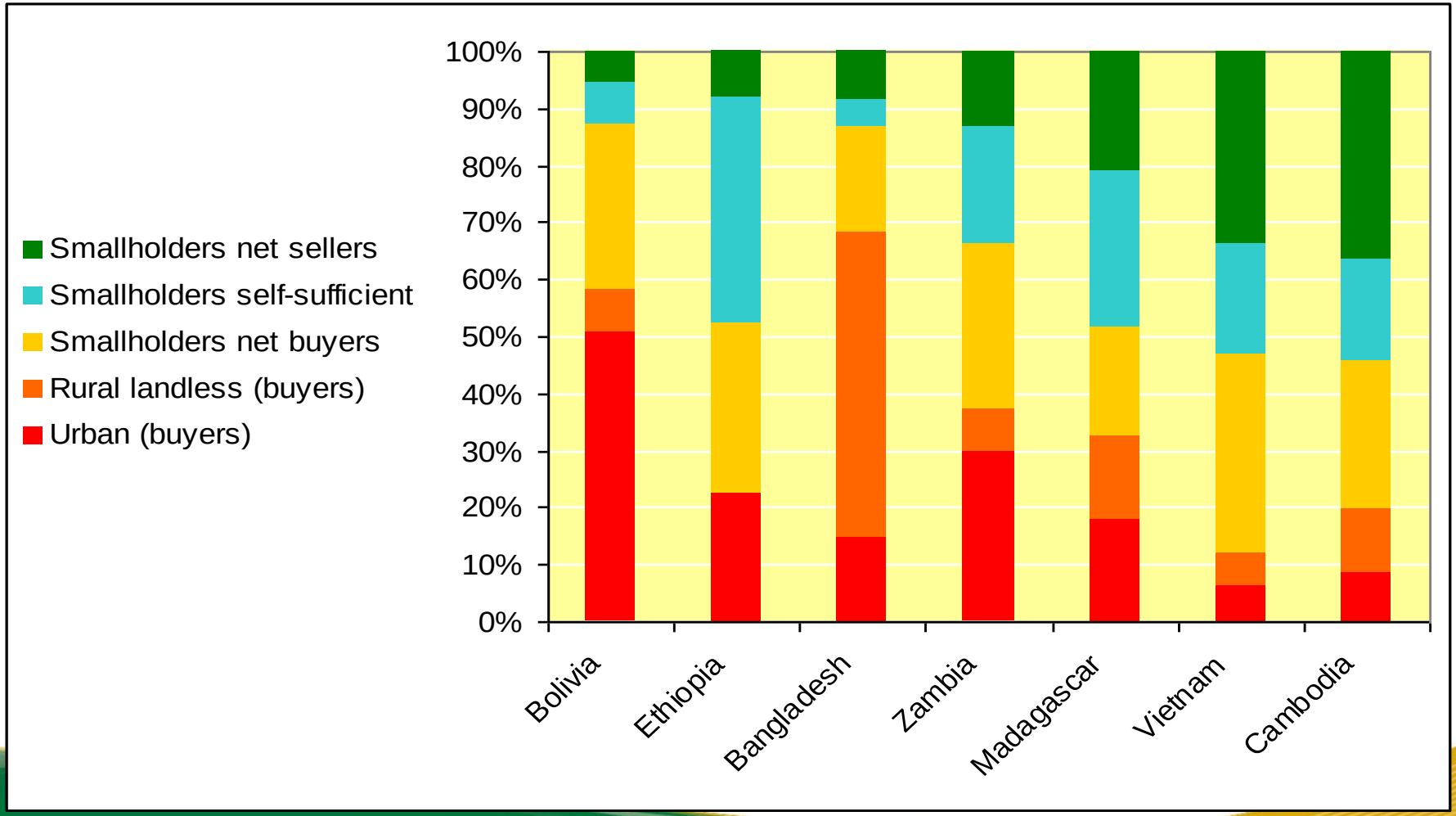
BEFS Tanzania – Who wins or loses from a rise in cassava food prices?

Welfare impacts in Kilimanjaro for a 10 percent increase in the price of cassava

Welfare impacts in Ruvuma for a 10 percent increase in the price of cassava



Impacts will vary for net sellers and net buyers of food



Source: World Bank 2007

Key message on food prices

There is a link

BUT

Biofuels one amongst many factors that influence food prices

AND

Need to look at it at country and household levels where it matters!

Sustainable Biofuels: What is needed

- **An in-depth understanding** of the situation and related opportunities and risks as well as synergies and trade-offs;
- **Implementation of good practices** by investors/producers in order to reduce risks and increase opportunities;
- **An enabling policy and institutional environment** to promote the implementation of good practices;
- **Appropriate monitoring and evaluation** of impacts and performance of good practices and policy responses
- **Political will, capacities** and **good governance** to implement the above

FAO's Sustainable Bioenergy Support Package

Typology of FAO Tools for Sustainable Bioenergy

	Before project implementation: Screening and risk prevention	**After project implementation: Assessment and monitoring**
Local Impact	BEFS Operator Level Tool	IFES analytical framework
Regional/ National impact	BEFS Rapid Appraisal	GBEP indicators

Examples of good practices

- Agro-ecological zoning
- Outgrower schemes
- Integrated food energy systems
  - Optimizing land use efficiency by mixing energy and food crops (e.g. rotations, agroforestry systems)
  - Optimizing biomass use through cascading uses (e.g. biogas from livestock manure)

Example of good practice: Integrated Food Energy Systems – Two types

Type 1:

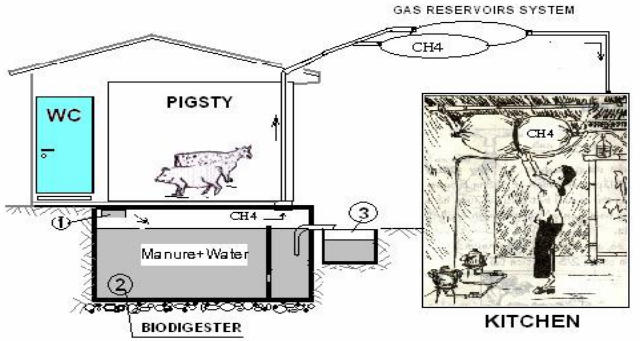
Optimising land use efficiency of food and energy production on the same land

Agroforestry system in the Maldives

Type 2:

Biomass use optimisation through recycling of all by-products

Pig-biogas system - Vietnam



The challenge is to scale up good ones

Examples of Outgrower Schemes for Biofuels

From food crops

Palm oil in Tanzania

Jatropha in Sri Lanka

From energy crop

GBEP Bioenergy Sustainability Indicators

PILLARS		
Environmental	**Social**	**Economic**
INDICATORS		
1. Life-cycle GHG emissions	9. Allocation and tenure of land for new bioenergy production	17. Productivity
2. Soil quality	10. Price and supply of a national food basket	18. Net energy balance
3. Harvest levels of wood resources	11. Change in income	19. Gross value added
4. Emissions of non-GHG air pollutants, including air toxics	12. Jobs in the bioenergy sector	20. Change in consumption of fossil fuels and traditional use of biomass
5. Water use and efficiency	13. Change in unpaid time spent by women and children collecting biomass	21. Training and re-qualification of the workforce
6. Water quality	14. Bioenergy used to expand access to modern energy services	22. Energy diversity
7. Biological diversity in the landscape	15. Change in mortality and burden of disease attributable to indoor smoke	23. Infrastructure and logistics for distribution of bioenergy
8. Land use and land-use change related to bioenergy feedstock production	16. Incidence of occupational injury, illness and fatalities	24. Capacity and flexibility of use of bioenergy

Agreed by 23 countries & 13 international organizations involving a total of 46 countries and 24 int. organizations

FAO's key messages on biofuels

- **Sustainability of biofuels is context specific.** Therefore its assessment must be based on reality not models and global studies
- **Tools and knowledge are now available** to help governments and operators reduce risks and enhance opportunities of biofuel development
- *Per se* **biofuels are neither good nor bad.** What matters is the way they are managed
- **Biofuels** should be viewed as another **opportunity for responsible investment in sustainable agriculture and rural development**.

Thank you for your attention!

Contact: Olivier.Dubois@fao.org

www.fao.org/energy/