



# Opportunities for Biofuels in Tanzania

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# Study : Biofuels for Transportation in Tanzania

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## Content

- **Transport Sector in Tanzania**
- **Land Availability**
- **Sugar and Ethanol Production**
- **Oil Crop Production**
- **Biofuel Policy Recommendations**
- **Summary – Overcoming Barriers**



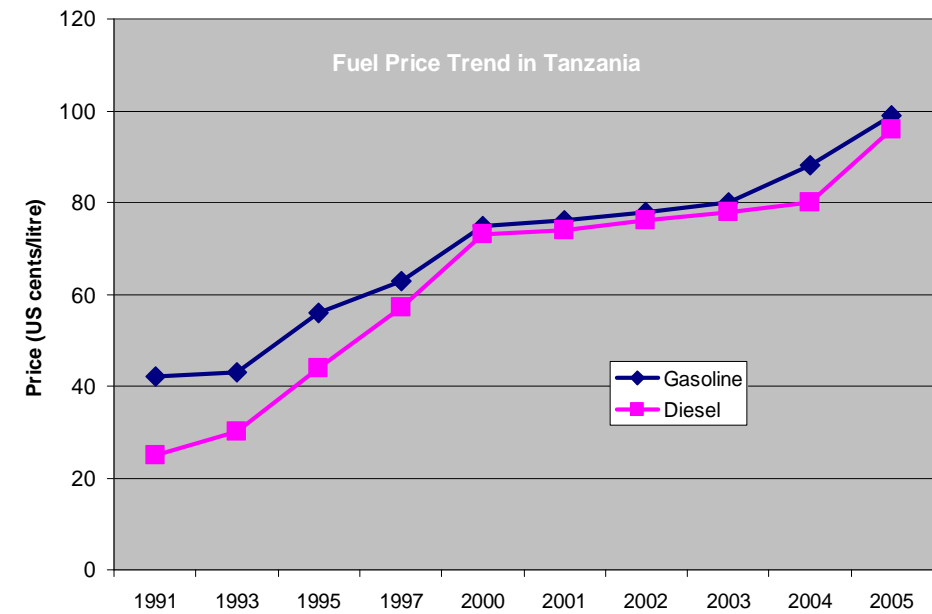
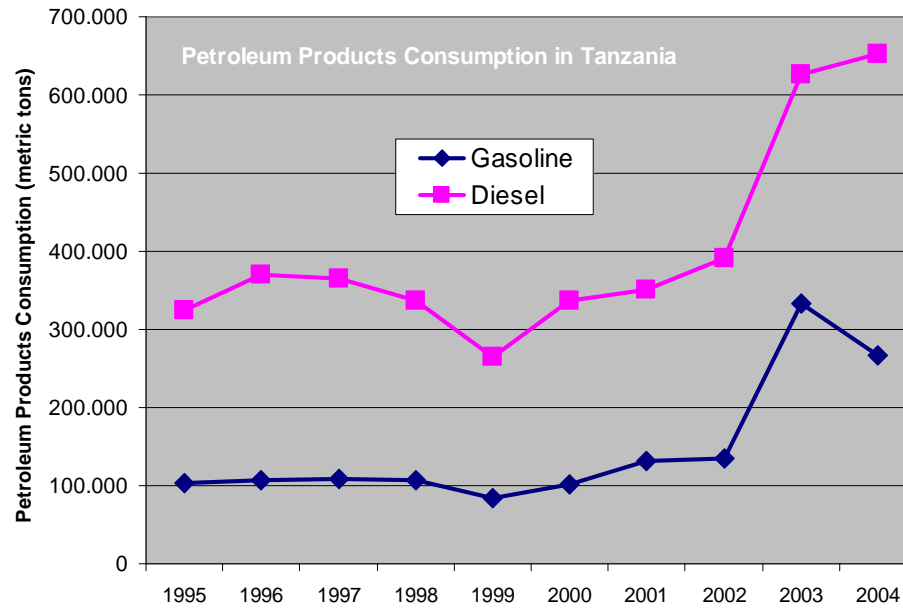


## Tanzania – Transport sector

- Tanzania is **totally dependent** on the import of petroleum products
- Liberalisation of the petroleum product market in 1997 lead to the close of the only refinery (TIPER)
- Today, 70 international oil marketing companies market and distribute refined petroleum products (large companies with own storage facilities)
- Import of petroleum products accounts for **40% of all imports**
- **Transport sector consumes >40% of the imported petroleum**
- Tanzania Petroleum Development Corporation (TPDC) forecasts an **annual growth of 5% for petrol and diesel**
- Prices for petroleum products have increased considerably
- Today, there is **no commercial production of biofuels** in Tanzania



# Tanzania – Fuel Consumption and Price



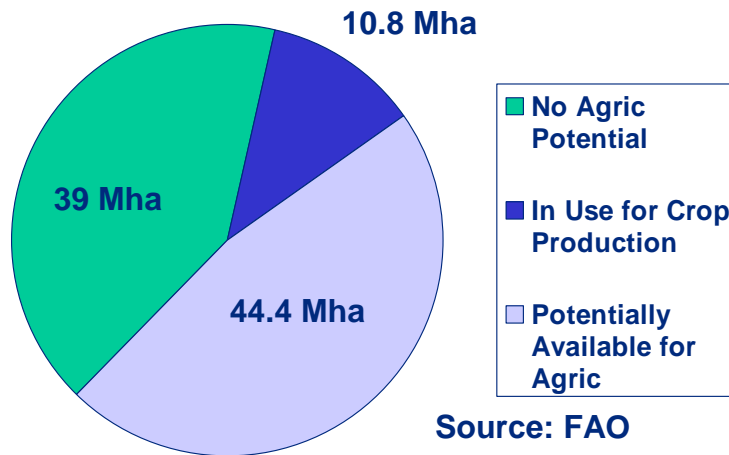


## Tanzania – Motivation for Biofuels

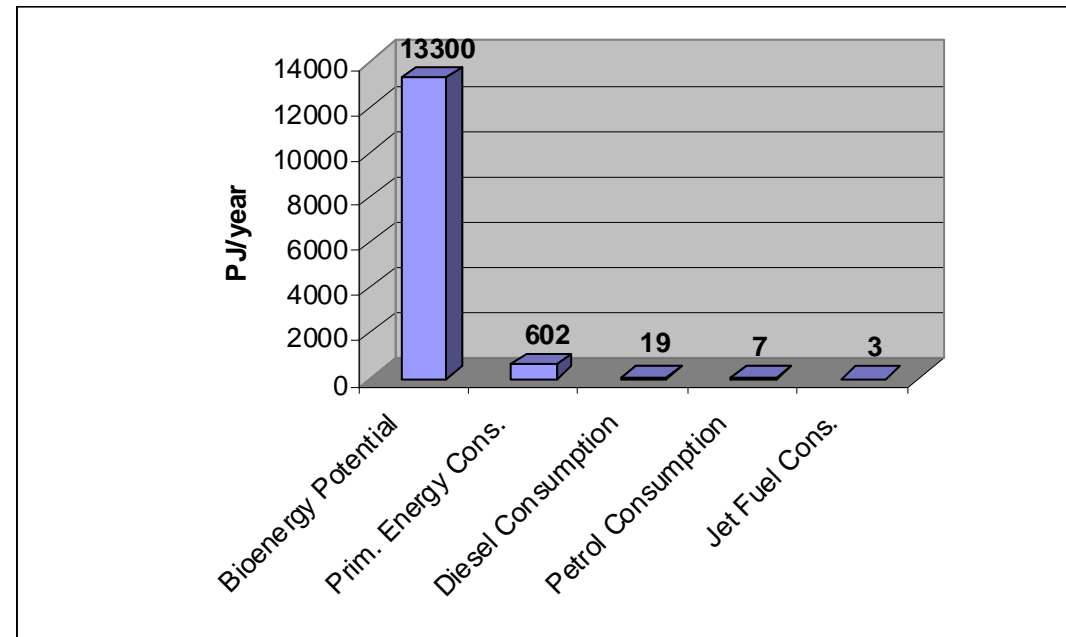
- **Reduction of oil imports**, diversification of energy sources and technologies
- Improvement of **energy security**
- **Development of new agricultural markets, income generation in rural areas**
- **Reduction of GHG Emissions**
- **Reduction of air pollution (CO, SO<sub>2</sub>, PM)**



## Tanzania – Land Availability



Total Land Area Tanzania: 94 Mha



Biomass Production: 75-300 GJ/ha/a



## Land Availability for Crop Production

**FAO Classification 'Very suitable' and 'Suitable'  
with intermediate levels of input (rain-fed cultivation)**

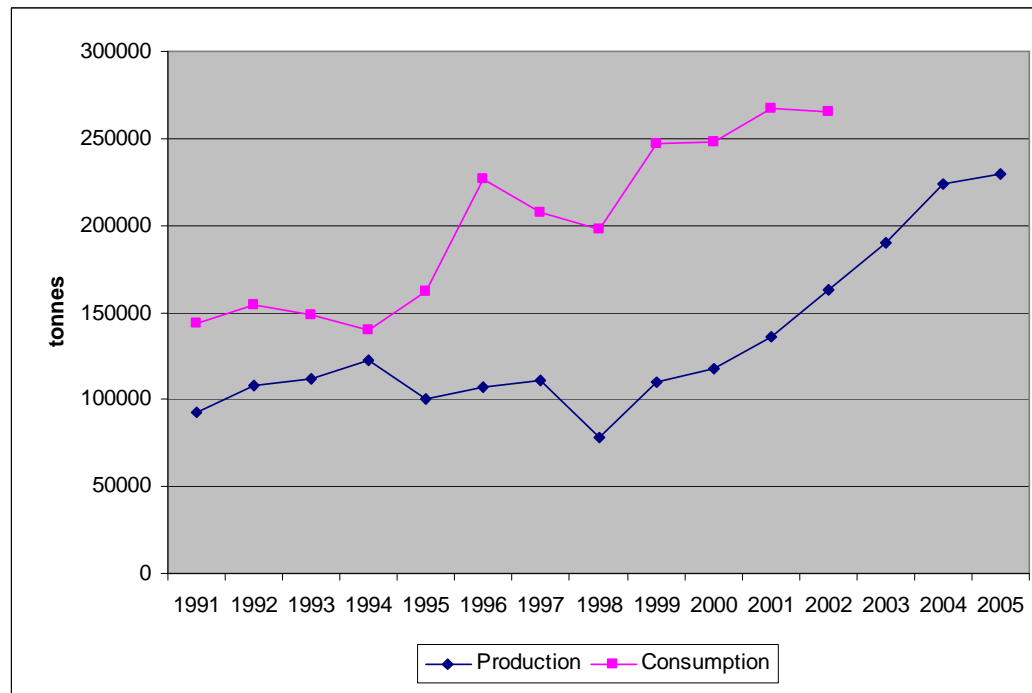
- **Sugar crops: 570.000 ha**
- **Oil crops: > 30 million ha**
- **Cereals: 24 million ha**
- **Root crops: 14 million ha**

**(10-30% may not be available for agriculture because of other competing uses, e.g. settlements, protected areas)**

Source: Global Agro-ecological Assessment for Agriculture in the 21st Century, <http://www.iiasa.ac.at>, accessed September 2005



## Sugar Production and Consumption



**Area under sugarcane increased from 23.000 to 39.000 ha during the last 5 years**



## Projections for the Sugar Sector

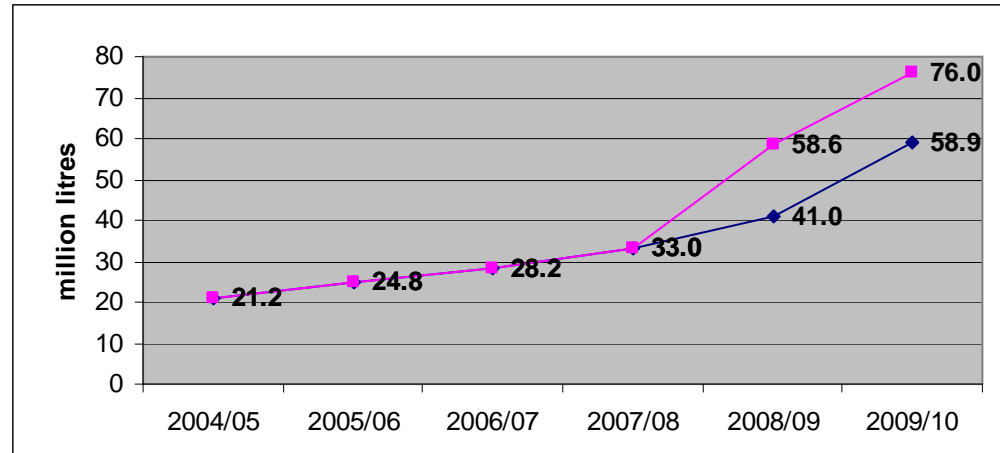
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Kilombero Sugar Company	111,000	120,000	130,000	150,000	170,000	200,000
Tanganyika Planting Company	68,000	72,000	75,000	78,000	80,000	80,000
Mtibwa Sugar Estates	70,000	75,000	80,000	90,000	100,000	100,000
Kagera Sugar Limited	12,000	34,000	46,000	54,000	70,000	80,000
Ruipa I	-	-	10,000	43,000	66,400	87,000
Small scale	10,000	15,000	16,000	16,000	18,000	24,000
<b>TOTAL</b>	<b>271,000</b>	<b>316,000</b>	<b>357,000</b>	<b>431,000</b>	<b>504,000</b>	<b>567,000</b>
<b>Consumption</b>	<b>380,411</b>	<b>401,063</b>	<b>422,908</b>	<b>446,485</b>	<b>471,224</b>	<b>497,546</b>
<b>Surplus (Deficit)</b>	<b>(109,411)</b>	<b>(85,063)</b>	<b>(65,908)</b>	<b>(15,485)</b>	<b>32,776</b>	<b>69,454</b>
<b>Exports</b>	<b>22,234</b>	<b>23,613</b>	<b>24,560</b>	<b>26,684</b>	<b>29,120</b>	<b>32,000</b>
<b>Surplus (Deficit)</b>	<b>(131,645)</b>	<b>(108,676)</b>	<b>(90,468)</b>	<b>(42,169)</b>	<b>3,656</b>	<b>37,454</b>

Sugar production, consumption and export in tons

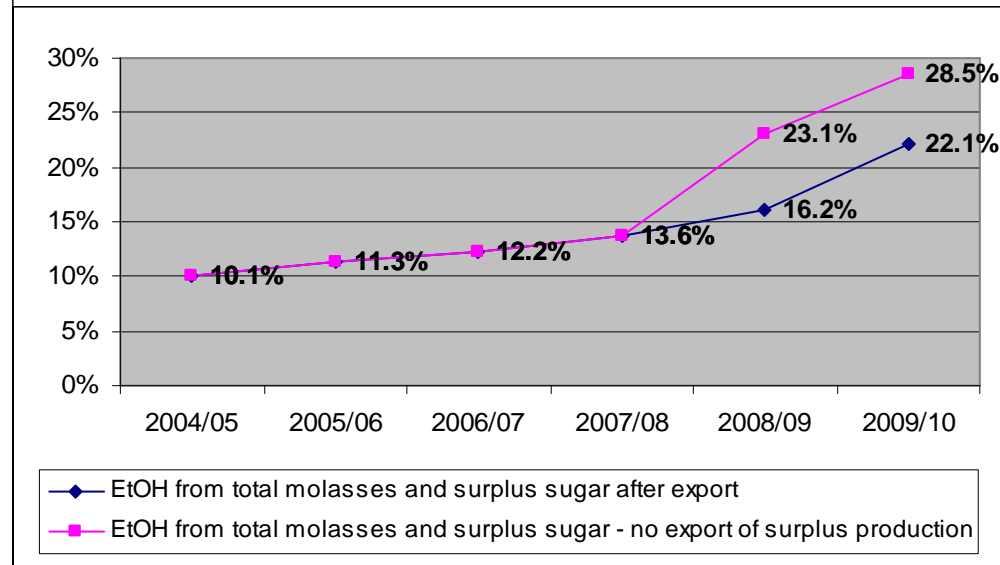
Source: Sugar Board of Tanzania



## Ethanol production from C-molasses



## Nationwide blend percentages (by volume)



Ethanol Yields (expected):  
 Sugar cane juice: 7.560 l/ha  
 C- molasses: 860 l/ha



## Ethanol Export Potential

- **E10** requirements in Tanzania for 2010: **26.7 million litres**
- Ethanol potential (sugar sector projections) from C-molasses and surplus sugar after export (~ 60.000 ha): **58.9 million litres**
- Additional ethanol potential from **sites identified as suitable** for future sugar production (~ 60.000 ha):

	Sugar Potential (t/a)	Ethanol Potential from C-molasses(Ml/a)	Ethanol Potential from Sugarcane Juice (Ml/a)
Ruipa	224,000	18.1	161.3
Ikongo	82,000	6.6	59.0
Mahurunga - Mtwara	10,000	0.8	7.2
Usangu Plains	70,000	5.7	50.4
Kilosa	60,000	4.9	43.2
Masaki Plains	200,000	16.2	144
<b>TOTAL</b>	<b>646,000</b>	<b>52.3</b>	<b>465.1</b>

Source: Sugar Board



## Oil Crops in Tanzania

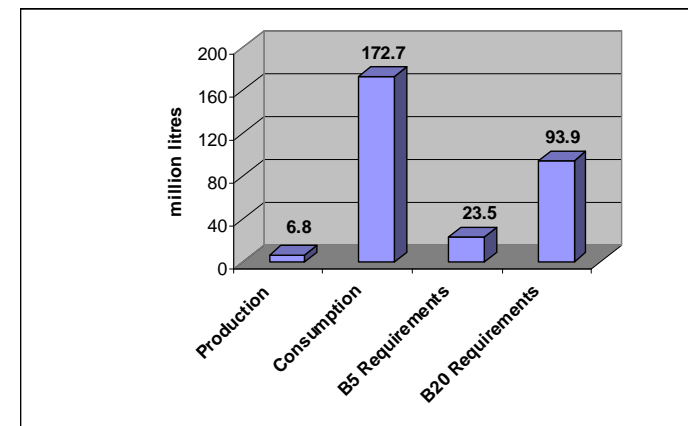
- Oil crops in Tanzania: oil palm, coconut, cashew nut, sunflower, sesame, soy beans, cottonseed, peanut, castor, jatropha
- Most promising crops for biofuel production: **oil palm, jatropha**
- FAO classification 'very to moderately suitable' for oil palm cultivation (rain-fed, intermediate input): **1.2 million ha**
- In 2004, **4.500 ha of oil palm** harvested (**low yields** of 1.500 l/ha)
- Import of palm oil from Malaysia and Indonesia (Tanzania not self-sufficient in most food oils)
- **Price of food oils too high** for competitive biodiesel production
- Jatropha curcas planted on small-scale for oil and soap production (yields may be significantly less than 1.500 l/ha)



## Palm Oil Project in Kigoma Region

- Newly established company FELISA Ltd. focuses on promotion of biofuels production and marketing in Tanzania
- Project: Cultivation of 8.000 ha oil palm
- Improvement of agricultural management (e.g. irrigation)
- Yield improvements to 5.000 l/ha
- Target palm oil production: 40 million l/a

Palm oil production and consumption



Land requirements (ha) for B20 blend

Oilseed Crop	2005	2006	2007	2008	2009	2010
<b>Oil Palm</b>	19,625	20,606	21,637	22,719	23,851	<b>25,053</b>
<b>Jatropha</b>	61,715	64,800	68,040	71,442	75,004	<b>78,782</b>



## Policy Recommendation – Set-up of Tanzanian Biofuels Task Force

**The Government of Tanzania shall establish a multi-sectoral stakeholder group (Govt. agencies, biofuels producer, oil industry, civil society)**

- Prepare stable and clear policies and regulations for the introduction of biofuels in Tanzania (e.g. blending mandates)
- Elaborate suitable incentives to ensure return of investment (e.g. tax reductions)
- Implement public awareness activities





## Biofuel Development in Tanzania

- Under the guidance of the Tanzanian Ministry of Energy, **a Biofuels Task Force has been established in April 2006**
- Development of **Biofuels Guidelines** and a **national Biofuels Strategy, Legislation and Regulations** (under preparation)
- Support for the Tanzanian Biofuels Task Force through the Partnership Dialogue Facility (PDF) of the EUEI
- Tanzanian sugar companies have performed **feasibility studies for ethanol production** (production price in LDC: 0,36-0,60 US\$/l)
- Several small- and medium-scale initiatives on oil crops (palm oil, jatropha oil) exist in Tanzania



## Summary – Overcoming Barriers

### Lack of suitable biofuel policies

- Establishment of National Biofuels Task Force
- Set-up of multi-stakeholder dialogue
- Development of a **national biofuel strategy**

### Land availability

- 4 million ha potentially available for crop production in Tanzania, land availability not likely to be a barrier to biofuel production
- Detailed assessment of local land availability (co-op. with farmers)
- Elaboration of **suitable sustainability criteria** (environmental, social, economic)



## Summary – Overcoming Barriers

### Competition with food and feed

- Currently, Tanzania is not self-sufficient in sugar as well as food oil production (food-biofuels competition)
- **Biofuels may provide stimulus for investment in the agriculture sector**

### Local revenue generation

- **Priority on national demand driven** development of the biofuels sector over export
- Level of national biofuels demand set by blending requirements that do not require engine modifications (e.g. E10, B10)
- Involvement of farmers through **outgrower schemes**



**THANK YOU!**

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