

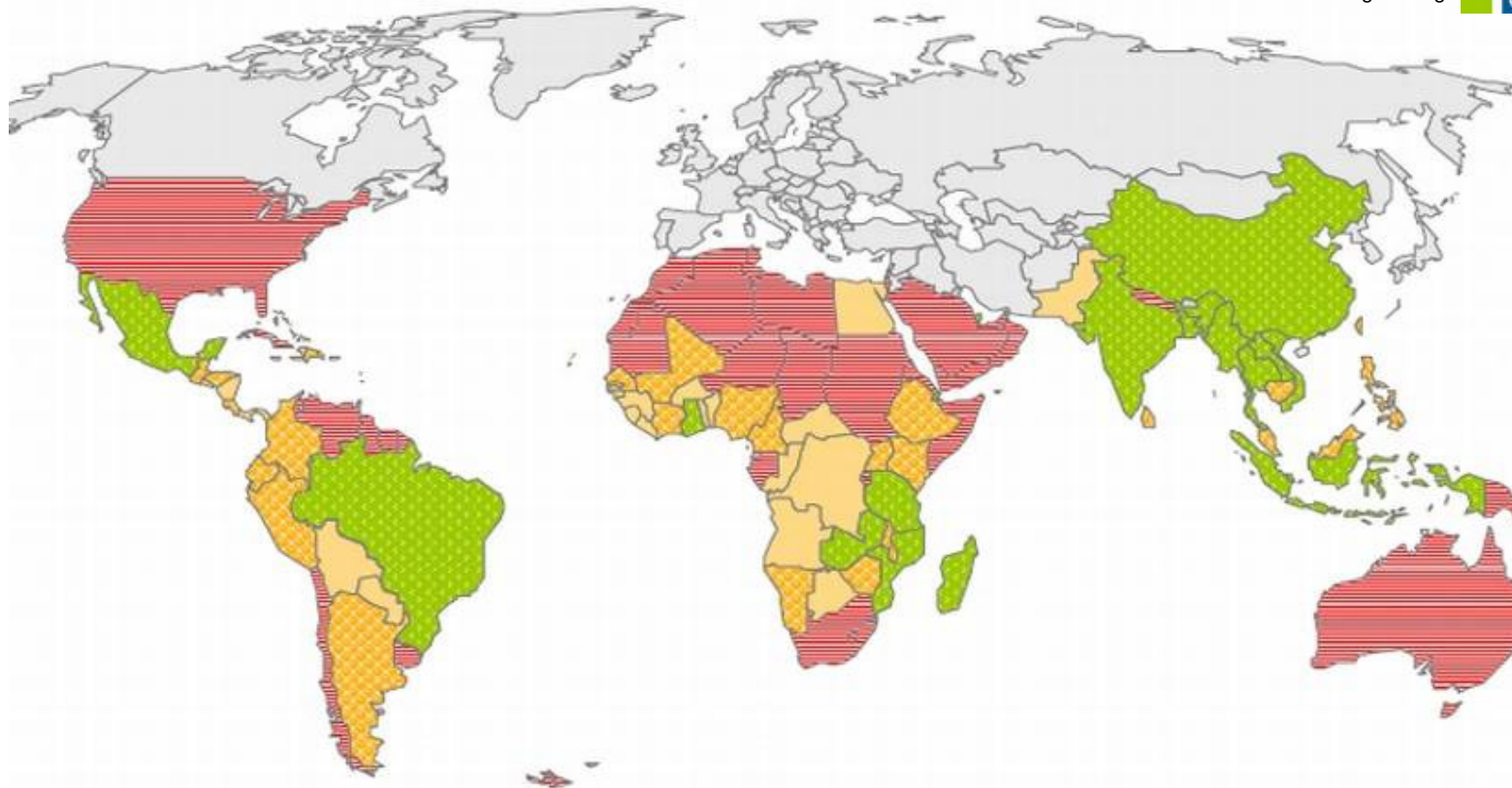


## ***Jatropha curcas L.***

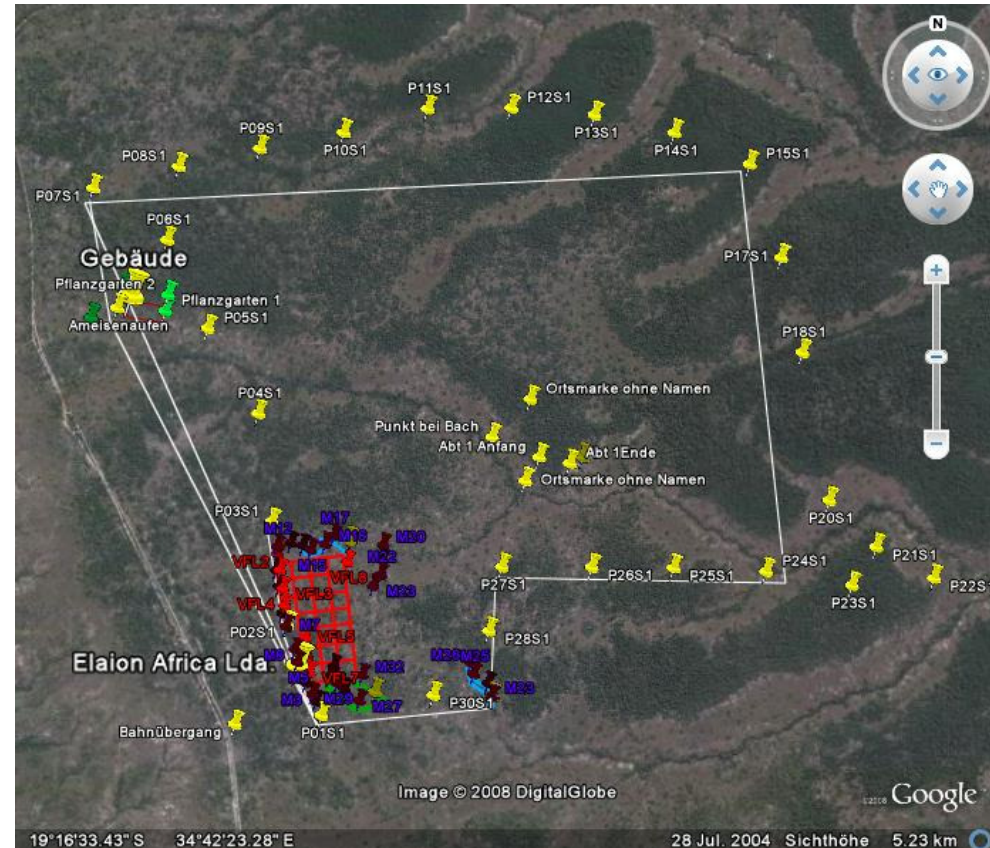


# Growing Activities

Global Market Study on Jatropha  
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# Mozambique - Milha 26



- **Central Mozambique 1.000 ha leased from government for 50 years**
- **Open woodland savanna, charcoal being the main ecosystem-service**
- **From degrading marginal- to sustainably cultivated areas**
- **Silvo-pastoral agroforestry, *Terra Preta dos Indios*, Food/Fuel/Fibre**

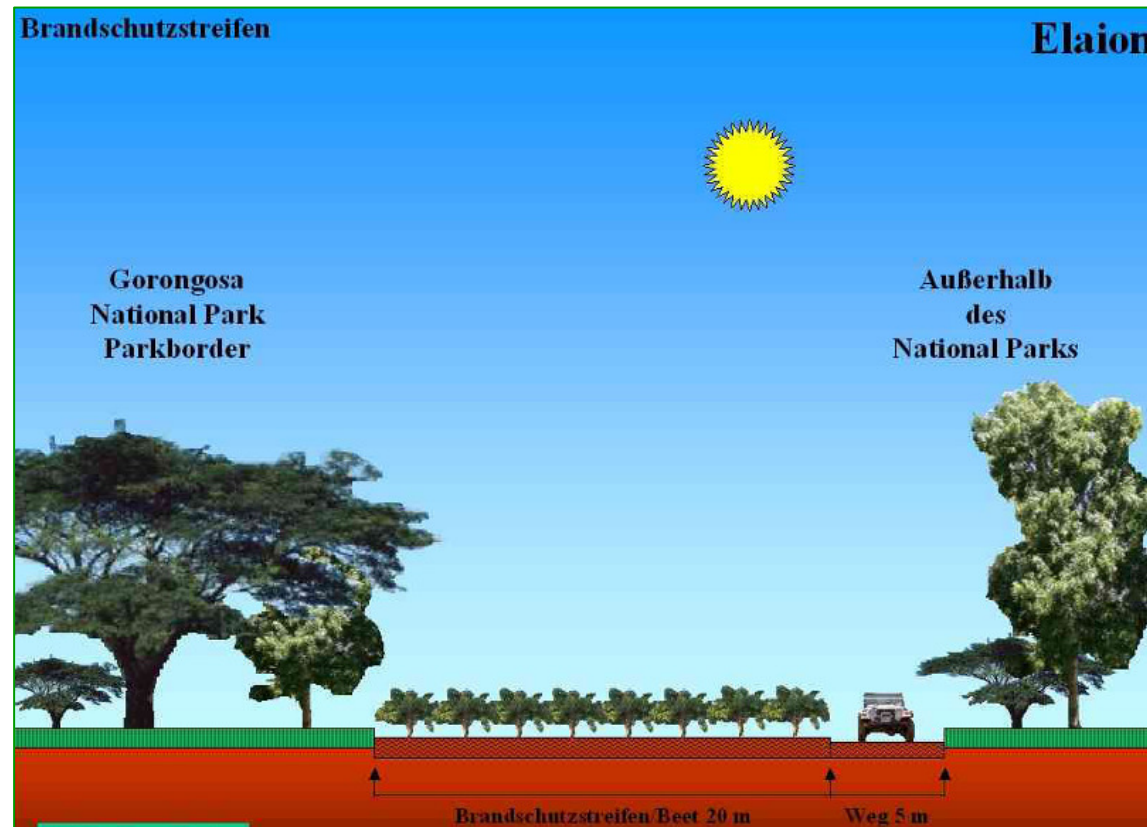
# Elaion Africa Lda.



# Infrastructure

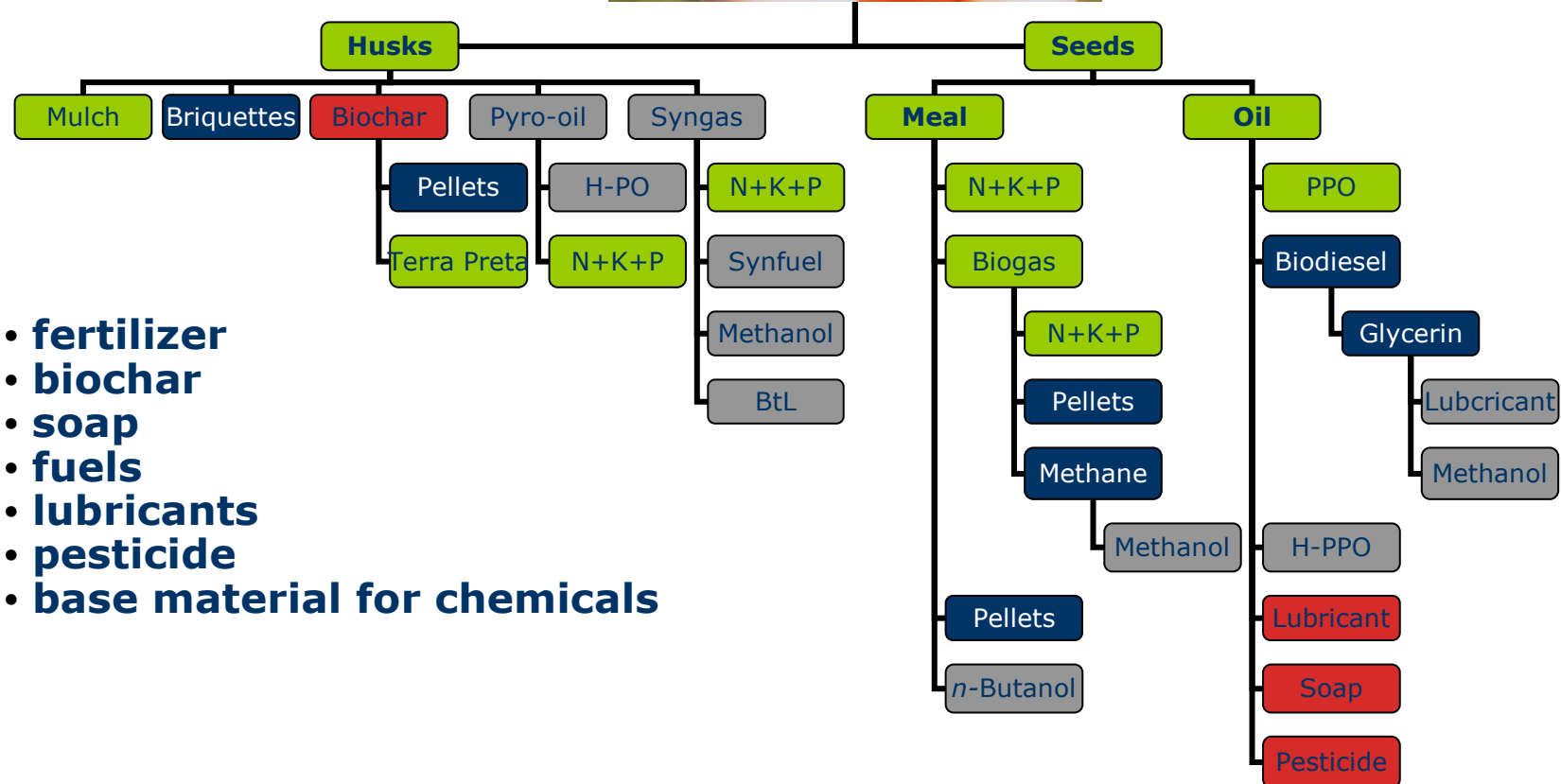


# Eco-social Services



- **Fire Protection of High Conservation Value Areas**
- **Land and income opportunity for relocated dwellers**

# Application



# Base oil

**BAM** Federal Institute for Materials Research and Testing

JATROPHA – The Seed of Energy  
CO<sub>2</sub> neutral fuels and lubricants based on sustainable non-food oils

**Jatropha as lubrication base oil**

Lubricants	NO-ACK %	VI	Pour - point °C	$\eta_{40}$ mm <sup>2</sup> /s	$\eta_{100}$ mm <sup>2</sup> /s	$\eta_{150}$ mm <sup>2</sup> /s	HTHS at 150°C mPa·s	OEC D 301 B/F %	Aquatic toxicity algae daphnia OECD mg/l 201 202		Type
Natoil HOS90 b.o.	0.5	200	-17	39.5	8.50	4.07	3.34				VOSO
VHOSO SR3 b.o.	0.5	202	-18	40.0	8.61		3.29	79.0	107	>1,000	VOSO
Mosambik-Elaion (ME1)	1.0	211	-6	34.0	7.84	3.84	3.0	86.0	>100	>1,000	JCL
Lesquerella	0.4	113	-26	130	15.2	6.06	5.03				HOFA
Fatty acid methyl ester (OBR)	78.6	143	-8	4.43	1.77	1.08	0.89	77.1	>100	>1,000	FAME
AGIP Blue			-9	3.13	1.26			79.8	>100	968	H-C Diesel
Diesel (2,000 ppm S)			-20	2.93	1.21			63.5		0.45	H-C Diesel

D. Spaltmann  
 Mikrobiologie und  
 Verschleißschutz  
 VI.2

Why Jatropha? Properties of J. plant J. Source Jatropha plant oil as fuel  
 J. plant oil as lub. Repro., availab., costs Summary

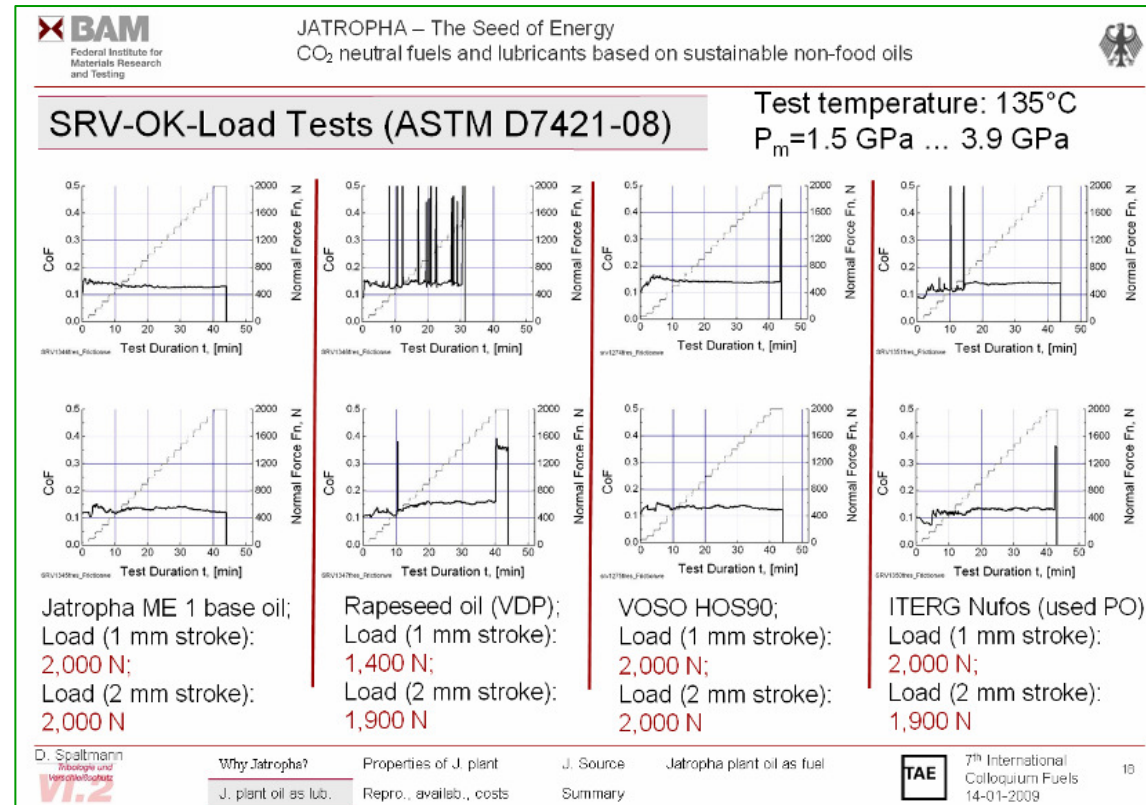
TAE 7<sup>th</sup> International Colloquium Fuels 14-01-2009 19



- **Mix of different oils from seeds, vegetables or algae to optimize desired characteristics**
- **Biological additives to enhance oxidation stability & pour point**



# Lubricant



- **Excellent base oil for engine lubricants**
- **Straight use with anti-oxidants and winterization thinkable!**

# Harvest

## Manual

- Depending on low cost work force
- About 600 Pickers for 1.000 ha
- Suited for small scale farmers
- 3 kg/h wild vs. 10 kg/h pruned



## Mechanized

- Initial investment
- Running costs
- Energy
- Damaging plants/harvesting all fruits

## Simultaneous

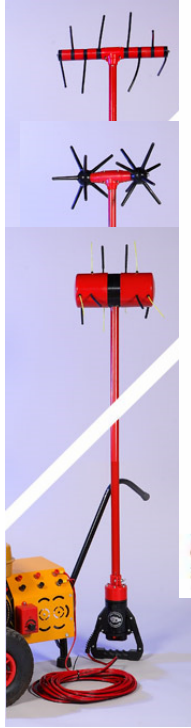
**fruiting required!**

### Options:

- pollination
- irrigation
- hormones



# Manual Harvest

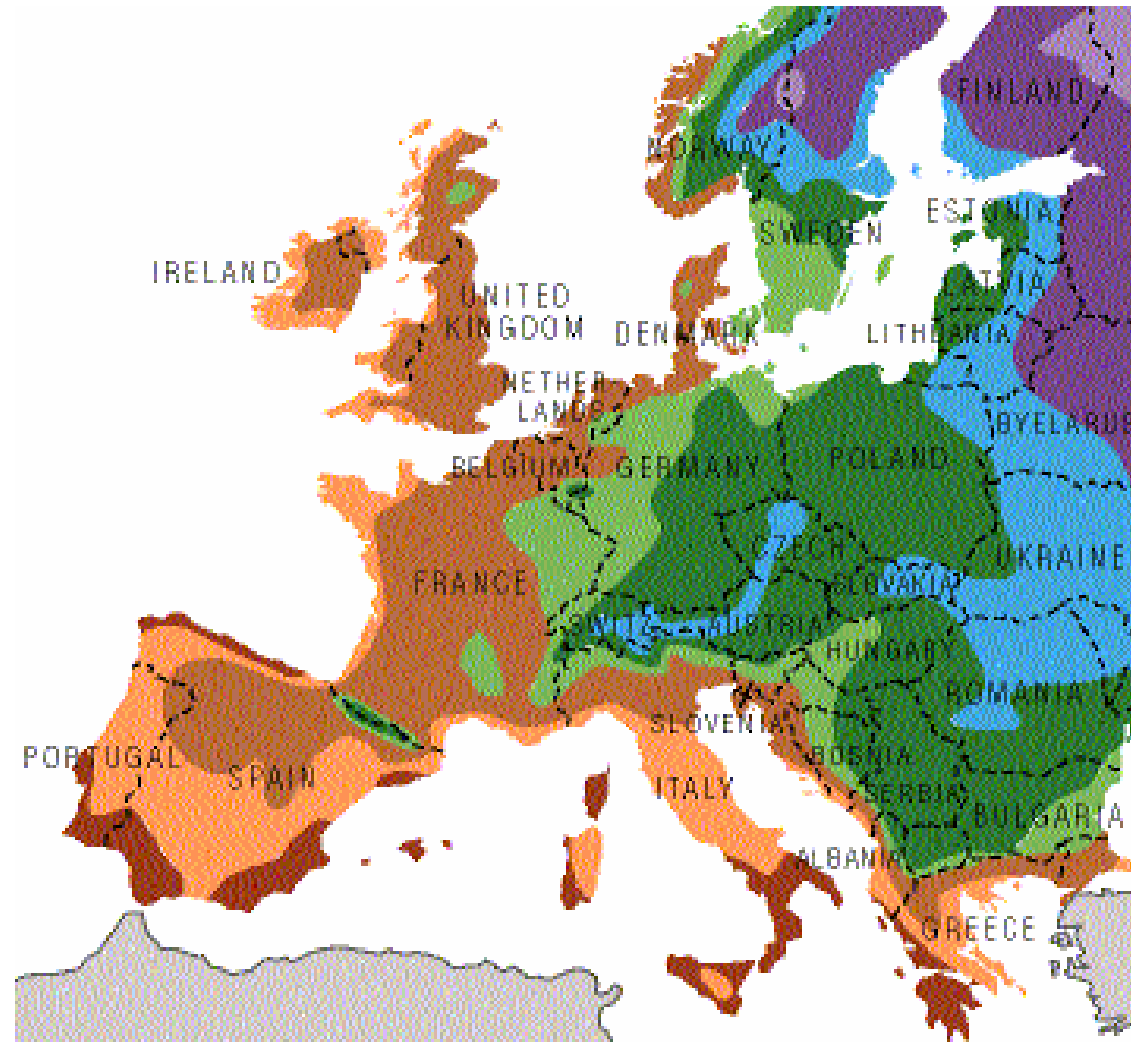


# Mechanized Harvest



## R&D Necessity

- **Mechanical harvesting**
- **Varieties tolerant to frost**



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