



CCCEP Lunchtime Seminar Series, November 14th, 2012



## Unpacking key livelihood challenges and opportunities in energy crop cultivation: village level perspectives on *Jatropha curcas* in Mali





# Research context

Energy security – Climate change

## Biofuels opportunities



Today, local farmers cultivate 600 hectares of land with jatropha, which provides electricity to 350 homes — roughly half of Garalo's

Rural development

The Garalo project is a testament to how biofuel production can greatly improve the lives of poor people in developing countries,

*Jatropha*  
“miracle crop”?

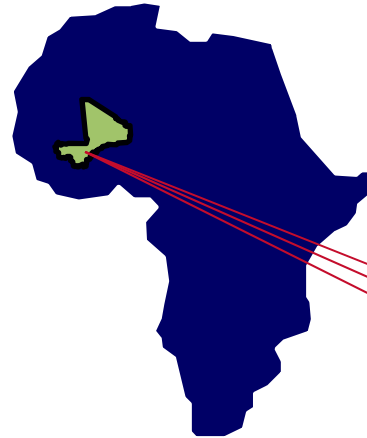


# What is *Jatropha*?



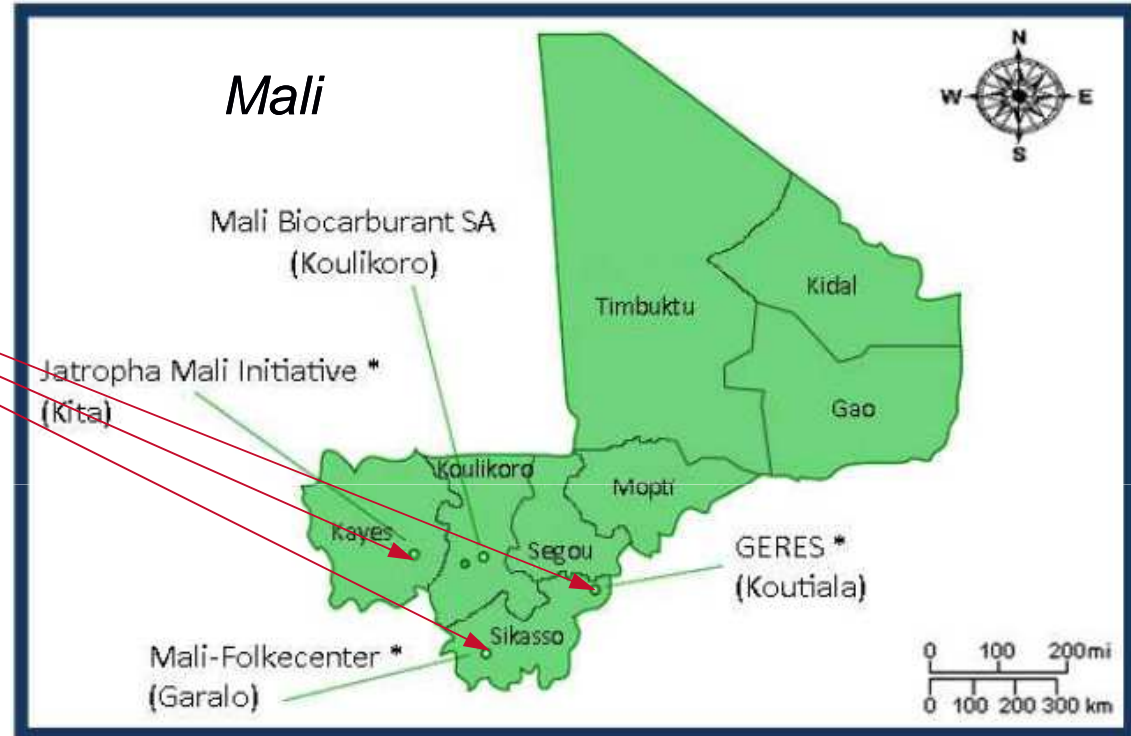


# Field site selection and research aim



Where?

Why?



## Aim:

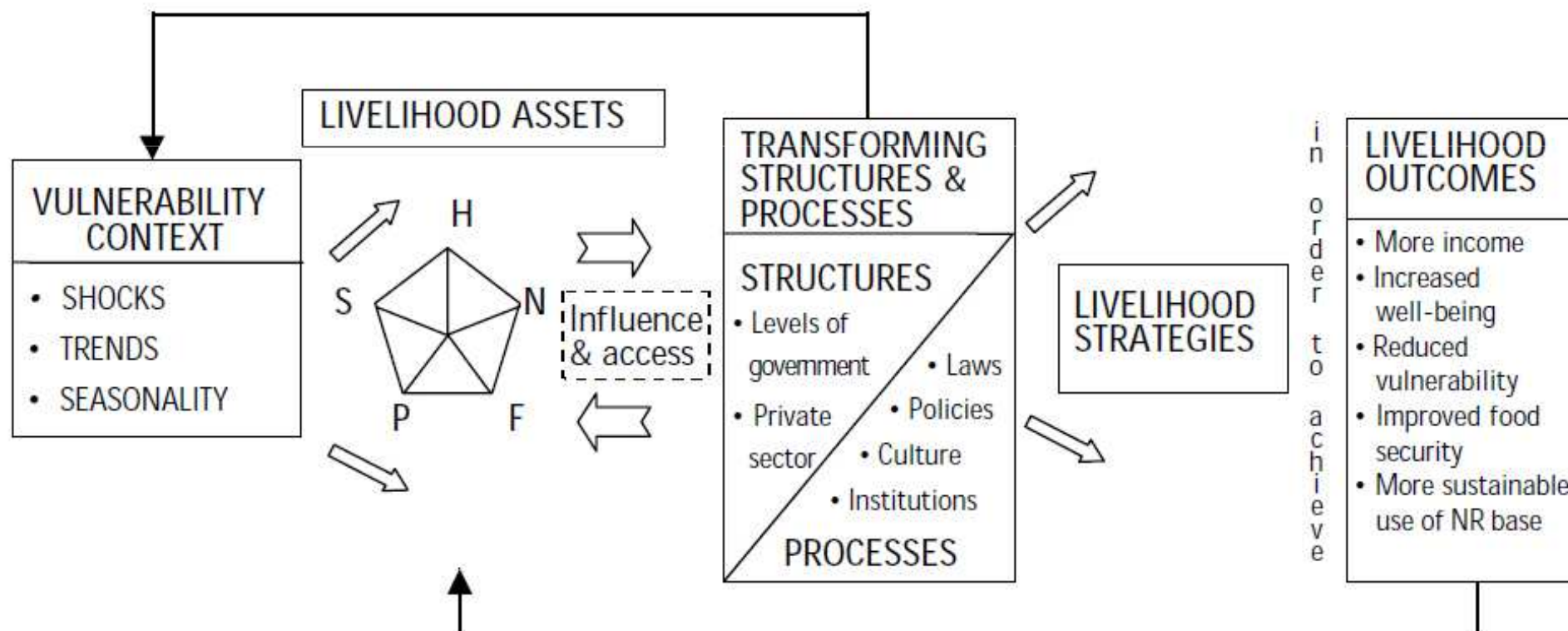
- To assess the potential of the **Malian Energy Policy** to:
- (i) promote rural development and
  - (ii) improve energy security



# Methodological approach

## Sustainable Livelihoods Framework<sup>1</sup>

**Key**  
 H = Human Capital      S = Social Capital  
 N = Natural Capital    P = Physical Capital  
 F = Financial Capital

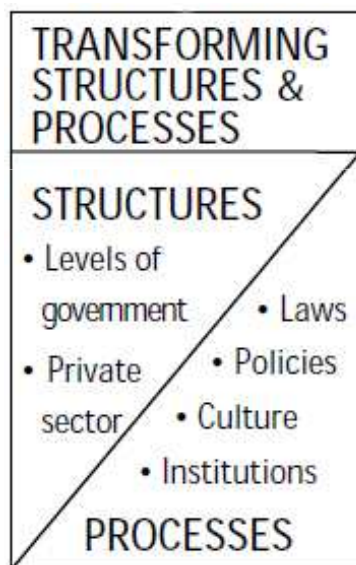


<sup>1</sup> (Chambers et al., 1992; Scoones, 1998); Figure source: DFID (1999)



# Methodological approach II

- Stakeholder analysis<sup>1</sup>
- Policy analysis<sup>2</sup>



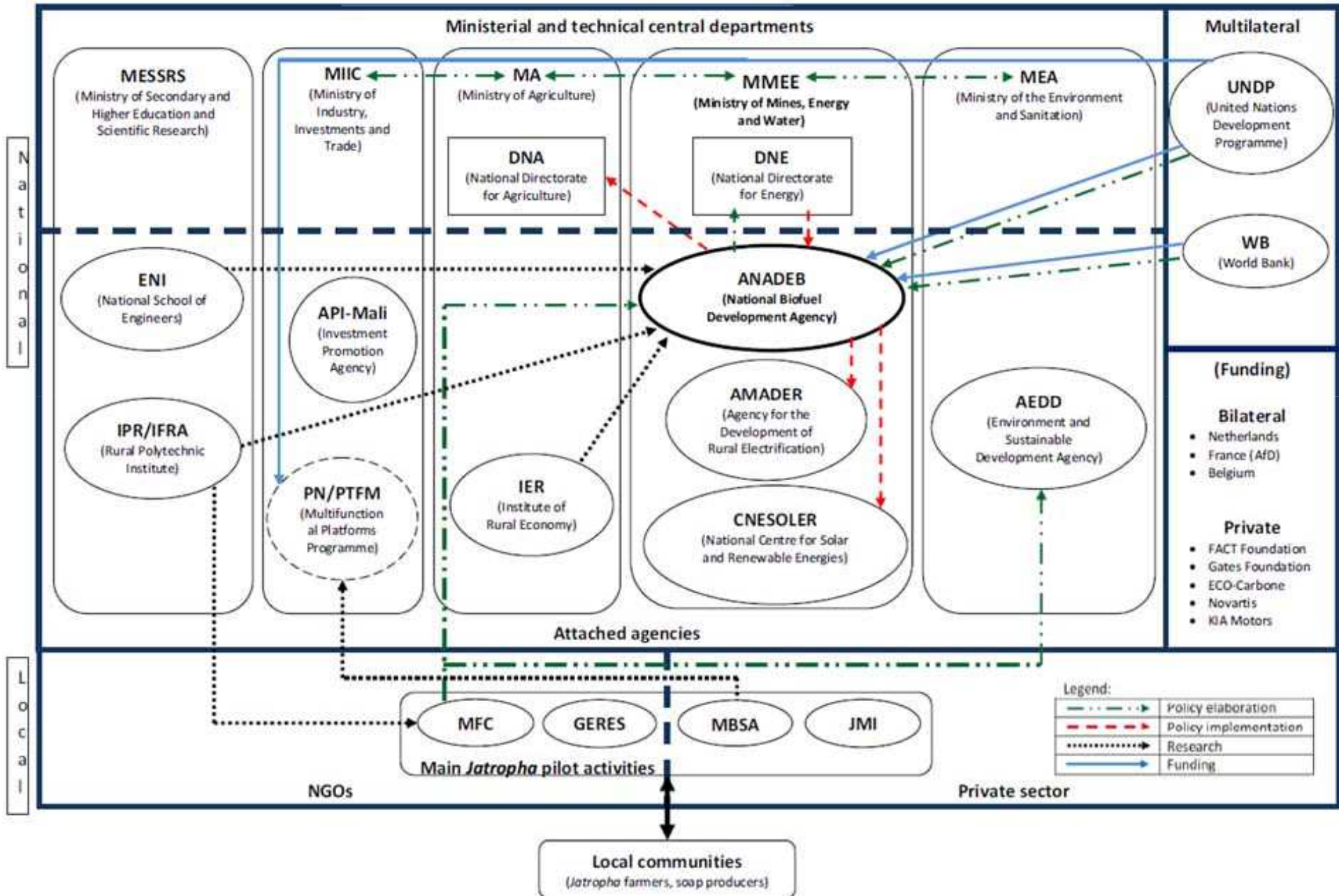
Year	Acronym	Title
1998	<b>PNPE</b>	National Environmental Protection Policy <i>Politique Nationale de Protection de l'Environnement</i>
1998	<b>NAP</b>	UNCCD National Action Programme
2002	<b>SDDR</b>	Rural Development Master Plan <i>Schéma Directeur Du Secteur Du Dév. Rural</i>
2006	<b>LOA</b>	Agricultural Orientation Law <i>Loi d'Orientation Agricole</i>
2006	<b>PEN</b>	National Energy Policy <i>Politique Énergétique Nationale</i>
2006	<b>NSREN</b>	National Strategy for the Development of Renewable Energy
2006	<b>G-PRSP</b>	2007-2011 Poverty Reduction and Growth Strategy Paper (2 <sup>nd</sup> generation)
2007	<b>NAPA</b>	National Adaptation Programme of Action to Climate Change
2008	<b>MDGs Plan</b>	Ten Years Action Plan to Achieve the MDGs <i>Plan décennal pour la réalisation des OMD</i>
2008	<b>NSBD</b>	National Strategy for Biofuels Development
2011	<b>PNCC/ SNCC</b>	National Climate Change Policy and Strategy <i>Politique Nationale Changements Climatiques</i>

<sup>1</sup> (Turcksin et al., 2011; Reed et al., 2009); <sup>2</sup> (Apthorpe, 1996; Knill et al., 2007)

# Key stakeholders in the Malian *Jatropha* activities



UNIVERSITY OF LEEDS



# Key stakeholders in the Malian *Jatropha* activities



UNIVERSITY OF LEEDS



Centre for  
Climate Change  
Economics and Policy

Sustainability Research Institute

SCHOOL OF EARTH AND ENVIRONMENT

## Policy and institutional frameworks for the promotion of sustainable biofuels in Mali

Nicola Favretto, Lindsay C. Stringer and Andrew J. Dougill

September 2012

Centre for Climate Change Economics and Policy  
Working Paper No. 103

Sustainability Research Institute  
Paper No. 35

## Energising development with *Jatropha curcas*?

Policy and institutional frameworks in the promotion of sustainable biofuels in Mali



By Nicola Favretto

November 2012

Prepared for PISCES by Practical Action Consulting

IN PRESS





## Soldiers Overthrow Mali Government in Setback for Democracy in Africa

By ADAM NOSSITER  
Published: March 22, 2012

DAKAR, Senegal — Soldiers in [Mali](#), a West African nation often cited as a democratic model, overthrew the elected government on Thursday, looted the presidential palace, arrested ministers and declared that they had seized power.

[Enlarge This Image](#)



Habibou Kouyate/Agence France-Presse — Getty Images  
Capt. Amadou Sanogo, shown Thursday, was identified on state television as the leader of the mutinous troops in Mali.

It was the latest government to fall as a consequence of the Arab Spring, though in this case it did not come through popular uprisings or protests for democracy. To the contrary, Mali was preparing to hold elections only a month from now, and the president, adhering to the Constitution, was not running again.

But the downfall of Col. Muammar el-Qaddafi in [Libya](#) [sent a flood of weapons](#) into Mali, bolstering a longstanding

Source: NY Times,  
22/03/2012



Source: BBC News,  
06/04/2012

# BBC NEWS

## AFRICA

6 April 2012 Last updated at 08:46

### Tuareg rebels declare independence in north Mali

A rebel group in northern Mali has declared independence for a region it calls Azawad, after seizing control of the area late last month.



# Livelihoods assessments - methods

## Household questionnaires & Participatory methods



Focus group, Garalo, 2011



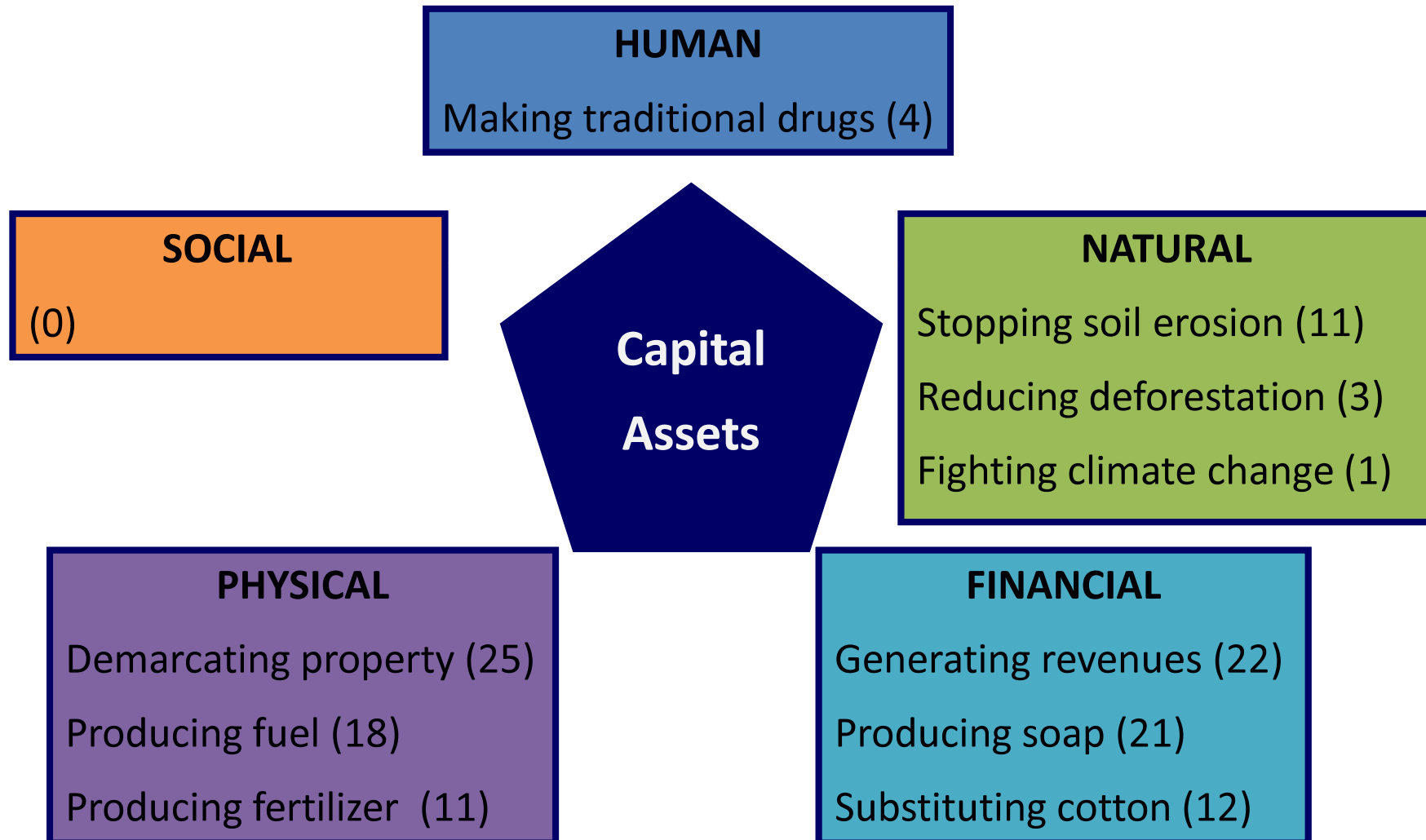
In-depth interview, Tandio, 2011

Transect walk, Tandio, 2011



# Uptake reasons

(household-level in-depth interviews, n = 30 )





# Opportunities and challenges

1. Land use and food security
2. Revenue generation
3. Rural energy security



# Land use and food security

## Food security not threatened when grown at small scale

*“I always give priority to cereals as I have to feed my family”*

- **Small-scale:** 77% of the plantations smaller than 3 ha
- **Living fence:** 83% use *Jatropha* to protect cereal crops from water flows, soil erosion and grazing animals



JATROPHA LIVING FENCES: Transect walk, Tandio 2011 (left) and Kouri 2010 (right)



## Land use and food security II

- **Land trade-offs? No** (82% intercrop *Jatropha* with cereals)
- Making better use of less fertile land

→ *“My main problem is that I lack of labour... most of my sons have left the village to work outside”*



JATROPHA INTERCROPPING: Transect walk, Karaya-T., 2011

- **Labour trade-offs? Yes** *“In August I have postponed the *Jatropha* harvest because I was too busy with cereals”*



## Revenue generation

- **Sale of seeds** (up to **US\$14 / year**): buy clothes for religious ceremonies (n=5), school materials (n=2), repair equipment (n=2)
  - **Low price of seeds**: *“Harvesting Jatropha requires time and labour... I do not harvest because it is not rentable”*
- **Jatropha vs. cotton**: *“The revenue from 1 hectare of cotton is bigger than the one coming from 5 years of work with Jatropha”*



UNHARVESTED JATROPHA: Transect walk, Garalo, 2011



COTTON FARMERS: Transect walk, Kita, 2011



## Revenue generation II

- **Sale of *Jatropha* soap:** bigger revenues (up to **US\$94 / year**)  
*“Soap production improved my life” (n=3)*



SOAP PRODUCTION: In-depth interview, Kita 2011 and 2010





# Rural energy security

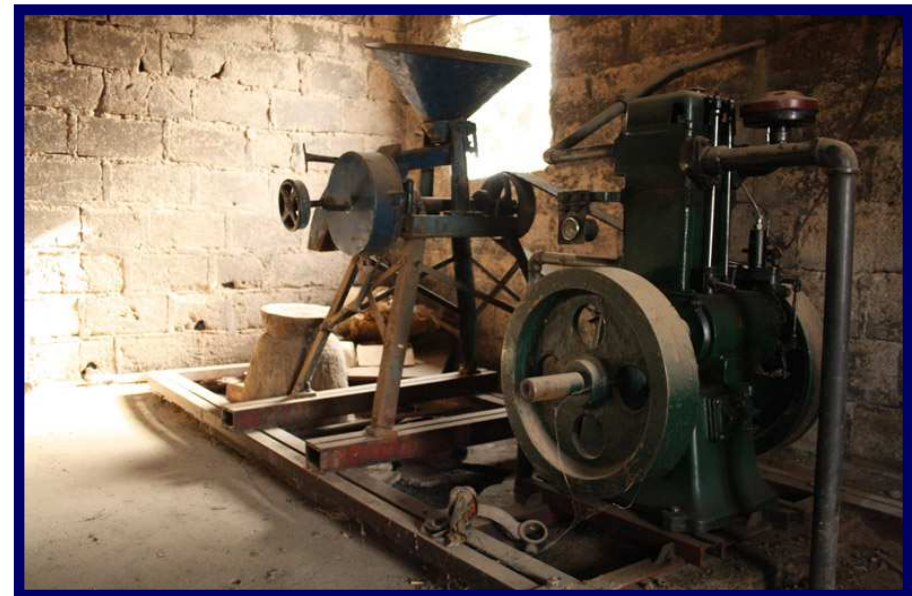
- Potential use of *Jatropha* oil for **rural electrification** (power generators) and **diesel substitution** (grinding machines)

→ Challenges:

- Projects (and plantations) are still young;
- Low yields and limited feedstock availability.



POWER GENERATOR: Semi-structured interview, Garalo, 2010



MULTIFUNCTIONAL PLATFORM: Garalo, 2010



# Main difficulties and concerns of *Jatropha* farmers

(n = 30 household-level in-depth interviews)

Difficulties	No.
Price is too low	25
Lack of agricultural equipment and fertilizer	16
Young trees are attacked by termites	13
Lack of support from the project developer	11
Lack of labour	7
Wild fires	5
Difficult access to water for tree nursery	4
The promised benefits have not yet materialized	4

## **Contribution to Sustainable Land Management (small scale)**

- *Jatropha* can be used as living fence to delimit food crops and stop soil erosion
- Food security not threatened
- Competition for labour, not for land

## **Revenue generation**

- Sale of seeds not profitable for smallholders, but promising source of diversification
- Benefiting from traditional use of *Jatropha* is most important to farmers (e.g. soap production)
- Trade-off between *Jatropha* and cotton

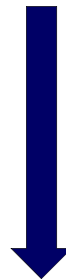


## Conclusions II

### Rural energy security

- *Jatropha* has a potential as energy crop
  - but household level constraints in cultivation must be overcome to improve yields and feedstock production

*“3 years ago [the project] came promising things, now they do not even come to collect the seeds. Last year I did not even harvest... If they keep disregarding us, I will abandon *Jatropha*”*



Jatropha is not a “miracle crop”

Adequate **farmer support** at village and household levels is **key!**

# Thank you!



[n.favretto@see.leeds.ac.uk](mailto:n.favretto@see.leeds.ac.uk)

# References



UNIVERSITY OF LEEDS

- APTHORPE, R. (1996) *Reading Development Policy and Policy Analysis: On Framing, Naming, Numbering and Coding*. The European Journal of Development Research 8:16–35.
- CHAMBERS, R., CONWAY, G. R. (1992) *Sustainable rural livelihoods: practical concepts for the 21st century*. IDS Discussion Paper 296. Institute of Development Studies, Sussex.
- DFID (1999) *Sustainable Livelihoods Guidance Sheets*. Department for International Development, London.
- FAVRETTO, N., STRINGER, L., DOUGILL, A. (2012) *Policy and institutional frameworks for the promotion of sustainable biofuels in Mali*. Working Paper 103, CCCEP, London and Leeds.
- GILBERT, N. (2011) *Local benefits: The seeds of an economy*. Nature 474, S18–S19.
- KNILL, C., LIEFFERINK, D. (2007) *Environmental Politics in the European Union: Policy-making, Implementation and Patterns of Multilevel Governance*. Manchester UP, Manchester.
- REED, M.S., GRAVES, A., DANDY, N., POSTHUMUS, H., HUBACEK, K., MORRIS, J., PRELL, C., QUINN, C.H., STRINGER, L.C. (2009) *Who's in and why? A typology of stakeholder analysis methods for natural resource management*. Journal of Environmental Management 90 (2009) 1933–1949.
- SCOONES, I. (1998) *Sustainable Rural Livelihoods A Framework for Analysis*. IDS Working Paper 72, Brighton, IDS.
- TURCK SIN, L. MACHARIS, C., LEBEAU, K., BOUREIMA, F., SVEND BRAM, J.M., DE RUYCK, J., MERTENS, L., JOSSART, J.M., GORISSEN, L., PELKMANS, L. (2011) *A multi-actor multi-criteria framework to assess the stakeholder support for different biofuel options : the case of Belgium*. Energy policy, 39 (1, 2011) : 200-214.



# Biofuels policy objectives and gaps

Timeframe	Replacement of diesel with <i>Jatropha</i> oil	Quantity of <i>Jatropha</i> oil (million litres)/year	Seeds productivity (T/ha)	Equivalent <i>Jatropha</i> (ha)
2008-2013	10%	39	3.125	71,680
2014-2018	15%	56	6.25	53,760
2019-2023	20%	84	9.375	47,787

- Actual yields (1.5 T/ha) notably smaller than predicted (3.1 T/ha)
- 5,000 ha total cultivated area of *Jatropha* in 2012 (vs. 70,000 ha)

*“The problem is that the institutions have focused their goals on oil production without even doing research on the tree first. The only research they did is on the use of the oil on engines, but the oil comes from the tree ...how can you make an engine work if the tree is not producing enough oil?”*

(semi-structured interview, IPR, 2012)



# Key policy themes and biofuels development

11 key policies and strategic documents analysed  
→ 3 key themes and 9 sub-themes identified

