The social project- understanding, anticipating and managing the social impacts and opportunities for bioenergy

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LACAf / GSB workshop

CENA, Piracicaba, Brazil

eit Knowledge & Innovation Community
Climate-KIC

The social project's basic components

1. **One year non-thematic (FAPESP) project - 2015**
   a) **Will deliver a research paper on 'the social impacts of industrial scale sugarcane-based biofuel production systems in Latin America (Brazil) and Africa (Mozambique, Angola, Malawi and Sierra Leone?)**
   b) **Link retrospective social analysis (based on Brazilian research and also informed by longer-running biofuel projects in Africa (Malawi, Zimbabwe) to analyse the potential impacts of new projects (ethanol and/or sugar) in sub-Saharan Africa**
2. **Thematic project (proposal)**
   a) **Three year project to develop and apply the prospective modelling framework**
   b) **To be discussed / developed Thursday afternoon**
   c) **We will be seeking counterpart funding to complement FAPESP funding**

Can biofuels support agricultural transitions?

Brazil has undergone an enormous agricultural transition over the last 40 years with sugarcane biofuels at the centre of this transition

Most food security / ag dev literature focuses on the role of small-holder agriculture in African / developing country development

'With almost 200 million people aged between 15 and 24, Africa has the youngest population in the world.' Estimates suggest that Africa's total labour force will be 1 billion strong by 2040, making it the largest and youngest worldwide. Furthermore Africa is the only region in which the rural population will be increasing.'(Montpellier Panel, 2014)

Wilson & Conway (2012). ONE BILLION HUNGRY: CAN WE FEED THE WORLD?

- Agriculture typically accounts for over 80% of the work force and 50% of GDP in developing countries.
- A 1% gain in GDP originating from agriculture generates a 6% increase in overall expenditure of the poorest 10% of the population.
- A 1% gain in GDP originating from non-agricultural sectors creates zero growth in overall expenditure of the poorest 10% of the population.

Brazil:
Assessing the social impacts of Brazil's sugarcane ethanol program

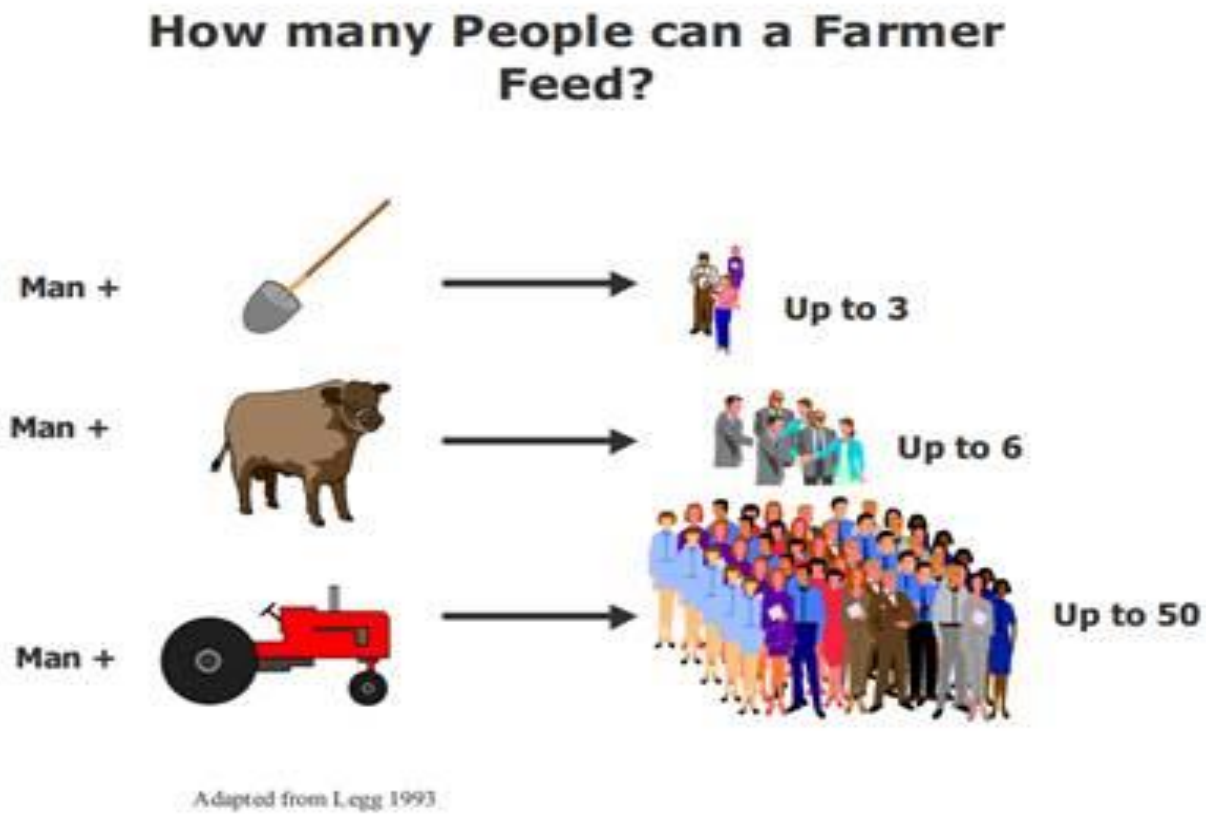
'The results of this research indicate that there is a significant and positive interaction between the sugarcane supply chain production and employment / income (positive elasticity) in the Sao Paulo state. However, the study does not show evidences that there is a significant interaction between the sector expansion and the levels of education and health.'(Bacchi & Caldarelli, 2014. 'Social-economic impacts of the sugar and ethanol sector expansion in the Sao Paulo state between 2005 and 2009.')

- Satolo analysis: initially concentrated on income impacts in Sao Paulo state
  - Now broadened to Centre-South
- Caldarelli analysis: expanded from income to include health and education 'development' at SP level
  - Will expand to Centre-South
- Overall outcomes are broadly positive
- What can be learnt to assist an African agricultural renaissance that is broadly socially beneficial ?

Sarah Best 'Growing Power: Exploring Energy Needs in Smallholder Agriculture' IIED, 2014

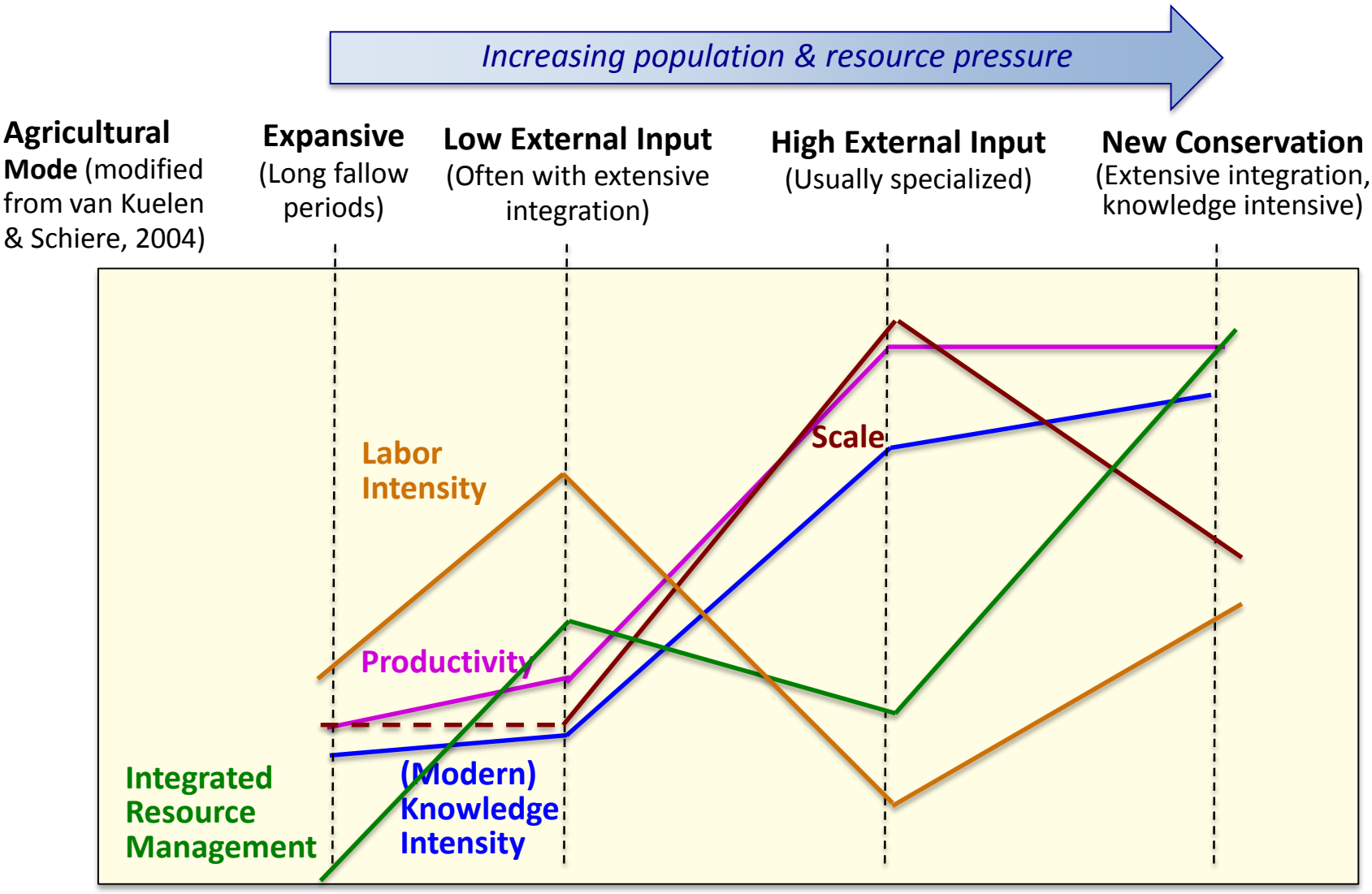
iied
Sarah Best
30th April 2014

What's the issue? (a) Food for all implies more modern energy and equipment in food system



Clarke, 2008. http://www.raeng.org.uk/events/pdf/252/lawrence_clarke.pdf

Evolution of Agriculture



Like cell phones, Africa might progress from the low external input/highly integrated mode to an African brand of new conservation agriculture bypassing some aspects of the high input/specialized mode.
Slide courtesy of Lee Lynd (2013)

Multiple 'models' are possible:
Issues of scale: Bioenergy Development Options

Large Scale

1. Sugarcane to EtOH
2. Palm / Soy Biodiesel

Integration & transition

Small Scale

1. Sweet Sorghum – micro-distillery
2. Woodlot gasification elec. (Hosahali)

Mill-owned estate

Very competitive globally

→ **Little Value Added to Local Communities**

Export potential

Small-holder led

Higher cost base
Less globally competitive

→ **High Value Added to Local Communities**

Export potential
Community-level winners and losers

Multi-product cropping

e.g. sweet sorghum

Economics Uncertain

→ **Complex-Value Added to Local Communities High risk**

Local Markets
Social Issues
Crop not well characterised

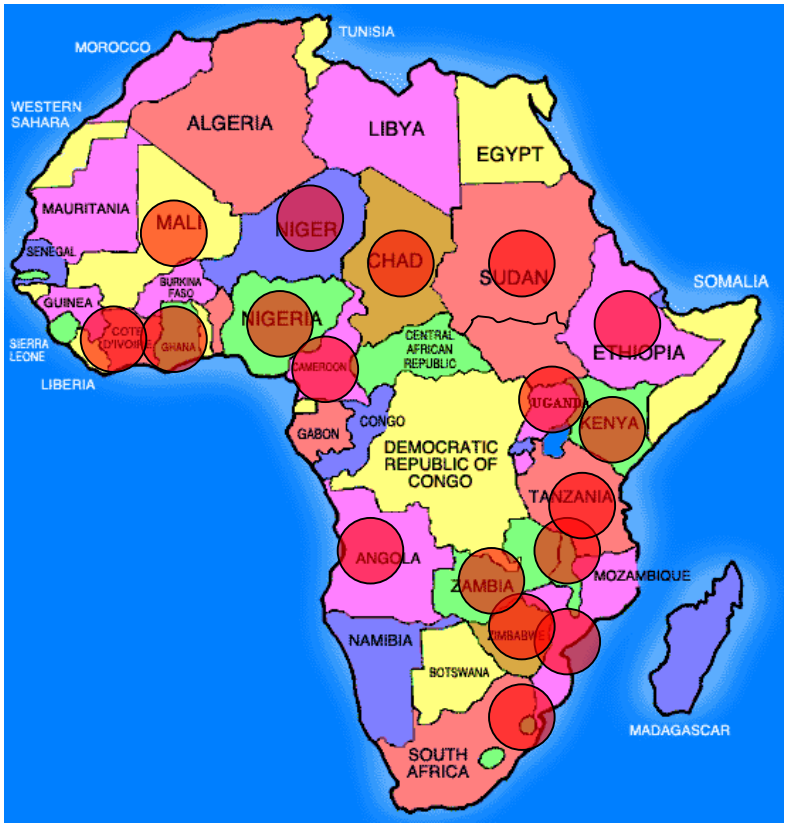
Single Bioenergy Product

e.g. multi-species woodlot

→ **Value Added to Local Communities High Risk**

Complex food-fuel-cash-crop interactions

Sugar Capacity Expansion and Greenfield Projects



- **The ISO has identified 72 sugar projects currently under consideration or under construction.**
- **Varying degrees of certainty to enter production between 2014 and 2020.**

Lindsay Jolly (2014).
International Sugar Organization