CLIMATE-SMART Agriculture 2015

Global Science Conference

March 16-18, 2015
Le Corum, Montpellier France

Climate-smart coffee systems in East Africa

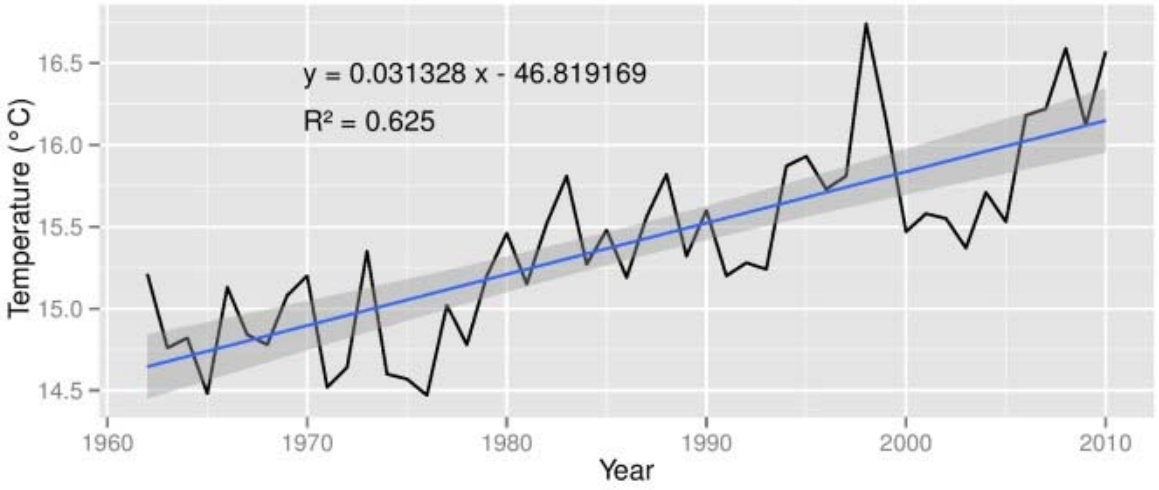
L. Jassogne, P. van Asten , P. Laderach , S. Craparo, T. Liebig, E. Rahn , M. Baca, S. Graefe , A. Whitbread, A. Nibasumba, E. Ampaire, G. Kagezi, P. Vaast

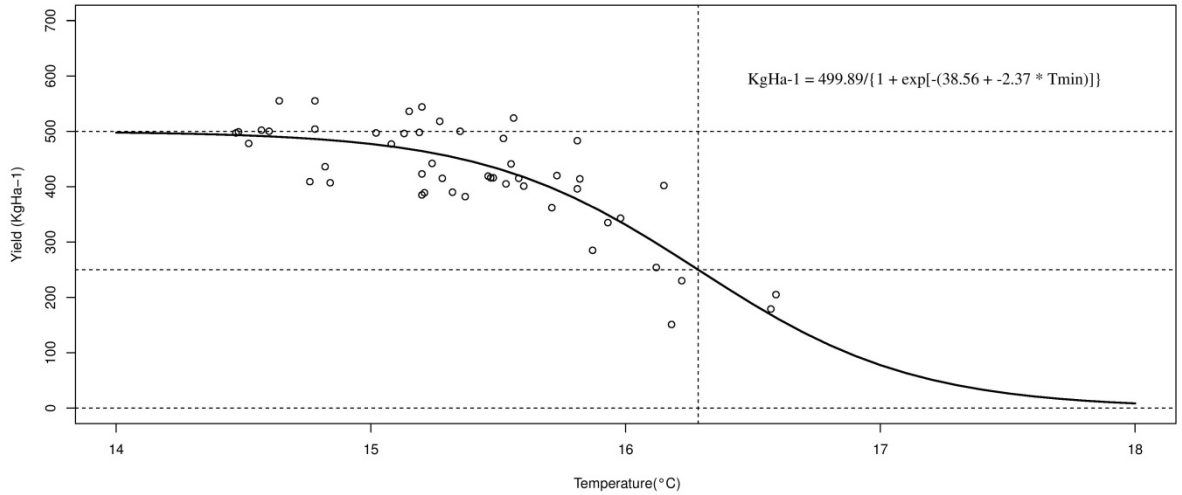
IITA, CIAT, Goettingen University, ISABU, NaCORI, ICRAF

Montpellier

March 16-18, 2015

Climate change has an impact on Arabica production in Tanzania





Year 2050

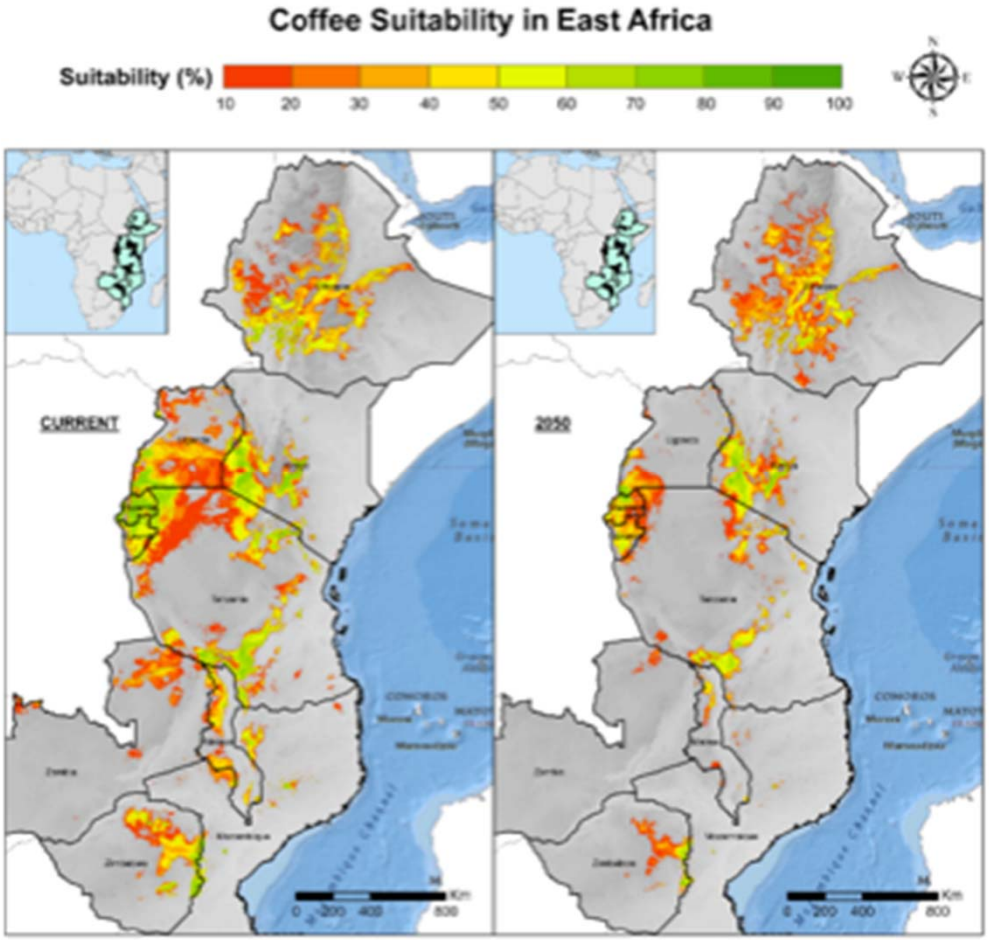
- 134kg/ha

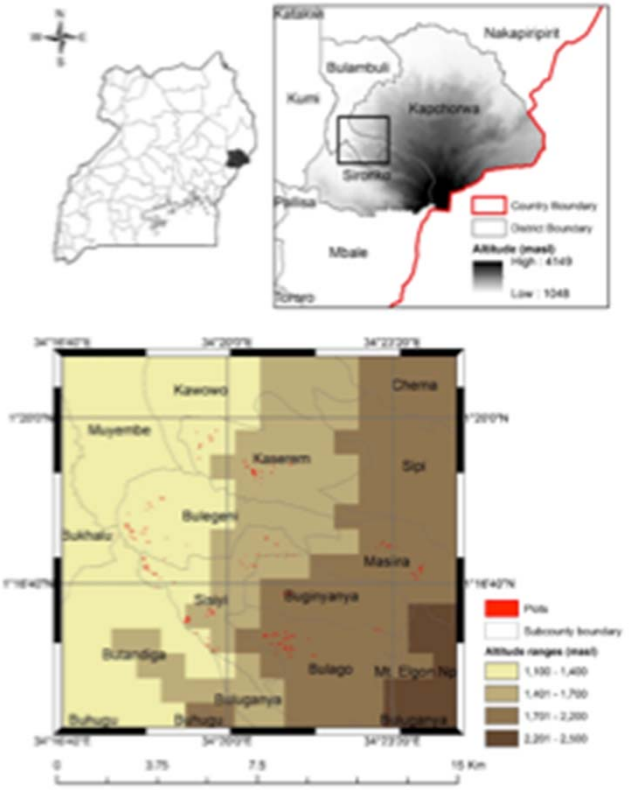
Equivalent to

- 60million USD
Of foreign export earnings per annum

CLIMATE-SMART Agriculture 2015

Coffee systems will change in the future

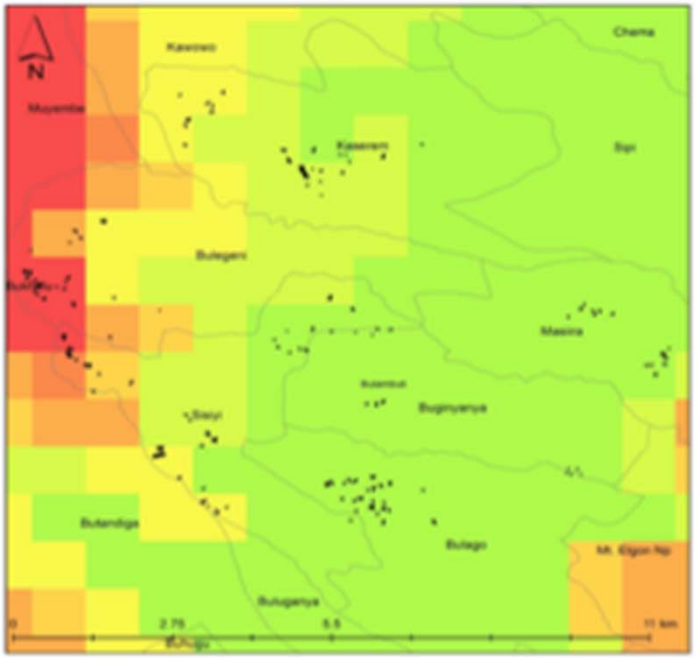




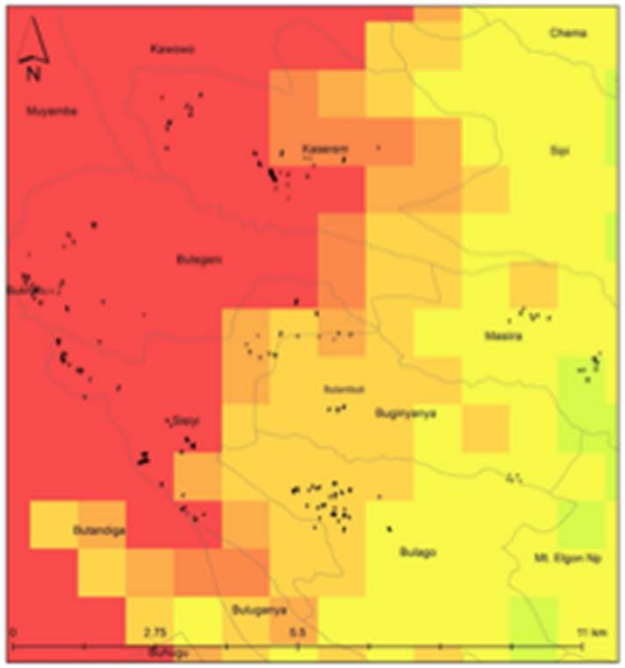
CLIMATE-SMART Agriculture 2015

Climate change adaptation per location

Current suitability



Future suitability



Planning for climate change adaptation in coffee: different things in different locations

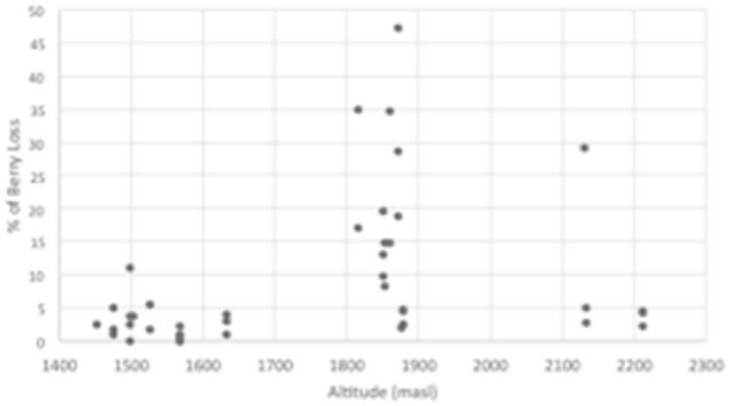
- Adapt your systems
- Adapt your crops – change your crops

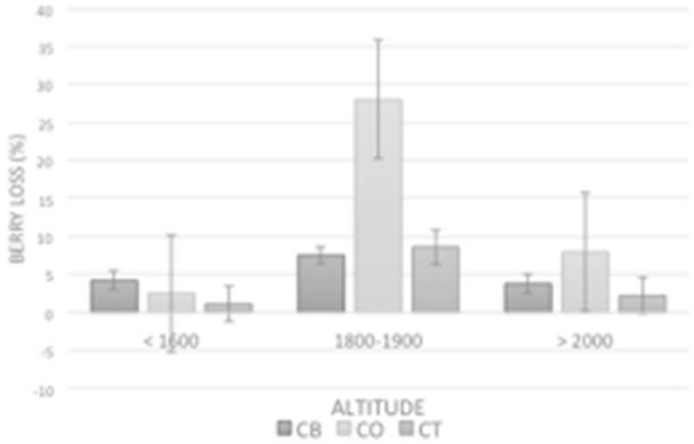
CLIMATE-SMART Agriculture 2015

Impact of climate change on coffee

Climate change has an impact on coffee directly and an impact on pests and diseases

Example of Coffee Berry Disease (but also coffee stem borer and leaf rust)





Is altitude (climate) the real factor?

There is a significant interaction between production systems

CLIMATE-SMART Agriculture 2015

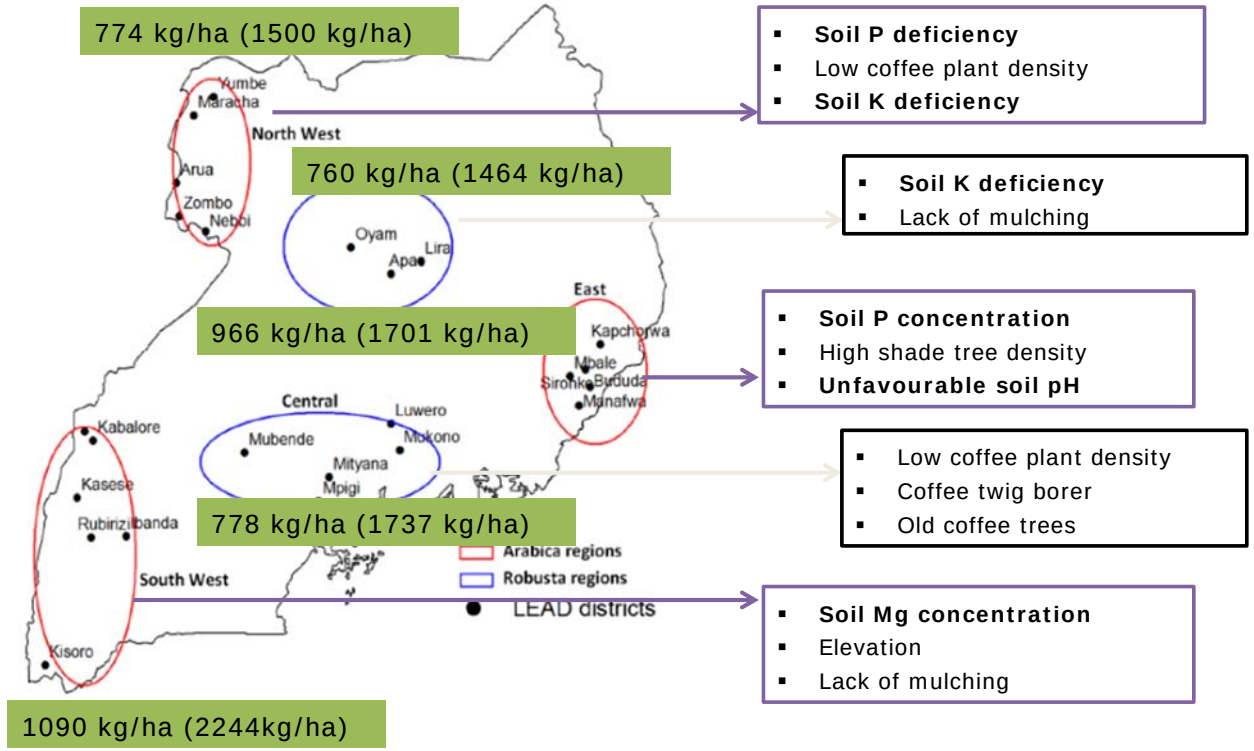
What can we do? Importance of scales

CLIMATE-SMART Agriculture 2015

At plant level: drought/disease resistant varieties, pesticides, herbicides, fertilizers, GAP, etc.

At plot level: coffee x banana, integrated soil fertility management, coffee x shade, etc.

Yield gap analysis for coffee in Uganda



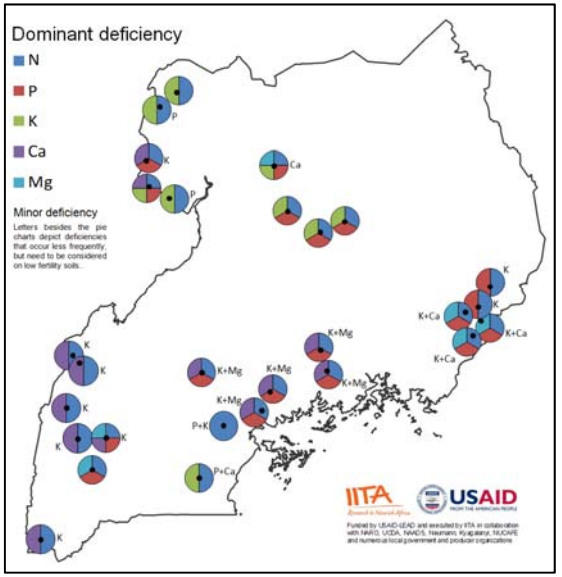
- **Soil P deficiency**
- Low coffee plant density
- **Soil K deficiency**

- **Soil K deficiency**
- Lack of mulching

- **Soil P concentration**
- High shade tree density
- **Unfavourable soil pH**

- Low coffee plant density
- Coffee twig borer
- Old coffee trees

- **Soil Mg concentration**
- Elevation
- Lack of mulching

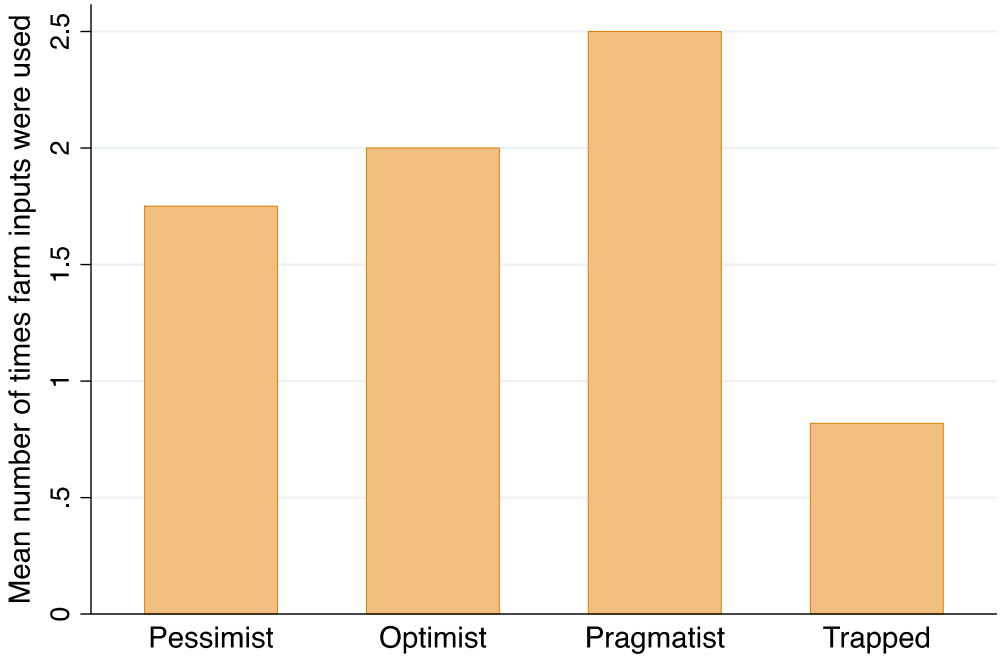


CLIMATE-SMART Agriculture 2015

What about adoption?

Need short-term benefits for the farmers

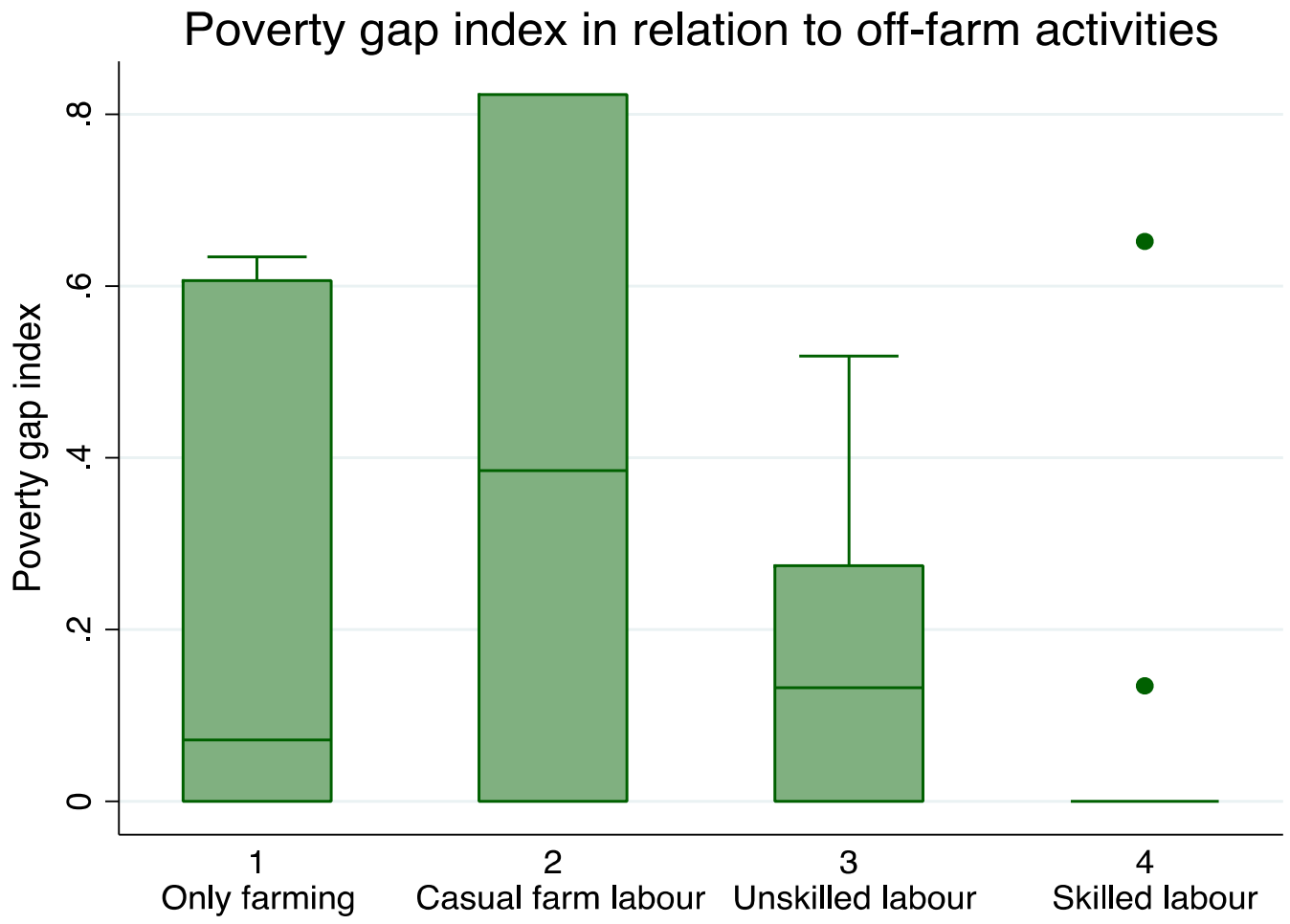
Do attitudes matter for technology adoption?



Pessimist	**Optimist**	**Pragmatist**	**Trapped**
Negative attitude, does not think farming is a good investment. Prefers investing in off-farm activities.	Proud to be a farmer, farming is good invesmtent. Wants children to farm.	Positively coping, farming is a good investment but children should not farm.	Does not want to farm and has low hope. But seems to be trapped in farming.

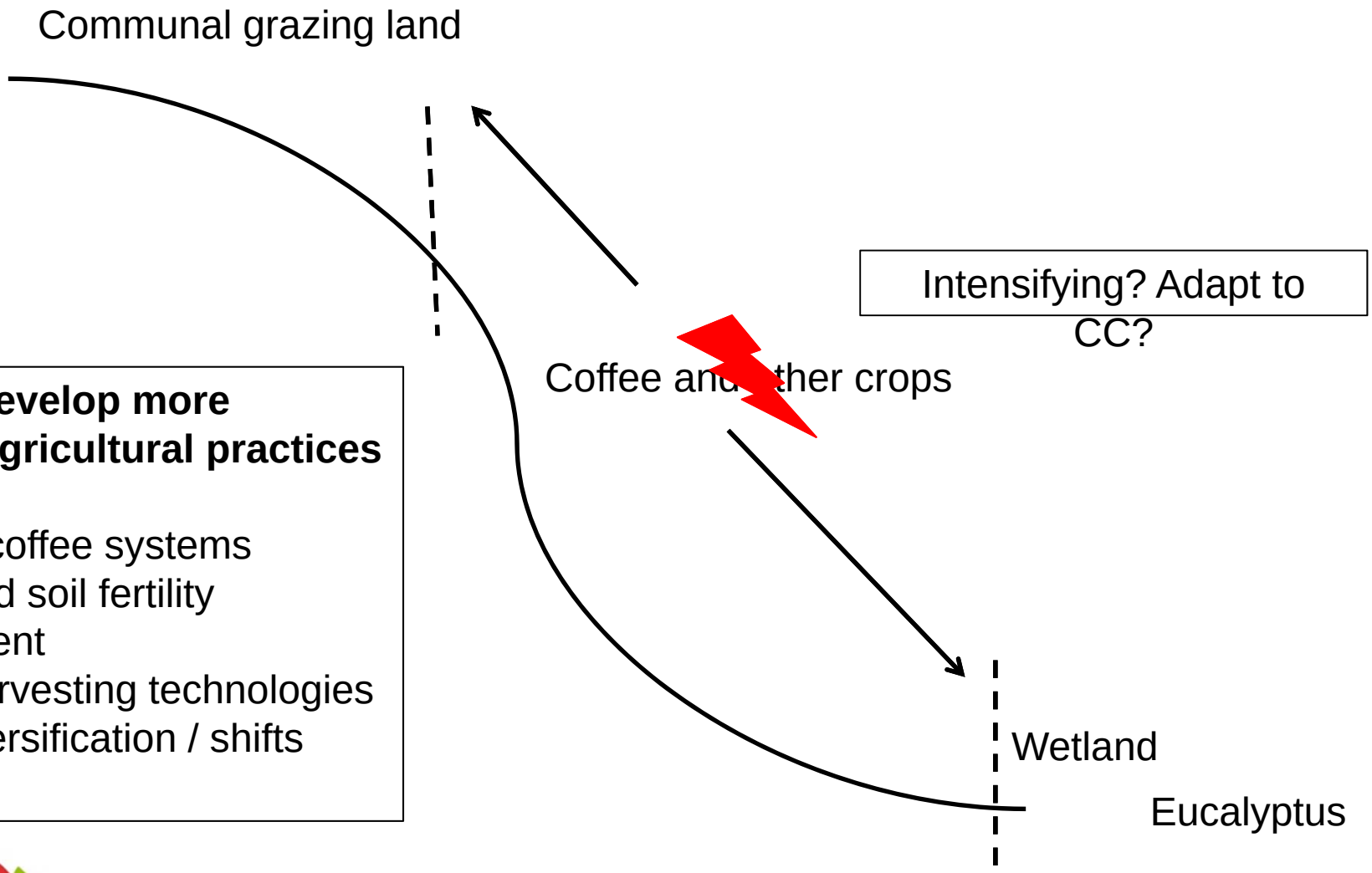
CLIMATE-SMART Agriculture 2015

Who can invest?



Not every investment costs the same money, we need to know which strategies are needed where, but we also need to know their cost

CLIMATE-SMART Agriculture 2015



Need to develop more resilient agricultural practices

- Shaded coffee systems
- Integrated soil fertility management
- Water harvesting technologies
- Crop diversification / shifts

CLIMATE-SMART Agriculture 2015

In the case of Rakai

Align wetland policy with climate change adaptation plan

Other challenges

Planning:

- Develop climate change adaptation plan at national and regional level
- What is the vision for the future?
- Scaling?

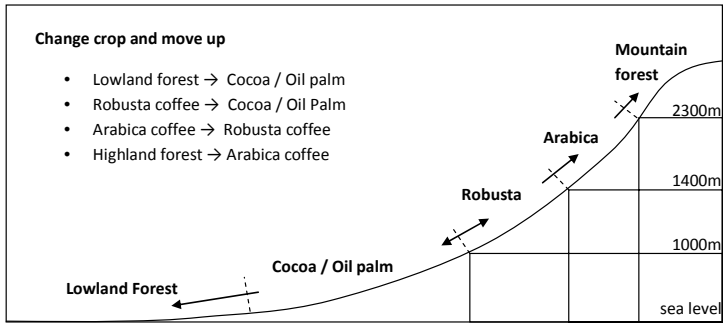
Adoption:

- Quality of inputs

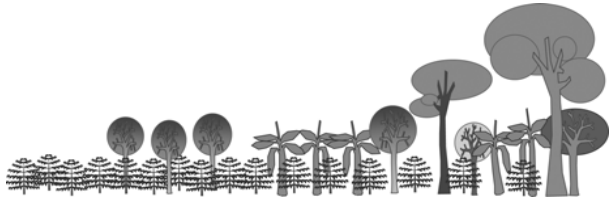
CLIMATE-SMART Agriculture 2015

Conclusions

- Training packages need to be planned by location
- Climate change adaptation also means developing other livelihood options than coffee
- Most of the research on climate change adaptation at plant and plot level
- There are different types of coffee farmers
- We need to have an investment scale with the technologies adapted to farmer types
- Constraints at landscape level might prevent adoption of CSA practices
- Constraints at policy level might prevent adoption of CSA practices



Possible changes in land use and crops induced by climate change



Plot level functions	Full sun monocrop	Shade tree monocrop	Banana / food intercrop	Polyculture system	Forest system
Yield quantity					
Yield quality					
External input use					
Nutrient recycling					
Production risks					
Plantation life					
Food security					
CC adaptation					
Carbon stock					
Ecological services					

light color = low → dark color = high

CLIMATE-SMART Agriculture 2015

Thank you! Merci! Asante! Webale! Dank u wel! Danke! Gracias!

- PhD and MSc students
- IITA: Piet van Asten, Edidah Ampaire, Herbert Ainembabazi, Richard Asare, Sander Muilerman, Els Lecoutere, Franco Magnet, David Mukasa
- CIAT: Peter Laderach, Mark Lundy
- ICRAF/CIRAD: Philippe Vaast
- University of Goettingen: Sophie Graefe and Anthony Withbread
- WUR: Ken Giller, Pablo Titonnell, Walter Rossing, Johannes Scholberg
- KUL: Roel Merckx
- NaCORI: Godfrey Kagezi, Wilberforce Wododa
- TACRi: Prof. Teri, Mr. Maro and Mrs. Suzana Mmbwambo
- CRIG: Dr. Kwapong
- HRNS: Stefan Cognini, David, Fortunate Paska, Ghislaine Bongers, Britta Deutsch
- Agro-Eco: Boudewijn van Elzakker, Willem-Albert Toose

CLIMATE-SMART Agriculture 2015