

Farm household characterization to inform (climate smart) agricultural interventions

Mark van Wijk & James Hammond

FarmD

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RESEARCH
PROGRAM ON
Livestock and Fish



RESEARCH PROGRAM ON
Climate Change,
Agriculture and
Food Security



The Challenge

Smallholder farmers across the developing world

Production on smallholder farms

(1) Is critical to the food security of the rural poor

(2) contributes the majority of food production at national level

Dealing with chronic poverty and food insecurity

Smallholder farm households: highly diverse!

The Challenge

This makes it difficult to

- Characterize & Describe
- Identify drivers and system interactions
- Target interventions
- Measure change

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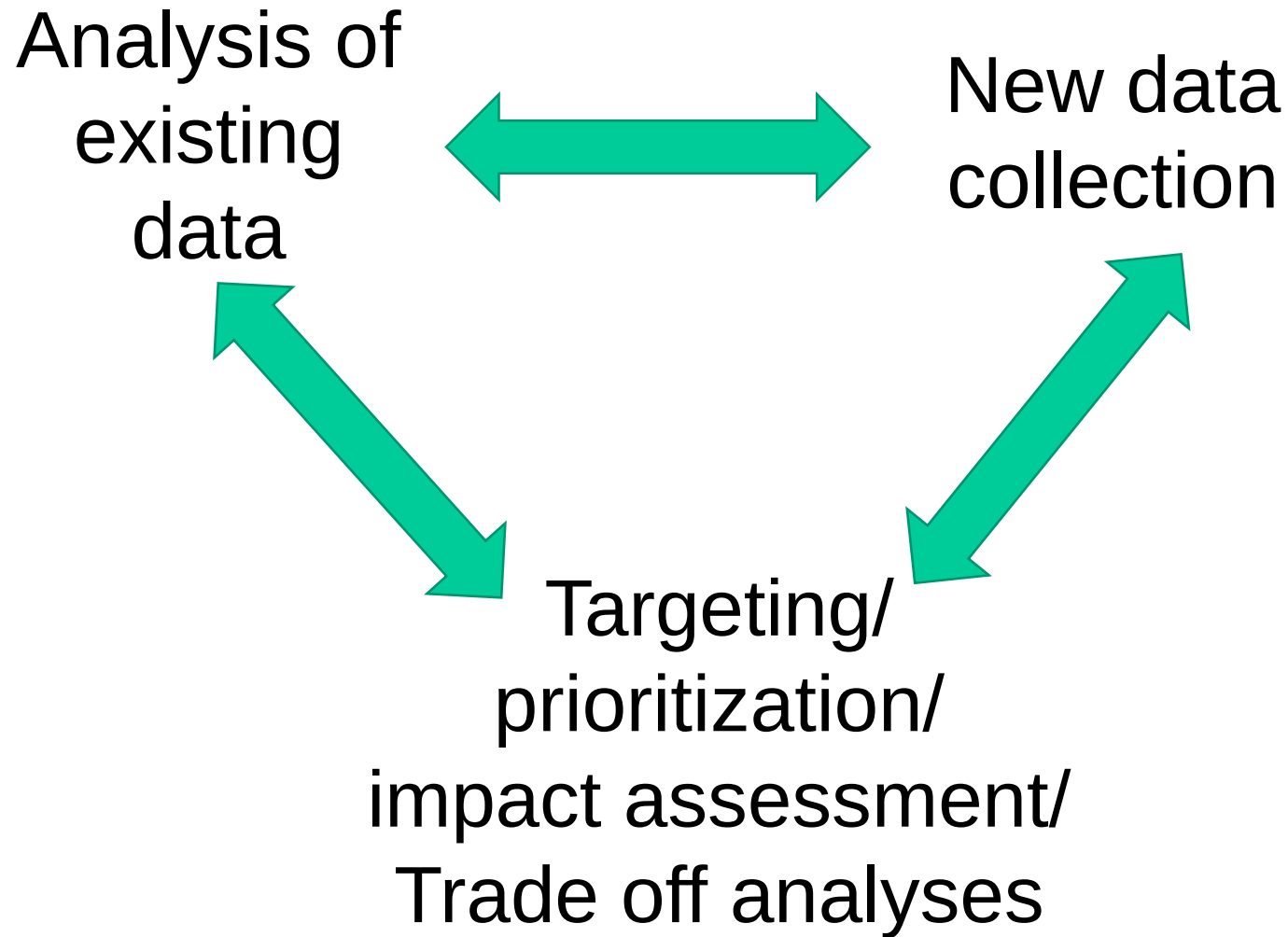
Find structure in variability in farming systems

Understand systems functioning

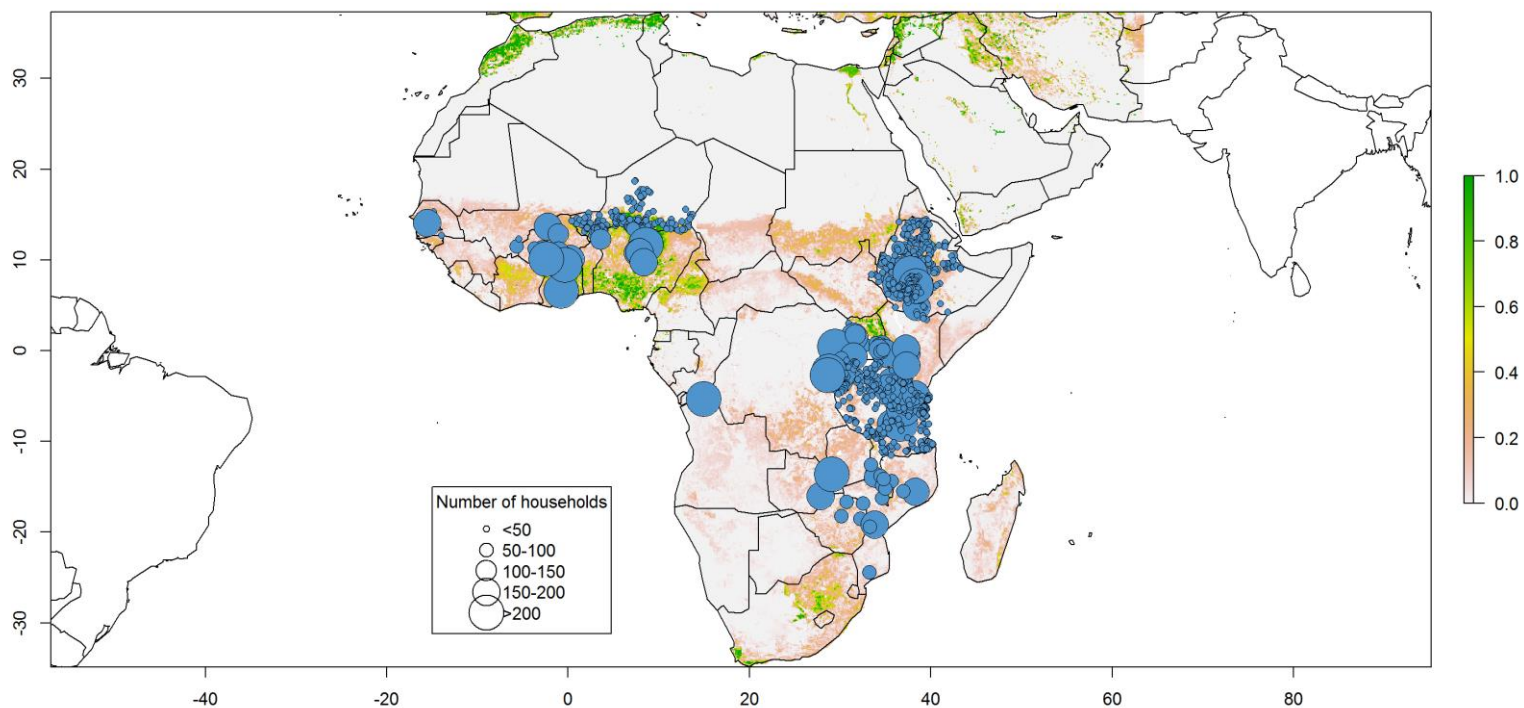
Relationships between agriculture and welfare (focus on food security)

Using farm household characterization data as our work horse

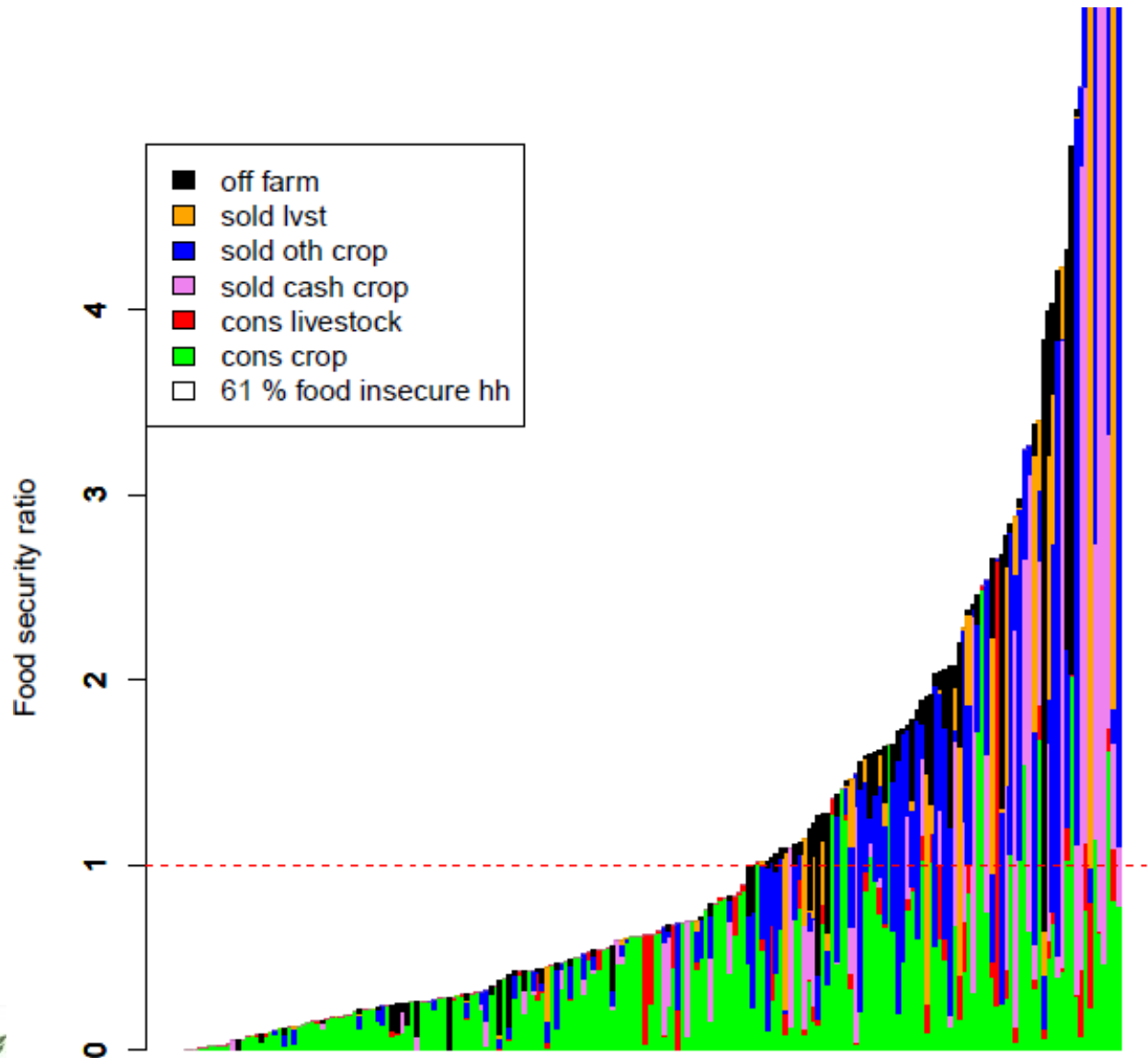
Setup



Analysis of existing data



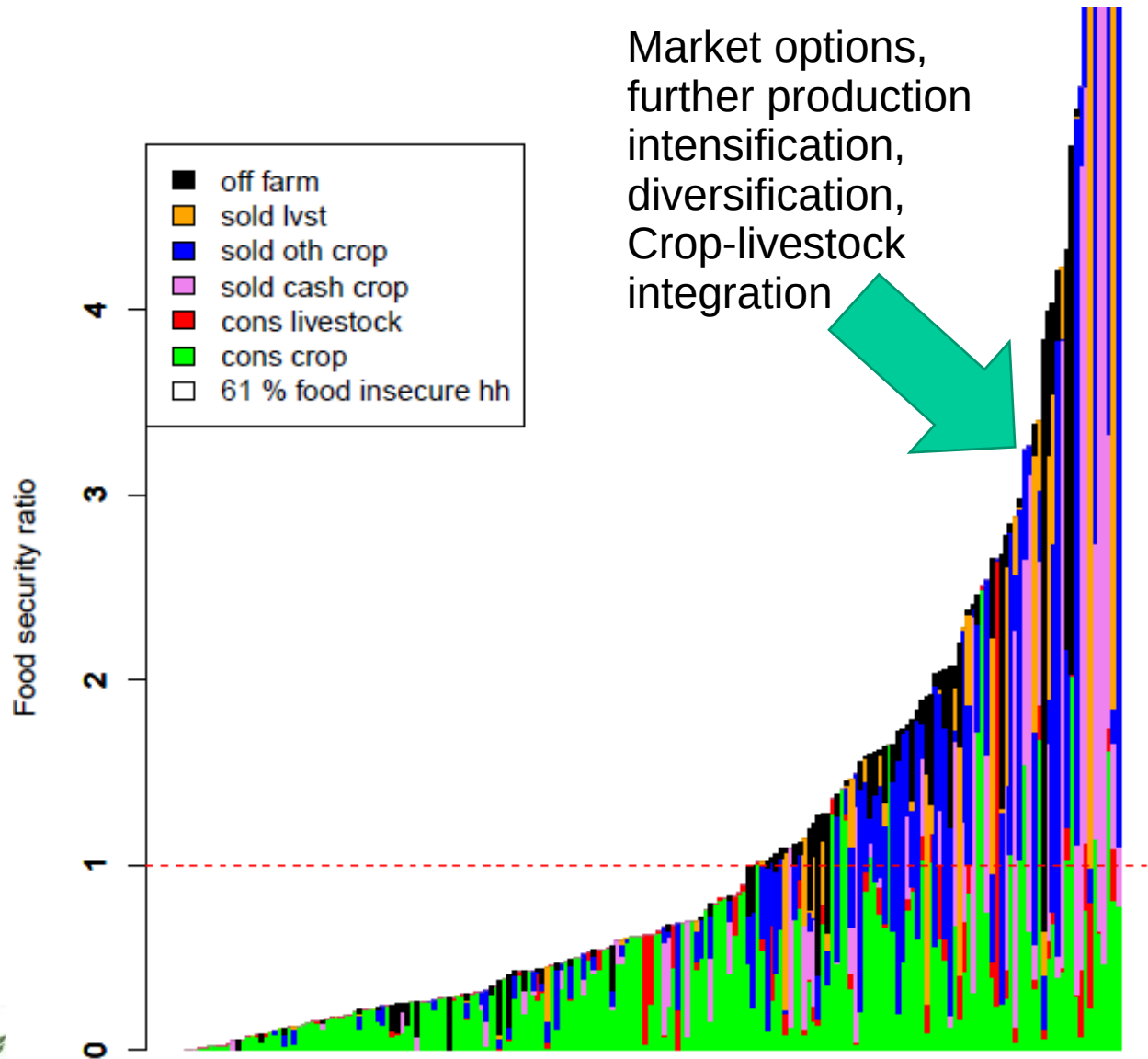
Variation in food security in one site (Lushoto, Tanzania)



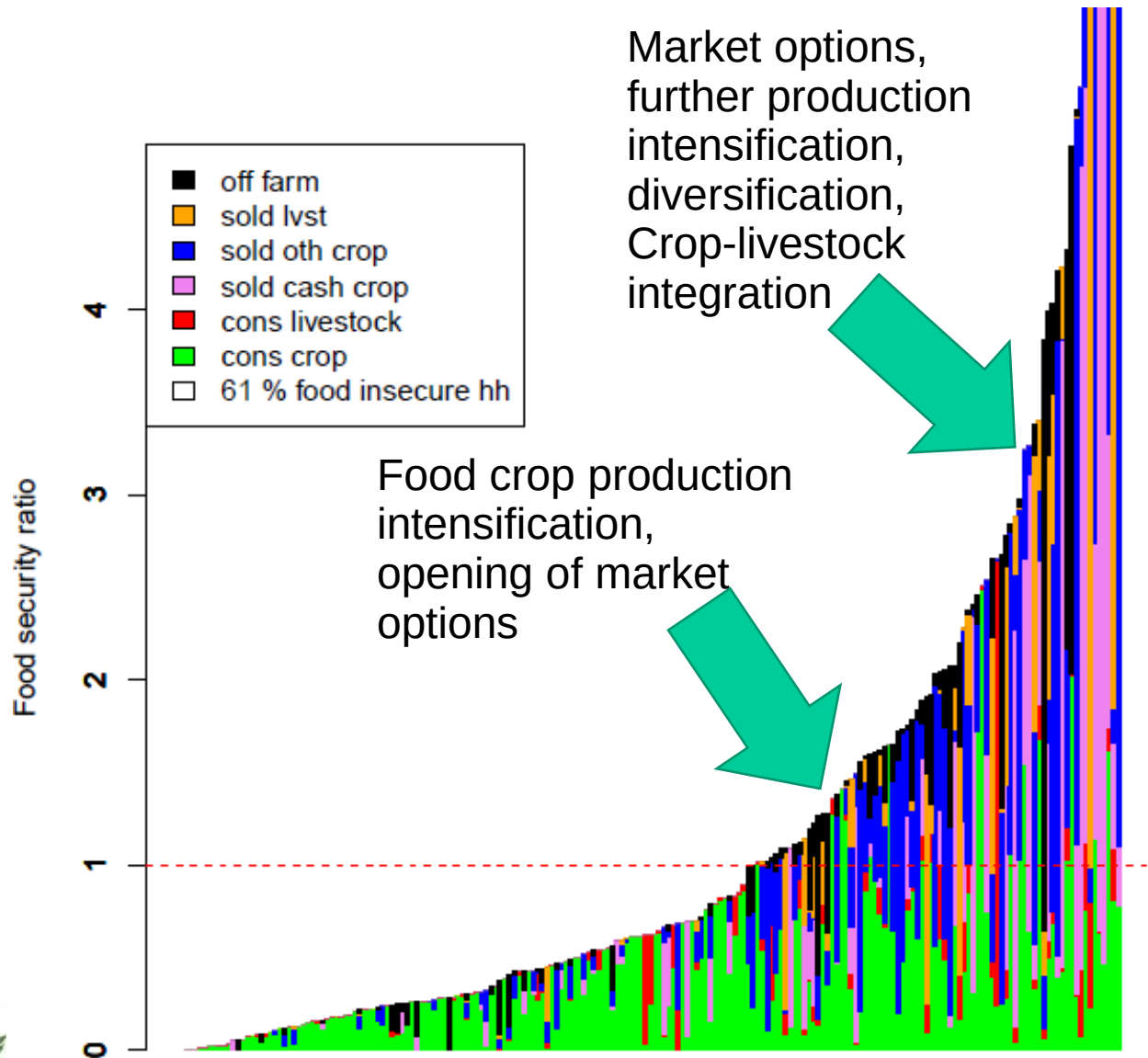
Enormous within
site variation in FS

Accompanied by a
complete shift in
farm orientation

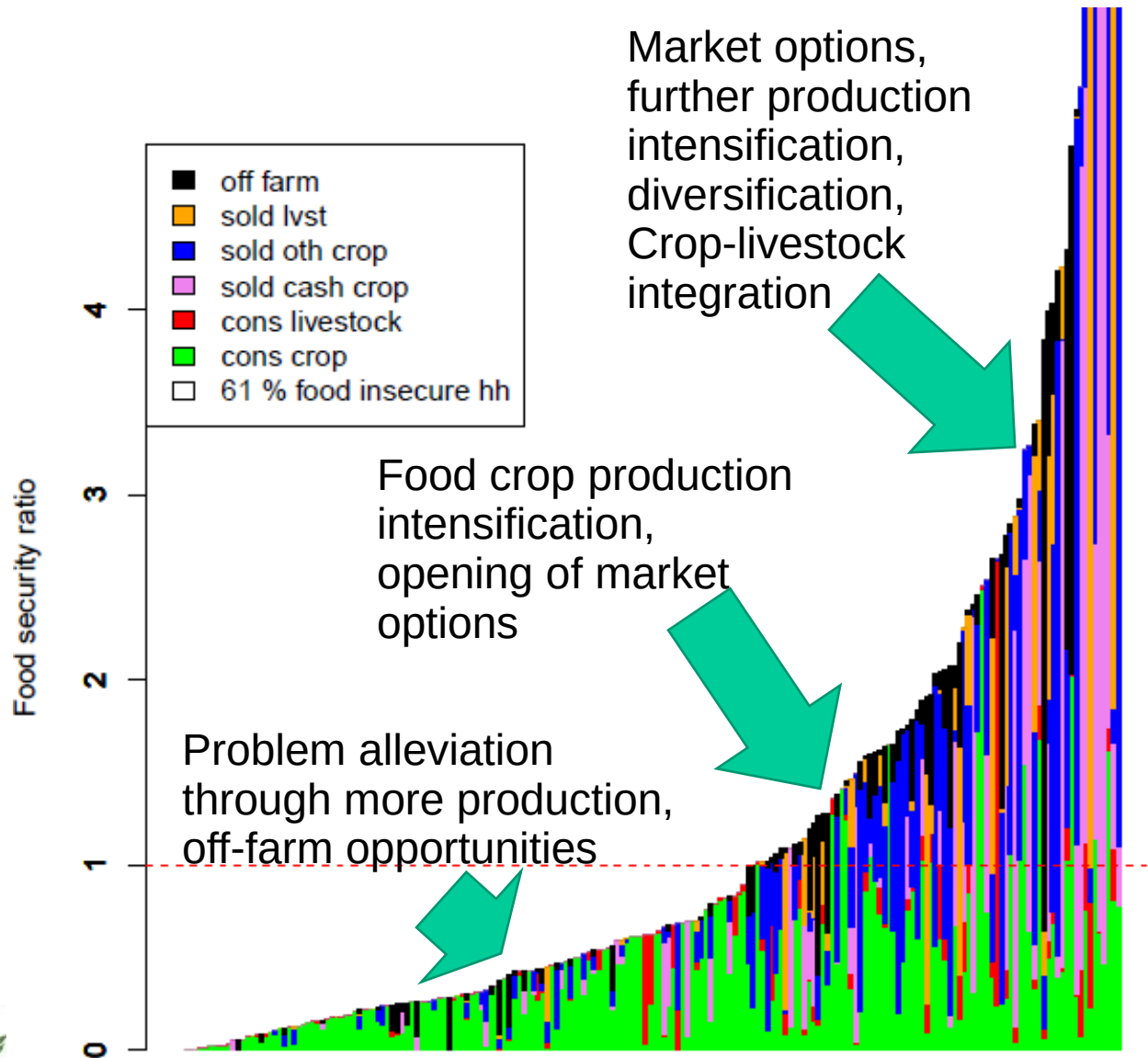
Target interventions



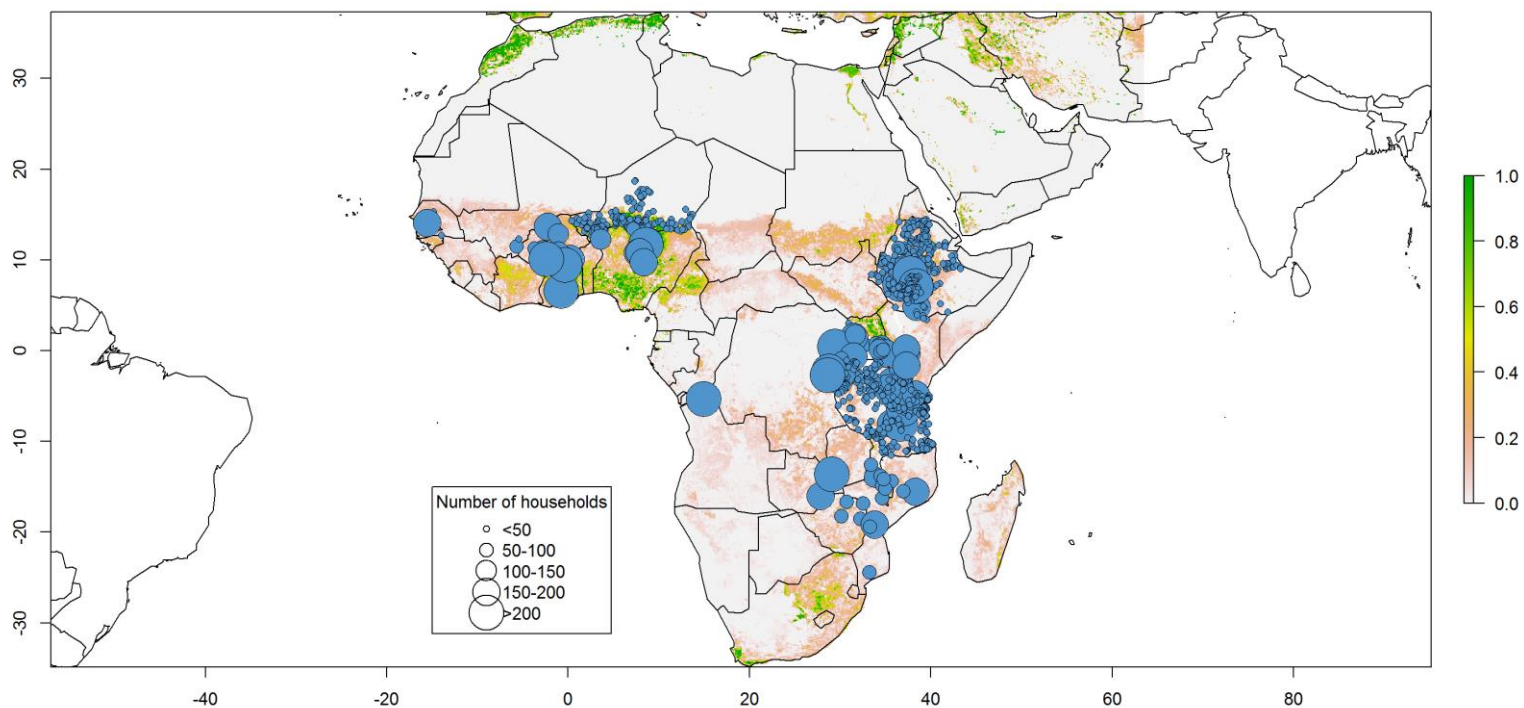
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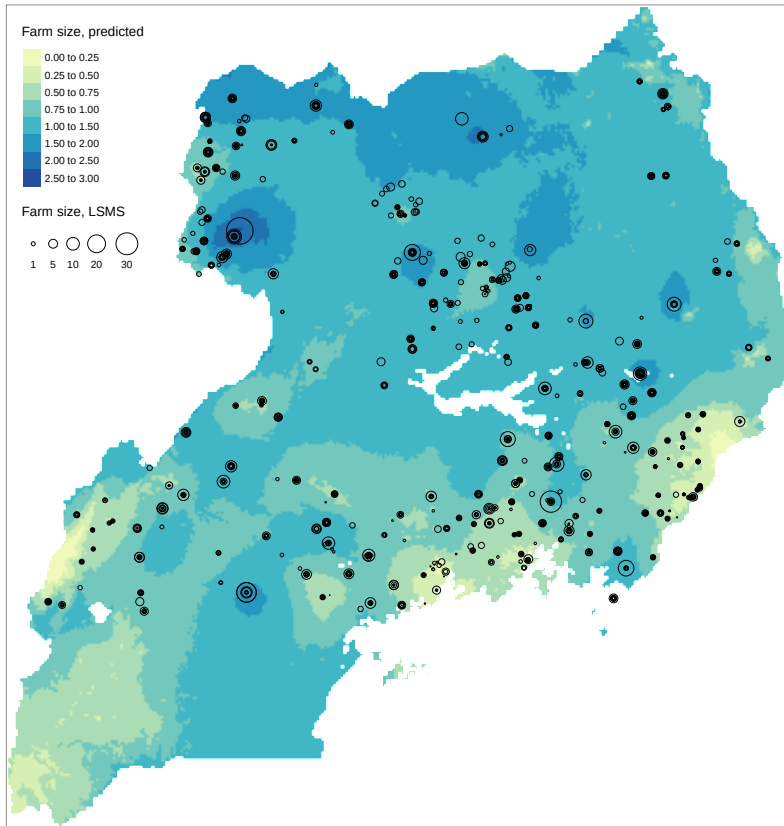


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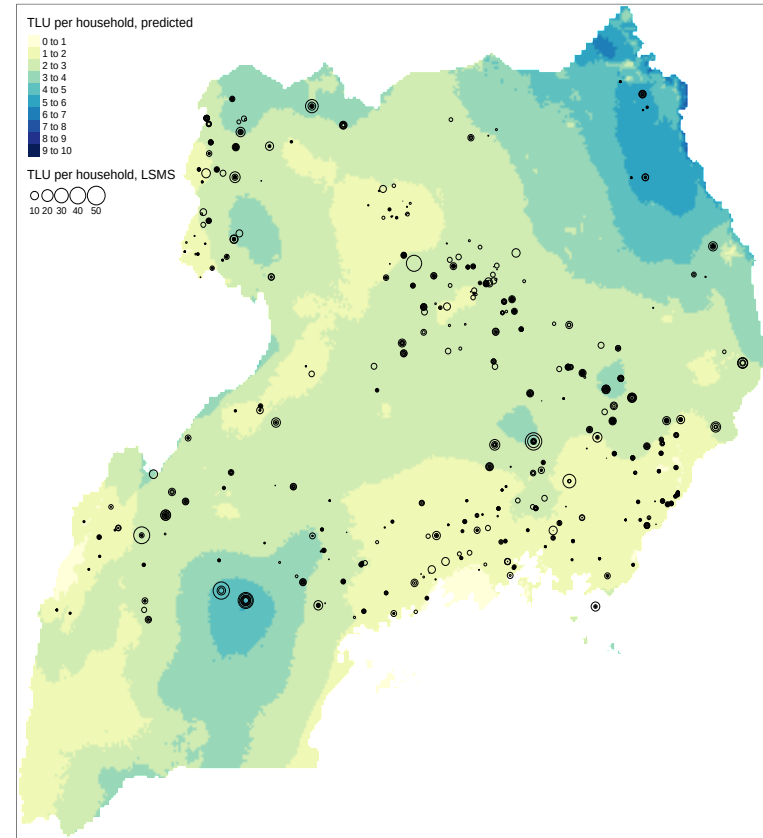


With this data we map productive resources (example of Uganda)

Farm size (in ha; blue large, yellow small)



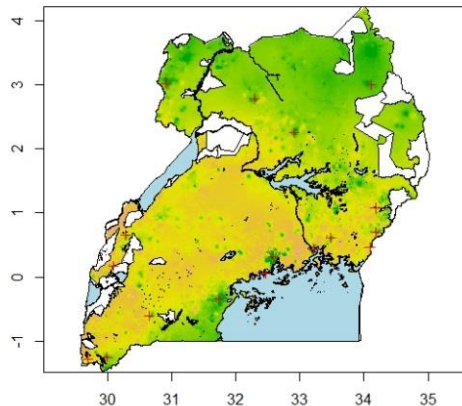
Livestock holdings (blue large, yellow small)



And what the key activities are for different groups of farm households

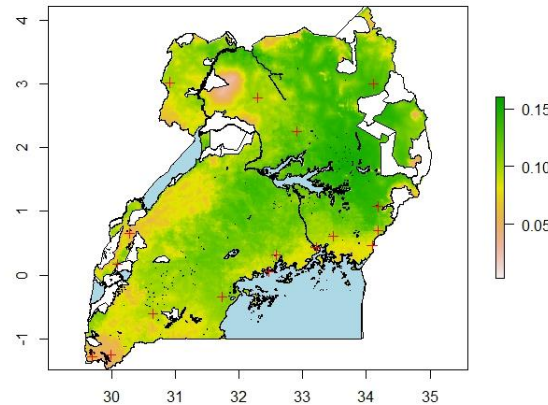
Off farm

Sum off-farm income M5a th=0.3



Livestock

Prediction livestock contribution M2a

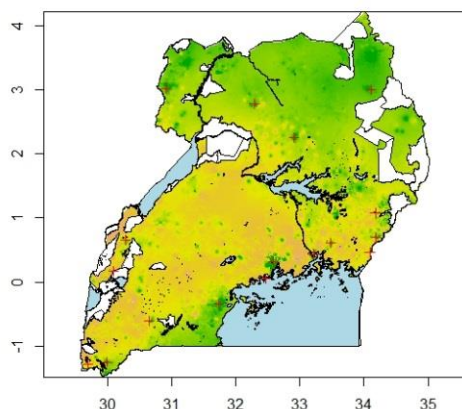


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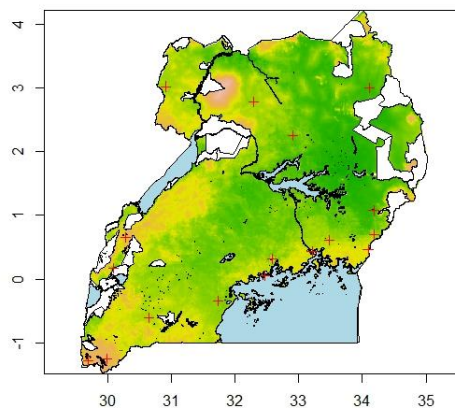
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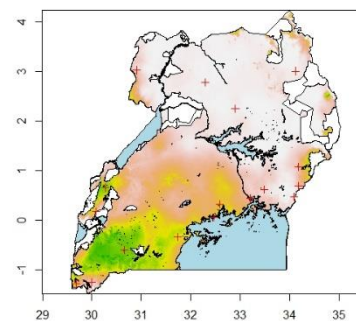


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Crops

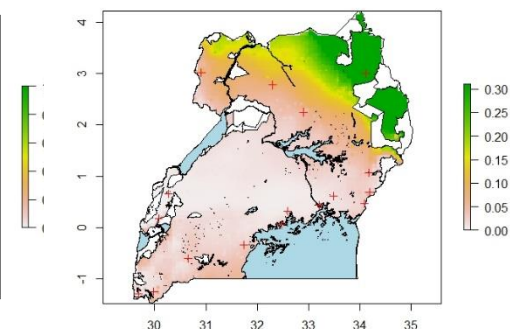
Banana

Sum banana contribution M6 (adj.)



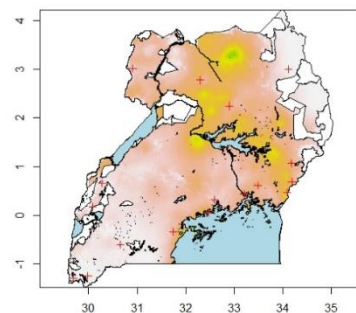
Sorghum

Sum of pred & residuals contr_sorghum with mod_M5 SK, th=0.3



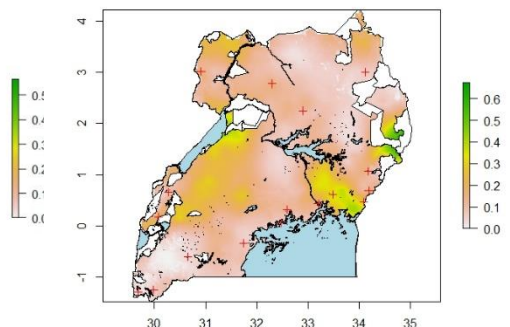
Cassava

Sum of pred & residuals contr_cassava with mod_M3 OK (ADJ.)



Maize

Sum of pred & residuals contr_maize with mod_M4a (adj)



This re-use of existing data sources

Working across scales using a bottom up approach:

Determining factors at local scale → consequences at large scale

Experiences of using existing data resources

- With relatively simple indicators a lot of information can be derived
- However, no standardization and harmonization
- Data use in existing surveys is extremely inefficient
- Overly long surveys lead to strong compromises in terms of data quality

RHoMIS

(Rural Household Multiple Indicator Survey)

- Harmonize indicators
- Standardize the way they are collected and quantified
- Collect data efficiently
(make use of modern technologies and advances in indicator development; 1h per household)
- Flexibility and adaptability: a tool that can be used in many locations and project settings



Drivers & Strategies

Farm HH

Characteristics:

Family Size/Composition
Gender-Differentiated
Decision-Making
Ethnicity
Cultivated Land
Livestock Holding

Livelihood:

Market Orientation
Livestock Orientation
Off-Farm Activities

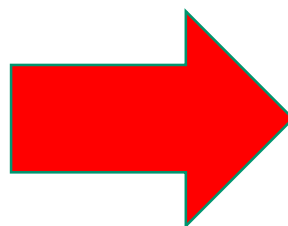
Agricultural System:

Land Allocation
Crop Diversity
Farm Integration
Intensification-
Fertilization
Irrigation
Organic based

Performance

Economic:

Value of Farm Production
Off-farm income



Agricultural System:

Farm Productivity
Crop Productivity
Livestock Productivity

Welfare

Food Security:

Food Availability
Hunger and Food Insecurity
Access Scale (HFIAS)
Household Diet Diversity
Score (HDDS)

Poverty:

Progress out of Poverty
(PPI)
Gross Income

Environment:

GHG Emissions
GHG Emissions Intensity
Nitrogen Balance

+ Other User-Defined
Indicators of Interest

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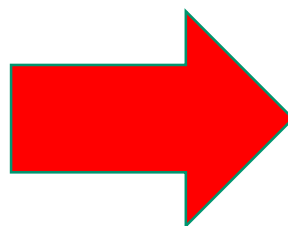
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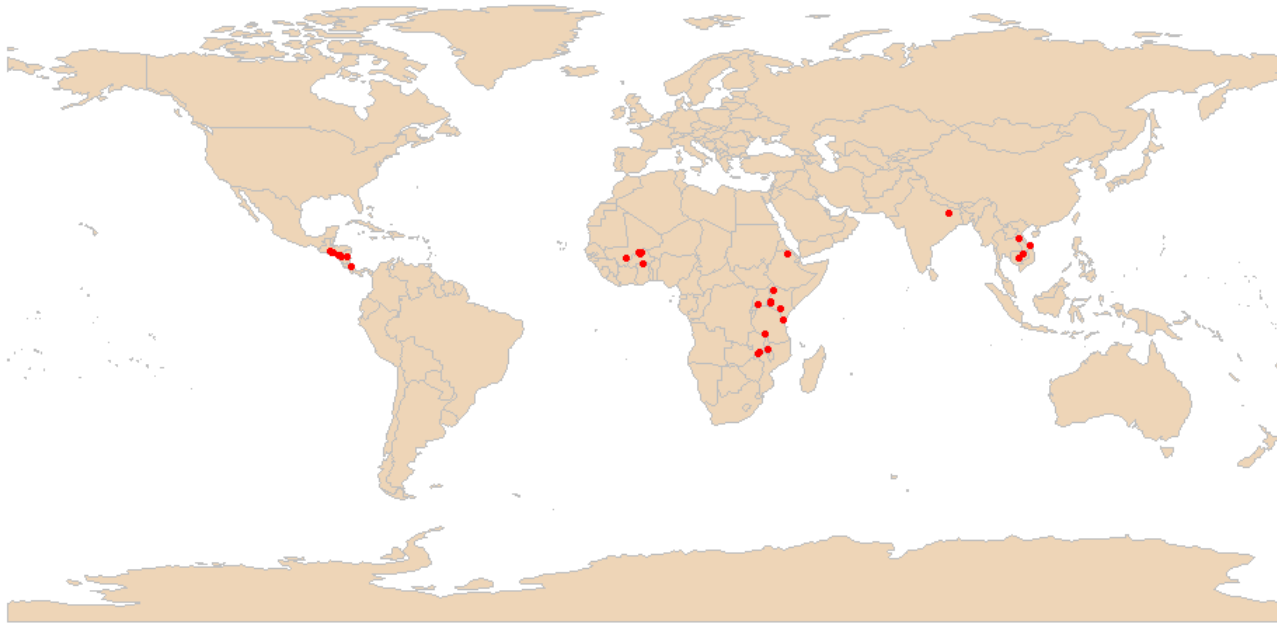
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+ Other User-Defined
Indicators of Interest

And with this harmonized, but nevertheless flexible approach, we build up

- Datasets
- Surveys & survey modules
- Processing, analysis and visualization code

Spontaneous Uptake



~7,000 households, ~16 countries, ~ 35 sites

Used by ILRI, ICRAF, Bioversity, CIMMYT, CIAT,
CSIRO, TreeAID, INDER, CONABIO

Type of analyses performed

1. Farming system characterization
2. Determinants of food security (pathway analyses)
3. Analyses of change over time
4. Evaluation of interventions

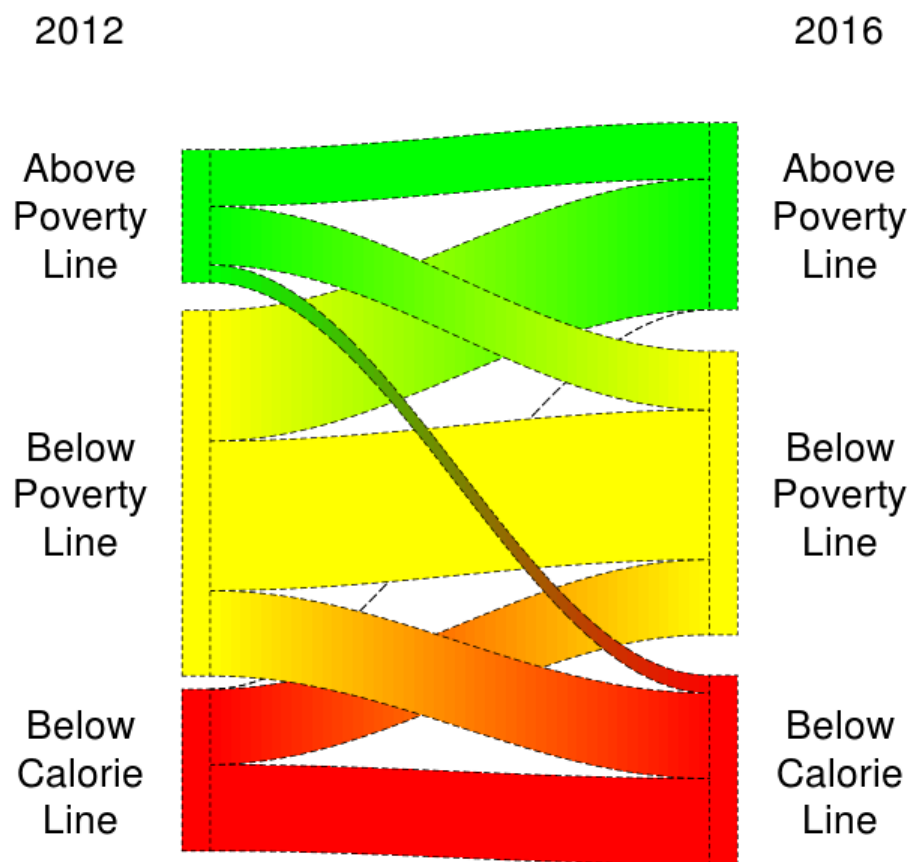
Household trajectories in time: results from a 2012 – 2016/17 comparison

How do farm livelihoods change over time?

Household trajectories in time: results from a 2012 – 2016/17 comparison

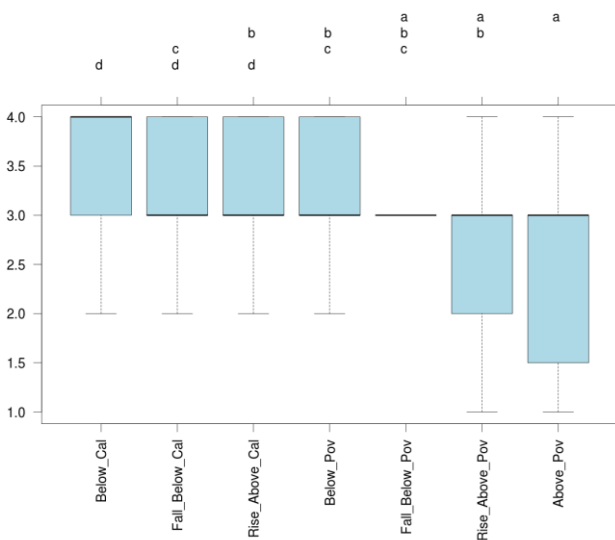
1. More than 600 HHs revisited in 2012 and 2016/2017
2. 4 contrasting sites in Kenya, northern Tanzania and Central Uganda
3. Defined groups along two thresholds: food security and poverty

Food security/income trajectory classes

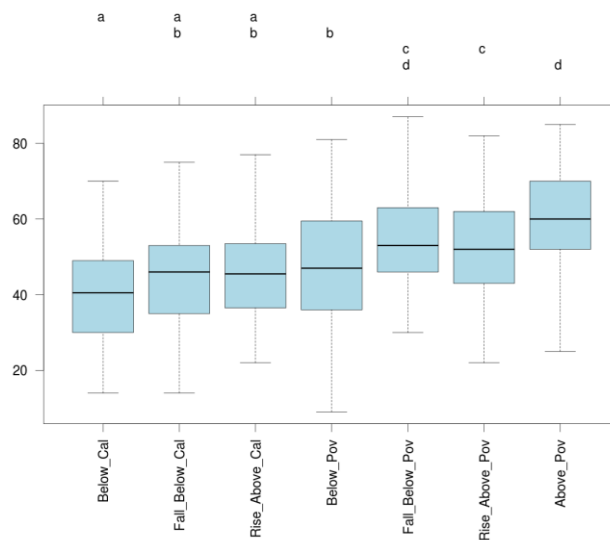


Trajectory groups and Welfare Indicators

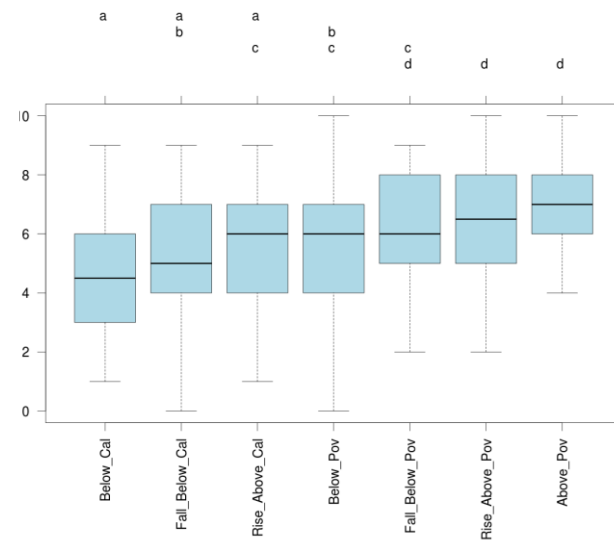
HFIAS



PPI

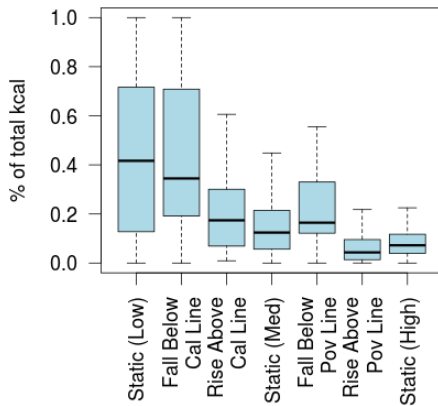


HDDS Bad Season

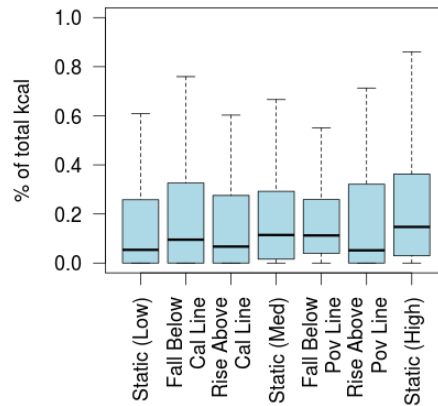


Livelihood strategies

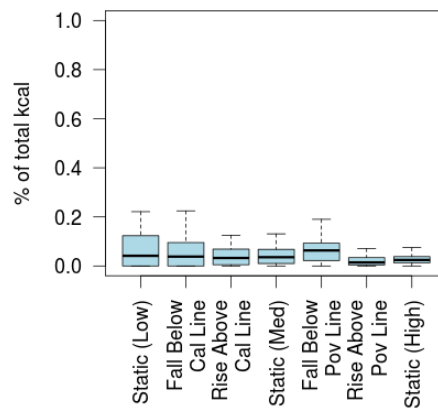
Crop Cons



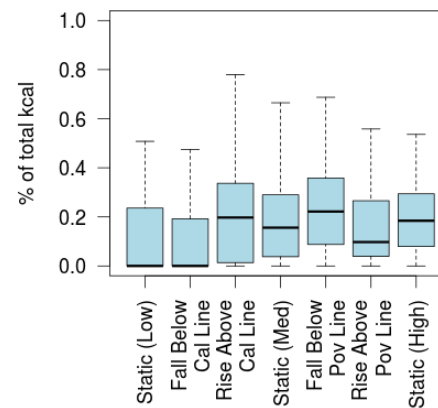
Crop Sold



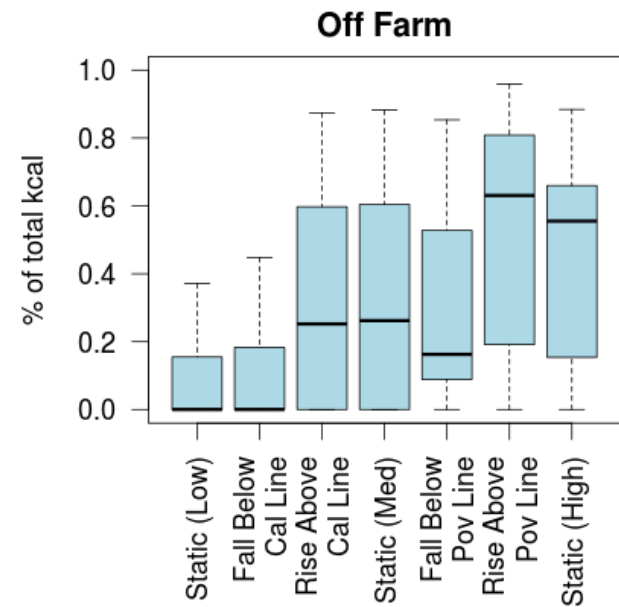
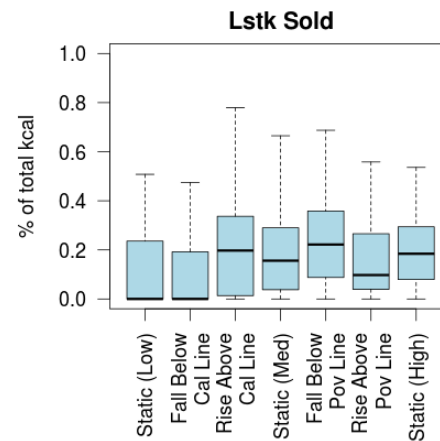
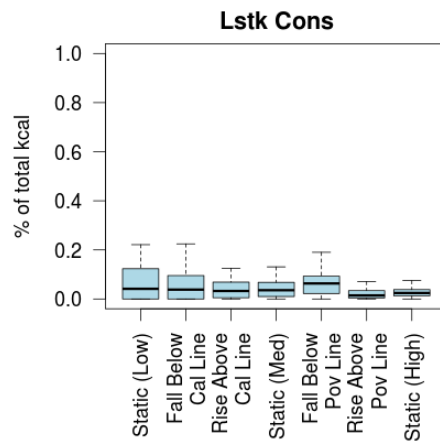
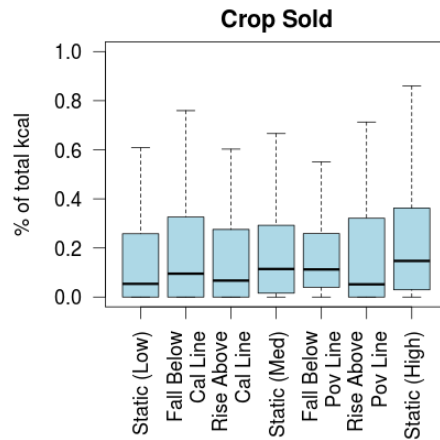
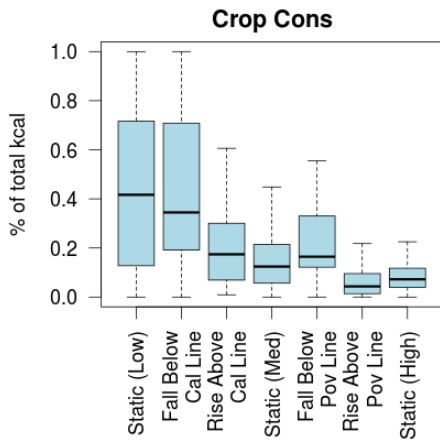
Lstk Cons



Lstk Sold

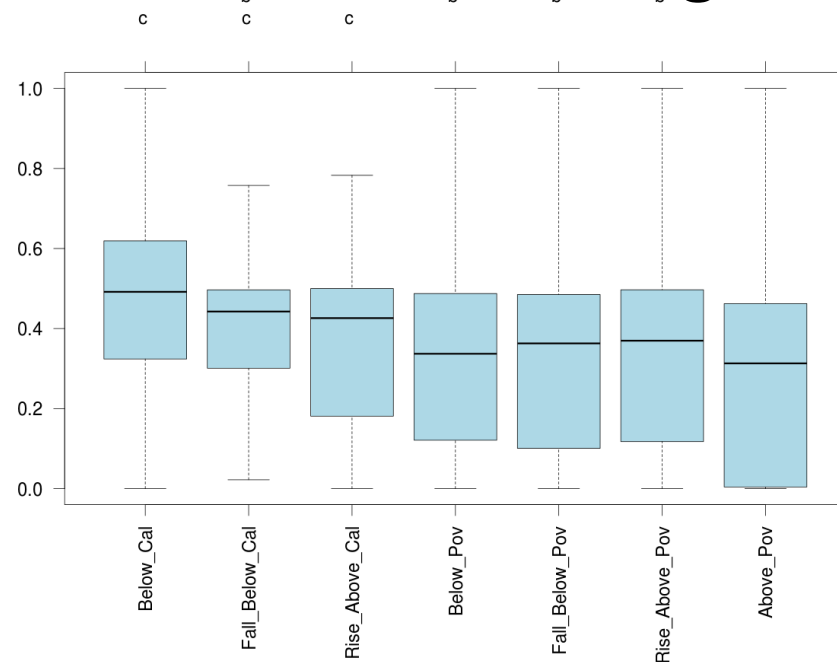


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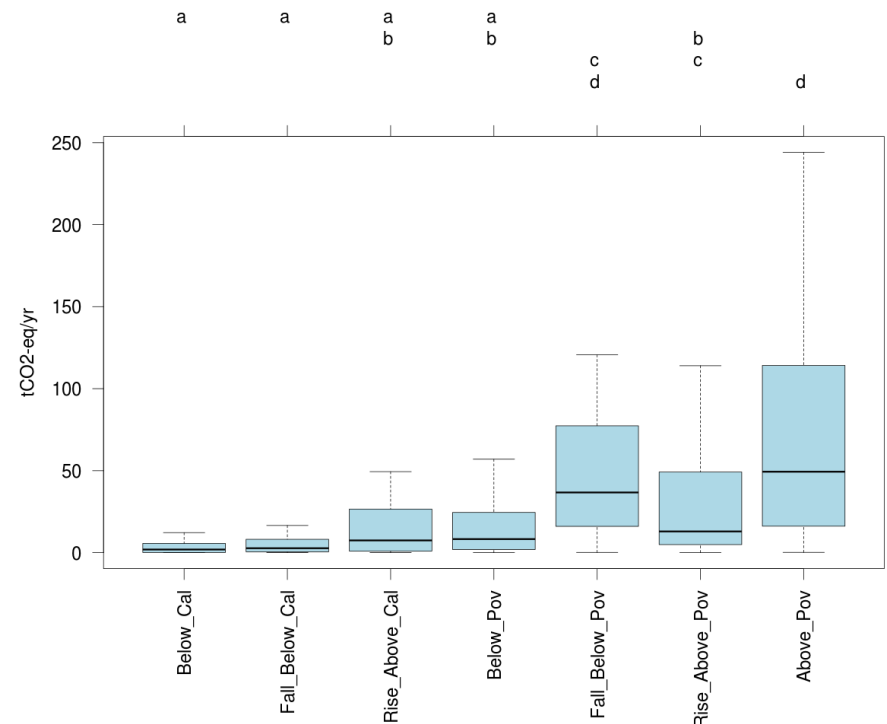


Livelihood strategies

Female control of decision-making



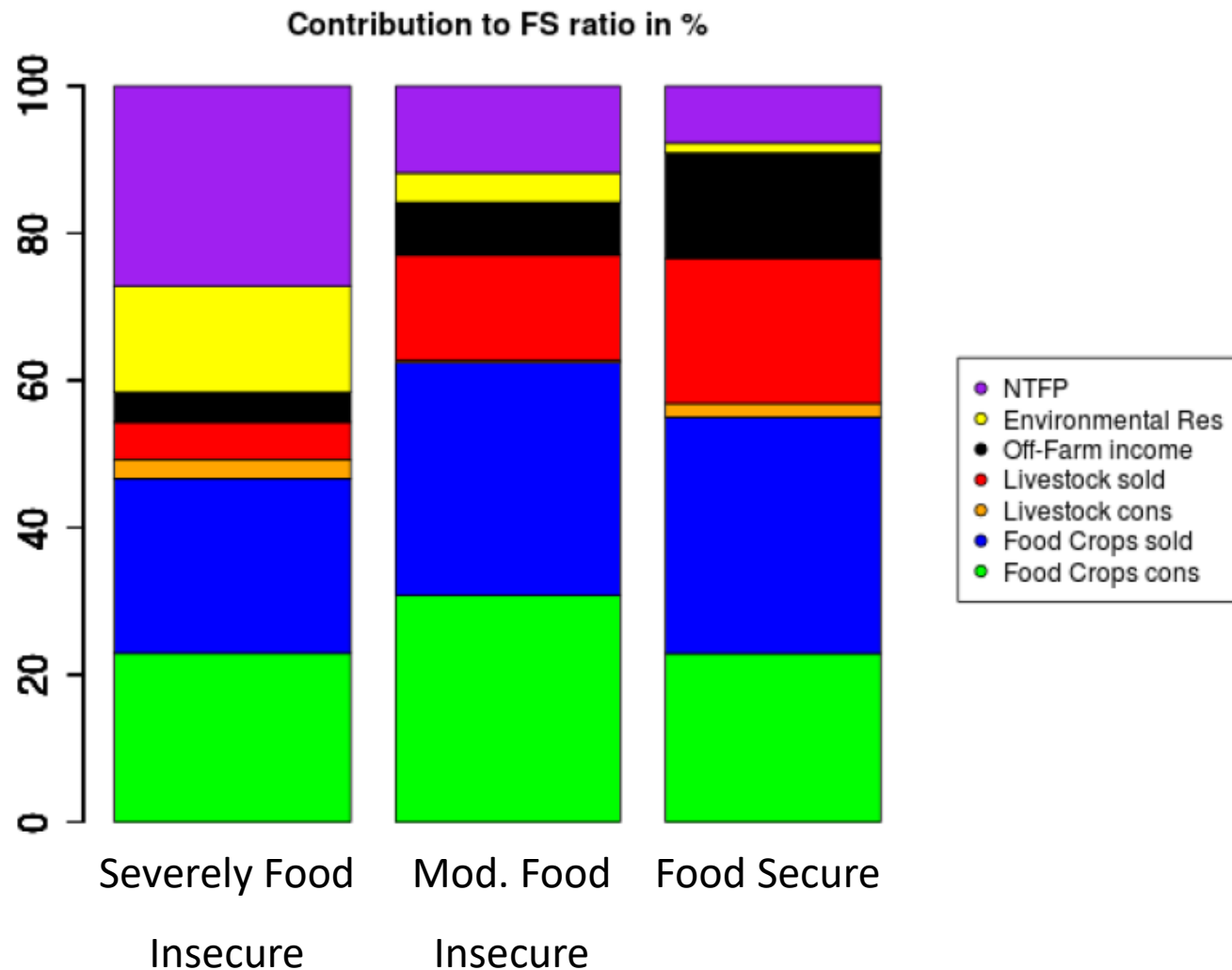
GHG emissions



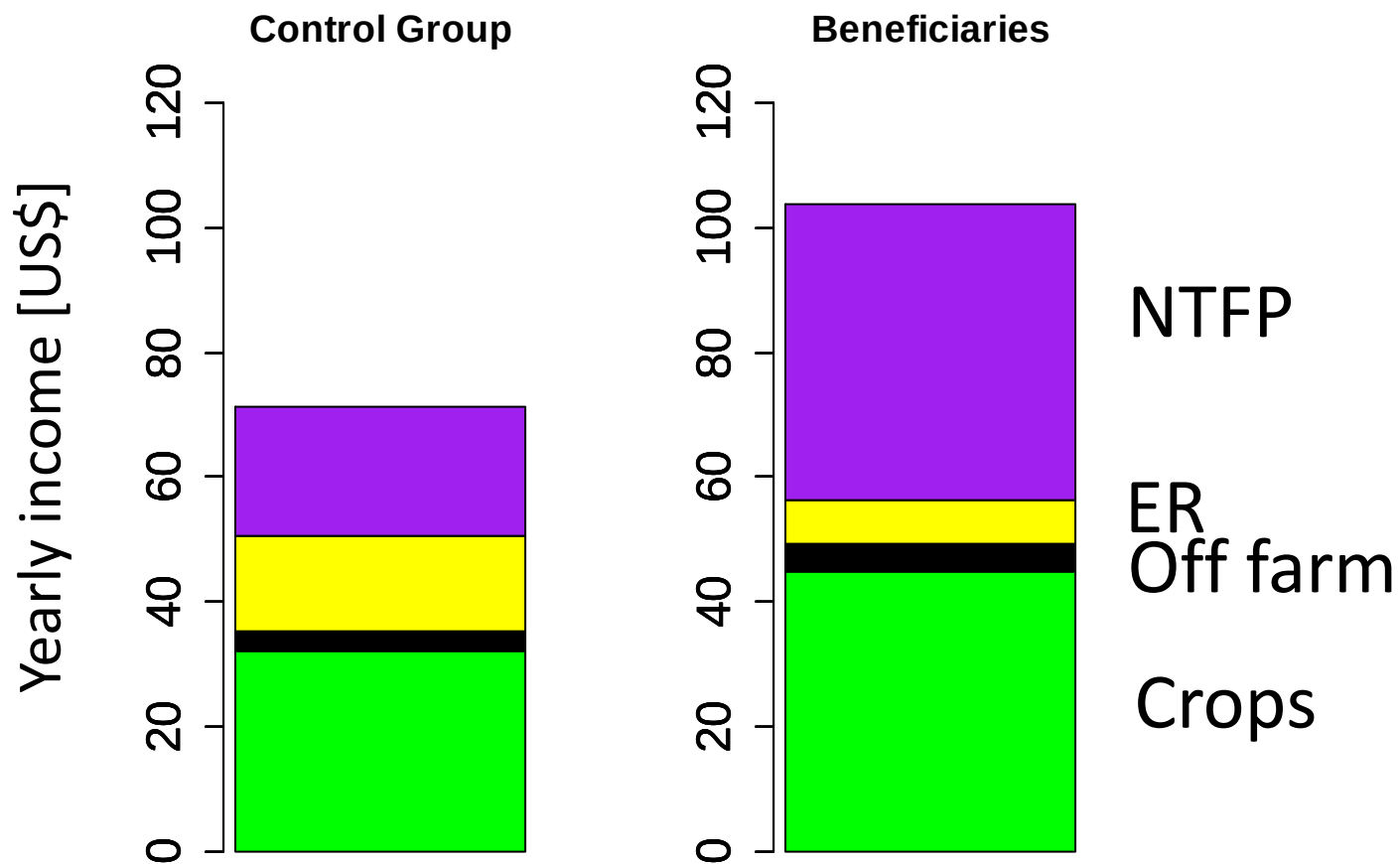
So what can we do for the poorest, most food insecure households?

Recent work with TreeAID on promoting the use of non-timber tree products in northern Ghana

Especially interesting for the most food insecure households



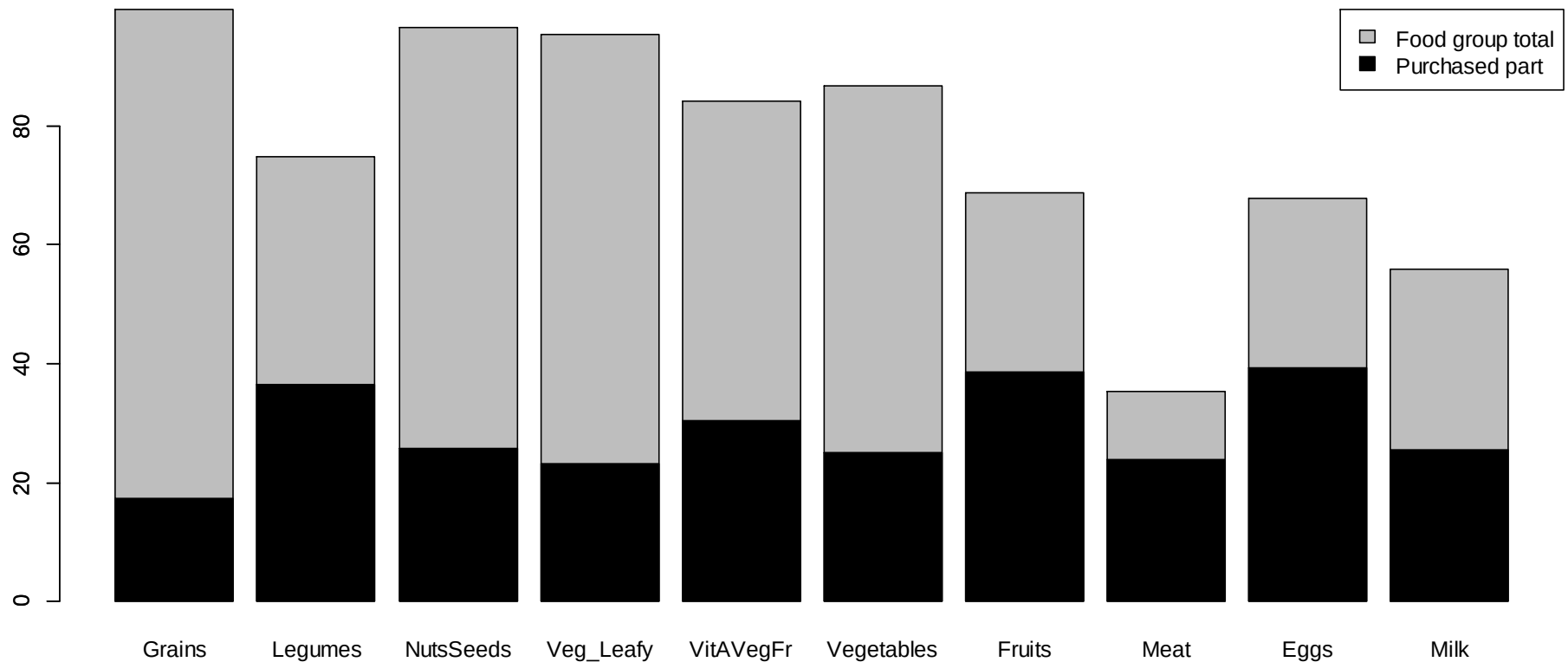
Non-Timber Forest Products: income



In new analyses we disentangle pathways to achieve food security and dietary diversity

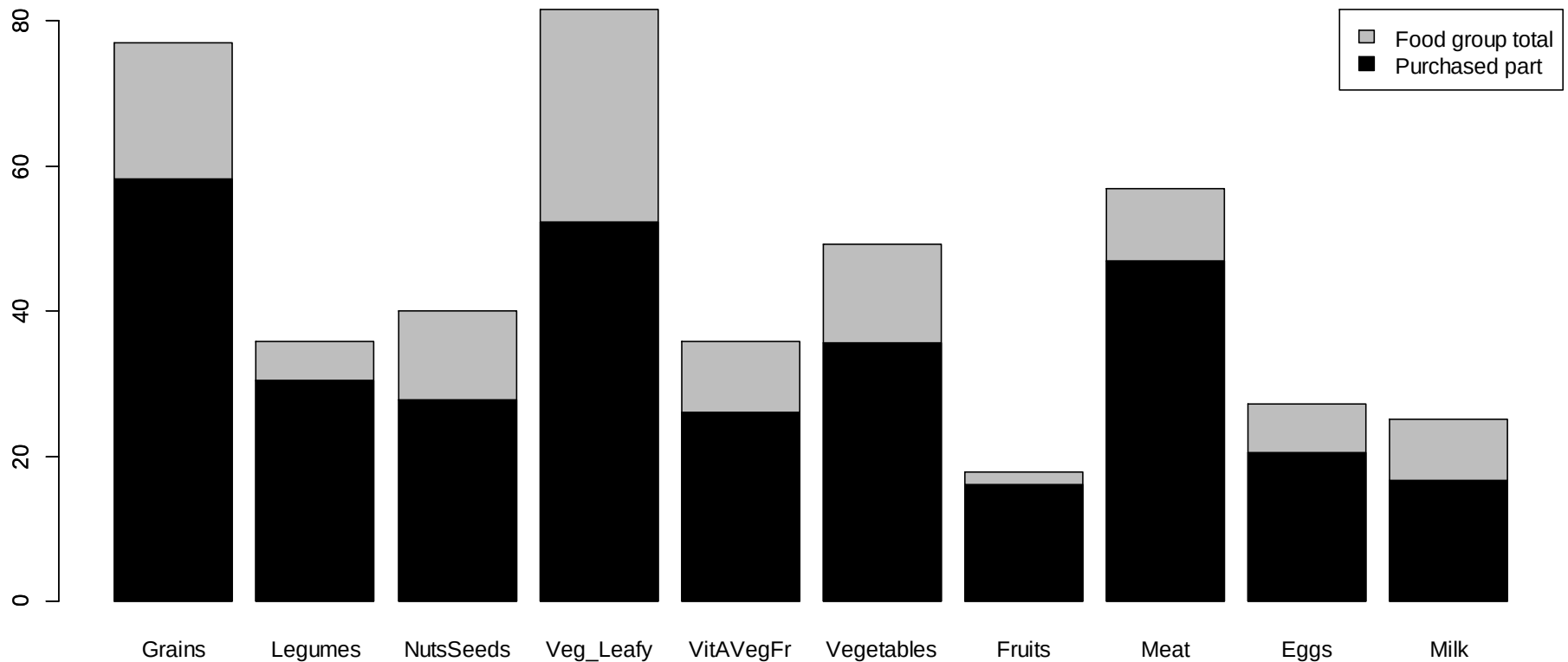
Diets: zooming in

HDDS after the growing season, % of HHs consuming certain food groups



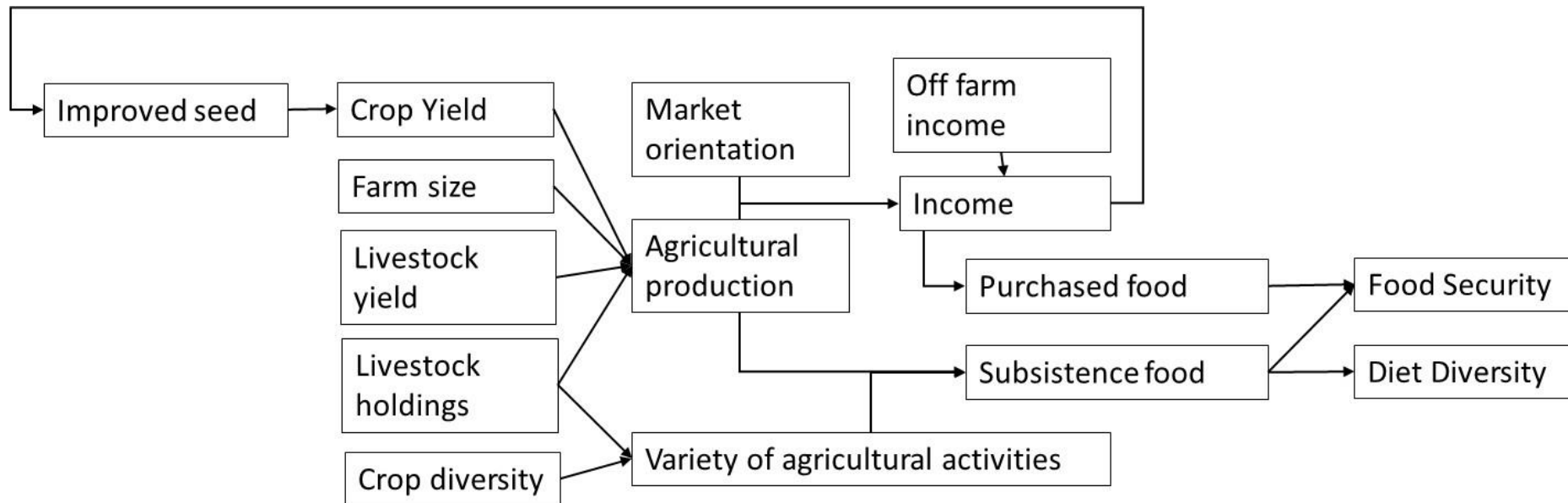
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HDDS Bad season, % of HHs consuming certain food groups



Pathway models

Yatenga



Take home messages

- Importance of off farm
- Different interventions are attractive for different groups of farmers: motivation X resources
 - (we think we have useful, rapid data collection and analyses tools to gain quantitative information on this)
- Targeted M&E is essential; bulldozer approaches do not work
 - Survey design
 - Target group
- Change in smallholder systems is going on, and rapidly!
- Given current data resources we can work across scales, no longer when working at farm household level we are presenting single case studies

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Thanks for your attention!

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Box 30709, Nairobi 00100 Kenya
Phone +254 20 422 3000
Fax +254 20 422 3001
Email ilri-kenya@cgiar.org

ilri.org
better lives through livestock
ILRI is a CGIAR research centre

Box 5689, Addis Ababa, Ethiopia
Phone +251 11 617 2000
Fax +251 11 667 6923
Email ilri-ethiopia@cgiar.org

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