

# Lessons learnt from previous household surveys, how to collect better and targeted data and first work on quantifying changes over time.

*Mark van Wijk & James Hammond*

*Simon Fraval, Todd Rosenstock, Nils Teufel, Jacob van Etten*

Impacts World, Potsdam

13<sup>th</sup> of October 2017



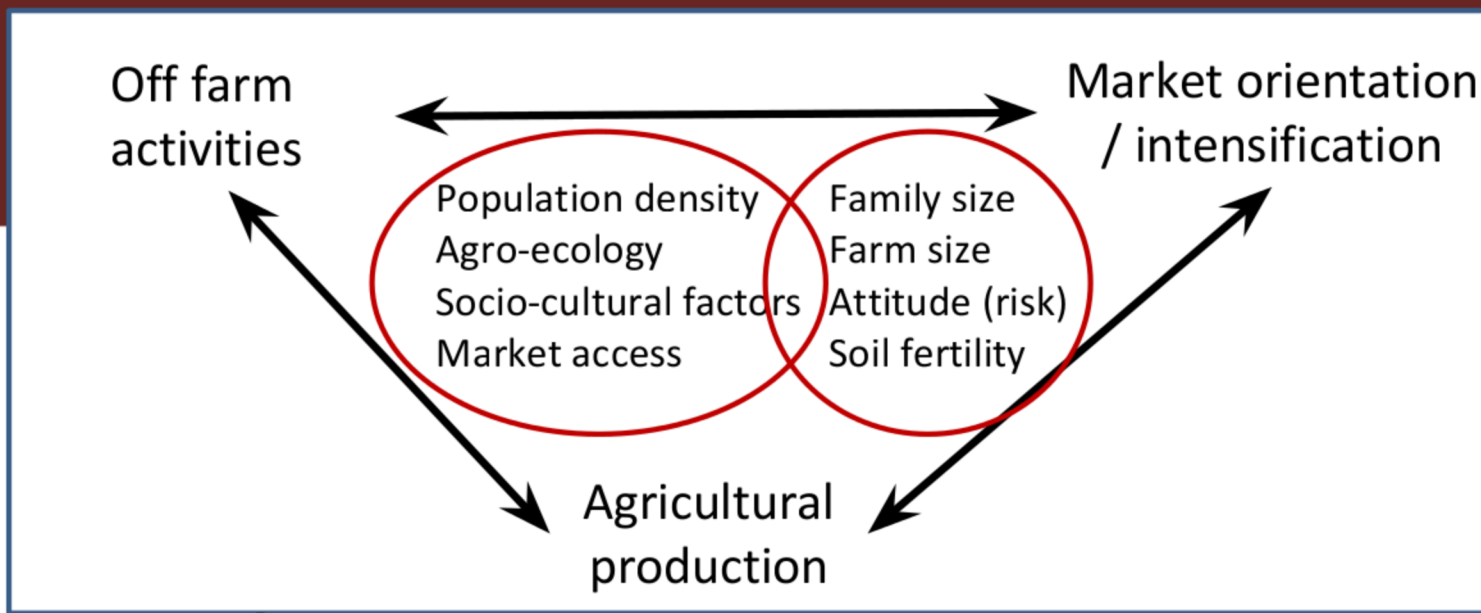
RESEARCH  
PROGRAM ON  
Livestock and Fish



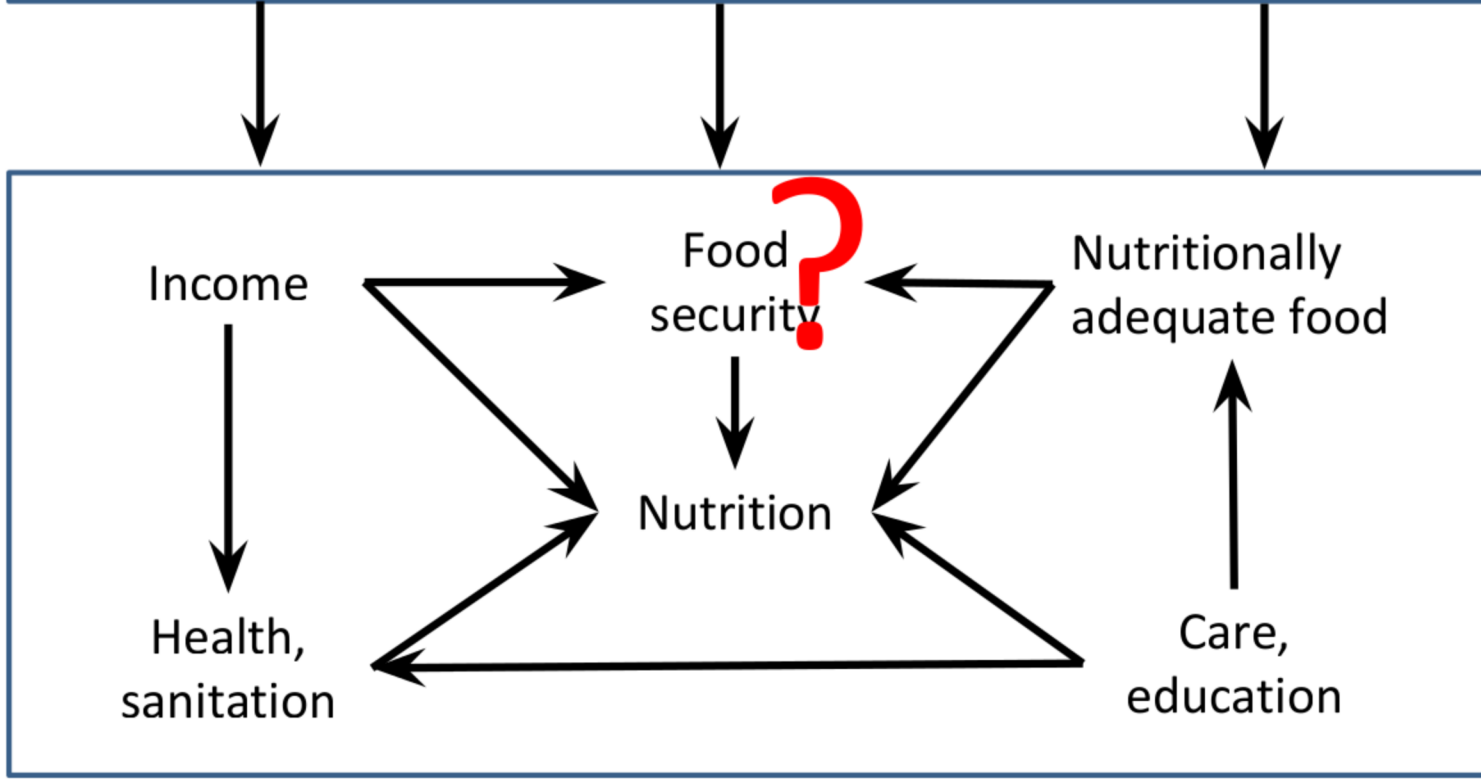
RESEARCH PROGRAM ON  
Climate Change,  
Agriculture and  
Food Security



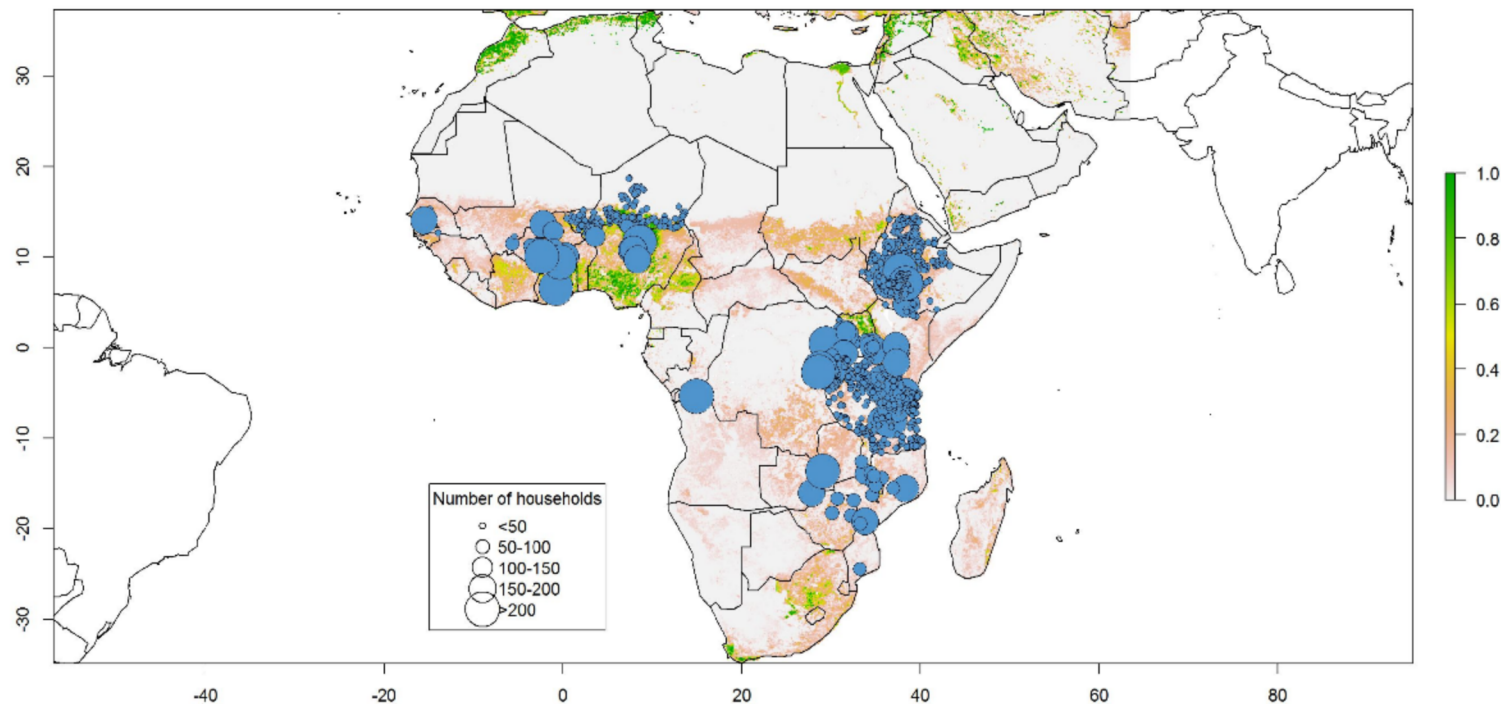
# Farm household



# Food security

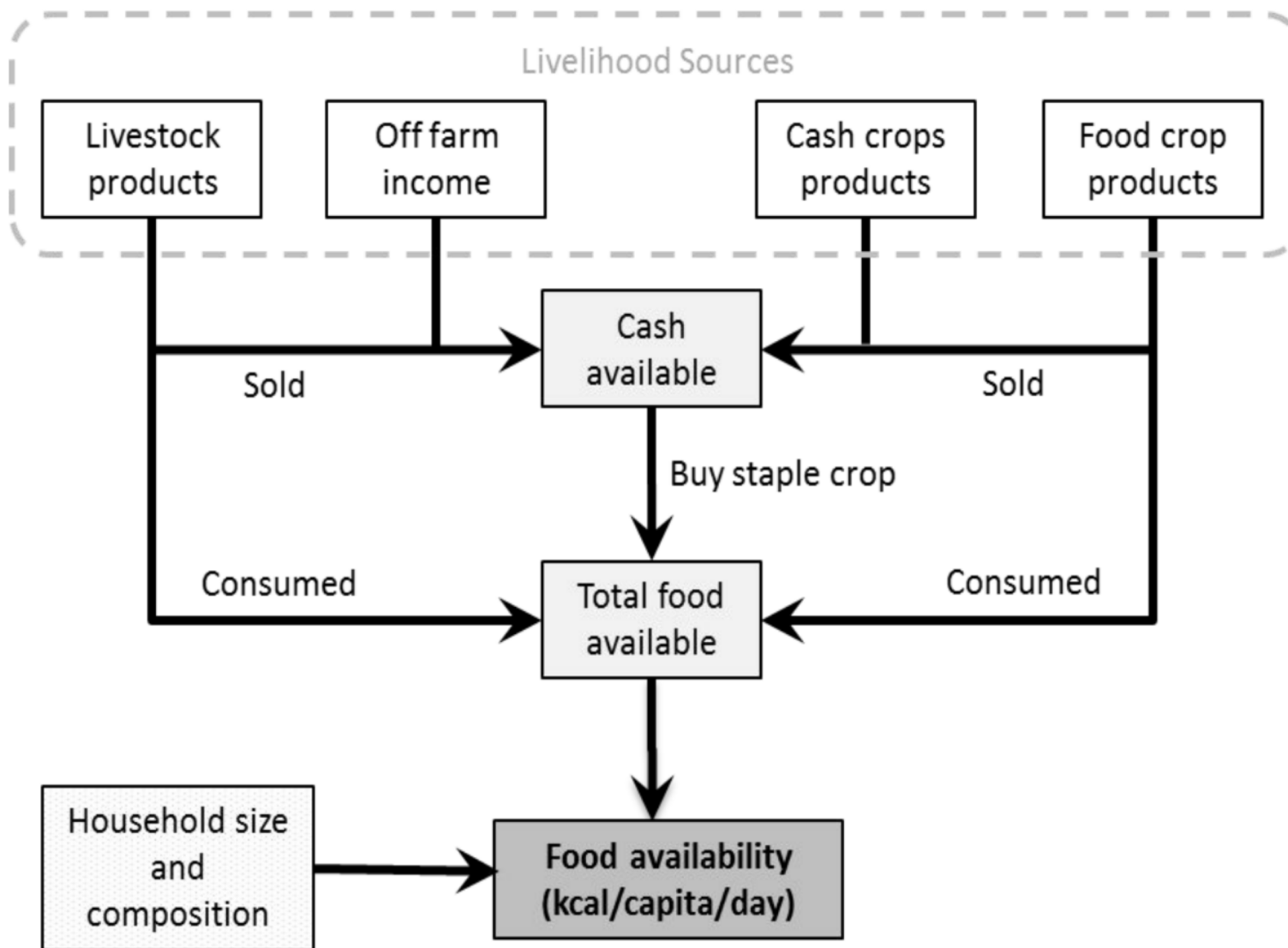


# Analysis of existing data



Frelat et al, 2016. PNAS  
Ritzema et al, 2017. Food Security  
Paul et al, 2017. Ag. Systems  
Wichern et al, 2017. Food Security  
Lopez-Ridaura et al, 2017. Ag Systems  
Waha et al., GCB, submitted  
Wichern et al., AgEE, submitted

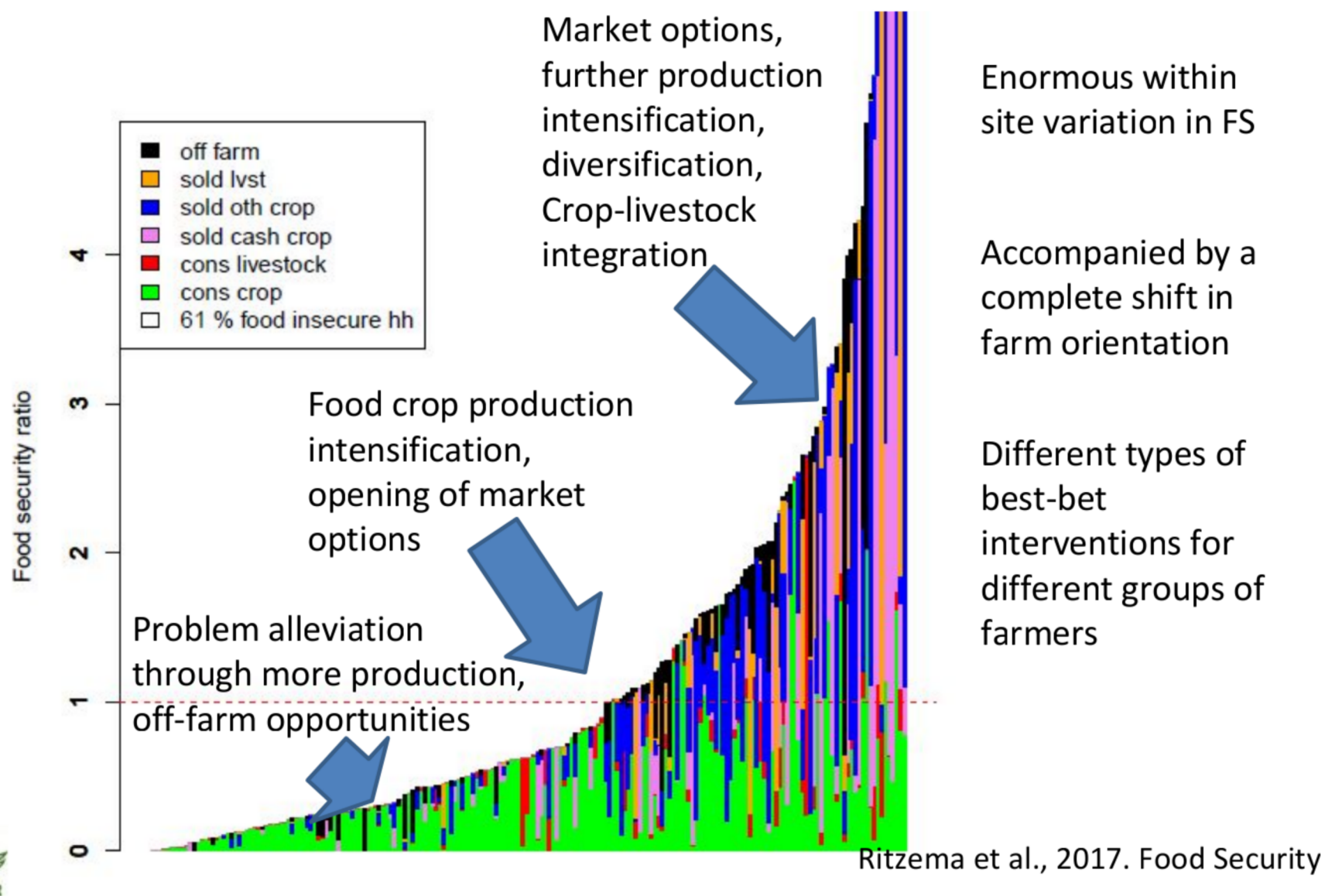
# Simple indicator of food security



Frelat et al., 2016. PNAS



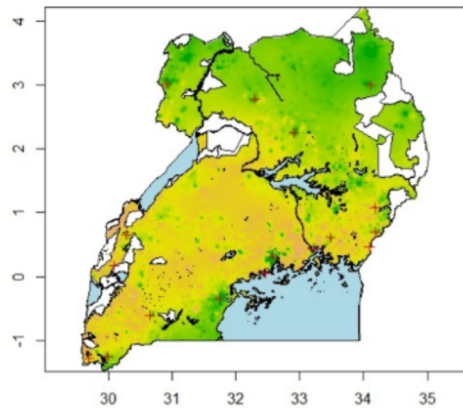
# Application: example of Lushoto, Tanzania



# What are the key activities are for different groups of farm households

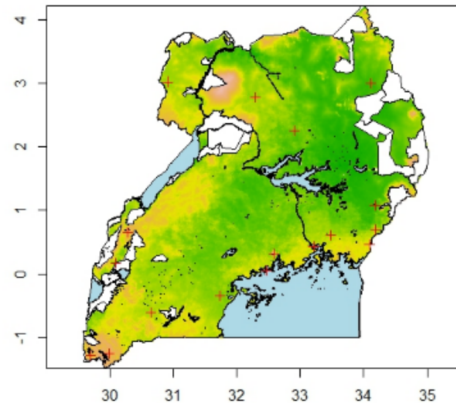
## Off farm

Sum off-farm income M5a th=0.3



## Livestock

Prediction livestock contribution M2a

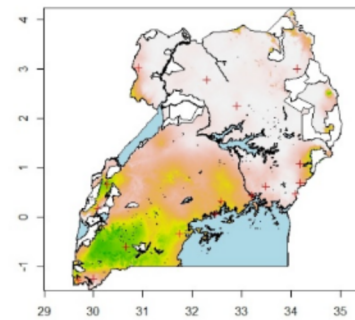


(green: important, yellow/white less important)

## Crops

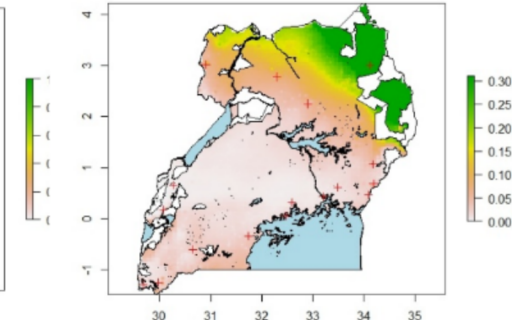
### Banana

Sum banana contribution M6 (adj.)



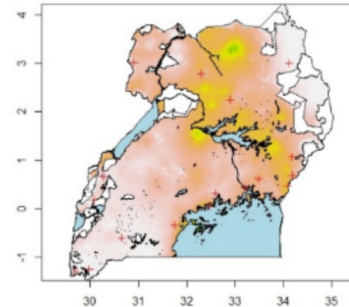
### Sorghum

Sum of pred & residuals contr\_sorghum with mod\_M5 SK, th=0.3



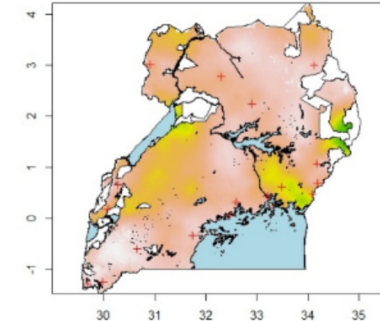
### Cassava

Sum of pred & residuals contr\_cassava with mod\_M3 OK (ADJ.)



### Maize

Sum of pred & residuals contr\_maize with mod\_M4a (adj)



Wichern et al., submitted

# 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 information collection
- 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
- Lean data rather than big data



# Drivers & Strategies

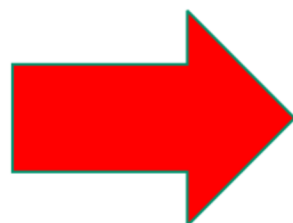
Farm HH  
Characteristics:  
Family Size/Composition  
Gender-Differentiated  
Decision-Making  
Ethnicity  
Cultivated Land  
Livestock Holding

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

Ritzema et al., 2017; in prep



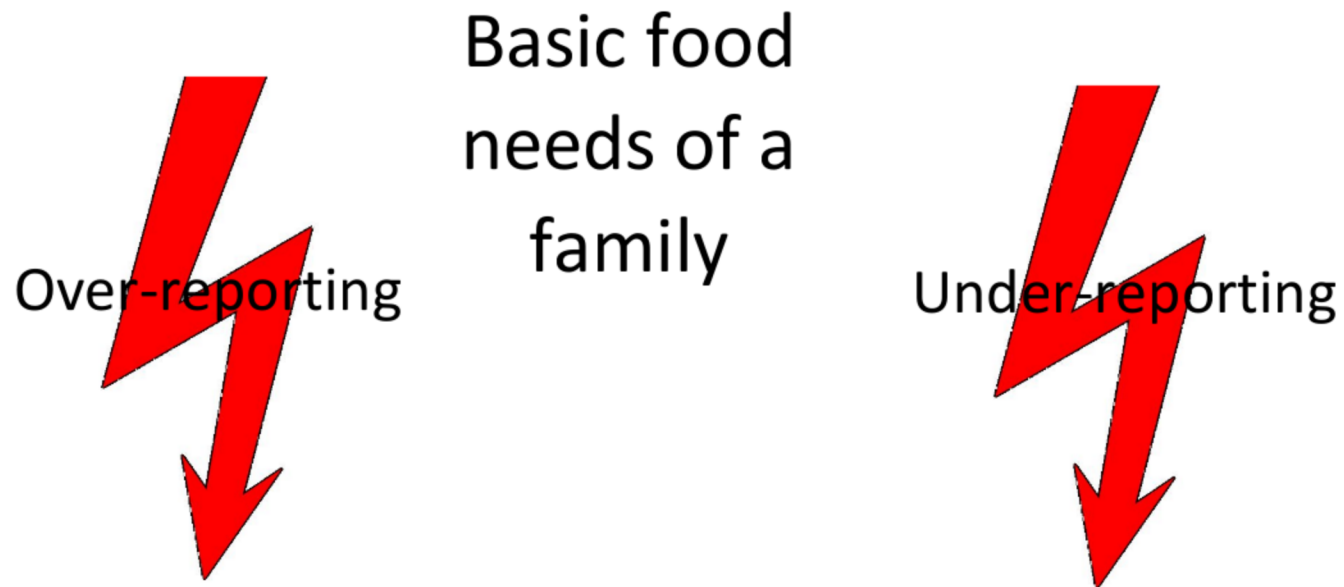
And with this harmonized, but nevertheless flexible approach, we build up libraries of

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

~7,000 households, ~16 countries, ~ 50 sites

Used by ILRI, ICRAF, Bioversity, CIMMYT, CIAT, CSIRO, TreeAID, INDER, Wageningen U.

# Quality Control



# Overall reliability of food security side survey data

Application	Too low Food Availability	Too high Food Self-Sufficiency	Overall quality reject
LSMS-ISA Uganda	10.6	14.7	25.3
LSMS-ISA Ethiopia	39.6	3.3	42.9
LSMS-ISA Tanzania	19.9	9.1	29.0
RhoMIS Nyando	6.8	3.7	10.5
RhoMIS Wote	8.1	6.2	14.3
RHoMIS Lushoto	17.5	2.3	19.8
ImpactLite Nyando	10.0	5.0	15.0
ImpactLite Wote	21.5	2.0	23.5
ImpactLite Lushoto	24.0	3.5	27.5

25 – 40%

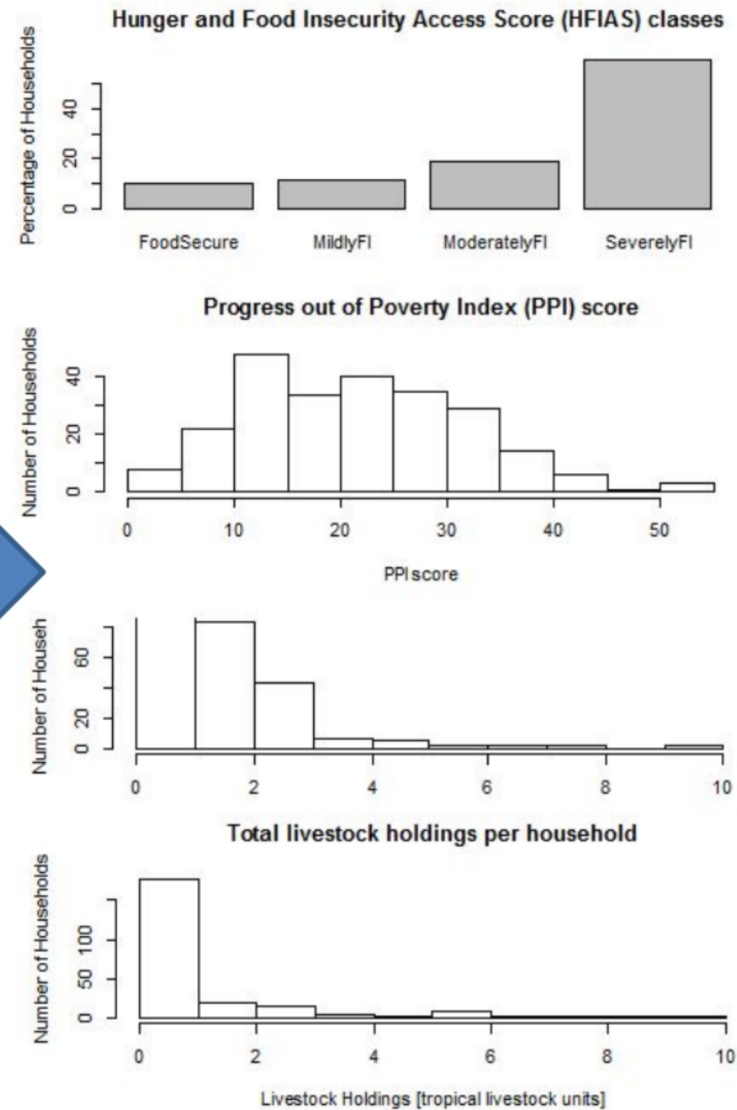
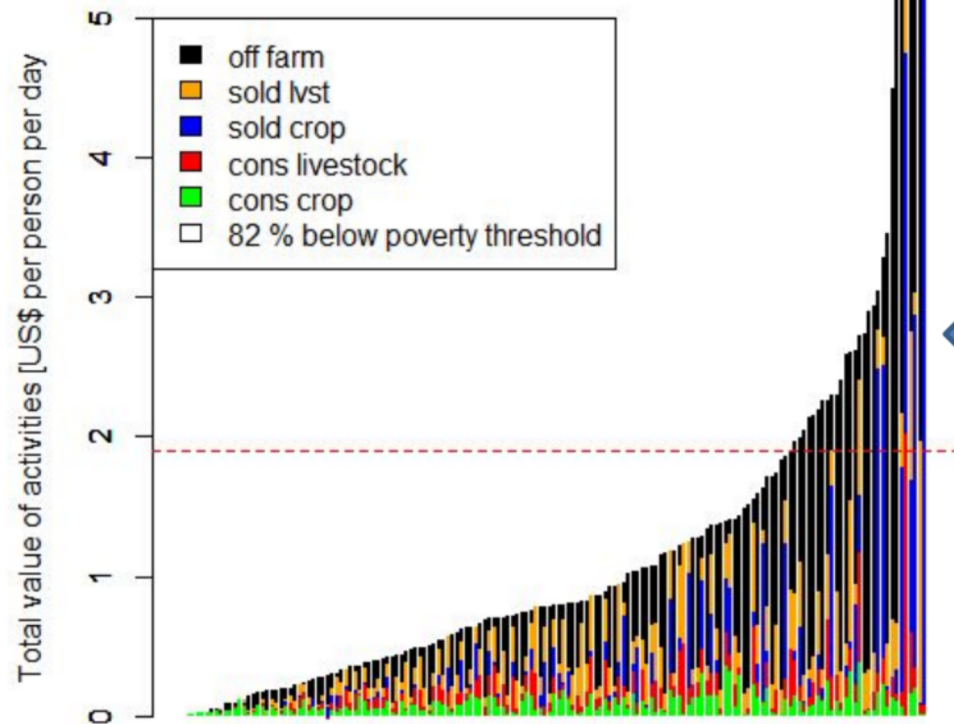
10 – 20%

15 – 30%

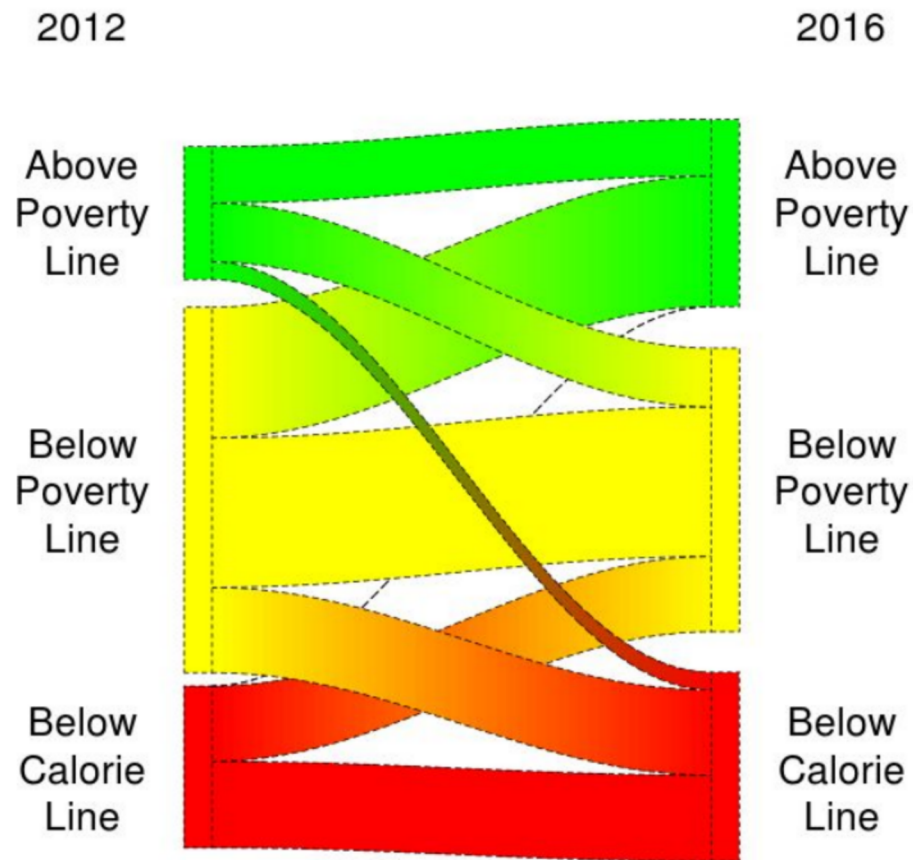
# Results

## Variation at site level

Nyando, Kenya, 2016



# Farmer welfare dynamics in East Africa

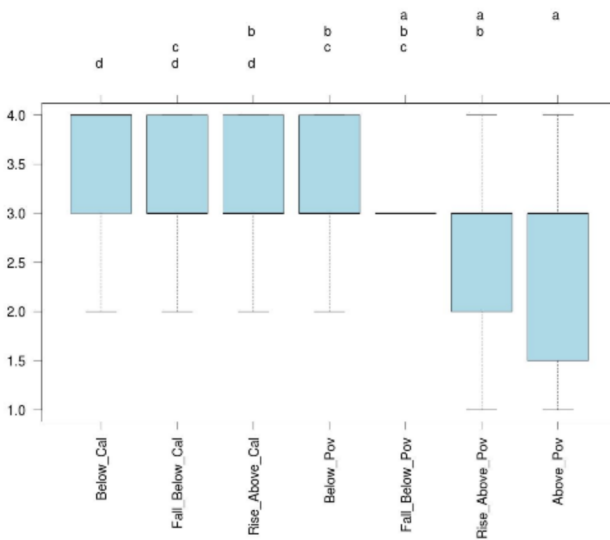


Hammond et al.

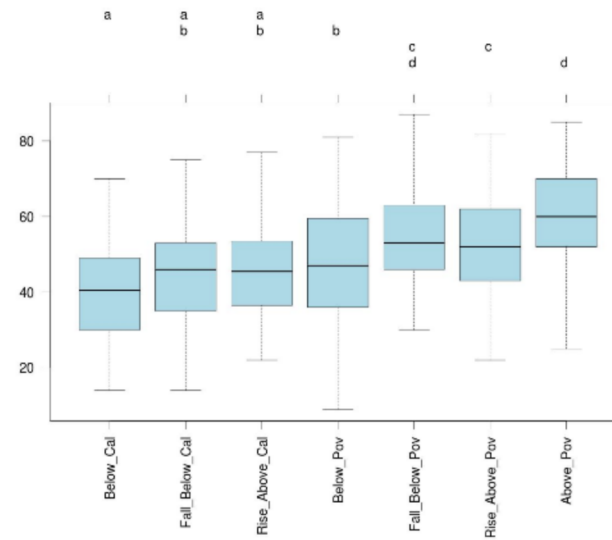


# Trajectory groups and Welfare Indicators

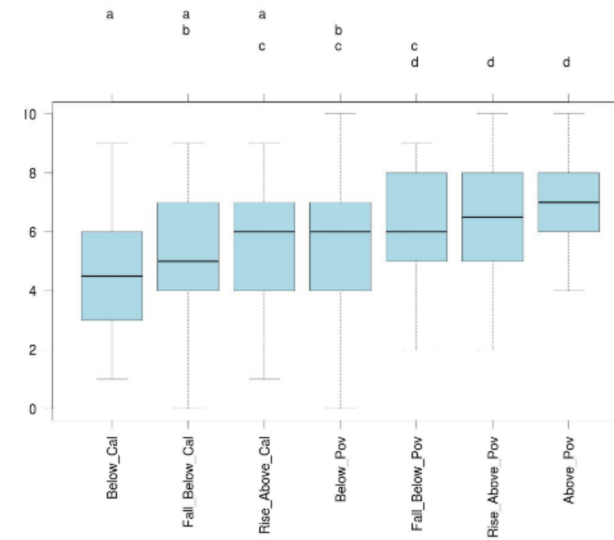
## HFIAS



## PPI

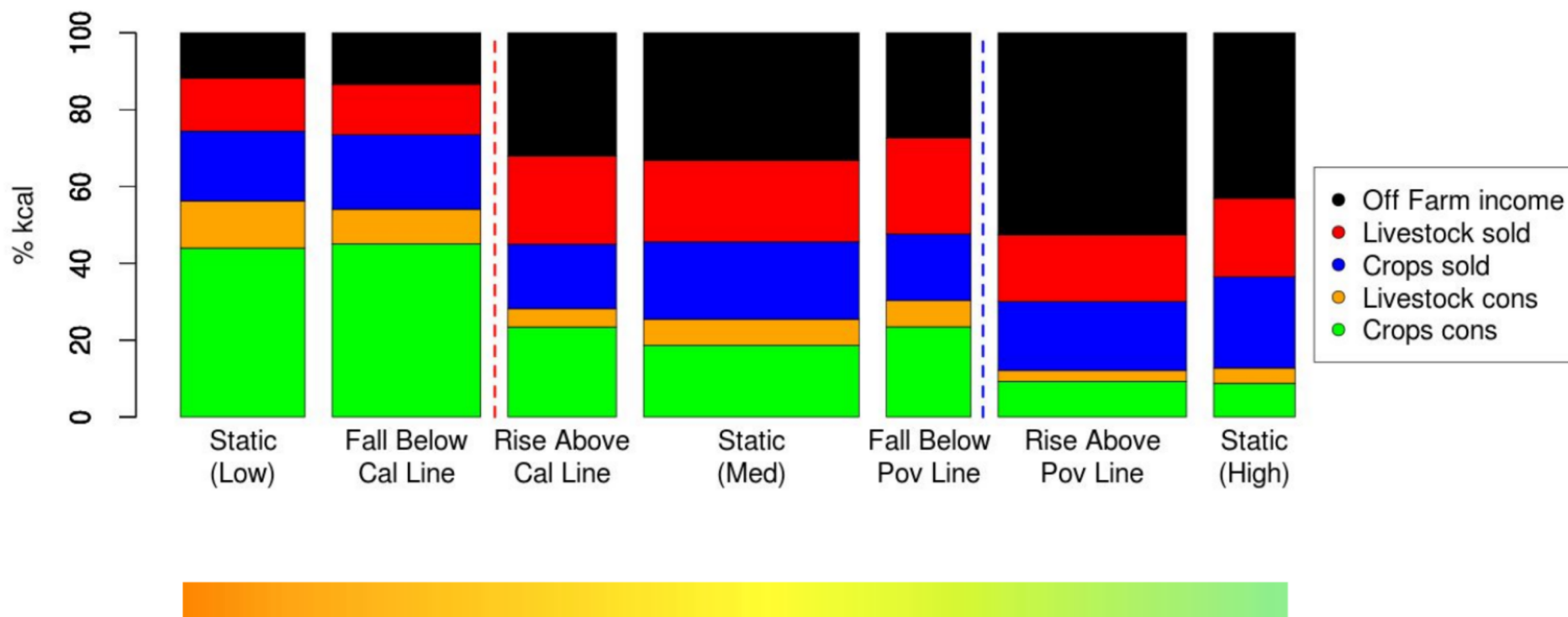


## HDDS Bad Season

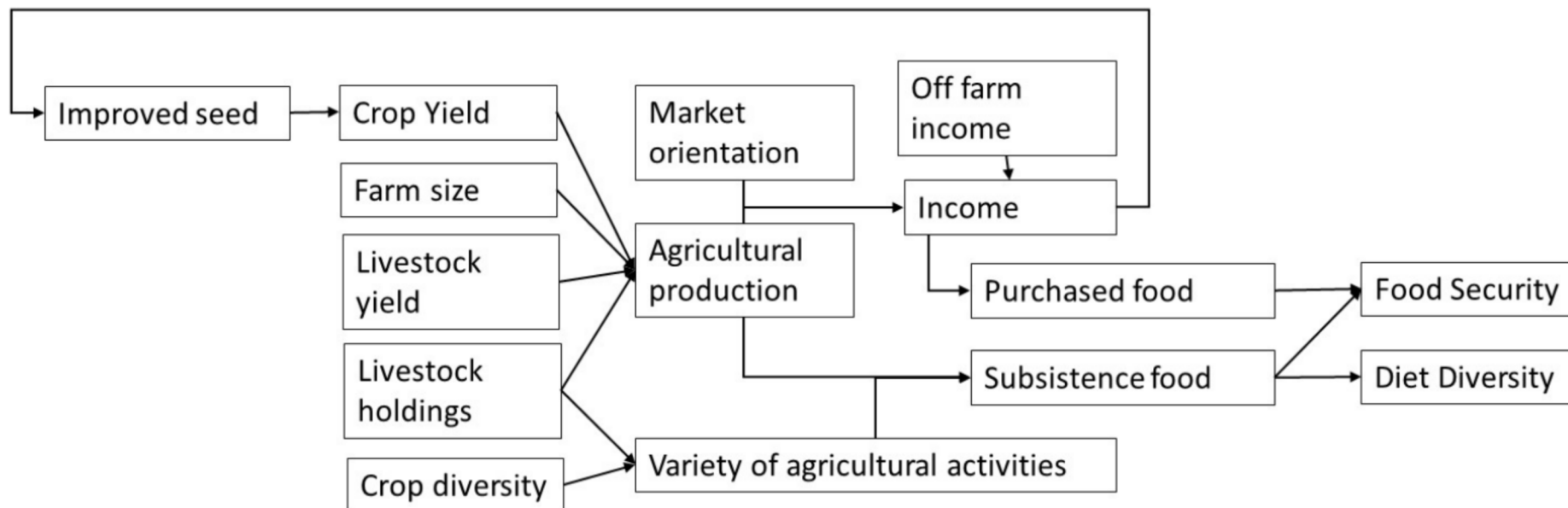


Hammond et al. In prep

# Livelihood strategies



# Pathway models



Fraval et al, submitted  
Ritzema et al., in prep

# What next?

- Continued database development
- ‘Data Challenge’ with Univ. of Bristol: the future of smallholder farming (analyses, methods, visualization, etc.)
- Collab with donors to get across project baselining and evaluation:
  - South-America with McKnight Foundation;
  - EU Sanitation and Nutrition programs
  - FtF
- Further expand our collaboration with smallish (iN)GOs (and private sector): strong demand for this type of rapid, on-the-shelf tools