Big data on small farms – sources and drivers of food security of smallholder farmers

Mark van Wijk, and many others

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Targeting and prioritization of options for farm households: dealing with diversity!

Generate quantitative information on what options can where work for whom

Identify robust interventions that cut across systems and socio-economic scenarios





Go simple!!



Keep the analysis simple enough to be able to apply it across HH characterization data collected in different surveys!





(re-)use household characterization data across a wide range of systems in SSA

Two types of data:

- Data of in-depth site specific characterization (~15k data analysed)
- 2. Data of across site variation (Worldbank Living Standards Measurement Survey) (~20k data put together)



Data sources: Type I





Simple indicator of food security





Application: example of Lushoto, Tanzania



Simple indicator of food security: test





Simple indicator of food security: analyses

ILR

STRATING.



Simple indicator of food security: key drivers

Interested in variations in the FA indicator within and across sites

We developed a mini-response model of key drivers: how far can we get with those?







Simple indicator of food security: test

Food Security limit



Simple indicator of food security: test



land (ha)



Country wide data; Worldbank LSMS ISA of Niger





Simple indicator of food security: contribution maps

Use farm HH level information to make these large scale maps: Bottom up approach using field knowledge!



Contribution of sorghum



Contribution of legumes



Contribution of cattle



Contribution of shoats



Contribution of poultry



Thanks to Robert Hijmans, UC Davis



Intervention analyses and prioritization





Ritzema et al., in prep

Simple indicator of food security





This we have now turned around to formulate a 'mini' survey that collects only the info needed for these calculations!

This survey is now available in ODK format for tablet use: ~30m per farmer

Currently setting up a modular system of this survey in which other modules can be added: gender equity, nutrition, emissions, AC, etc.

ALL info collected is directly coupled to calculations through automated R scripts



Survey and analysis framework

Thereby we have an automated system in which as the data come in we can perform

- Data checking and cleaning
- Directly perform the calculation of indicators

Thereby reducing time between collection and actual data use and production of results enormously (one of the standard critique points of HH characterization surveys!)



Survey and analysis framework

This tool we will now apply in two ways:

- 1. Base-lining and characterizing systems:
 - A. State of the system
 - B. Perform intervention and prioritization analyses
- 2. M & E:

A. Who adopts? Identify relationships with farm household characteristics

B. Integral farm household level assessment of effects of adoption: shifts in activities, effects on FS, gender control, etc.



Bring in risk in the analyses: zooming in again





Risk: zooming in





Rigolot et al., in prep

Diversification & risk





Diversification and risk





Series of questions:

- 1. More diverse farms more food secure?
- 2. If yes, where does that happen and where not?
- 3. Are there thresholds (e.g. farm size) above which diversification is effective?
- 4. Off farm versus on-farm diversification?
- 5. Does diversification lead to reduced downside risk?
- 6. Downside risk of what? Food security, profitability, sustainability, food self-sufficiency, etc., etc.



Set of tools and data to

- 1. Detailed farming systems characterization and analyses
- 2. Farm HH model analyses of risk, diversification across distributions of farms and farming systems
- Re-use data and generate data for large scale analyses: refine/improve farming systems classification at country and continental scale (work with Wageningen U. and CSIRO)



Thanks!!

