A RHoMIS update: activities of the last year

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McKnight annual meeting, Puembo, Ecuador
9th of July 2019

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INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

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RHOMIS
Rural Household Multi-Indicator Survey

Rural Household Multi-Indicator Survey

- A system for designing farm household surveys and compiling the data
- To reduce burden of survey design and reporting in Ag4Dev
- To produce standardised and harmonised data
- Flexible *whilst* standardised: can be tailored to local context and research needs

- RHoMIS Consists of:
  - questionnaire modules
  - data processing and analysis code
  - digital infrastructure

Hammond et al Ag Sys

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How does it work?

Survey design phase

& translati

Partitioned and Global databases

Writte n in R

Database

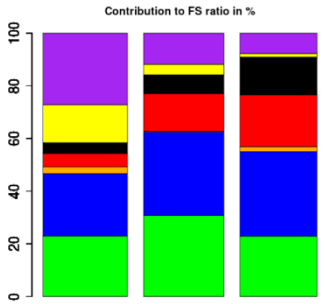
Website

Library of analysis code

Survey template

Completed surveys

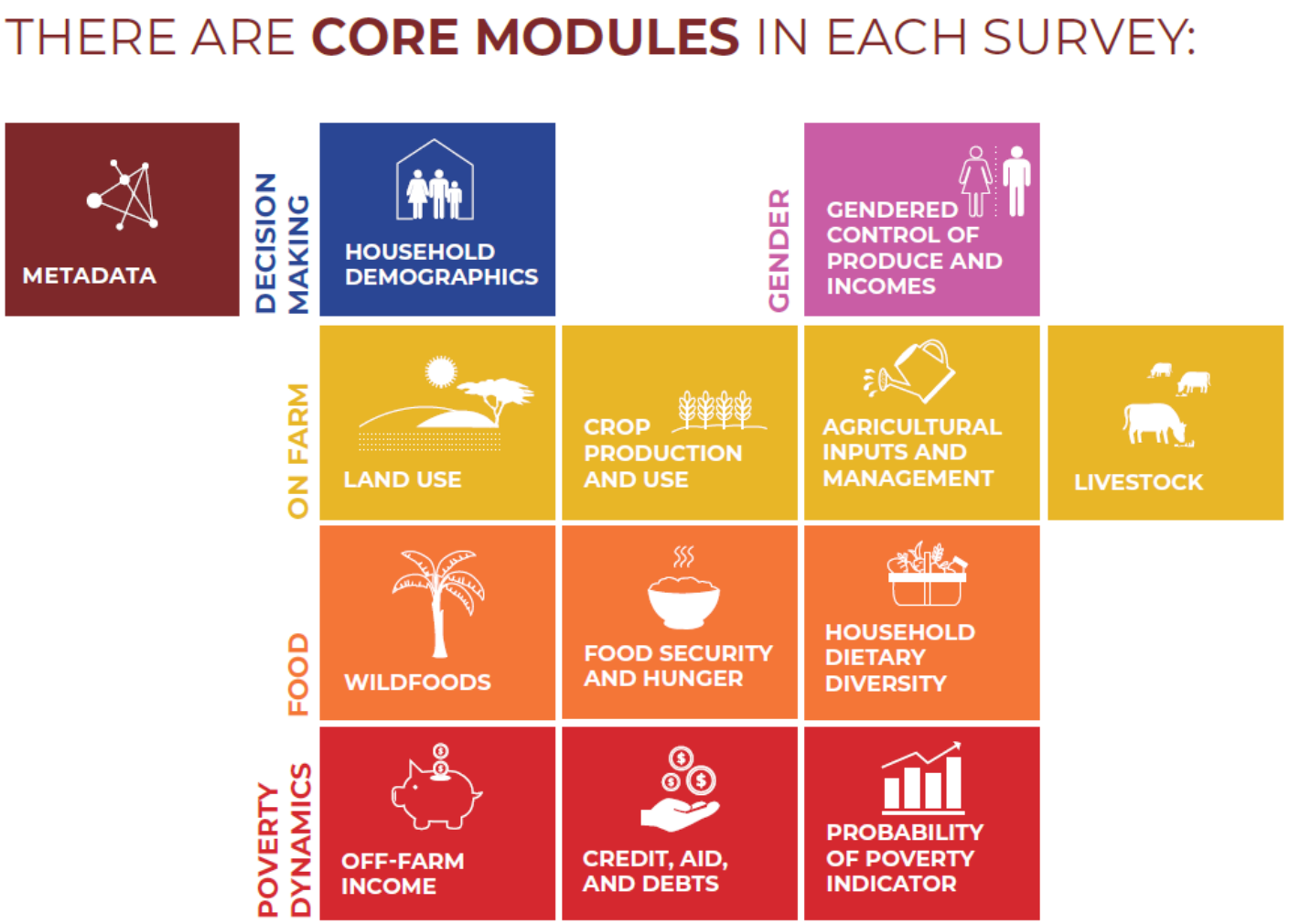
Reporting of results



ODK softwar e

Interview farmer

Survey Content: Core Modules



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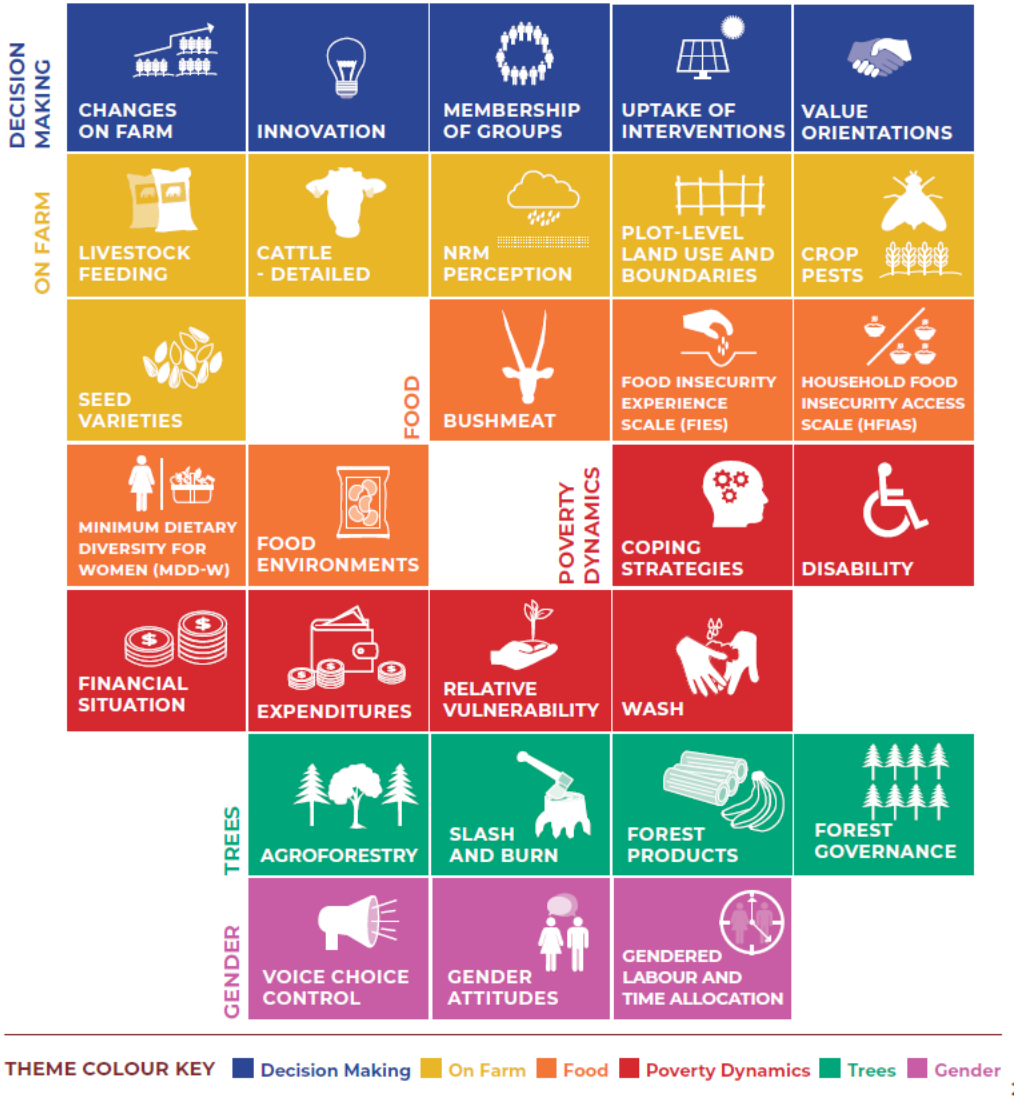
Survey Content: Optional Modules



+ Bespoke user-defined questions and indicators

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Uptake since 2015 and the RHoMIS Database

- More than 25,000 interviews in 31 countries
- Used by Research Organisations, Major Donors, and NGOs

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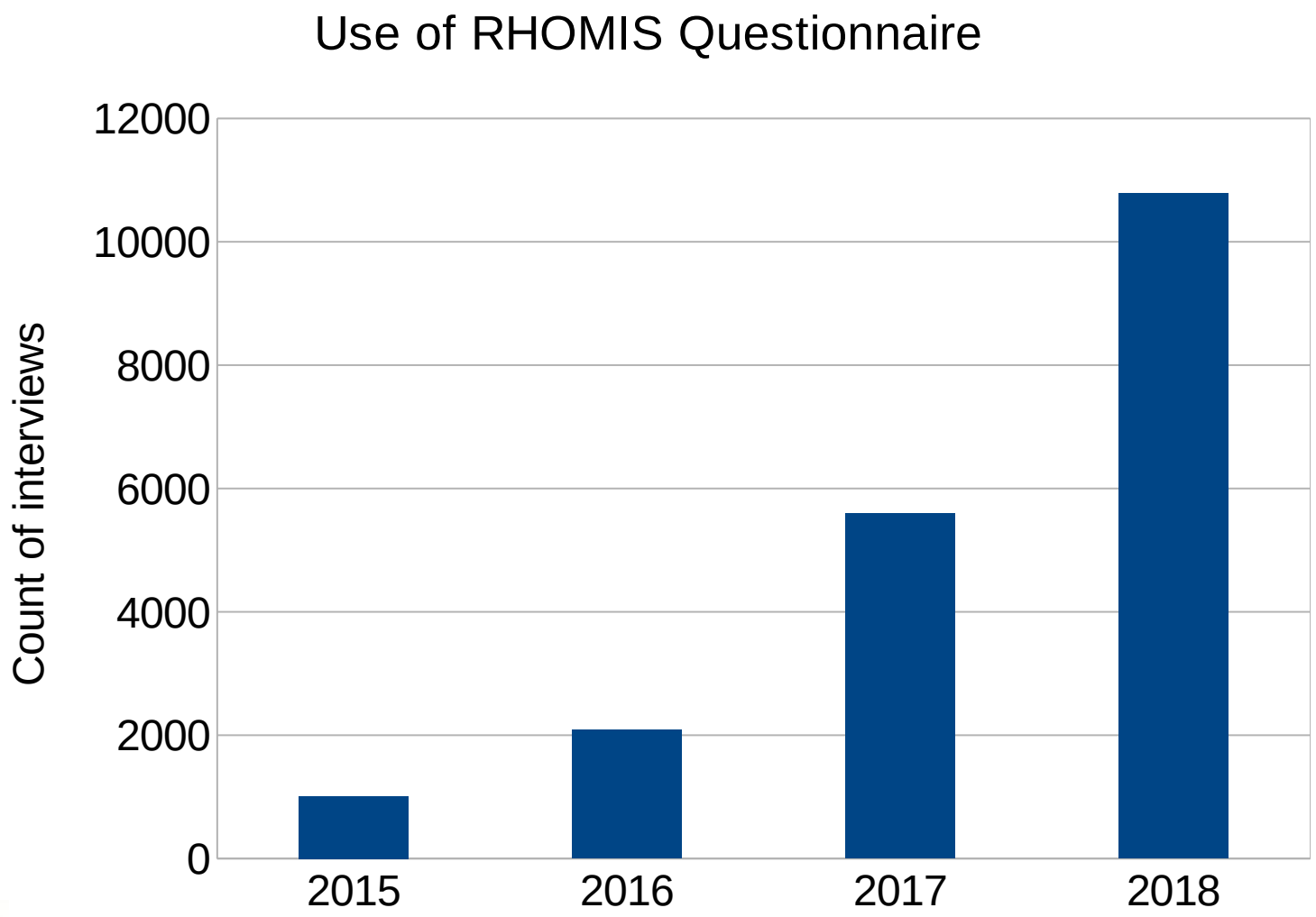
Exponential increase in use of survey tool (and growth of dataset)



Making Use of the Data: A few highlights

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RHoMIS – SIAF link

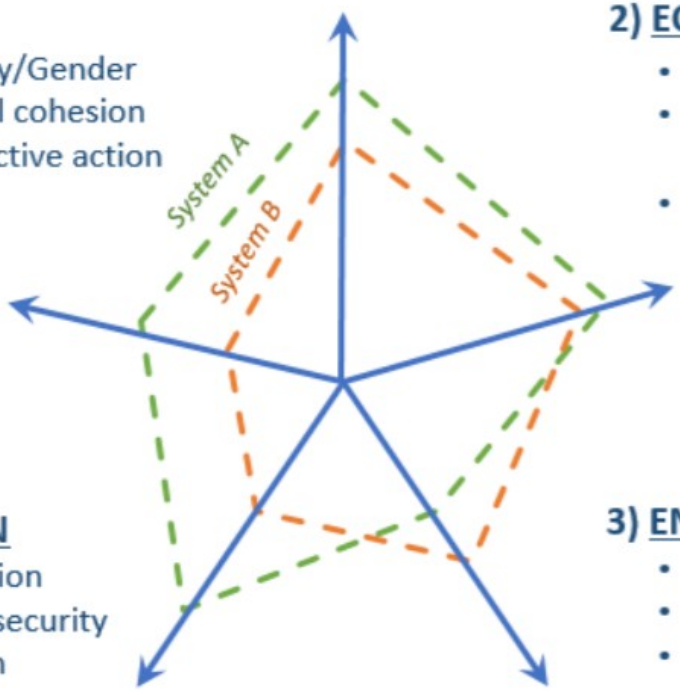
1) PRODUCTIVITY
- Crop yields
- Animal production
- Variability of production

2) ECONOMIC
- Profitability
- Variability of profits
- Labor requirement

3) ENVIRONMENTAL
- Biodiversity
- Water quality
- Soil quality

4) HUMAN
- Nutrition
- Food security
- Health

5) SOCIAL
- Equity/Gender
- Social cohesion
- Collective action



Landscape + Scale

Farm/Household Scale

Field/Animal Herd Scale

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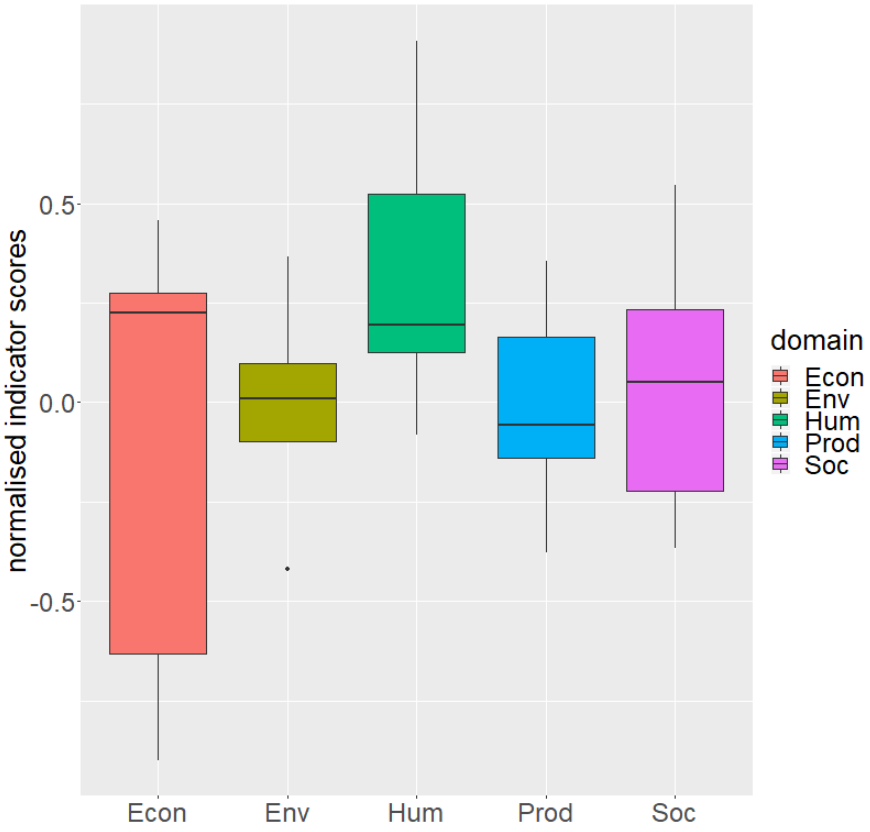
Towards a rapid Sustainability Assessment



Domain	Indicator	Traffic light	Mean.Score	Unit
Prod	most imp crop yield	Yellow	2386	kg/ha.yr
Prod	crop value efficiency	Yellow	537	USD/ha.yr
Prod	crop diversity	Green	8	count of species
Prod	avg milk yield.animal.day	Yellow	0.9	l/animal.day
Prod	lstk value efficiency	Red	341.1	USD/TLU.yr
Prod	lstk div	Yellow	2.4	count of species
Econ	TotalValueActivities	Red	0.6	USD/pers.day
Econ	Income sources	Yellow	4.1	count
Econ	Market Orientation	Yellow	0.3	proportion sold
Econ	Off Farm Income Efficiency	Red	28.3	USD/pers.yr
Econ	PPI Likelihood above 1.90	Green	65	% above $1.90 pov line
Env	GHG emissions kgco2eq.yr	Green	5686	kgCO2-eq/yr
Env	irrigation months p year	Red	1.1	months/yr
Env	Sustainable Land Practices	Yellow	4	count
Env	farmer perception soil assets	Yellow	1.8	count
Hum	Hunger Experience	Green	3.3	ordinal scale (1-4)
Hum	DD leanseason	Yellow	5.3	food groups consumed/month
Hum	Head.Education	Yellow	3.2	ordinal scale (1-7)
Hum	innov ind	Yellow	2.9	arbitrary (0-5)
Hum	techs trialled	Yellow	2.4	count
Hum	months food secure	Green	11.8	count of months
Soc	female assets	Yellow	2.7	count
Soc	female.control	Green	0.6	proportion
Soc	group membership	Yellow	1.4	count
Soc	info receive freq	Yellow	2	count/yr
Soc	techs promoted	Yellow	7.4	count/yr
Soc	community resource sharing	Red	1.9	count gifts given/received
Soc	dependancy ratio	Red	0.75	ratio non-workers:workers

Drawing on the SIAF framework: https://sitoolkit.com/

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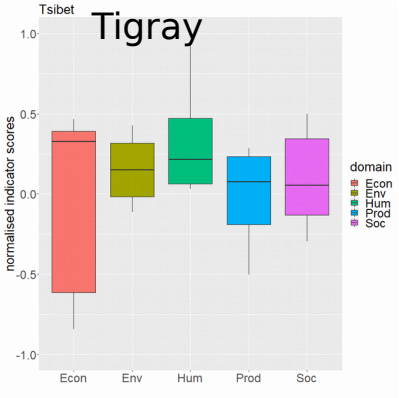
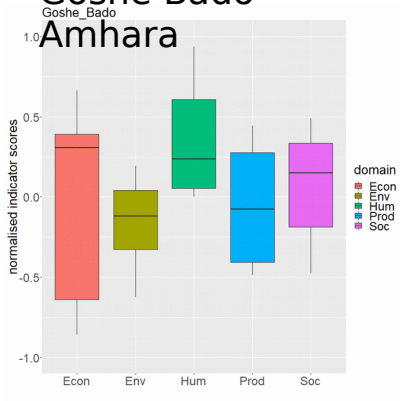
SIAF Results: Kebeles

Tsibet - Tigray



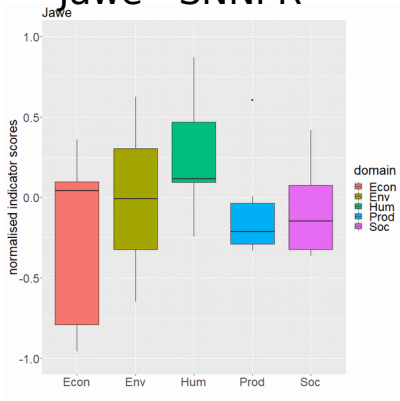
Domain	Indicator	Traffic Light	Mean Score	Unit
Prod	Most Imp Crop Yield		2078	kg/ha.yr
Prod	Milk yield		1.8	l/animal.day
Env	Irrigation		3.2	mnth/yr
Env	Sustainable Land Practices		6.6	Count
Env	Farmer's Soil Quality		1.6	Score (0-3)

Goshe Bado - Amhara



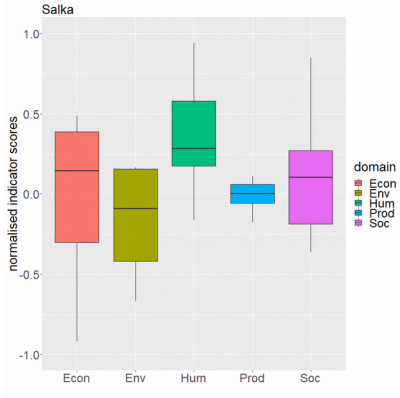
Domain	Indicator	Traffic Light	Mean Score	Unit
Prod	Most Imp Crop Yield		1413	kg/ha.yr
Prod	Milk yield		3.3	l/animal.day
Env	Irrigation		0.2	mnth/yr
Env	Sustainable Land Practices		5.1	Count
Env	Farmer's Soil Quality		1.3	Score (0-3)

Jawe - SNNPR



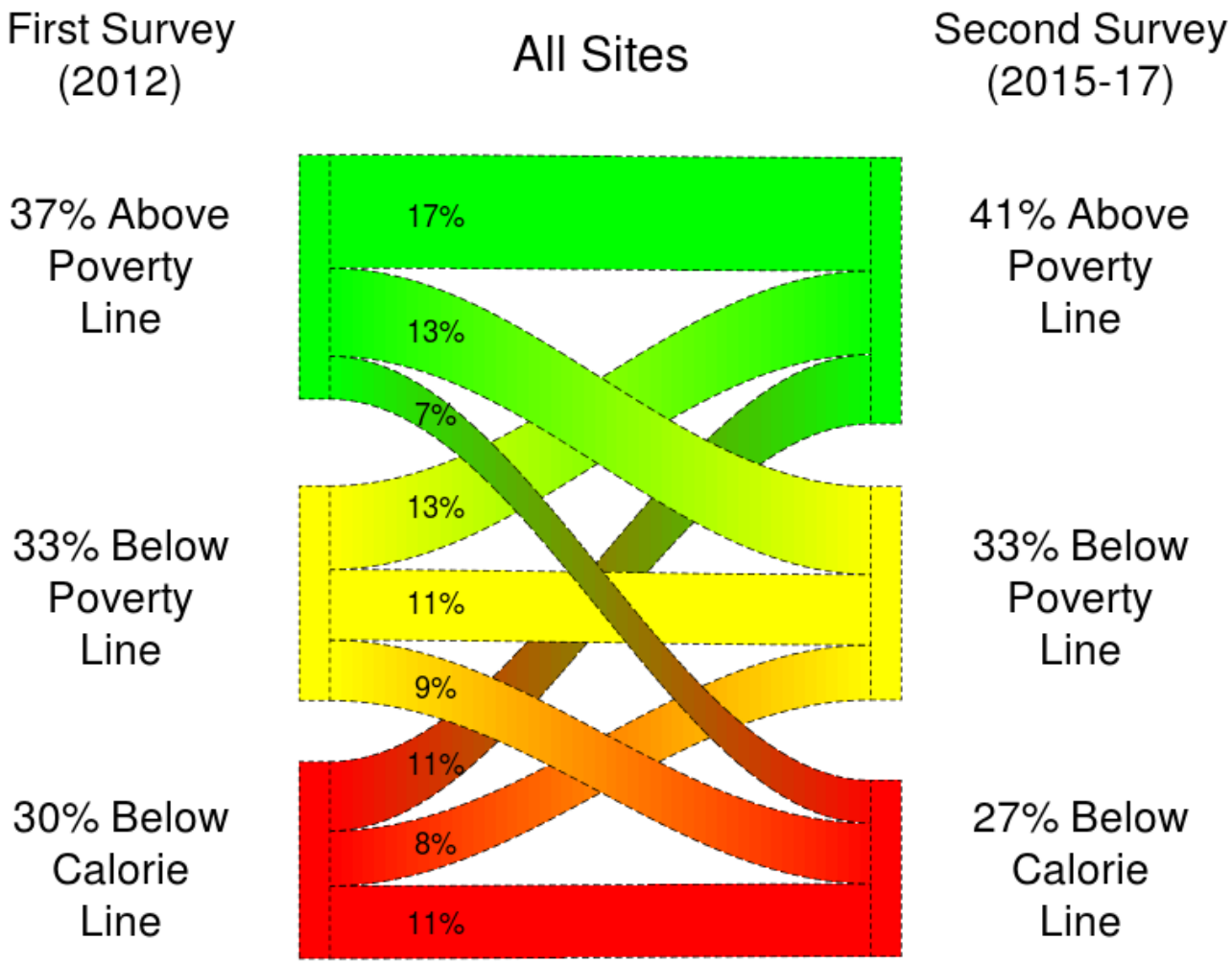
Domain	Indicator	Traffic Light	Mean Score	Unit
Prod	Most Imp Crop Yield		2431	kg/ha.yr
Prod	Milk yield		1.5	l/animal.day
Env	Irrigation		0.1	mnth/yr
Env	Sustainable Land Practices		2.5	Count
Env	Farmer's Soil Quality		2.2	Score (0-3)

Salka - Oromia



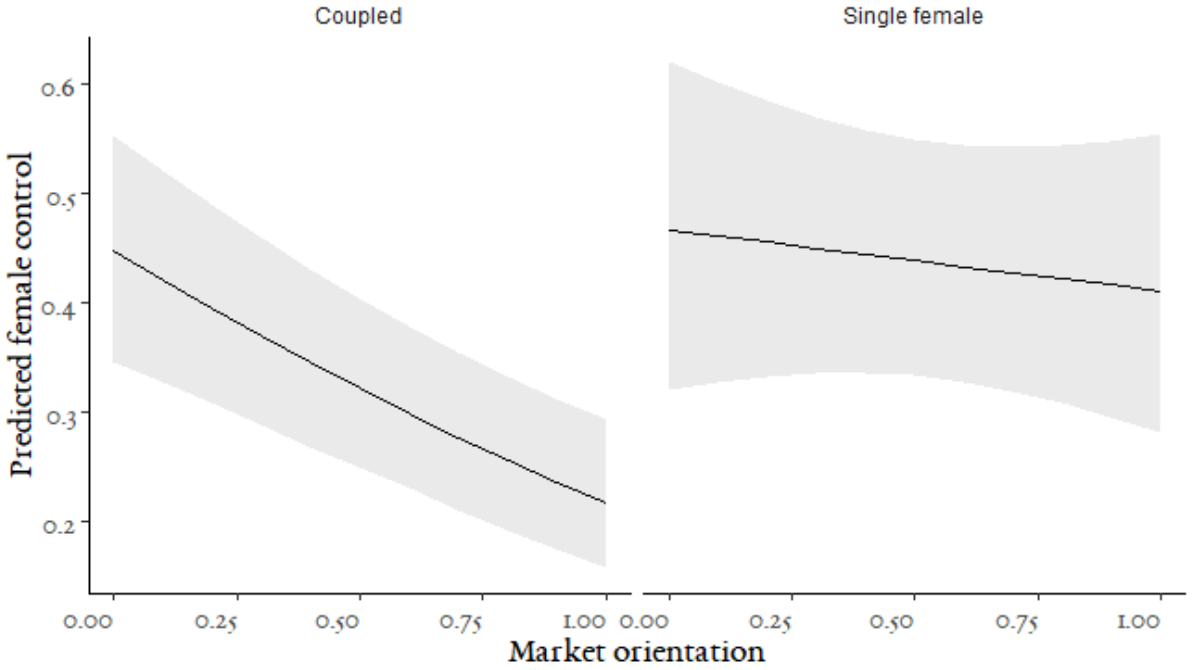
Domain	Indicator	Traffic Light	Mean Score	Unit
Prod	Most Imp Crop Yield		3794.5	kg/ha.yr
Prod	Milk Yield		1.9	l/animal.day
Env	Irrigation		0	mnth/yr
Env	Sustainable Land Practices		1.9	Count
Env	Farmer's Soil Quality		2	Score (0-3)

Overall Poverty Rates Static, but this hides a lot of change in household prosperity



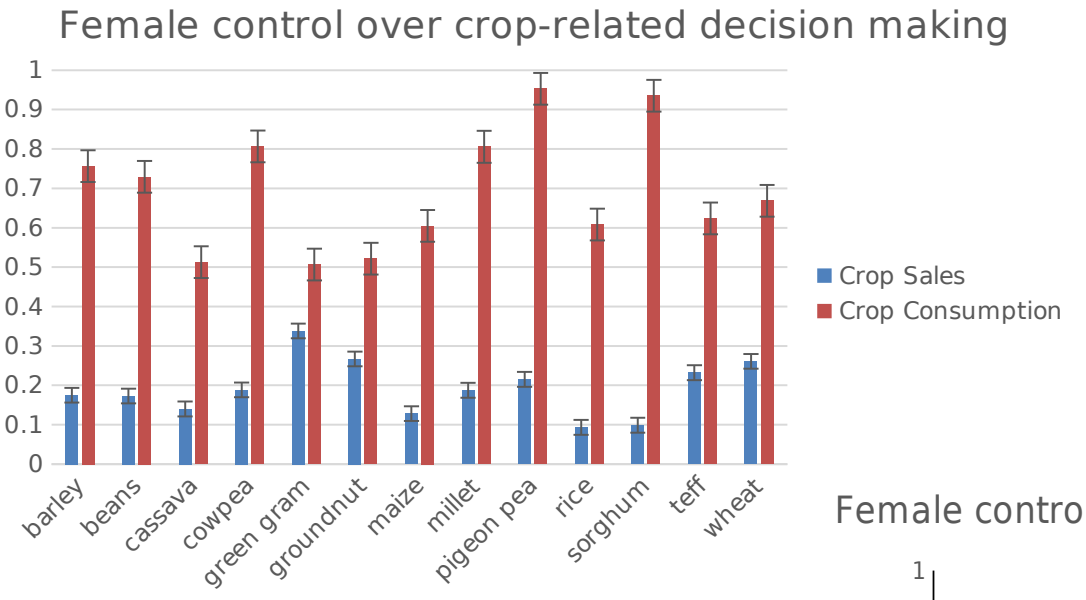
Gender Control and Commercialisation of Smallholder Agriculture

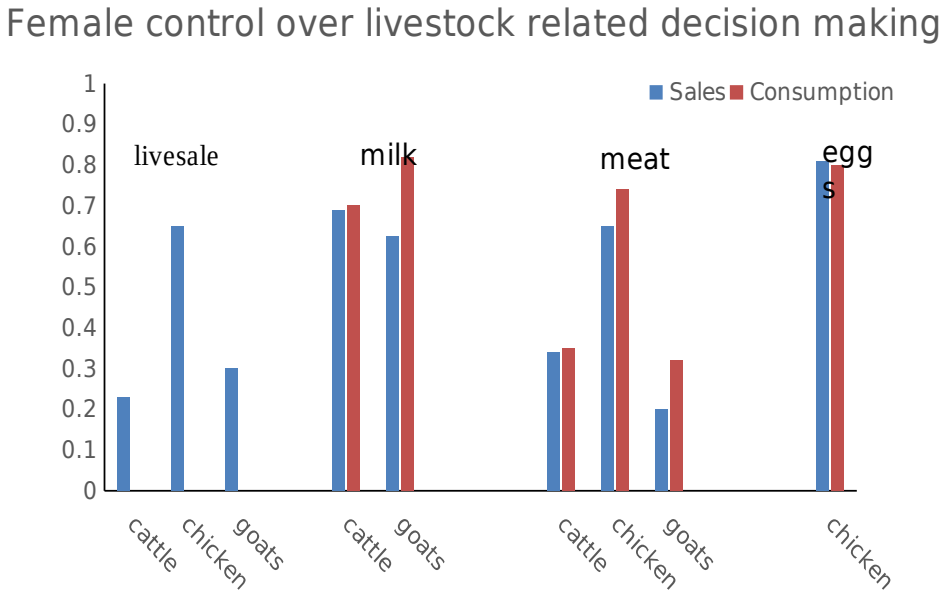
2,859 households in three East African countries – Ethiopia, Kenya, and Tanzania.



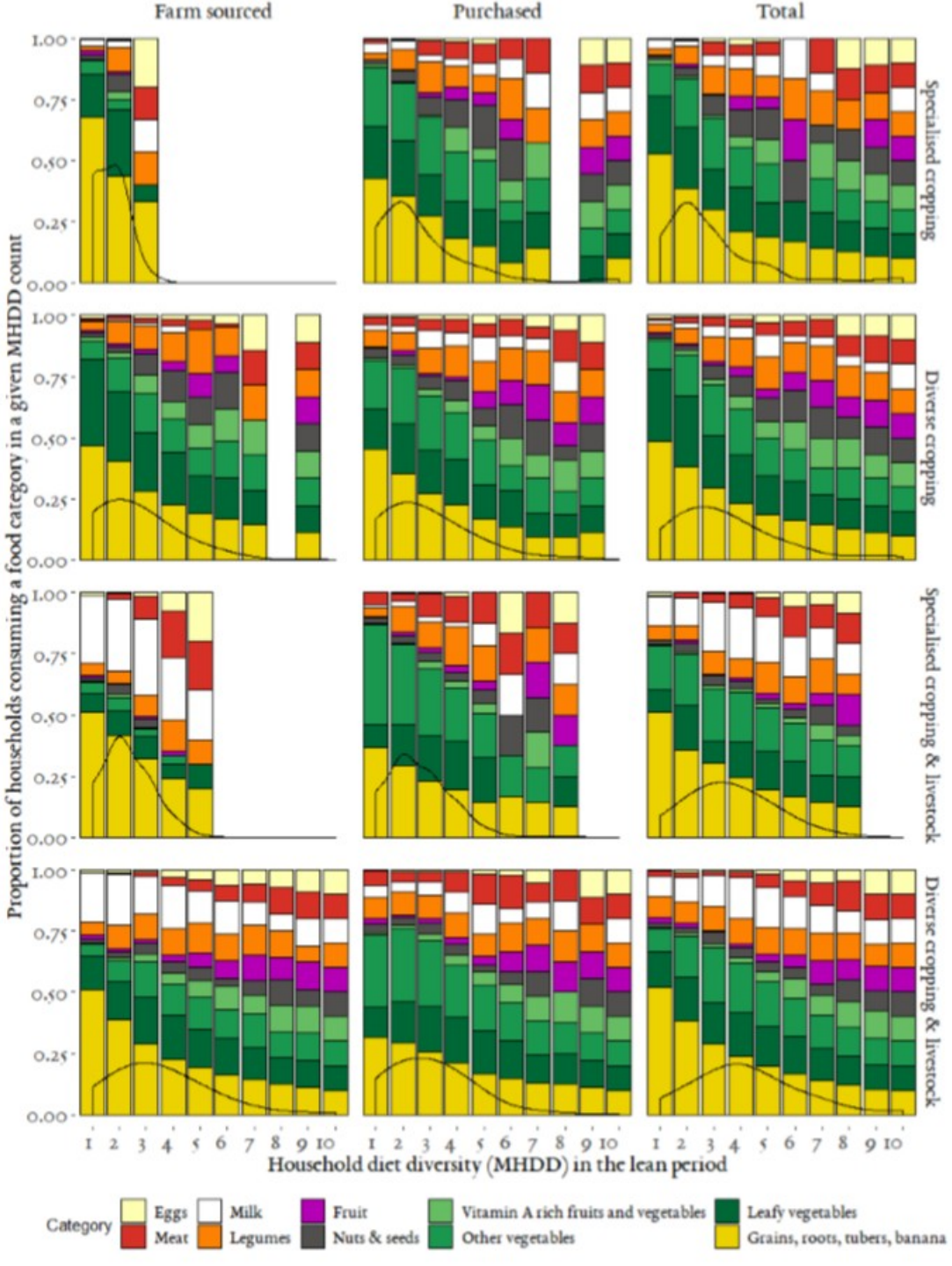
Tavener et al, 2019, Frontiers in Sus

Gendered Control Over Specific Commodities





Nutrition


Farm sourced
Purchased
Total
Specialised cropping
Diverse cropping
Specialised cropping & livestock
Diverse cropping & livestock
Proportion of households consuming a food category in a given MHDD count
1.00
0.75
0.50
0.25
0.00
1 2 3 4 5 6 7 8 9 10
Household diet diversity (MHDD) in the lean period
Category
Eggs
Meat
Milk
Legumes
Fruit
Nuts & seeds
Vitamin A rich fruits and vegetables
Other vegetables
Leafy vegetables
Grains, roots, tubers, banana

PLOS ONE

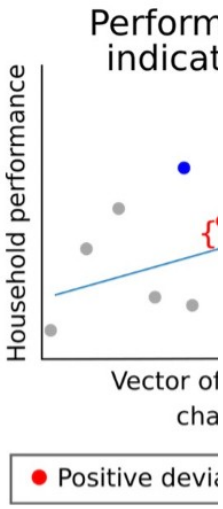
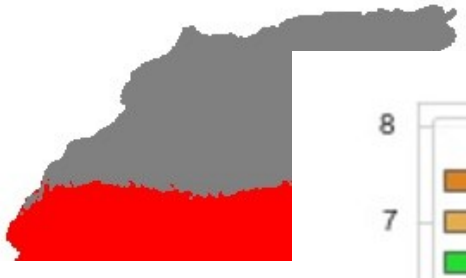


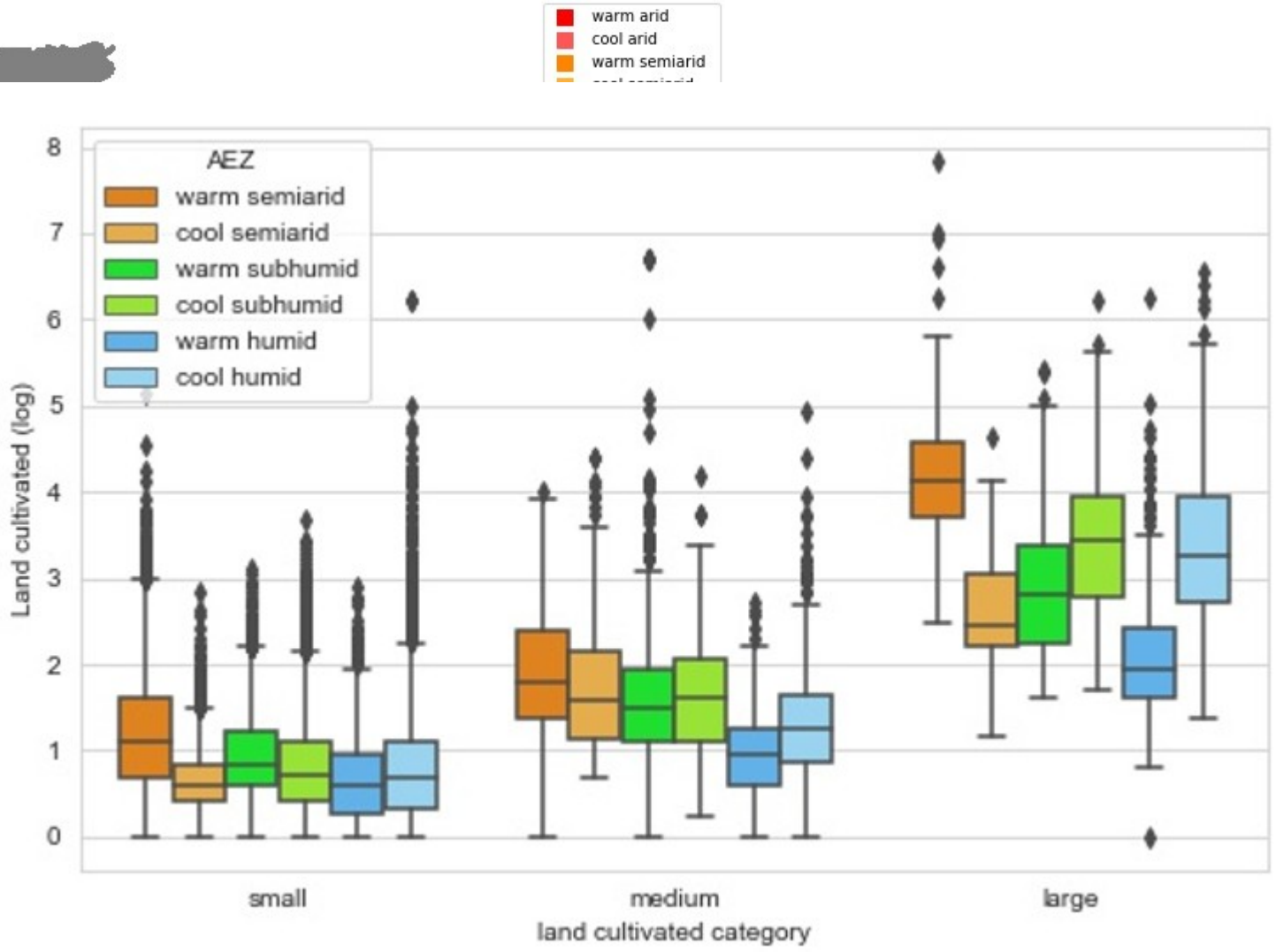
Fig 2. Conceptual
lines show median
most successful hou

Table 7. Positive deviant practices observed with positive deviant households and total numbers of households that would be targeted with each practice, following the resource homologue approach (n_{max} = 521).

Practice	Code	Mechanism	Frequency observed	Number of target households	% of total
Production of cassava planting material	Cp	Generating income by producing and selling quality cutlings of an improved cassava variety	1	42	8
Investments into improved crop storage	Cs	Decreasing post-harvest losses by investing into improved crop storage constructions or triple layer PICS sacks [48]	2	76	15
Resource-efficient intercropping of maize and pigeon-pea	Ic	Decreasing plant competition for environmental resources by sowing pigeon pea at the lower end of the shadow-side slope of ridges	1	77	15
"Livestock bank"	Lb	Increasing household resilience by maintaining ruminant livestock even against short-term utility logic, for sale in emergency situations	3	107	21
Milk business	Mb	Generating income by pooling small-scale cow milk production with neighbors and sending bulk produce to buyer in town via public transport	1	68	13
Shared use of mechanical tillage	Mt	Increasing economic farm efficiency by pooling capital with neighbors to hire a tractor-tillage service provider, saving wages for manual tillage laborers	3	131	25
Intensified poultry production by artificial lighting	Pi	Increasing poultry production per unit of time by investing into a solar power-driven light bulb, enforcing artificial lighting all night and increasing daily food intake of poultry	1	68	13
Up-scaled poultry production	Pu	Increasing production and productivity of poultry by investing into bigger, more secure coops and/or new animals of improved breeds	2	96	18
Meticulous scheduling of labor allocation during land preparation and sowing of crops	Sc	Decreasing risk of crop failure by applying agronomic knowledge and skills in proper priority-setting for time and labor allocation during early phases of the growing season	6	521	100
Speculative purchase and stockpiling of crop	Sp	Generating income by investing into buying crop when prices are low, renting storage space, and selling when prices are high	1	54	10
Small shop for ago-inputs, and building materials	Ss	Generating income by running a small village shop, often employing family members, selling agro-inputs sometimes on a commission base	1	348	67
Transportation business	Tb	Generating income by investing into a van that connects two urban centers multiple times per day, with a family member employed as driver	1	55	11
Commercial tree nursery	Tn	Generating income by producing and selling tree seedlings, including	1	96	18



land cultivated		
livestock holdings		
commercial focus	low sales	cro mec sa
letter	A	I
AEZ present	cool semiarid, warm subhumid, warm humid	wa sem co sem wa subh co subh cool h



Make data publicly available: final steps for first batch (including Peru

Data Descriptor Template

Scope Guidelines

Data Descriptors submitted to *Scientific Data* should provide detailed descriptions of valuable research datasets, including the methods used to collect the data and technical analyses supporting the quality of the measurements. Data Descriptors focus on helping others reuse data, rather than testing hypotheses, or presenting new interpretations, methods or in-depth analyses. Relevant datasets must be deposited in an appropriate public repository prior to Data Descriptor submission, and their completeness will be considered during editorial evaluation and peer review. The data must be made publicly available without restriction in the event that the Data Descriptor is accepted for publication (excepting reasonable controls related to human privacy issues or public safety).

Title

The Rural Household Multiple Indicator Survey data of more than 13,500 farm households in 21 countries.

Authors

Firstname Lastname[1], Firstname Lastname[2]

Affiliations
1. institution
2. institution
corresponding author(s): Firstname Lastname (email@address)

Abstract

170 words maximum

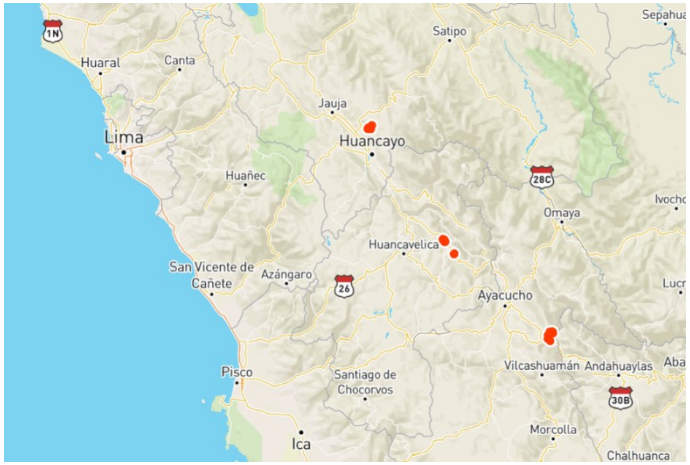
The Rural Household Multiple Indicator Survey (RHoMIS) is a harmonized farm household survey approach which collects information of 750 variables covering household composition, farm area, crops grown and their production, livestock holdings and their production, agricultural product use and variables underlying standard indicators like the probability of poverty index, the hunger and food insecurity access scale and dietary diversity. These variables are used to quantify more than 40 different indicators on farm household characteristics, welfare, productivity and economic performance.

Aplicaciones en McKnight CCRP - Andes

1. Peru (lead: Steve Vanek)
2. Ecuador (lead: Israel Navarrette)
3. Bolivia (lead Miguel Fuentes).
4. Ecuador (lead Aida Imbaquingo)

Aplicaciones en McKnight CCRP - Andes

1. Peru (lead: Steve Vanek)



171 hogares

RHoMIS Análisis exploratorio de un programa de investigación McKnight en Perú

RHoMIS the Rural Household Multi-Indicator Survey

ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

Los pequeños agricultores que viven en los Andes centrales de Perú fueron entrevistados utilizando la herramienta RHoMIS. Las entrevistas fueron realizadas por Yanapai y Vecinos Mundiales

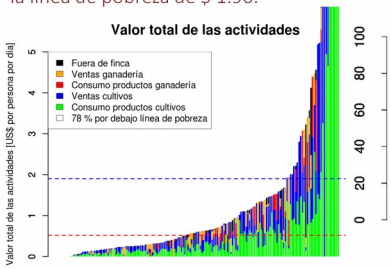
Metodología

La encuesta RHoMIS fue adaptada por los miembros del equipo McKnight y ILRI, en colaboración con los socios locales del proyecto implementador. Se utilizaron módulos RHoMIS estándar y se desarrollaron preguntas personalizadas teniendo en cuenta las características únicas de los sitios. En total 173 hogares fueron entrevistados.

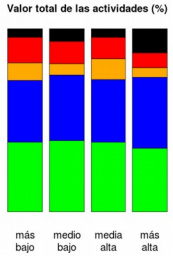
Mapa de ubicaciones de la encuesta

Medios de subsistencia de los hogares

El valor total de todos los productos agrícolas, si se vendiera en los mercados locales, más el valor obtenido del trabajo fuera de la finca, se puede usar para conceptualizar los medios de vida de los hogares. Las siguientes cifras muestran que la mayor parte del valor en esta ubicación se debe a los cultivos, y alrededor de dos tercios de los hogares viven por debajo de la línea de pobreza de $ 1.90.



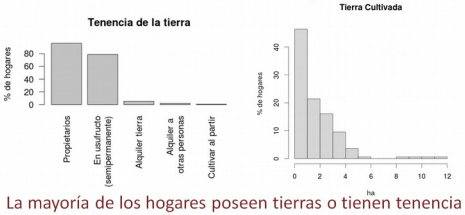
Cada barra vertical representa un hogar



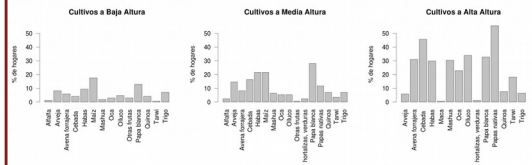
Fuentes de valor por cuartil de riqueza

RHoMIS está disponible para su uso en proyectos de McKnight. Juntos, nos gustaría desarrollar indicadores de Intensificación Agroecológica, además de los de Seguridad Alimentaria, Roles de Género y Prácticas Agrícolas.

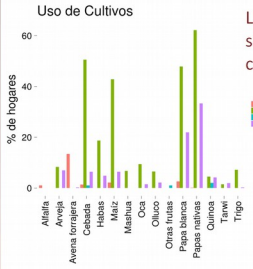
Tenencia de la tierra, tamaño de la granja y cultivo



La mayoría de los hogares poseen tierras o tienen tenencia semipermanente sobre tierras comunales. Los siseos de las granjas son en su mayoría inferiores a 2 hectáreas



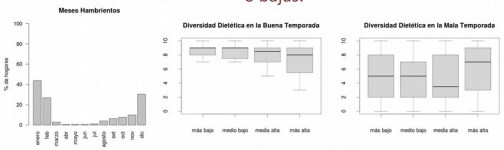
La mayoría de los hogares tenían tierras en múltiples zonas de elevación. La tierra de alta elevación se usaba más comúnmente para los potatos nativos, otros tubérculos nativos o la cebada. Tierras de elevación media y baja fueron más utilizadas para la papa y el maíz.



La papa blanca y las patatas nativas son los cultivos comerciales más comunes. Los cultivos alimentarios básicos son la papa, la papa, el maíz y la cebada.

La papa nativa se cultiva principalmente en tierras altas, rara vez se irriga, pero está fuertemente fertilizada con fertilizantes químicos y orgánicos. Las legumbres se usan para mejorar el suelo a elevaciones altas, pero no a elevaciones medias o bajas.

Seguridad Alimentaria



Diciembre, enero y febrero fueron los meses más magros. La diversidad de la dieta es mucho peor durante los meses de escasez, y hay cierta evidencia de que los hogares más ricos tienen una peor diversidad dietética.

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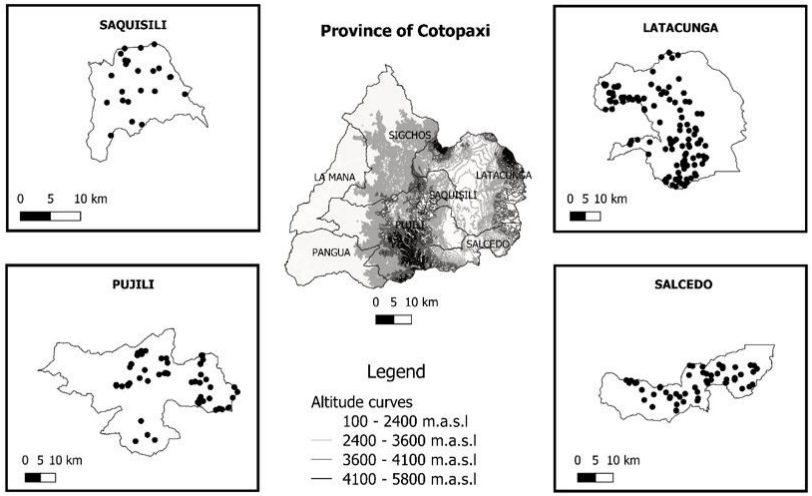
Aplicaciones en McKnight CCRP - Andes

2. Ecuador (lead: Israel Navarrette)



266 hogares

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Seed availability, access and quality of potato seed systems in Cotopaxi-Ecuador

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[2] Knowledge, Technology and Innovation, Wageningen University and Research, Wageningen, The Netherlands
[3] Centre for Crop Systems Analysis, Wageningen University and Research, Wageningen, The Netherlands
[4] Instituto Nacional de Investigaciones Agropecuarias del Ecuador, (INIAP) Quito, Ecuador
[5] CIP, RTB, Lima, Peru

Background

Understanding potato seed systems in developing countries will potentially improve the livelihoods of smallholder farmers. In Ecuador, the province of Cotopaxi is one of the most important potato production and diversity areas. However, this province is characterized by a low productivity (12.8 t ha^{-1}) (SINAGAP, 2016) and by a change on the preferred varieties that modify the *in situ* potato diversity (Travail 2016). One of the main factors causing these issues is the seed. Unfortunately, the poor understanding of the potato seed systems has limited the improvement of productivity and the maintenance of potato diversity. Here, we report a research aiming at understanding seed availability, access and quality of the potato seed systems in the province of Cotopaxi.

Focus Group Discussions

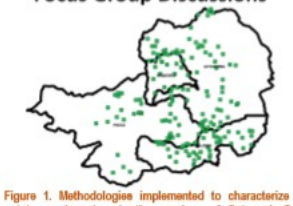

Figure 1. Methodologies implemented to characterize the potato seed system in the province of Cotopaxi. Green squares represent the location of surveys implemented

Methodology

Different tools were used: (1) The multi-stakeholder framework, (2) potato seed exchange surveys, and (3) a formal survey (Figure 1).

The multi-stakeholder framework

The multi-stakeholder framework is a matrix-like tool aiming to understand seed availability, access, and quality (RTB 2016). We collected the information through interviews, focus groups discussions (Figure 1), analysis of secondary data and a literature review.

Potato seed exchange surveys

Farmers (participants = 95) and extension agents were interviewed about their seed / information exchange networks using the methodology suggested by Tadesse *et al.* (2017).

Formal survey

A rural household characterization (n=260) was designed adapting the survey suggested by Hammond *et al.* (2017). The survey was implemented using a stratified sampling design considering the cantons as strata (Figure 1).

Results

Seed availability

In Cotopaxi, there is a low availability of registered and certified seed. The national statistics estimate that the government supplies near 6% of the seed. Yet, the variety Super Chola is the only one disseminated. Private companies and traders supply seed of other few varieties like Suprema or Única (not in the formal system). Our results estimate the presence of 24 varieties cultivated, disseminated and maintained by farmers. Seed availability is mainly affected by climatic problems such as freezing , drought or hail, and by biotic problems such as tuber moth and Andean weevil. There is no information available about nematodes and viruses.

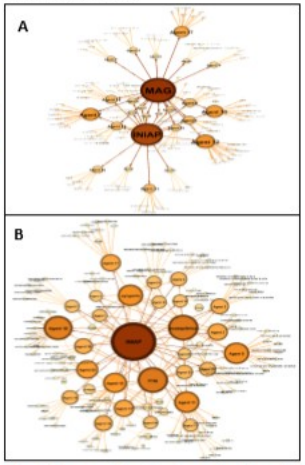

Figure 2. Governmental seed exchange network described by extension agents. A Seed exchange network. B Information exchange network.

Seed access

Seed potato is disseminated by different isolated stakeholders. The Ministry of Agriculture (MAG) and INIAP are the main sources for registered and certified seed as shown in Figure 2A. Seed of initial categories is produced by INIAP in a large greenhouse near Quito. Then, extension agents of MAG and INIAP (Figure 2A) deliver the seed to formal organizations. INIAP is the main stakeholder exchanging information about seed and varieties (Figure 2B).

Farmers mainly reuse their seeds. However, common seed sources are neighbours, relatives, and the market (Figure 3A). Yet, the importance of each source differs among the different cantons (Figure 3A). Farmers consider the altitude where the seed was produced the previous cycle due to the fact that yields are higher (Figure 3B).

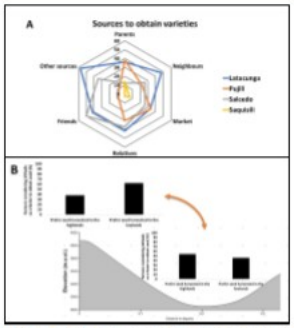

Figure 3. Farmers' seed sources and preferences. A Main farmers' seed sources among different cantons. B Farmers preferences to acquire the seed depending on the altitude.

Seed quality

In Ecuador, there is a regulation indicating thresholds for seed-borne pests and diseases for registered and certified seed. The perception of seed quality differs among stakeholders. However, the main quality cues mentioned are:

- Absence of pests, diseases and mechanical issues
- Adequate physiological status
- Colour
- Size
- Number of eyes

Unfortunately, there is no information of seed-borne pests and diseases affecting seed quality.

Discussion

Availability and access of registered or certified seed are limited. Local seed systems supply seed of a diversity of varieties. Other seed sources play essential roles in the province. Yet, their importance differs depending on the canton. Seed quality cues differs among stakeholders, and there is poor knowledge of the seed-borne pests and diseases. A better understanding of the seed systems, potential interaction among different stakeholders, and seed-borne pests is necessary to build more resilient seed systems in Cotopaxi.

Acknowledgements

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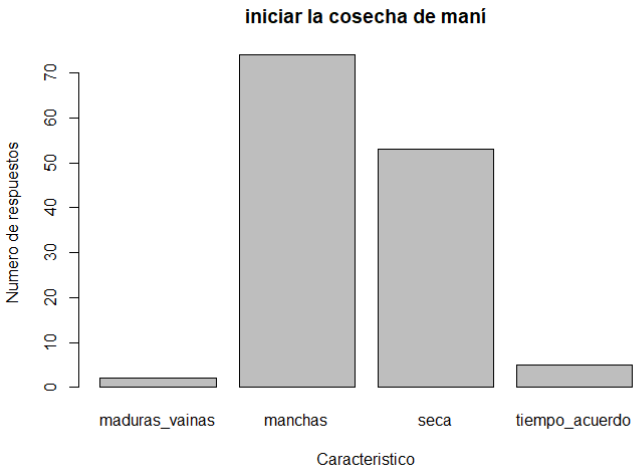
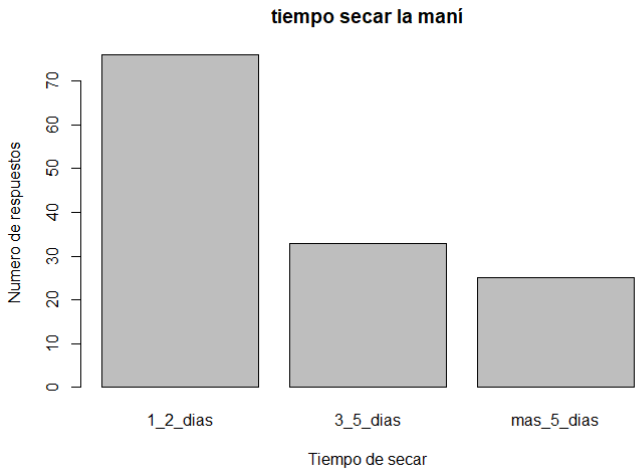
Aplicaciones en McKnight CCRP - Andes

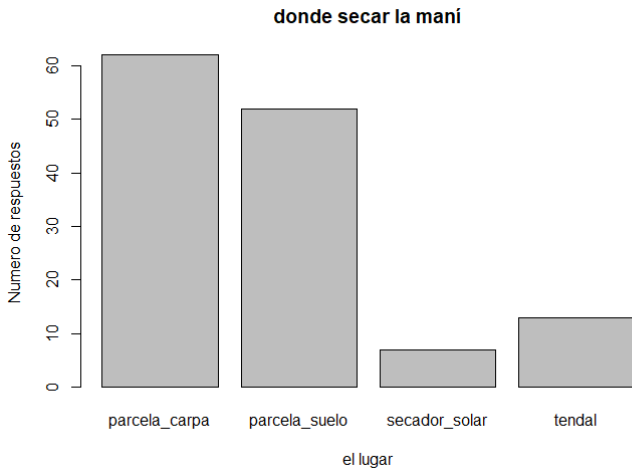
3. Bolivia (lead Miguel Fuentes).

134 hogares

Aplicaciones en McKnight CCRI Andes
Aflatoxines en mani







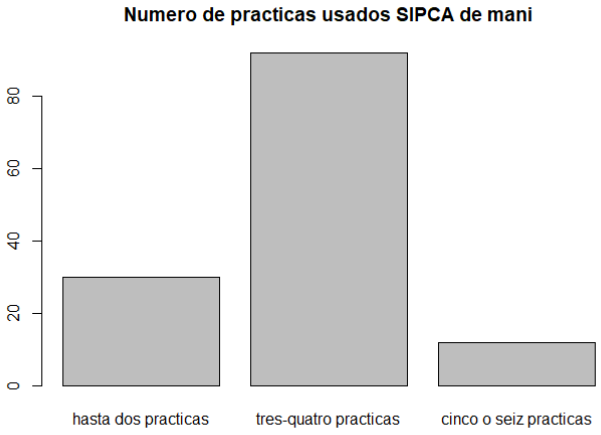


TABLA DE FRECUENCIA, PRÁCTICAS DE SIPCA EN MANÍ

Region	Realiza hasta 2 practicas	Realiza 3 - 4 practicas	Realiza 5 - 6 practicas
Alcala	1	25	17
Mizque	1	14	5
Villa_serrano	10	53	8

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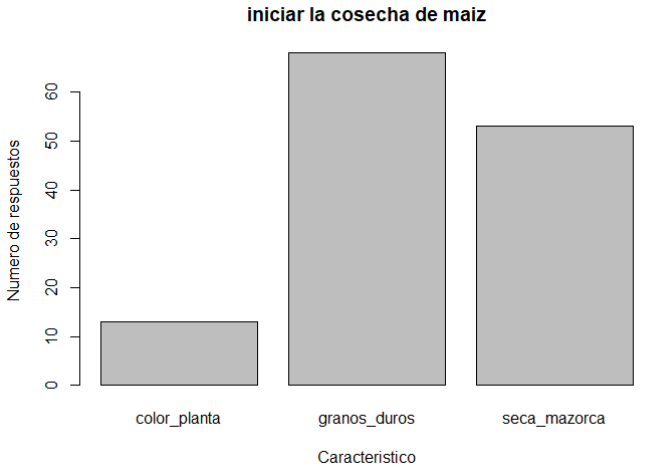
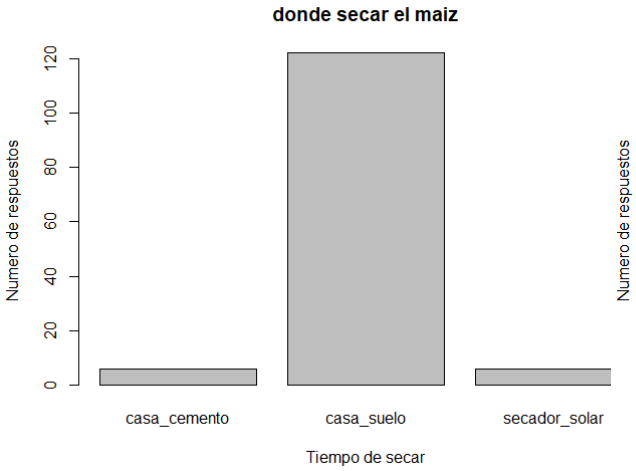
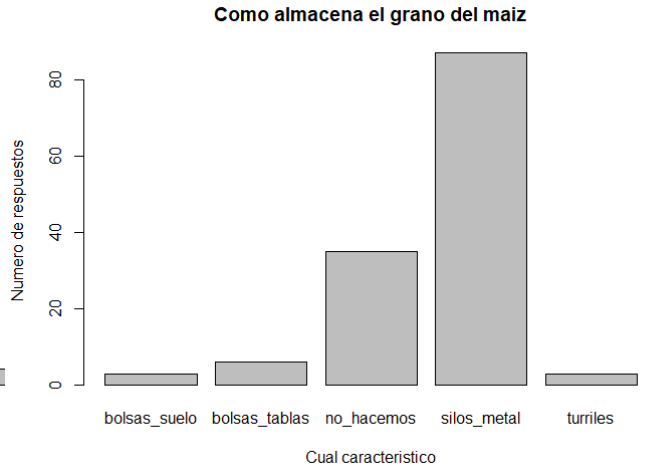
Aplicaciones en McKnight CCRI Andes
Mycotoxinas en maiz







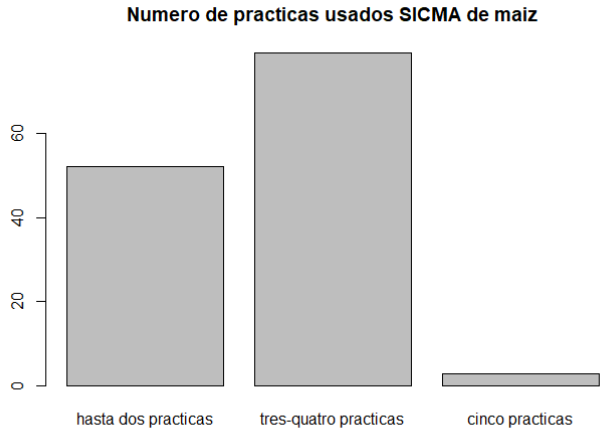


Tabla de frecuencia, prácticas de SICMA en Maíz.

Region	Realiza hasta 2 practicas	Realiza 3 - 4 practicas	Realiza 5 practicas
Alcala	14	26	3
Mizque	4	16	0
Villa_serrano	34	37	0

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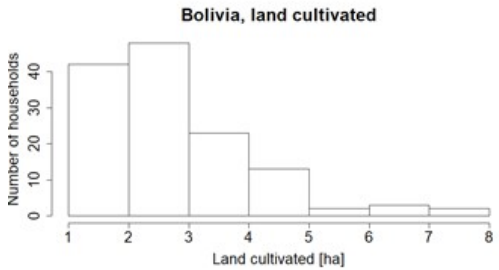
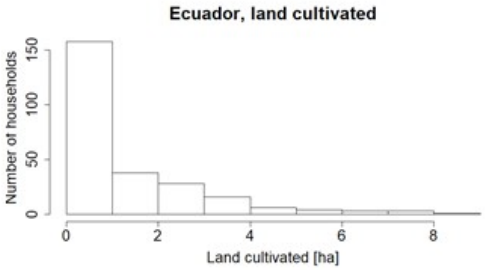
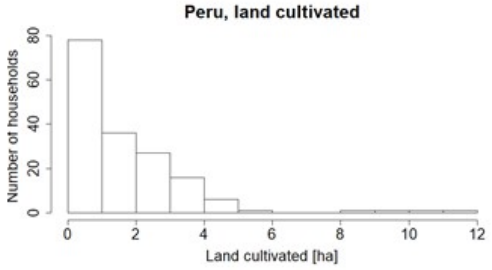
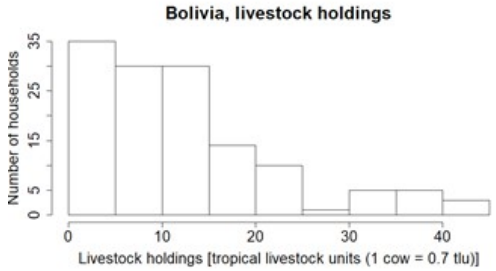
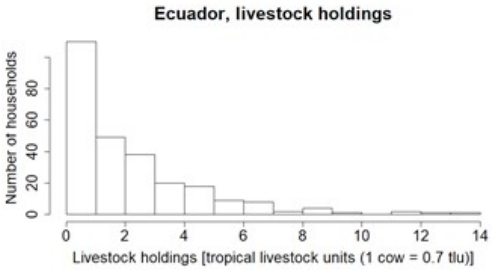
Across site comparisons

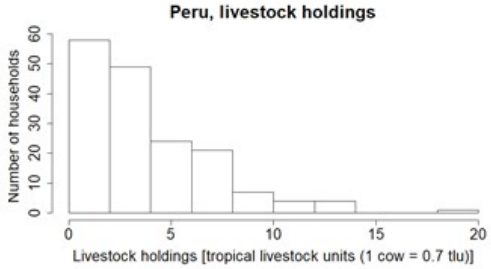


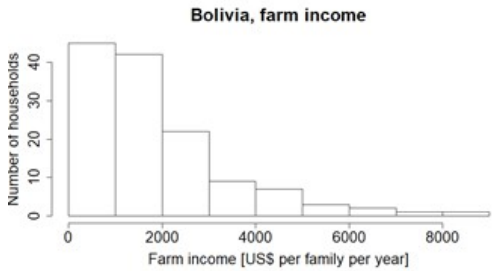


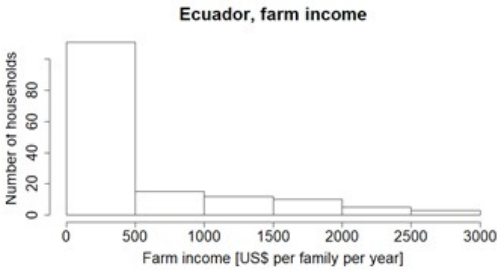


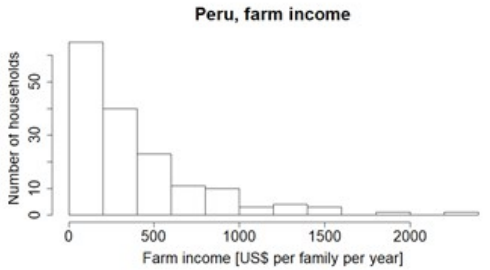


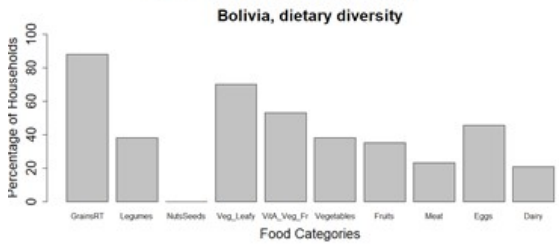


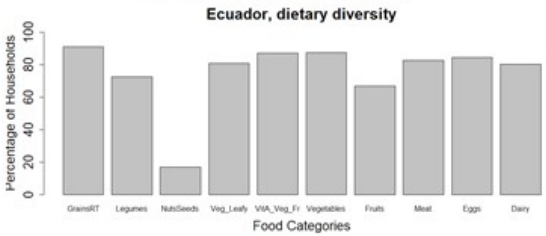


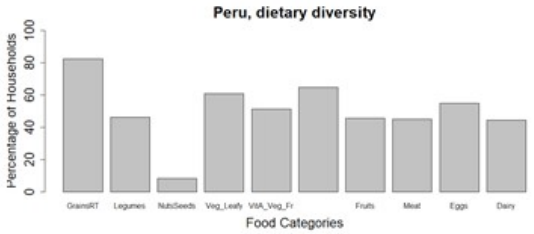












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Quieres mas informacion?

Jueves – open space: podemos discutir mas!

Juntar la informacion de RHoMIS con otros Fuentes de datos?

Cuales typos de analyses son mas interesantes para McKnight y los