Social networks and agricultural production knowledge

Findings from the Mt. Elgon Region (Kenya and Uganda)

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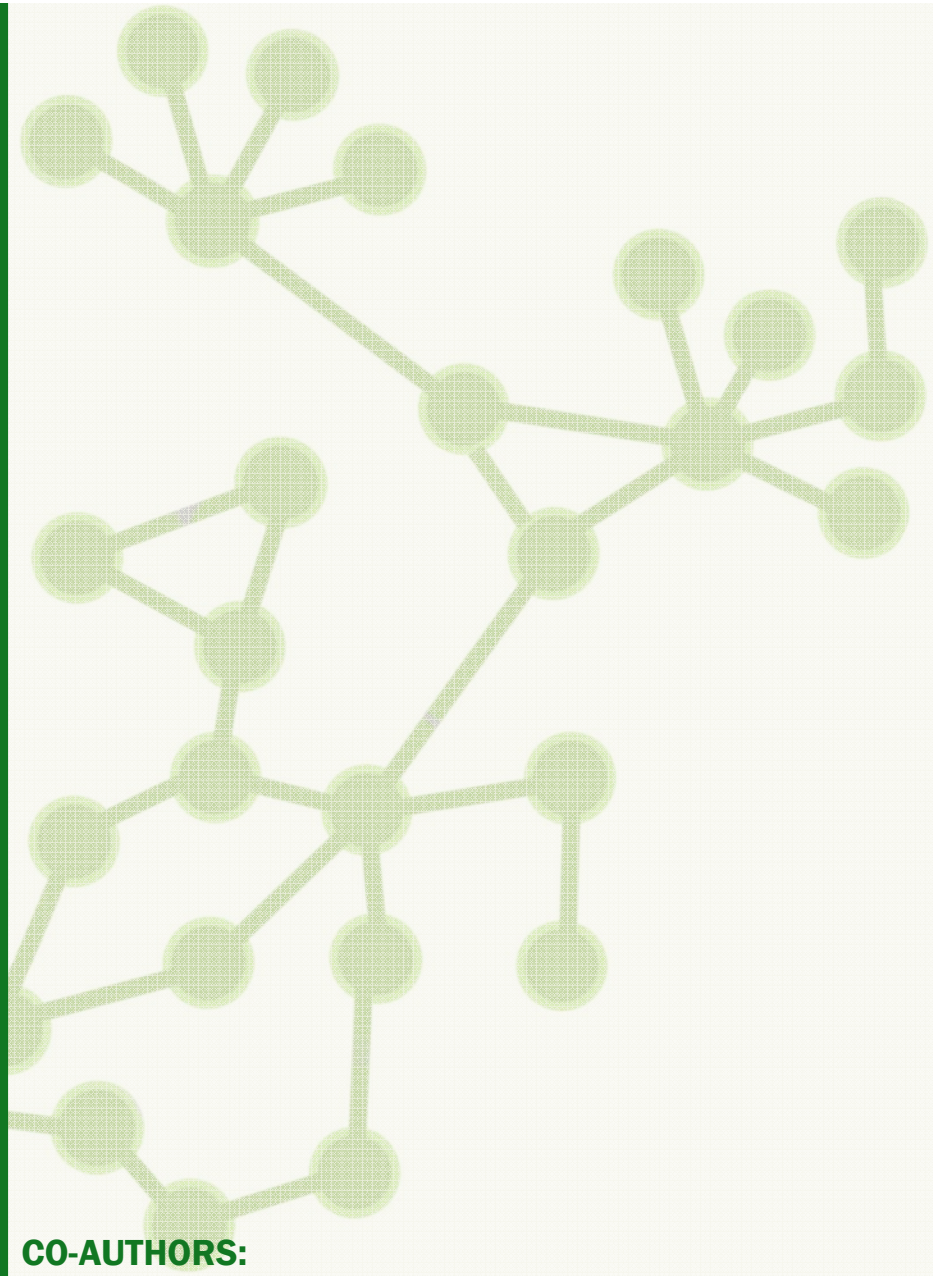

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VirginiaTech 1872 Invent the Future

SANREM CRSP
Sustainable Agriculture and Natural Resource Management
Collaborative Research Support Program

TODAY, WE'LL TALK ABOUT…

- mind-set change
- conventional farming & conservation agriculture
- a bit about the Mt. Elgon region
- our research problem
- our findings
- our conclusion

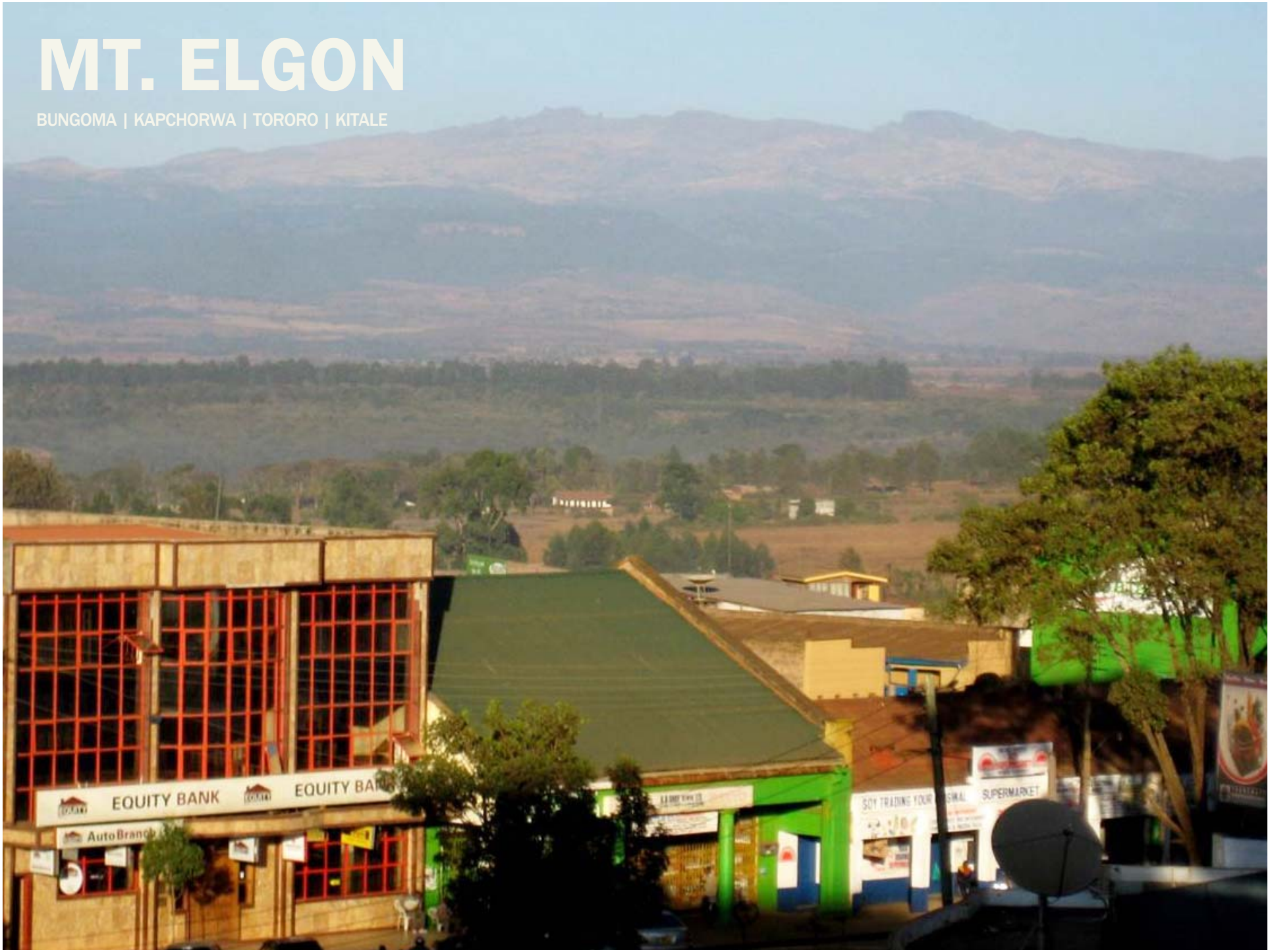

✗ WHAT NOT TO DO

CONVENTIONAL FARMING & CONSERVATION AGRICULTURE

	CONVENTIONAL FARMING	CONSERVATION AGRICULTURE
MINIMIZING TILLAGE	✗ plough/hoe to improve soil structure and control weeds	✓ disturb the soil as little as possible to maintain soil health, plant directly into soil
MAINTAINING SOIL COVER	✗ remove or burn crop residue, leaving soil bare	✓ cover the soil as much as possible to protect soil from erosion and limit weed growth
MIXING & ROTATING CROPS	✗ same crop planted each season	✓ mix and rotate crops to maintain and improve soil fertility and prevent pests

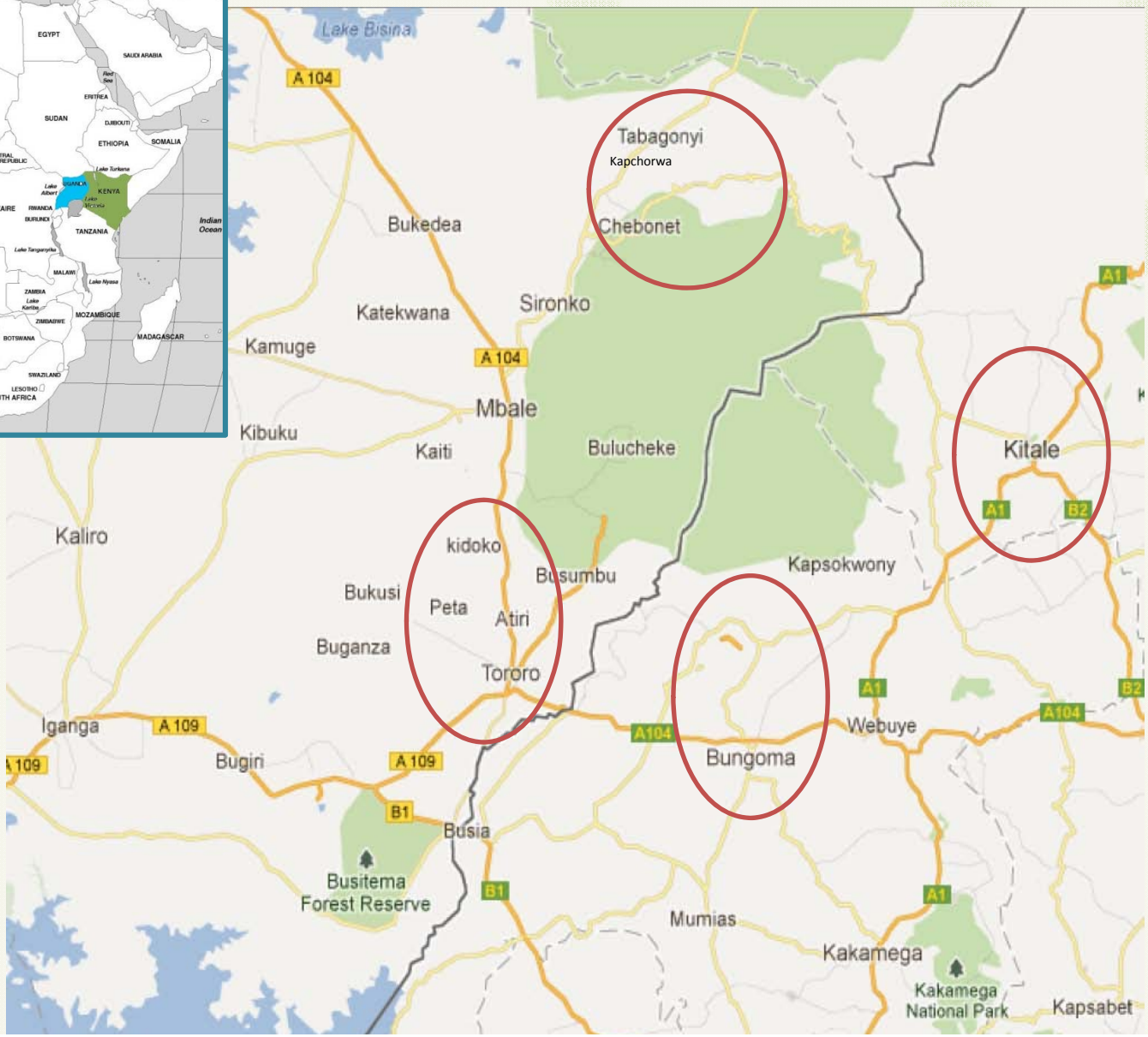
MT. ELGON

BUNGOMA | KAPCHORWA | TORORO | KITALE



THE COMMUNITIES

BUNGOMA | KAPCHORWA | TORORO | KITALE



OUR RESEARCH PROBLEM

- **Purpose |** How to engage with local mind sets in ways that are transformative and yield positive outcomes

- Change agent perspectives |

  Agricultural change agents are trained in conventional production practices and memorized scientific “facts”

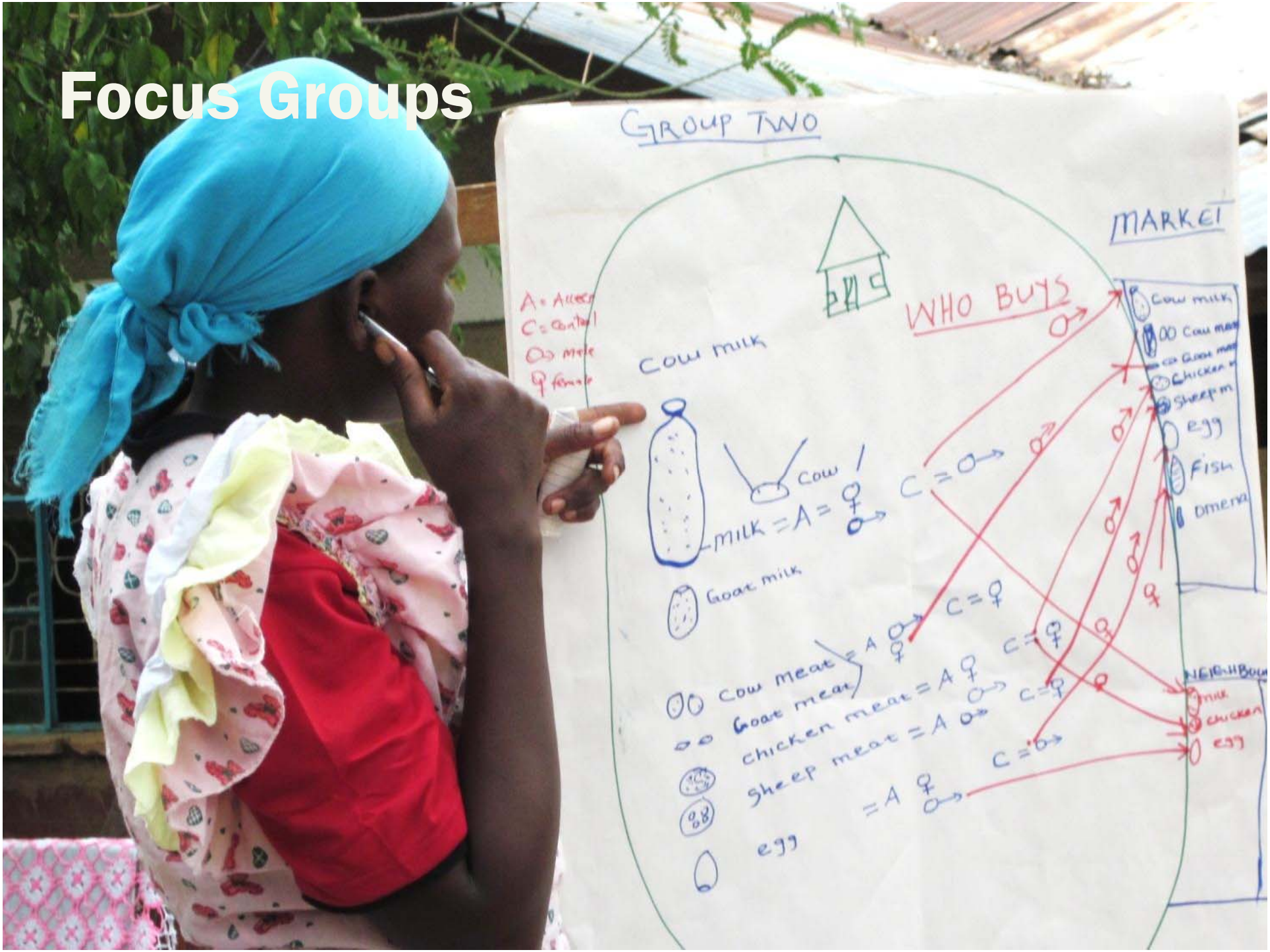
- Farmer agro-ecological knowledge |

  agro-ecological knowledge and its application in production informs farming discourse in local social networks

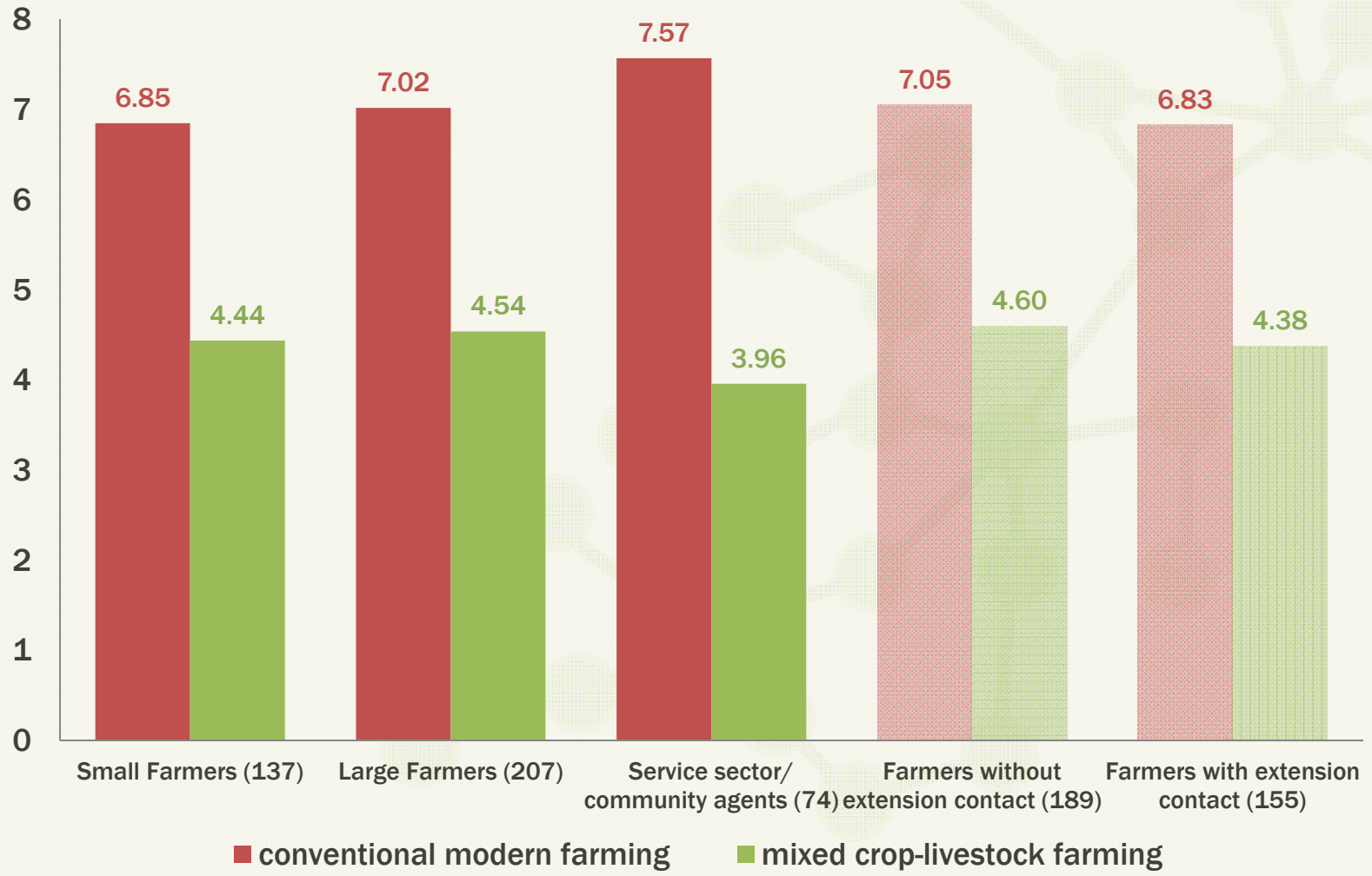
- Conservation agriculture requires adaptation |

  CA doesn’t fit well with that memorized knowledge and challenges conventional farming wisdom

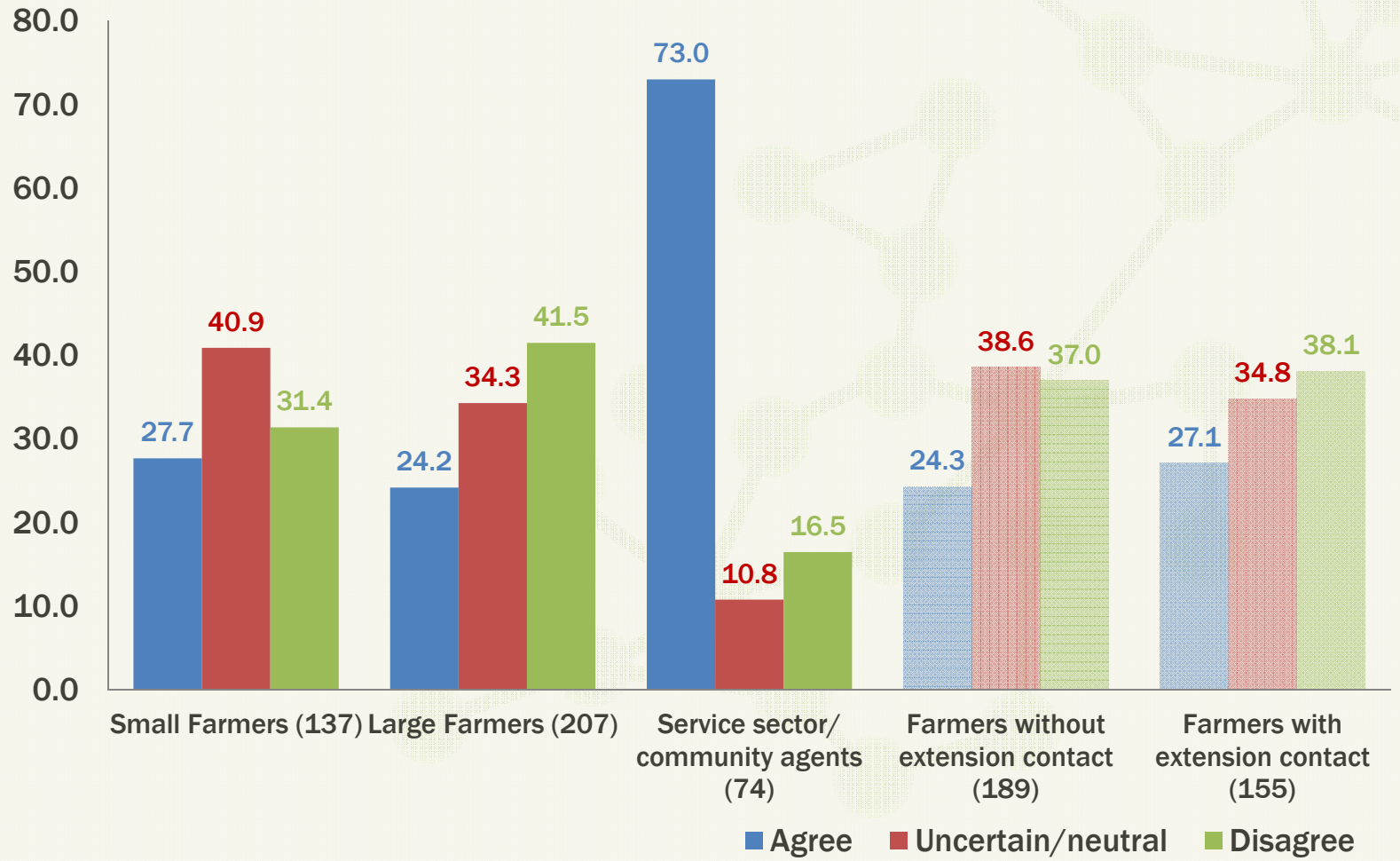
Focus Groups



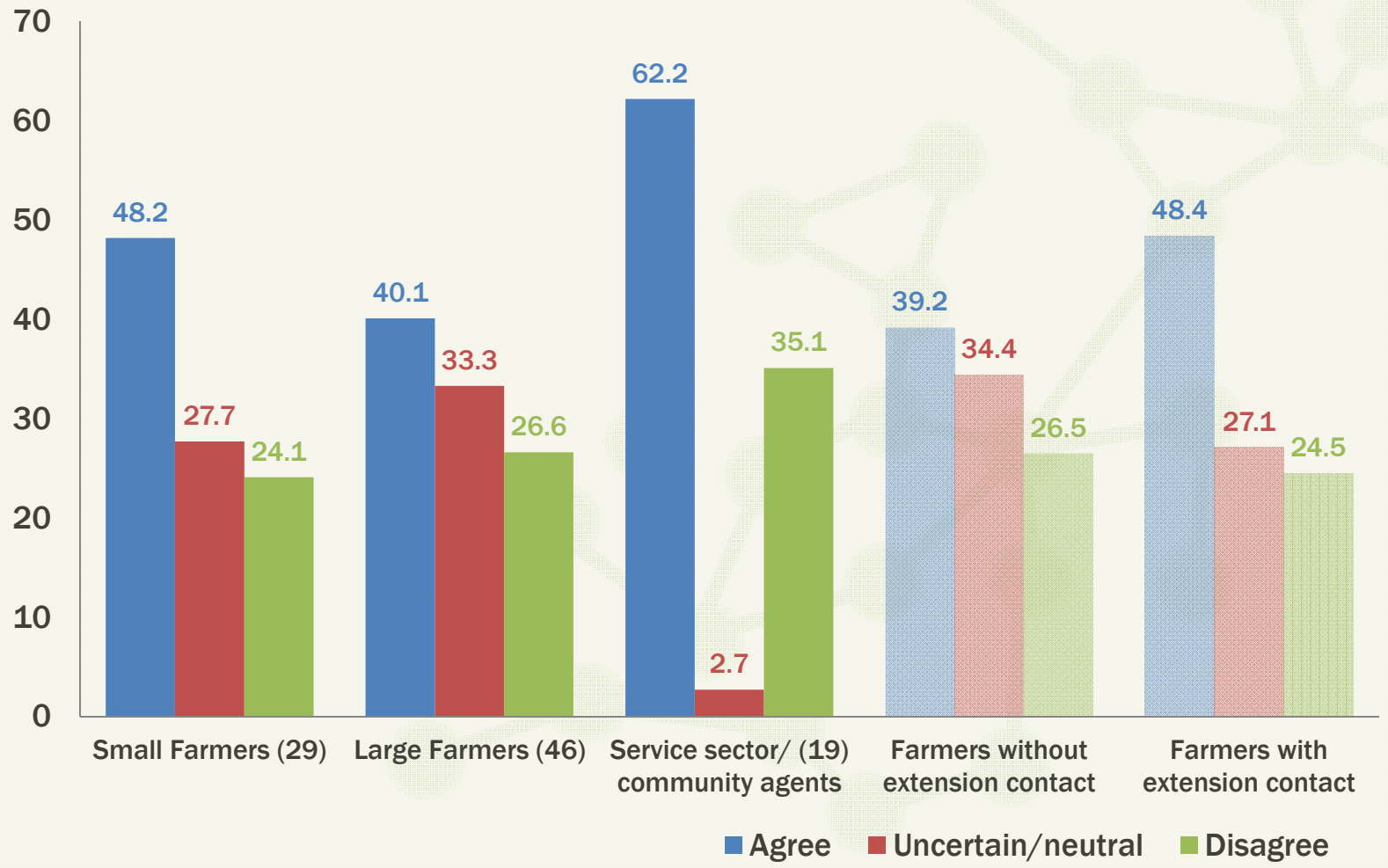
Mean scores for Kenyan and Ugandan farmers and non-farm agents level of agreement on basic farming perspectives



STATEMENT: One should maintain a permanent crop cover.



STATEMENT: Tillage causes land degradation.



Regression Table 6.1: Modern capital intensive farming

INDEPENDENT VARIABLES	VARIABLE GROUPS		ALL		BEST MODEL	
	Beta	sig	Beta	sig	Beta	sig
Agro-ecological Zone						
Tororo	.166	.01	.450	.02	.221	.00
Kapchorwa	-.126	.06	.234	.08		
Bungoma	-.034	.60	.216	.04	.102	.06
Adj. R^2	.053	.00				
Resource endowments						
Tractor	-.039	.54	.254	.00	.237	.00
Animal traction	-.087	.12	-.048	.41		
Area farmed	.007	.91	-.017	.76		
Wealth index	.016	.80	.084	.25		
Importance of off-farm income	-.081	.14	-.063	.26		
Access to credit	.153	.01	.089	.16		
Adj. R^2	.014	.09				
Personal Characteristics						
Age-respondent	.040	.49	.043	.57		
Gender-respondent	.024	.69	.058	.31		
Education-respondent	-.007	.90	-.017	.78		
Female household head	-.015	.81	-.090	.17		
Poor health	-.117	.04	-.105	.05		
% energy from staples	.088	.11	.065	.21		
Adj. R^2	.002	.36				
Network connectivity						
Extension contact	.224	.04	.289	.01	.300	.01
Frequency extension contact	-.271	.02	-.378	.00	-.390	.00
NGO Contact	-.013	.91	-.007	.95		
Frequency NGO contact	.164	.15	.156	.17	.185	.00
Vendor contact	-.100	.22	-.131	.13		
Frequency vendor contact	.032	,77	.099	.37		
Average contact frequency	-.018	.75	.079	.58		
Total network contact frequency	-.255	.02	-.250	.02	-.270	.00
Adj. R^2	.087	.00				
Adjusted R^2			.145	.00	.150	.00

Regression Table 6.2: Mixed farming

INDEPENDENT VARIABLES	VARIABLE GROUPS		ALL		BEST MODEL	
	Beta	sig	Beta	sig	Beta	sig
Agro-ecological Zone						
Tororo	-.348	.00	-.052	.89		
Kapchorwa	-.014	.25	.063	.64	.153	.02
Bungoma	-.299	.00	-.285	.01	-.197	.00
Adj. R^2	.107	.00				
Resource endowments						
Tractor	.161	.01	-.109	.25		
Animal traction	-.007	.90	.029	.63		
Area farmed	-.015	.80	-.004	.94		
Wealth index	.008	.90	-.064	.31		
Importance of off-farm income	-.001	.99	-.011	.84		
Access to credit	-.013	.83	.138	.03	.126	.04
Adj. R^2	.008	.19				
Personal Characteristics						
Age-respondent	.029	.62	.001	.99		
Gender-respondent	-.018	.77	-.071	.21		
Education-respondent	.053	.36	.024	.69		
Female household head	.038	.54	.074	.21		
Poor health	.012	.83	.017	.75		
% energy from staples	.021	.71	.011	.84		
Adj. R^2	-.013	.94				
Network connectivity						
Extension contact	-.145	.18	-.237	.04	-.140	.01
Frequency extension contact	.012	.91	.124	.30		
NGO Contact	-.217	.05	-.208	.07	-.116	.05
Frequency NGO contact	.142	.22	.108	.35		
Vendor contact	.145	.08	.093	.28		
Frequency vendor contact	-.303	.01	-.254	.02	-.201	.02
Average contact frequency	.196	.00	.279	.05	.229	.00
Total network contact frequency	.242	.02	.244	.03	.273	.00
Adj. R^2	.078	.00				
Adjusted R^2			.133	.00	.149	.00

Regression Table 7.1:

One should maintain a permanent crop cover

INDEPENDENT VARIABLES	VARIABLE GROUPS		ALL		BEST MODEL	
	Beta	sig	Beta	sig	Beta	sig
Agro-ecological Zone						
Tororo	-.200	.00	-.224	.24		
Kapchorwa	-.245	.00	-.194	.15		
Bungoma	-.351	.00	-.399	.00	-.236	.00
Adj. R^2	.076	.00				
Resource endowments						
Tractor	.098	.12	-.100	.29		
Animal traction	-.108	.05	-.014	.81		
Area farmed	-.058	.32	-.106	.06		
Wealth index	.076	.22	.054	.39		
Importance of off-farm income	-.089	.10	-.075	.18		
Access to credit	.083	.15	.131	.04	.139	.01
Adj. R^2	.040	.00				
Personal Characteristics						
Age-respondent	.193	.00	.142	.02	.182	.00
Gender-respondent	.159	.01	.112	.05	.100	.05
Education-respondent	.006	.92	-.034	.57		
Female household head	-.031	.60	-.026	.66		
Poor health	-.118	.03	-.086	.11		
% energy from staples	.080	.03	.061	.24		
Adj. R^2	.048	.00				
Network connectivity						
Extension contact	-.019	.86	-.044	.70		
Frequency extension contact	.060	.61	.104	.39		
NGO Contact	-.458	.00	-.386	.00	-.420	.00
Frequency NGO contact	.360	.00	.290	.01	.343	.00
Vendor contact	.167	.05	.156	.07	.132	.01
Frequency vendor contact	-.188	.09	-.081	.46		
Average contact frequency	.018	.77	-.029	.84		
Total network contact frequency	.100	.35	.080	.46		
Adj. R^2	.050	.00				
Farming Perspectives						
Modern capital intensive	.138	.01	.107	.06	.105	.04
Mixed farming system	-.014	.77	-.051	.36		
Adj. R^2	.015	.02				
Adjusted R^2			.157	.00	.153	.00

Regression Table 7.2:

Tillage Causes Land Degradation

INDEPENDENT VARIABLES	VARIABLE GROUPS		ALL		BEST MODEL	
	Beta	sig	Beta	sig	Beta	sig
Agro-ecological Zone						
Tororo	-.073	.27	-.049	.80		
Kapchorwa	-.173	.02	.205	.14	.268	.00
Bungoma	-.089	.17	-.007	.95		
Adj. R^2	.045	.00				
Resource endowments						
Tractor	.051	.41	048	.62		
Animal traction	.065	.24	.052	.39		
Area farmed	-.074	.21	-.059	.32		
Wealth index	.161	.01	.149	.02	.143	.01
Importance of off-farm income	-.023	.68	-.008	.89		
Access to credit	-.191	.00	-.115	.08		
Adj. R^2	.037	.00				
Personal Characteristics						
Age-respondent	.012	.83	-.004	.94		
Gender-respondent	-.142	.02	-.148	.01	-.149	.01
Education-respondent	.060	.28	.036	.56		
Female household head	.075	.22	.116	.06	.109	.05
Poor health	.007	.90	-.001	.99		
% energy from staples	.163	.00	.130	.02	.132	.01
Adj. R^2	.033	.01				
Network connectivity						
Extension contact	.085	.46	.028	.81		
Frequency extension contact	-.004	.97	.109	.38	.106	.04
NGO contact	-.101	.38	-.199	.08		
Frequency NGO contact	.131	.28	.183	.12		
Vendor contact	.113	.19	.101	.25		
Frequency vendor contact	-.151	.19	-.137	.23		
Average contact frequency	.058	.35	-.012	.94		
Total network contact frequency	-.029	.79	-.034	.76		
Adj. R^2	-.003	.53				
Farming Perspectives						
Modern capital intensive	-.003	.95	.135	.02	.130	.01
Mixed farming system	.053	.28	.010	.86		
Adj. R^2	-.002	.56				
Adjusted R^2			.104	.00	.118	.00

OUR CONCLUSIONS

Sense-Making |

there are real differences between the agricultural production knowledge of non-farm agents and farmers

Contextual knowledge and mutual understanding |

these differences are driven by farmers' lived experience of the agro-ecology and the networks that support living in that environment in contrast to memorized science

Receptivity to change |

new ideas may find receptivity on the basis of personal characteristics and resource endowments, but also through grounding concepts in local knowledge

Mind-Set change |

Mind-set change requires negotiating new understandings among network members in the process of making adaptations to production practices

Thank you! Questions?