RHOMIS
Rural Household Multi-Indicator Survey

ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

World Agroforestry Centre

Linking Climate, Agriculture and Nutrition:
Leveraging external data to unlock livelihood pathways in RHoMIS

Peter Steward, Kristal Jones, Christine Lamanna, Todd Rosenstock, Suneetha Kadiyala

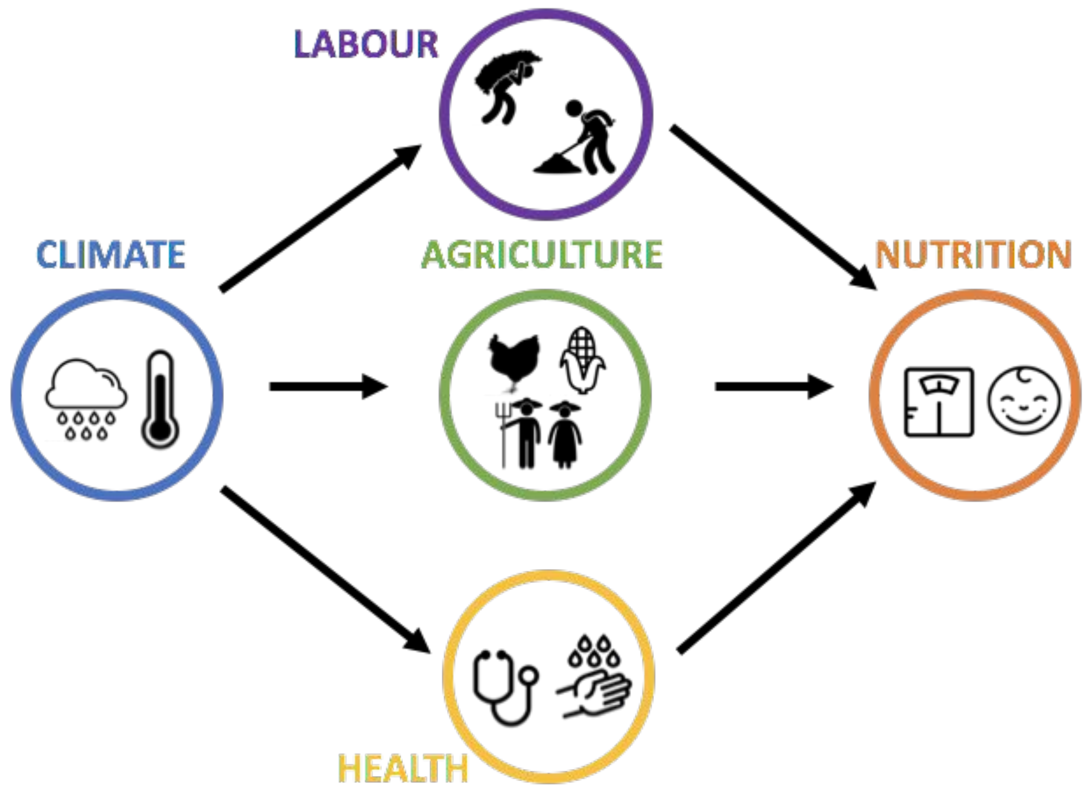
immana
Innovative Methods and Metrics for Agriculture and Nutrition Actions

SCAN

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

Agricultural Livelihoods in a Changing World

Multiple pathways have been proposed to link agriculture to nutrition outcomes, including direct consumption of farm products, generation of income, labour, and gender-based decision making. However, climate change can directly impact agriculture, nutrition, and indirectly impact the pathways that link them as well. While RHoMIS captures much of the complexity of agricultural livelihoods, it cannot necessarily capture climate realities experienced by farmers. Here **we developed tools to link RHoMIS observations with climate, biophysical, and socioeconomic datasets to analyze links between climate, agriculture and nutrition.**



Simplified model of climate, agriculture and nutrition linkages - the reality is much more complex!

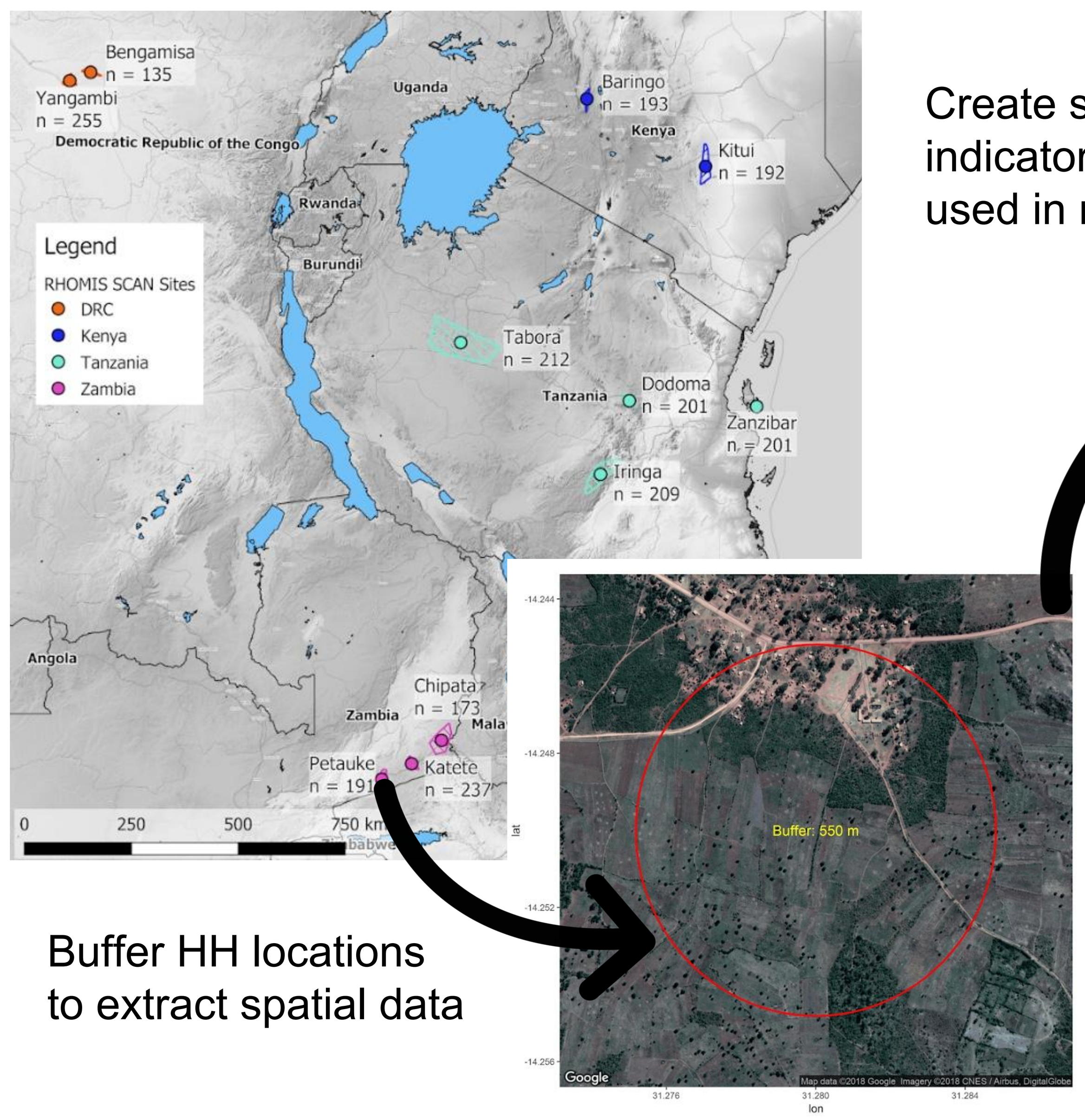
Datasets used & statistic added to RHOMIS observations

Data Type	Dataset	Variables	Resolution	Statistics
Climate	POWER	Daily temp, solar rad., windspeed, humidity, pressure	55.5 km 1983-Present	1) Long-term average (LTA) 2) Seasonal value* across multiple years 3) Seasonal deviance from LTA
	AgMERRA		28-111 km 1980-2010	
	CHIRPS	Daily precipitation	5.5 km 1981-Present	The above were calculated for variables including: Rainfall (total, rain days, dry spells) Temperature, GDD (low, optimum, high, >max) PET, water balance Planting date
	TARCAT		4 km 1983-Present	
Socio-Economic	Harvest Choice	13 variables relating to health, wealth, markets and production	9.25 km 2005-2012	FAO farming system, livestock unit density, cropland area, maize & pulse production, time to market (5 sizes), DHS wealth index, TPHR, % stunting and wasting
Landcover	ESA CCI-LC	38 landcover classes calculated annually	300 m 1992-2015	% cropland and woodland within 2 km
Soils	SoilGrids	24 soil parameters, 3-6 depths	250 m 2015-16	Texture, chemistry, structure, taxonomy, water capacity
Physical	SRTM DEM	Elevation	30 m, 2014	Elevation, aspect, slope

** FAO crop calendars used to were used estimate growing seasons for different crops. Statistics were generated for the entire season and for a 30 day window after planting*

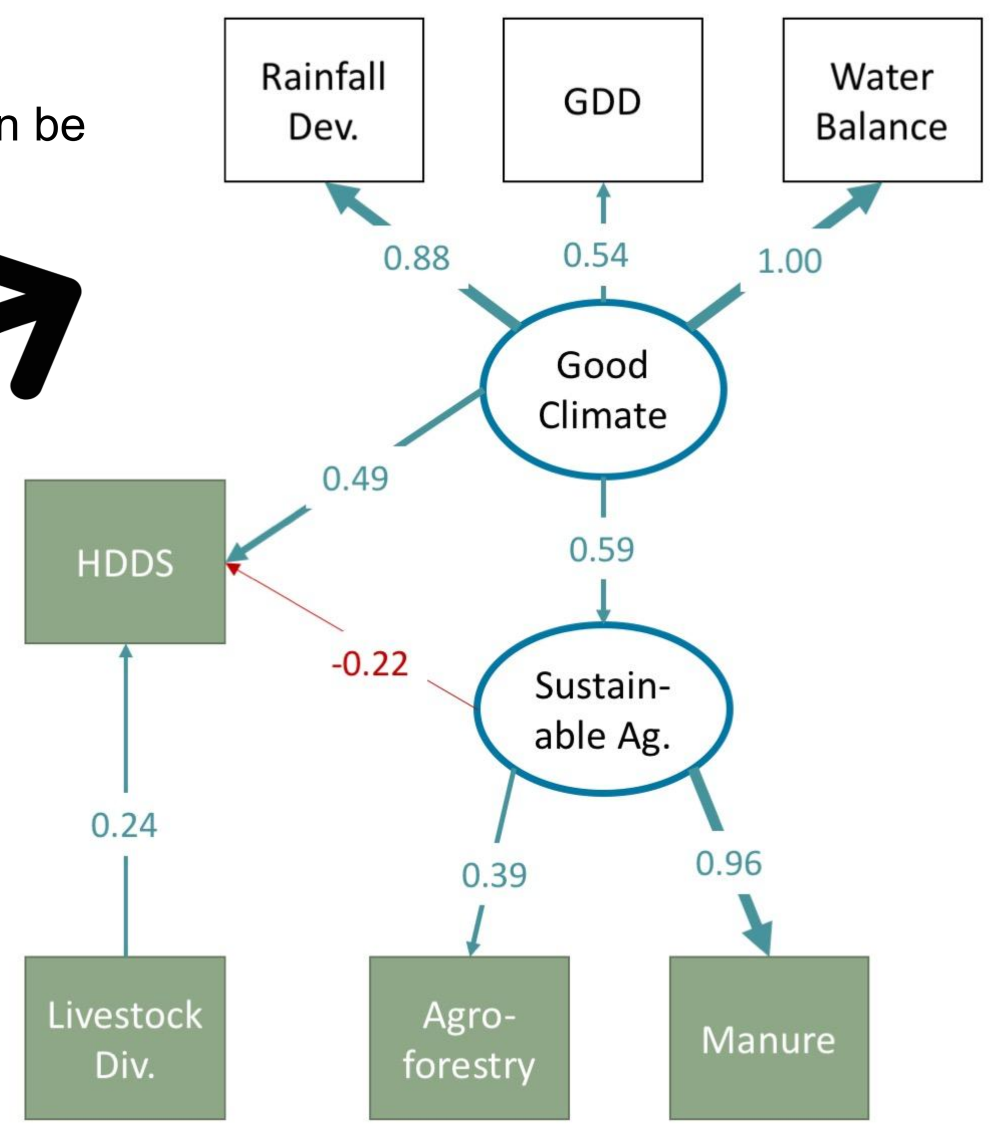
All spatial data we can currently extract https://goo.gl/SpPgeV; Other spatial datasets https://goo.gl/CEruuB

Do Climate and Agriculture Impact Nutrition in RHoMIS Households?



Buffer HH locations to extract spatial data

Create statistics/ indicators that can be used in modeling



Through **Structural Equation Modeling,** we found evidence that a **favorable climate had a strong positive influence on dietary diversity,** as did livestock diversity. However, we found a **negative linkage between sustainable agricultural practices and dietary diversity!** At the same time, favorable climate conditions mean households are more likely to practice sustainable agriculture.

- We have the tools to extract spatial data for RHoMIS and explore climate stress, shocks, resilience and adaptation!
- Free and rich data can help avoid unexplained “highly context specific outcomes”
- SEM shows strong climate, agriculture and nutrition linkages, but some are counter-intuitive, highlighting the complexity of households
- Next Steps: expanding SEM to include more variables, and potentially adding more external data to compare across sites.

Poster presentation from the RHOMIS Users’ Group Workshop – held at Wageningen, the Netherlands, on 20-22 of November 2018.