Links between diet diversity and production system diversity in Mali

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Leading questions and motivations

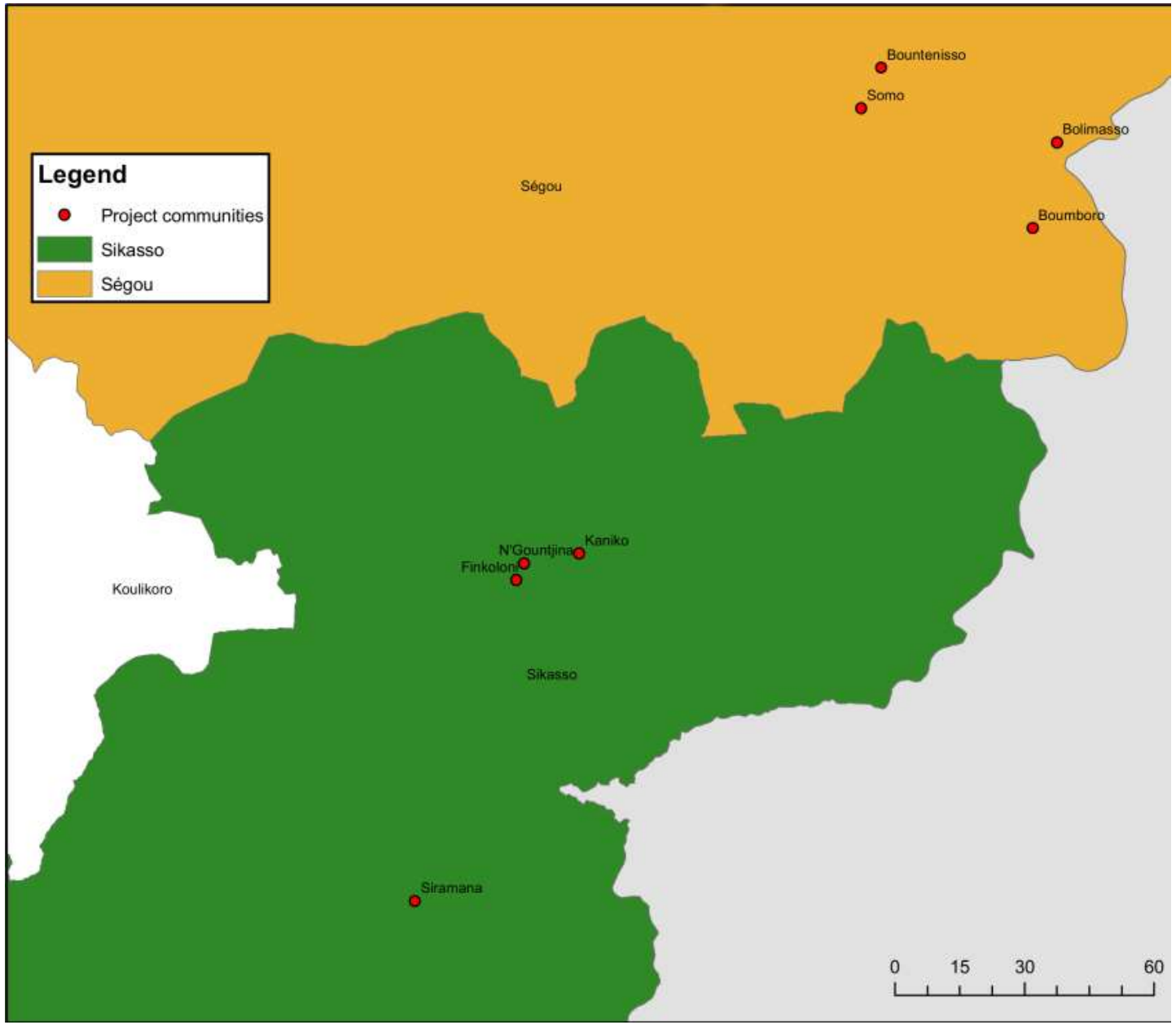
- Scarce evidence on existing linkages between production diversity and diet diversity.
- What is the role of NUS for food and nutrition security?
- Could NUS improve food security and diet diversity and bridge dietary gaps?

Data Collection

2 regions in southern Mali: Sikasso and Ségou.

6 Villages, 414 Households interviewed, male and female head of household as respondents.

Questions on household, land tenure, crops and livestock, income sources, foods consumed and agricultural practices.



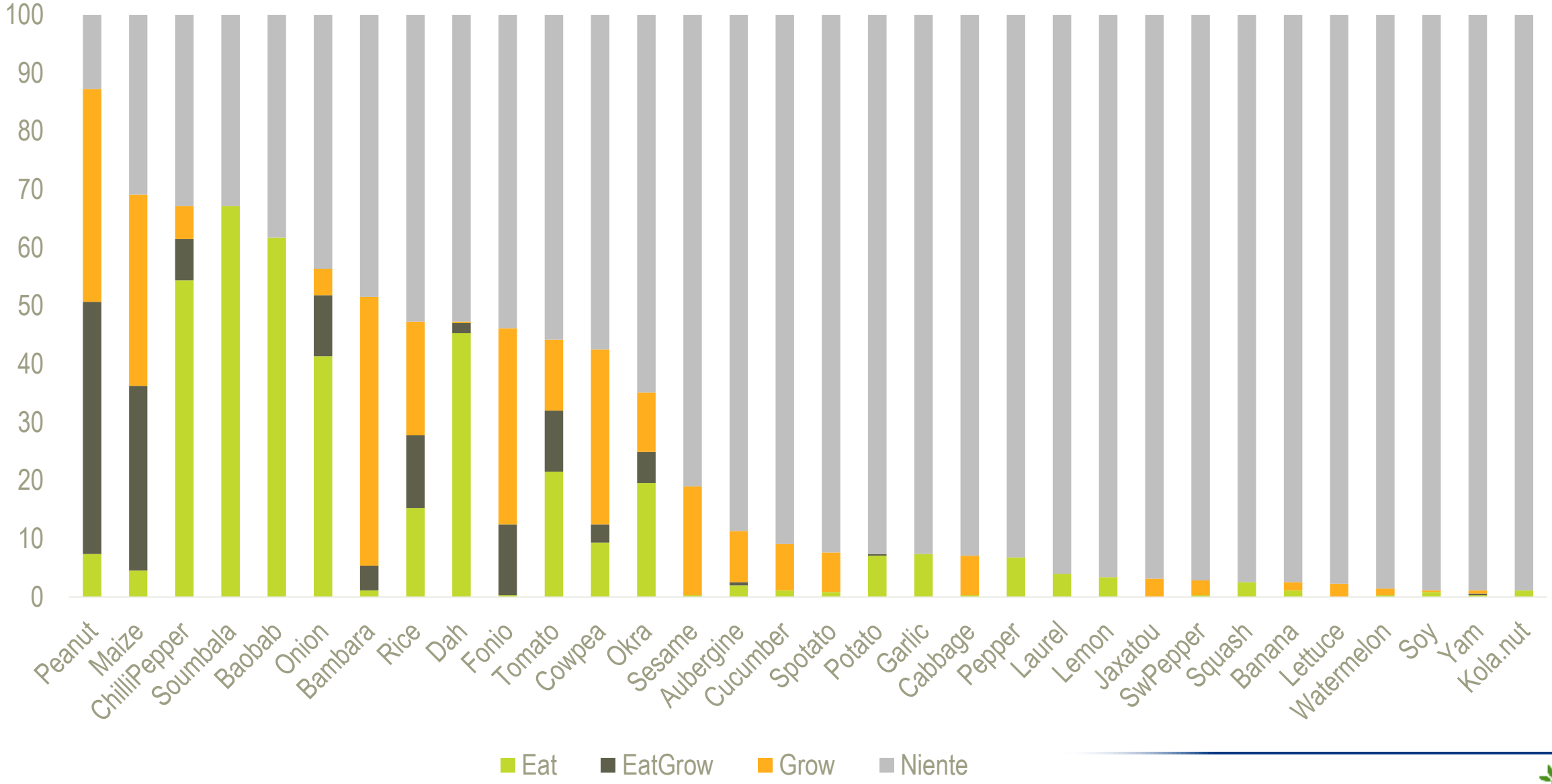
Indicators

- **MAHFP -** Months of adequate household food provisioning (Bilinski and Swindale, 2010)
  - A tool used to better understand the patterns of food insecurity throughout the year. Respondents were asked to indicate which months last year they did not have enough food to eat.
- **HFIAS -** Household Food Insecurity Access Scale (Coates, Swindale & Babinski 2007)
  - A tool to assess the relative level of household food insecurity in the past four weeks and how often. Three domains of food insecurity: i) anxiety and uncertainty about the household food supply; ii) insufficient quality; and iii) insufficient food intake.
- **MDD-W -** Minimum Dietary Diversity for Women (FAO and FHI 360, 2016)
  - Data collected through 24 h dietary recall. Proxy to understand the micronutrient adequacy of the diet of women of reproductive age. Composed by ten defined and mutually exclusive food groups.

Methods of Analysis

- Cluster analysis
  - Non metric multidimensional scaling (NMDS) using vegan package in R.
    - 4 Clusters identified for each region.
- Analysis of Deviance for Multivariate Generalized Linear Model
  - To identify specific links among production system, food security and diet diversity.
- Generalized linear models
  - 2 models with the richness (R) and the evenness (H) of the species produced on the farm (Shannon Weiner index), land owned, poverty likelihood, off farm income and composition, derived from the cluster analysis.
    - Models for richness in the diet, MDDW, HFIAS Score, MAHFP, food security and food insecurity.
- Generalized linear models for food groups
  - Models for the richness of consumption of the food group, with the scale and richness of the production of the same food group as covariates.

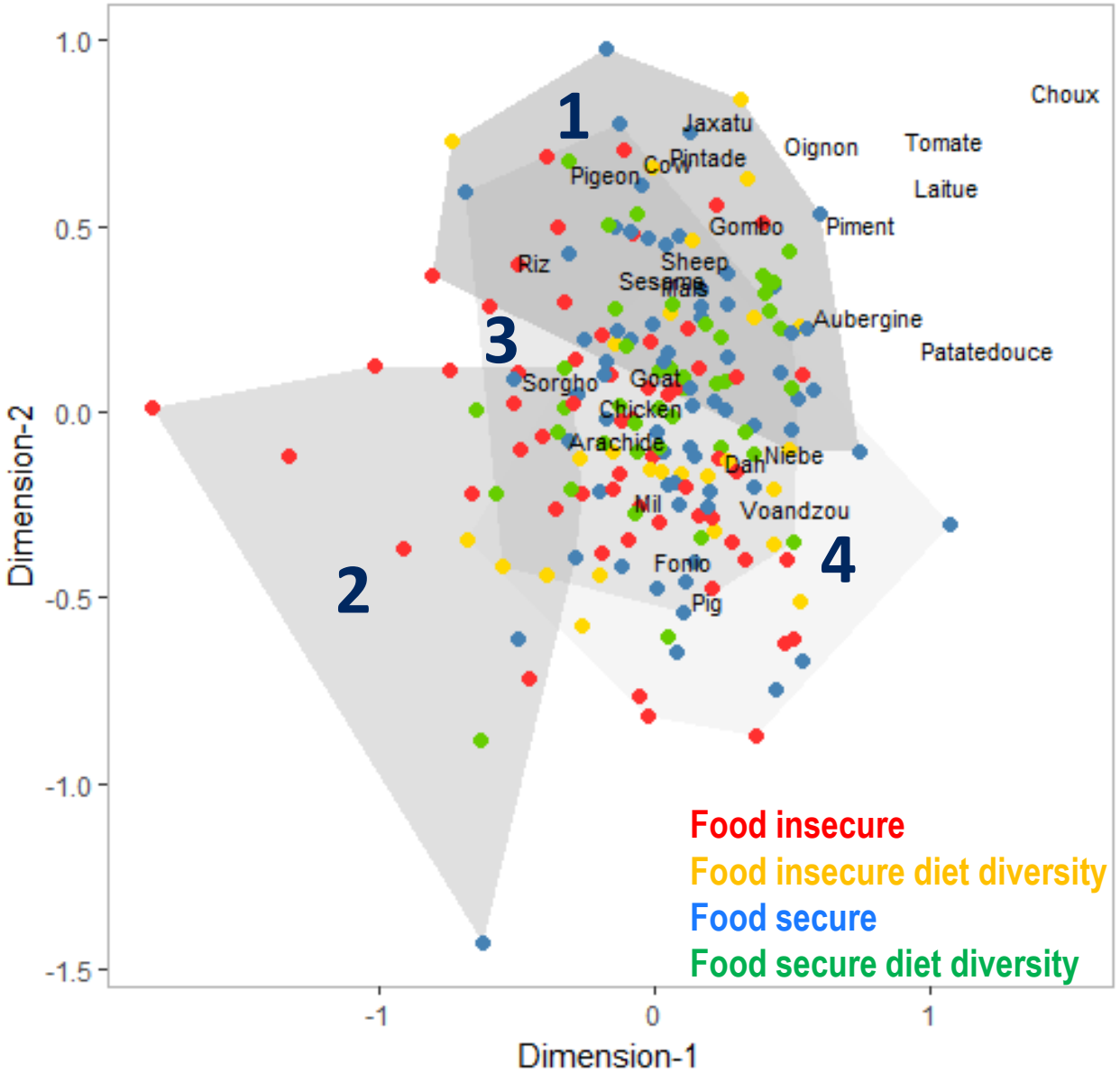
Results – Production System



Results – Diet and Food Security

Overall		
	Food Insecure	**Food Secure**
MDDW <5	115	144
MDDW >5	33	60
Ségou		
MDDW <5	61	72
MDDW >5	26	44
Sikasso		
MDDW <5	54	72
MDDW >5	7	16

Ségou – Composition



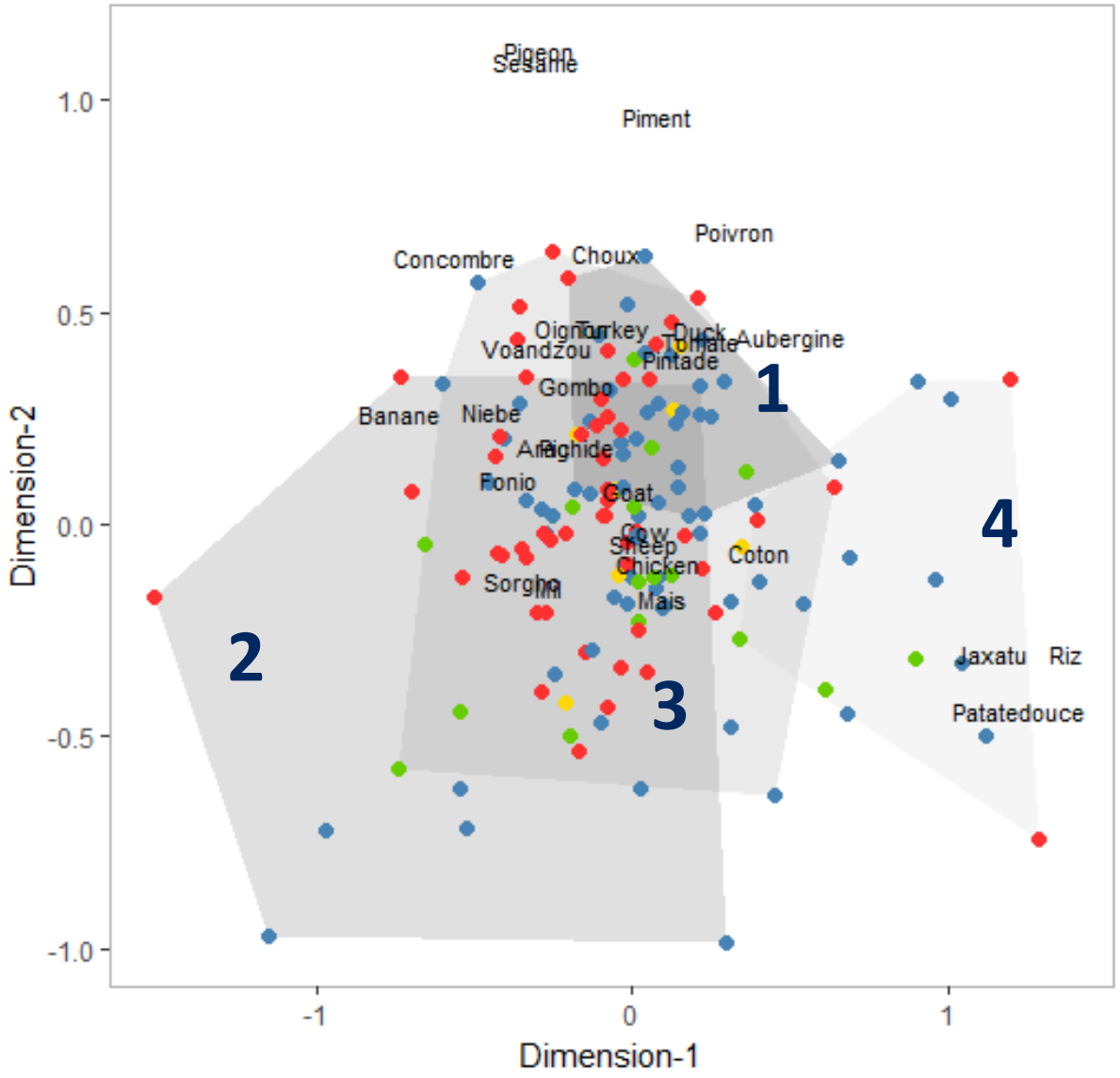
Cluster 1 - Onion, tomato, cowpea (*Vigna unguiculata*) and animals.

Cluster 2 - Most deprived. Chicken.

Cluster 3 - Maize, animals, fonio

Cluster 4 - Fonio, Bambara groundnut, chicken, cowpea, pigs.

Sikasso - Composition



Cluster 1 - Diverse. Millet, sorghum, vegetables, animals, Bambara groundnut, cotton.

Cluster 2 - Sorghum, millet, peanut.

Cluster 3 - Peanut, millet, sorghum, cotton.

Cluster 4 - Rice, sweet potato, jaxatu (*Solanum aethiopicum*), cotton, less animals.

Linear Models Results

Response	Region	Land Ha/Pers	Poverty Likelihood	Off Farm Income	Crop Diversity			Animal Diversity		
					R	H	Region:Crop	R	H	Region:Animal
MDDW Reached R				*						
MDDW Reached H				*						
MDDW Score R				.	*			.		
MDDW Score H									*	
Food Secure R				*				**		.
Food Secure H	*			*			.		*	
HFIAS Score R	**							***		.
HFIAS Score H	***					*	*		***	
MAHFP R								*		
MAHFP H	***					*	**		*	

Conclusion

Importance of animals, native species and a more diversified food system for food and nutrition security.

NUS role to be further investigated. Appears to be linked to a more traditional system.

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Limitations and next steps

- 61 HH excluded from final analysis.
- 24 hours dietary recall once per household.
- Lack of information on food procurement.
- Future data collection will provide additional information on seasonality of crops, allowing for a better understanding of the food system.

Thank you

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