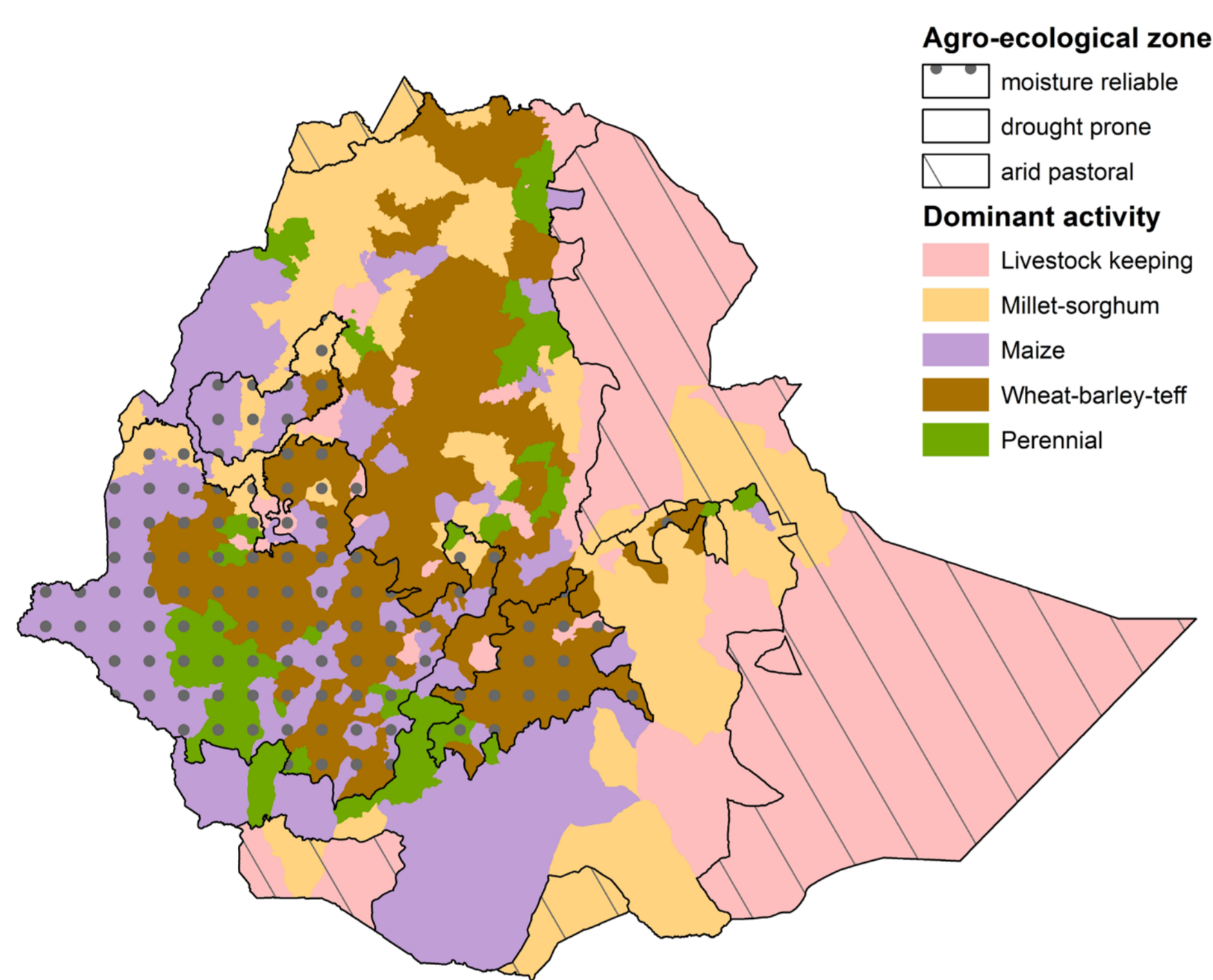


## Motivation

- Smallholder farmers:** Dominate food production: produce 90% of grain  
 Experience food insecurity: on average farm size < 1ha  
 In transition: poverty line decreased from 45.5% to 27.8% over past decade.
- Agricultural sector:** Backbone of Ethiopia's long-term plans for economic growth

## Objective

To analyze long-term changes to the agricultural sector and its consequences for the evolution of Ethiopian smallholder farmers under various policy scenarios.



Spatially-explicit typology of smallholder farmers

## Typology

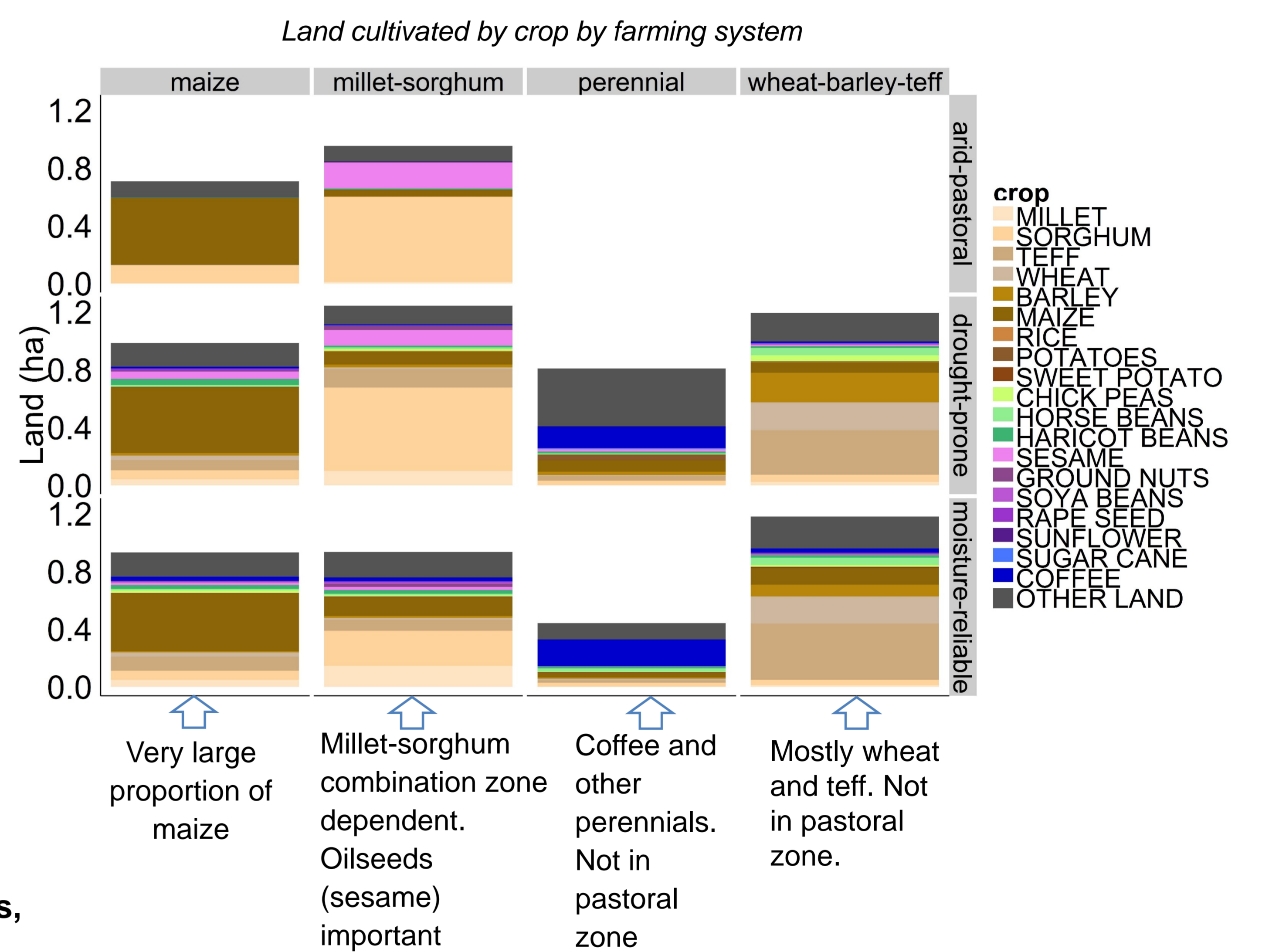
A new farming typology is established using farm household data (LSMS/ISA-ERSS survey comprising ~ 3000 households). This is based on:

- The agro-ecological zone:** Moisture-reliable and drought-prone highland areas and the pastoralist lowland areas
- The dominant activities:** Pure livestock-keeping or a combination of crops and livestock based on main crops grown

Each farming system has different possibilities to grow in terms of productivity (input/output ratio).

Interaction with large scale farmers is taken into account.

The resulting typology is harmonized using national statistics and extrapolated to all regions of Ethiopia.



That result in constraints or opportunities, depending on the socio-economic characteristics of the farming system:

Major future challenges:

- Population increase
- GDP growth
- Dietary change

Affect farm-system specific

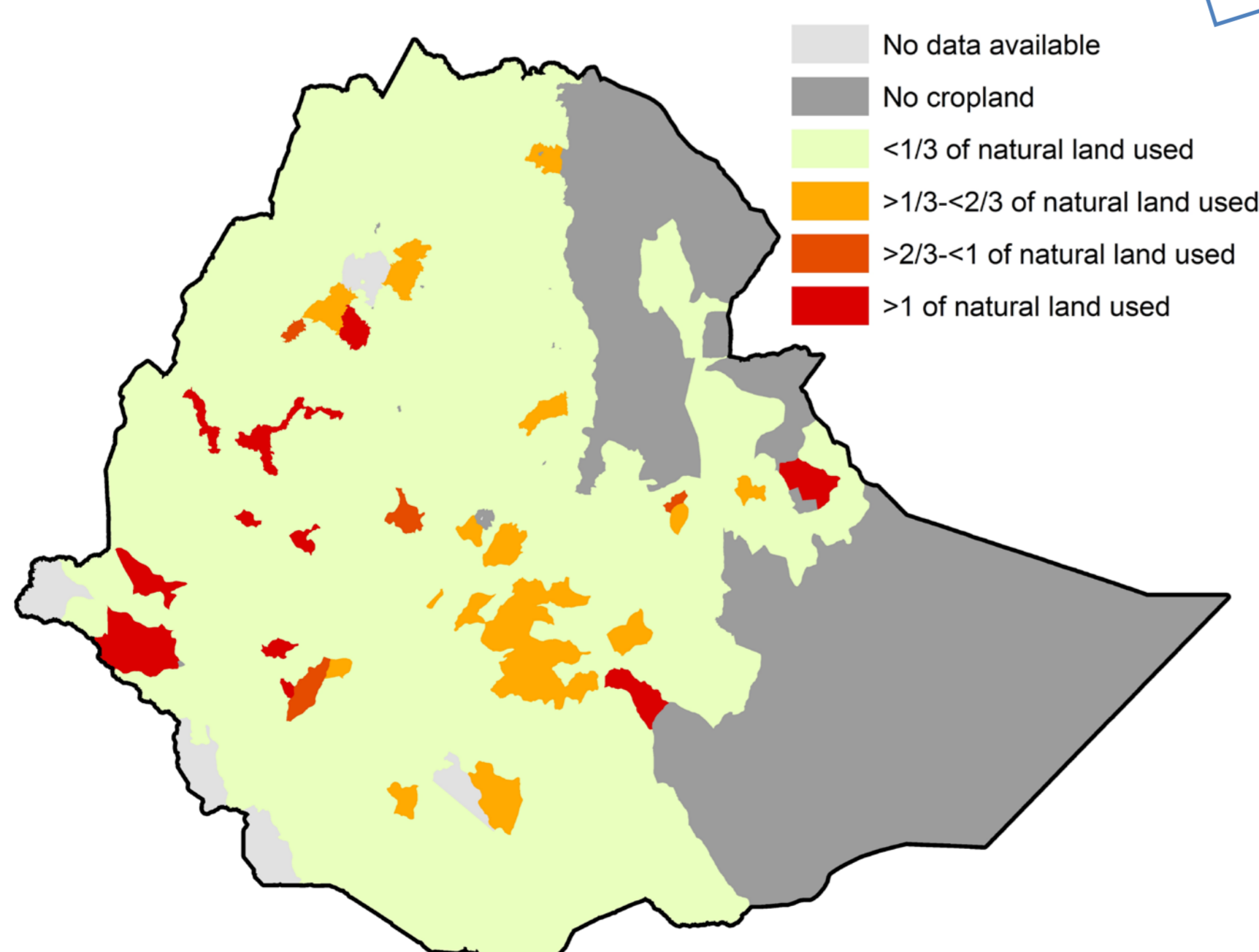
Food and feed production and consumption



Animal production And consumption



Income and Food security



Total increase in cropland necessary in order for smallholder farmers in 2030 to produce food for self-consumption under the same practices, specified by the uptake of other natural land. In some areas (orange and red) productivity increase will be crucial to improve food security.

## GLOBIOM

GLOBIOM is a globally-consistent partial equilibrium model with spatial land-use patterns and biophysical resource constraints.

Typology with initial endowment in livestock and crop production is integrated in an Ethiopia-version of GLOBIOM.

Aim is to analyze where deficiencies occur and how these can be resolved via trade, productivity and the impact of policies.

## Conclusion

Policies aiming to improve productivity in order to reduce poverty and the future uptake of natural land will subsequently be implemented in GLOBIOM:

- Increase in input use and irrigation development to enhance productivity
- Infrastructure development to facilitate trade between deficit and surplus regions

Impact of policies over time on smallholders' poverty and food security status will be assessed for each farming system. This will enable an assessment of policy options at both the local and national level.

## Acknowledgements

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