

# HOW DOES RISING RURAL POPULATION DENSITY AFFECT SMALLHOLDER AGRICULTURE? EVIDENCE FROM ETHIOPIA, KENYA & MALAWI

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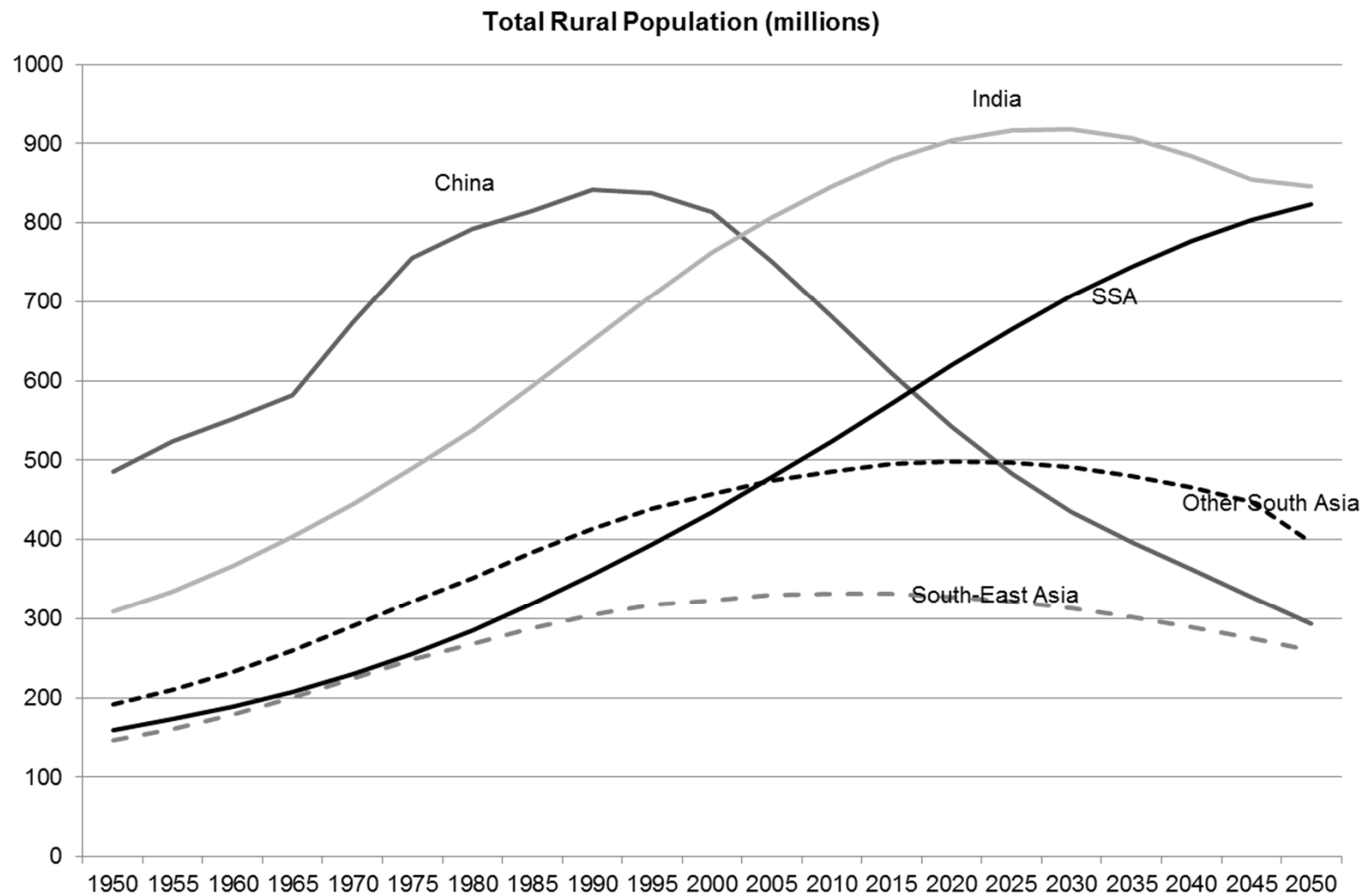


# Motivation

- Population densities in many sub-Saharan Africa are much higher than they were two decades ago
- The rising rural population densities are profoundly affecting farming systems
  - Diminishing land sizes and limited scope of accessing land
  - Limited off-farm opportunities
- Are increasing population densities inducing innovations aimed at intensifying the use of land?
  - Consistent with the induced innovation theories of Boserup (1965) and Ruttan and Hayami (1971)



# Total rural population projections



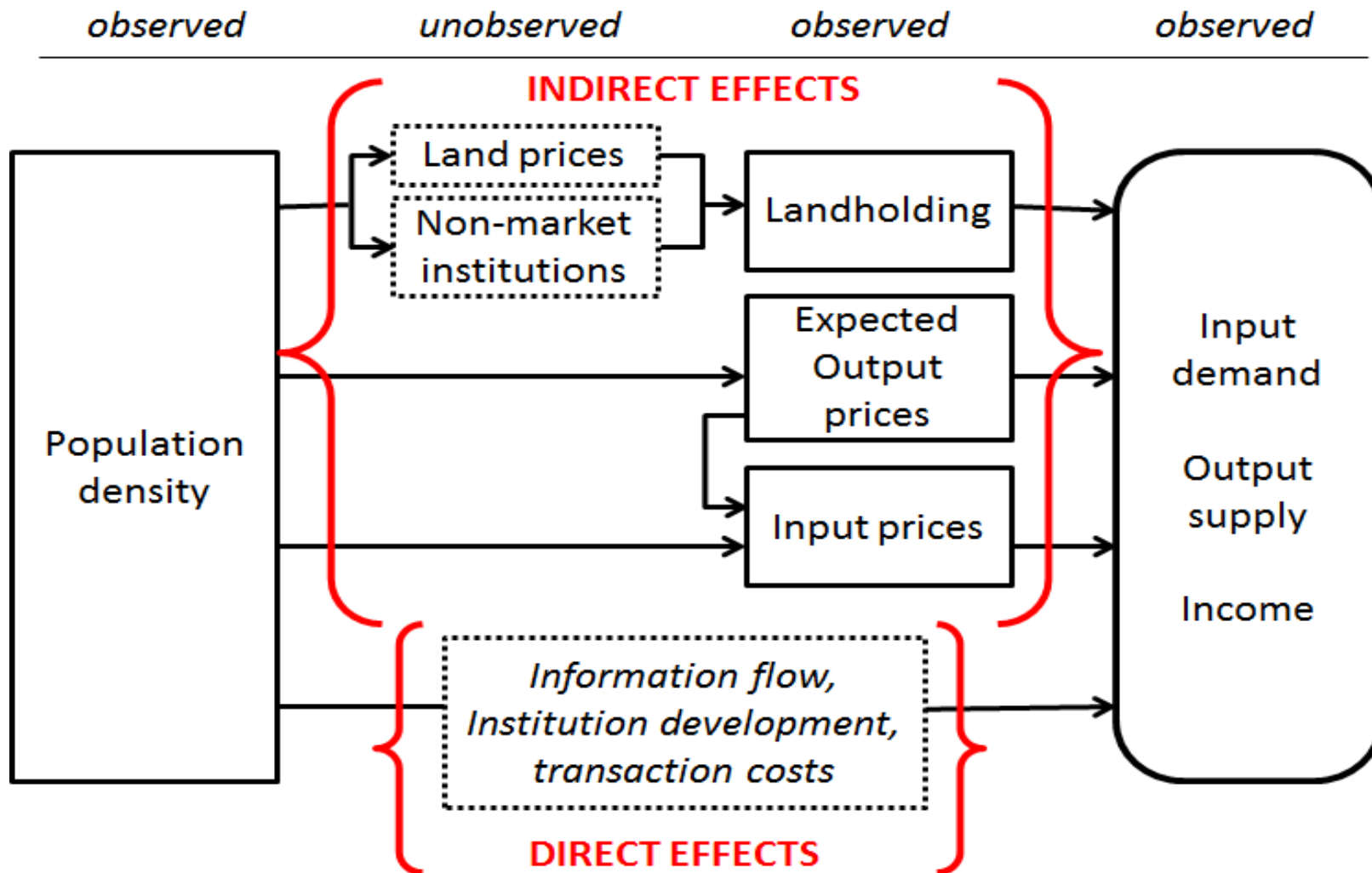
Source: UN Pop Council, 2013



## Increasing land conflicts-Newspaper Headlines



# Effects of population density on smallholder-intensification- analytical framework



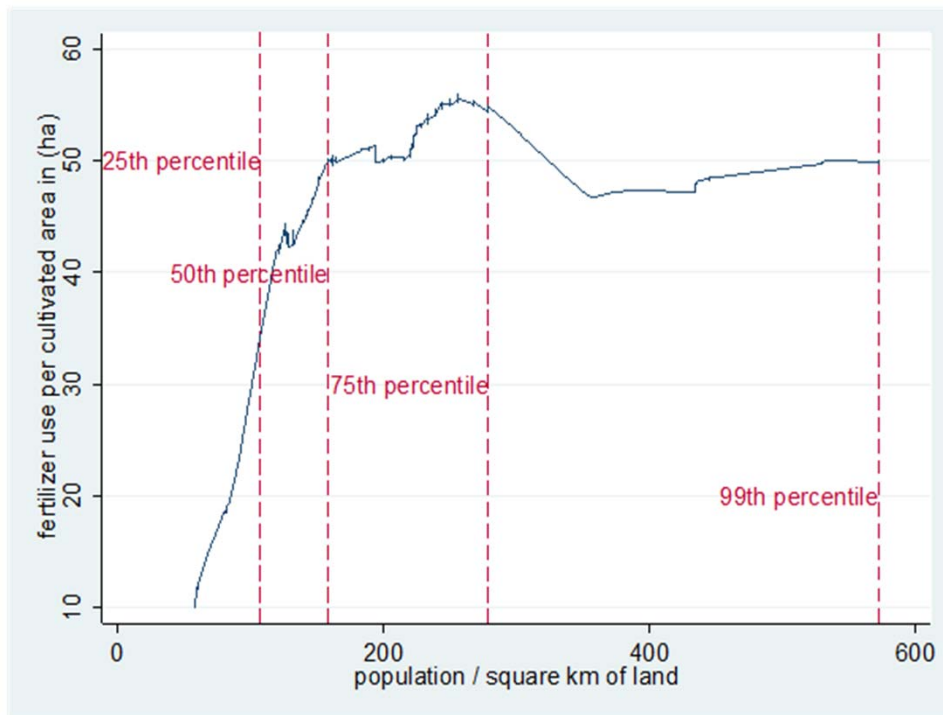
## Data sources

- **Ethiopia:** 6 waves of household-level data from the Ethiopian Rural Household Surveys covering 1293 households
- **Kenya:** 5 waves of panel survey data on 1,146 farm households
- **Malawi:** 3 waves of rural farm households; only 1375 households were re-interviewed in the last wave
- **Geographic Information Systems:** Population and land estimates data came from two GIS databases:
  - Global Rural–Urban Mapping Project (GRUMP)
  - GlobCover 2009

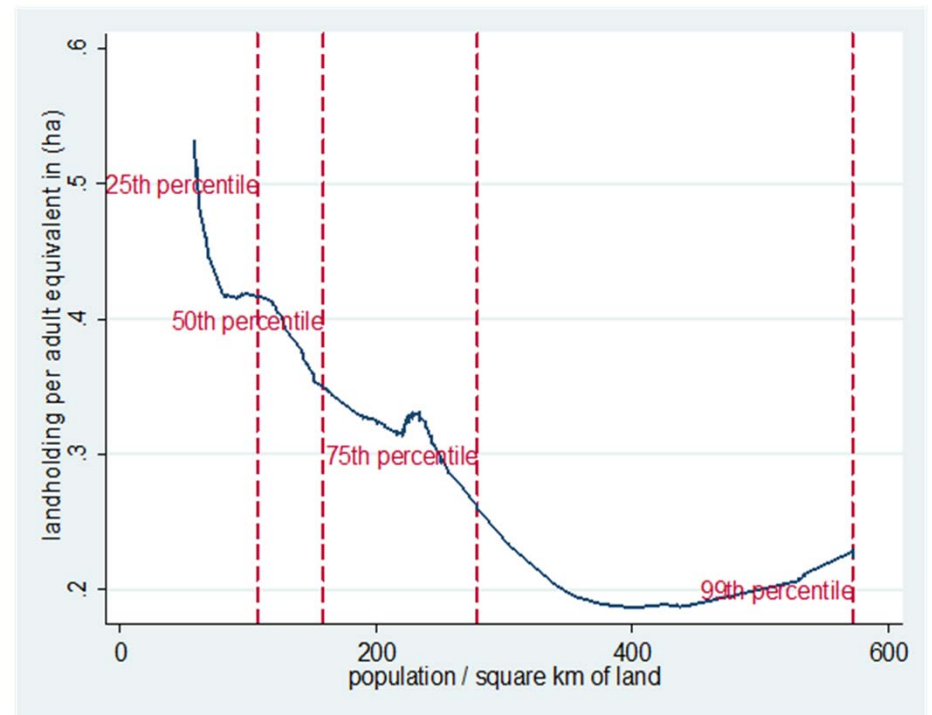


# RESULTS: ETHIOPIA

Kilogram of fertilizer used/ha, by population density



Household landholding / adult equivalent by population density



# RESULTS: KENYA

Figure 1: Fertilizer quantities applied per hectare cultivated

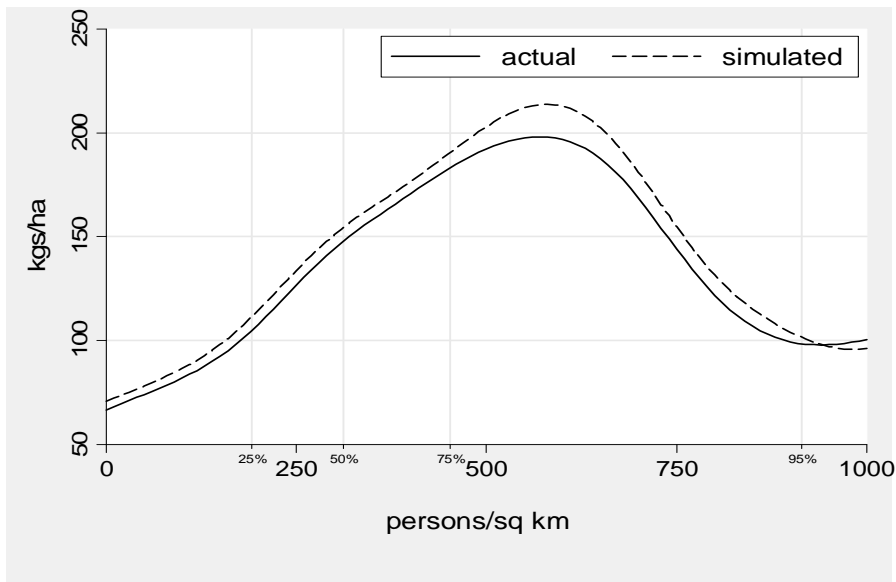


Figure 2: Total value of cash expenditures per ha cultivated

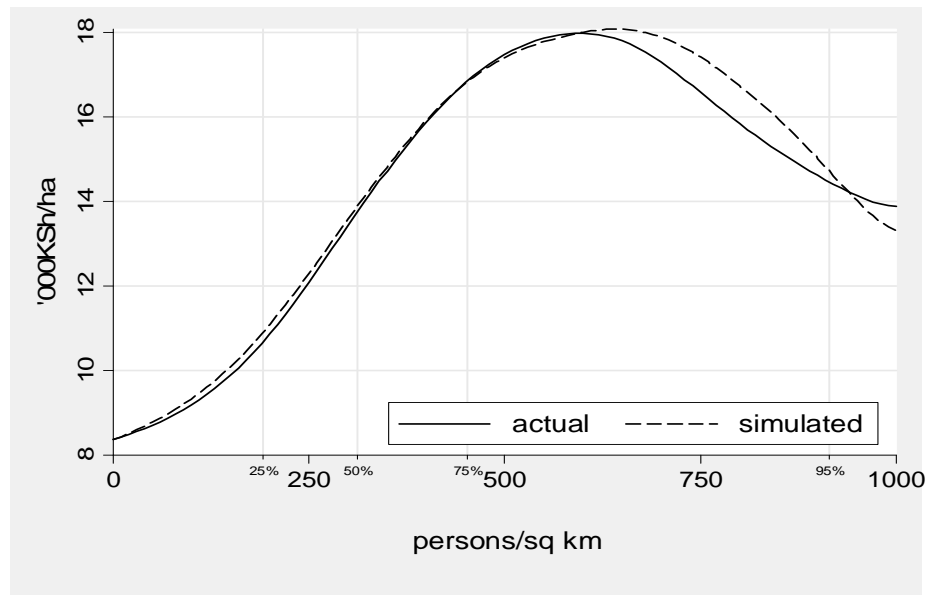


Figure 4: Net crop income per hectare cultivated

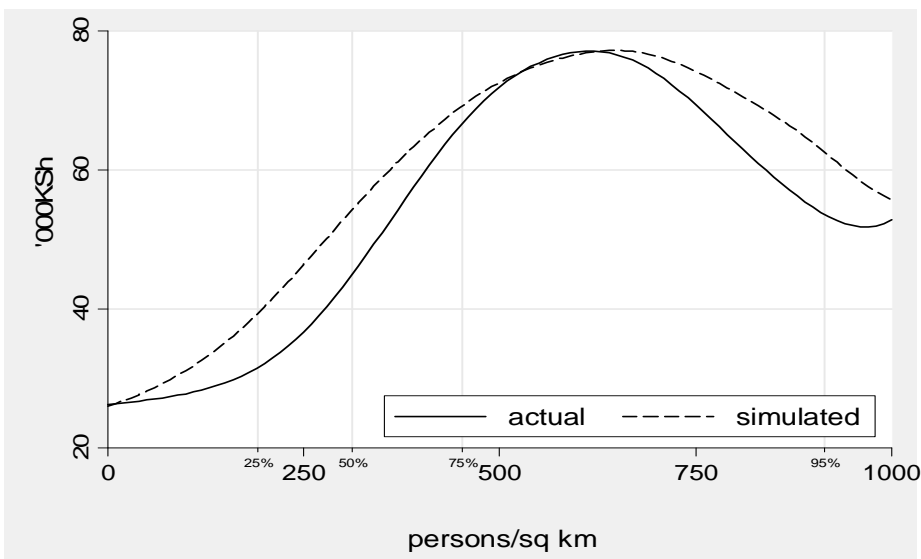
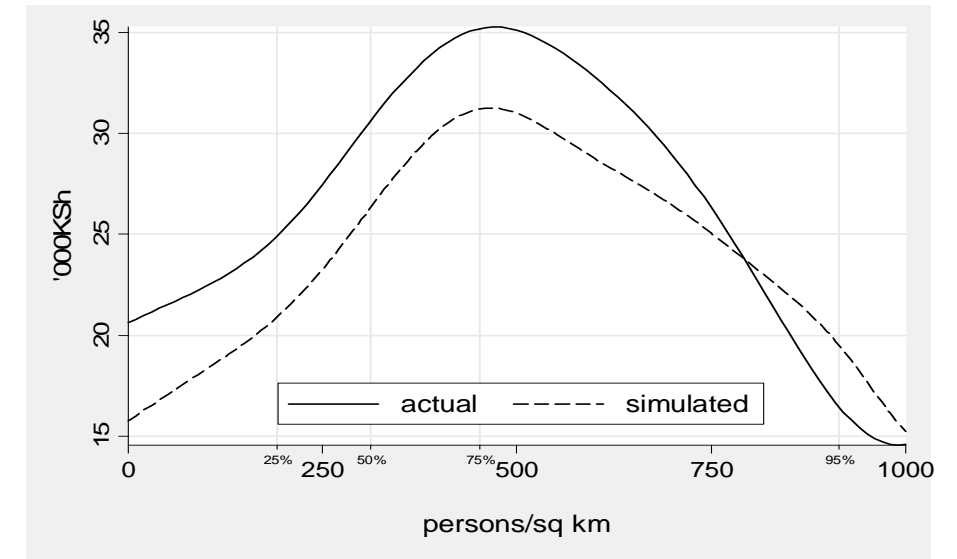


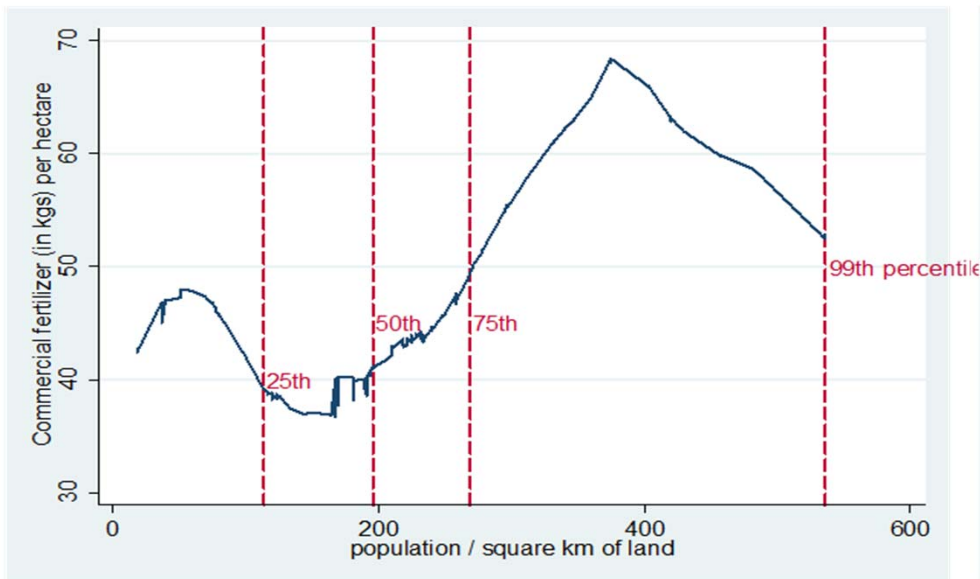
Figure 5: Net crop income per family labor (resident adults)



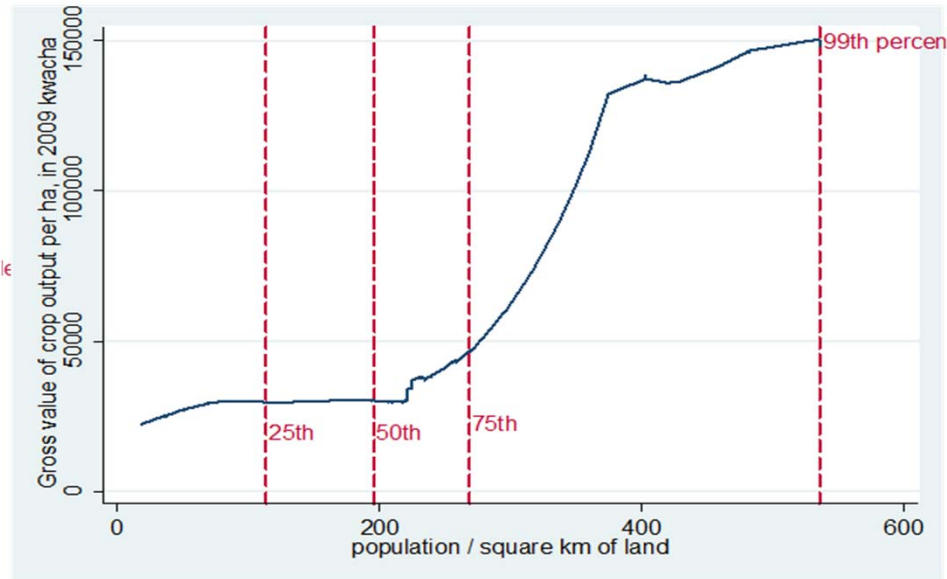


# RESULTS: MALAWI

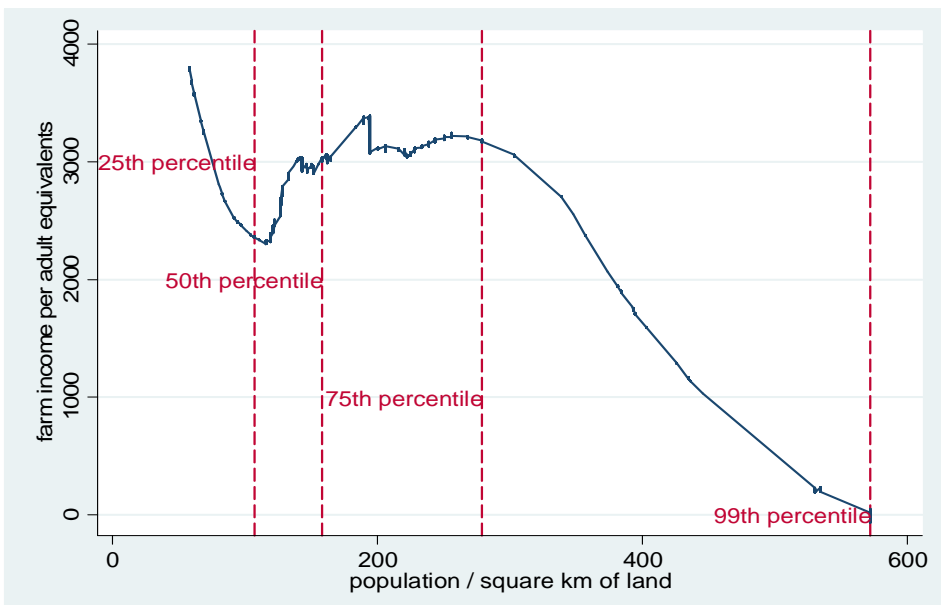
Fertilizer kg/ha, by pop. den.



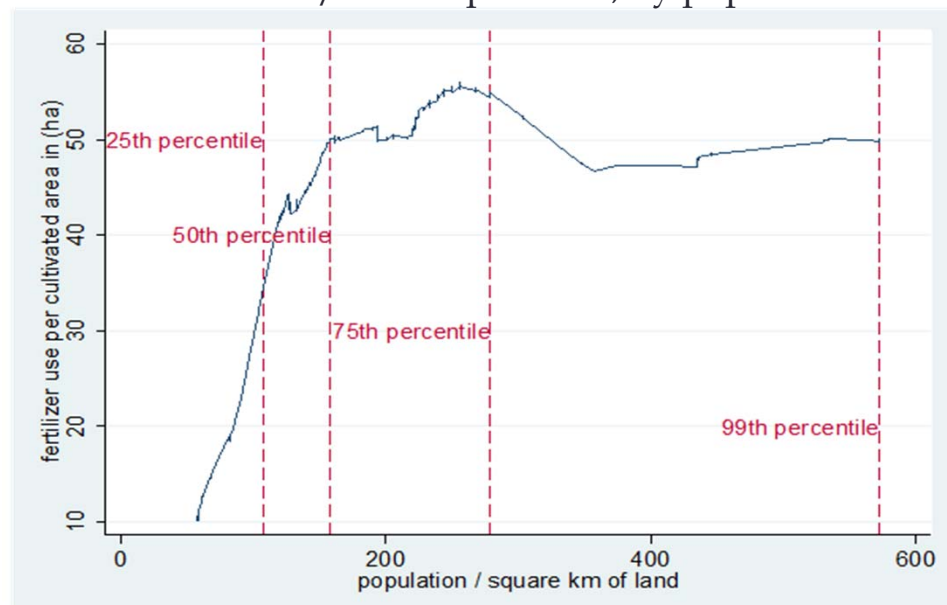
Gross value of crop output/ha, by pop. den.



Farm Income per Adult Equivalent, by pop. den.



Value of assets/adult equivalent, by pop. den.



## Summary of findings

- Rural population density is projected to increase by 48% in sub-Saharan Africa in the next 35 years
- Population density is endogenous- what are the drivers of population density in sub-Saharan Africa?
- Rising population densities are influencing household behavior and farming systems in sub-Saharan Africa
  - Intensification is not possible beyond some population density thresholds
  - 13% of the rural population in Kenya live in areas beyond the thresholds
- Our results do not explain the reasons for the decline in agricultural intensification
  - Signs of unsustainable agricultural intensification- reduced fallows; soil mining, etc.



# Acknowledgements



