AAMP Briefing Packet 1.2.a. Spatial Tools for Food Policy Analysis

(i) mapping market sheds

(ii) GIS concepts and mapping tools

(iii) raster files

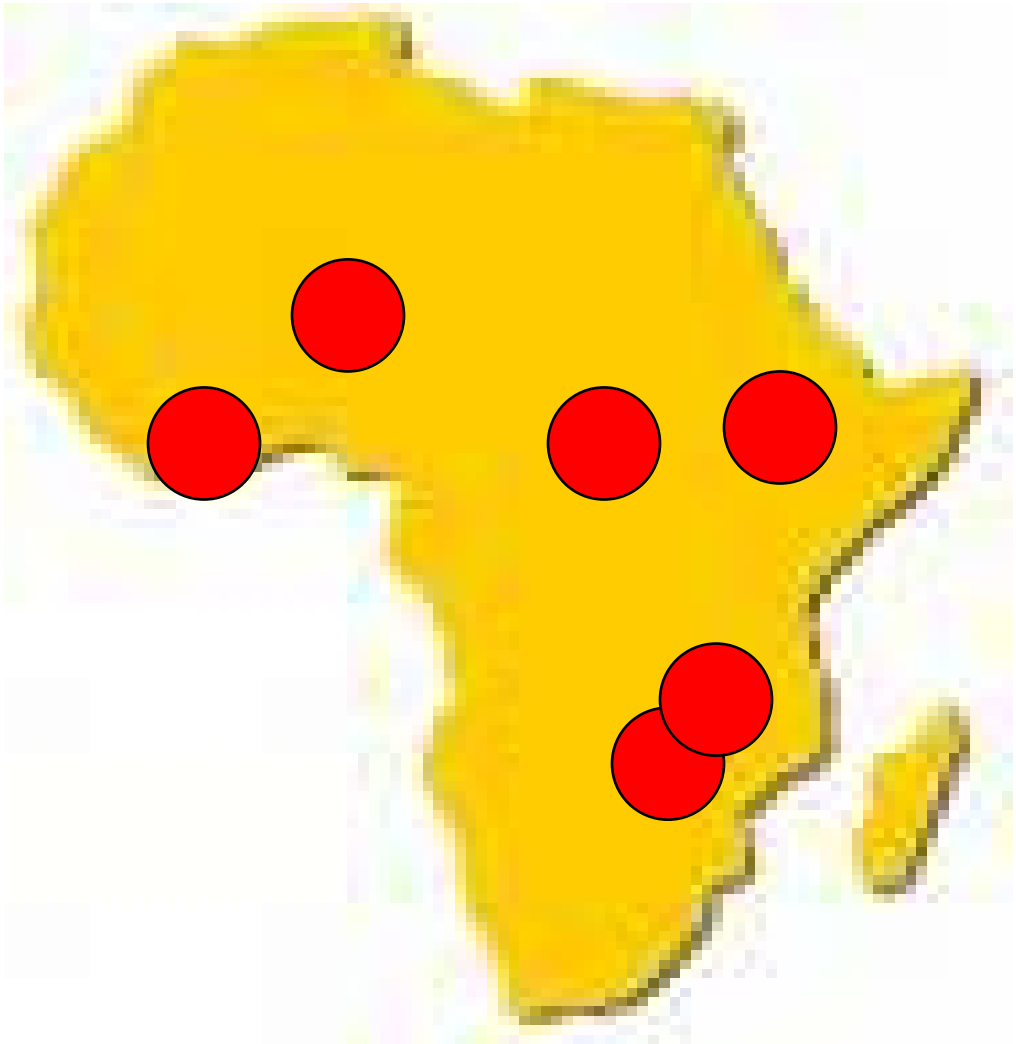
(iv) shape files

MICHIGAN STATE UNIVERSITY

IFPRI

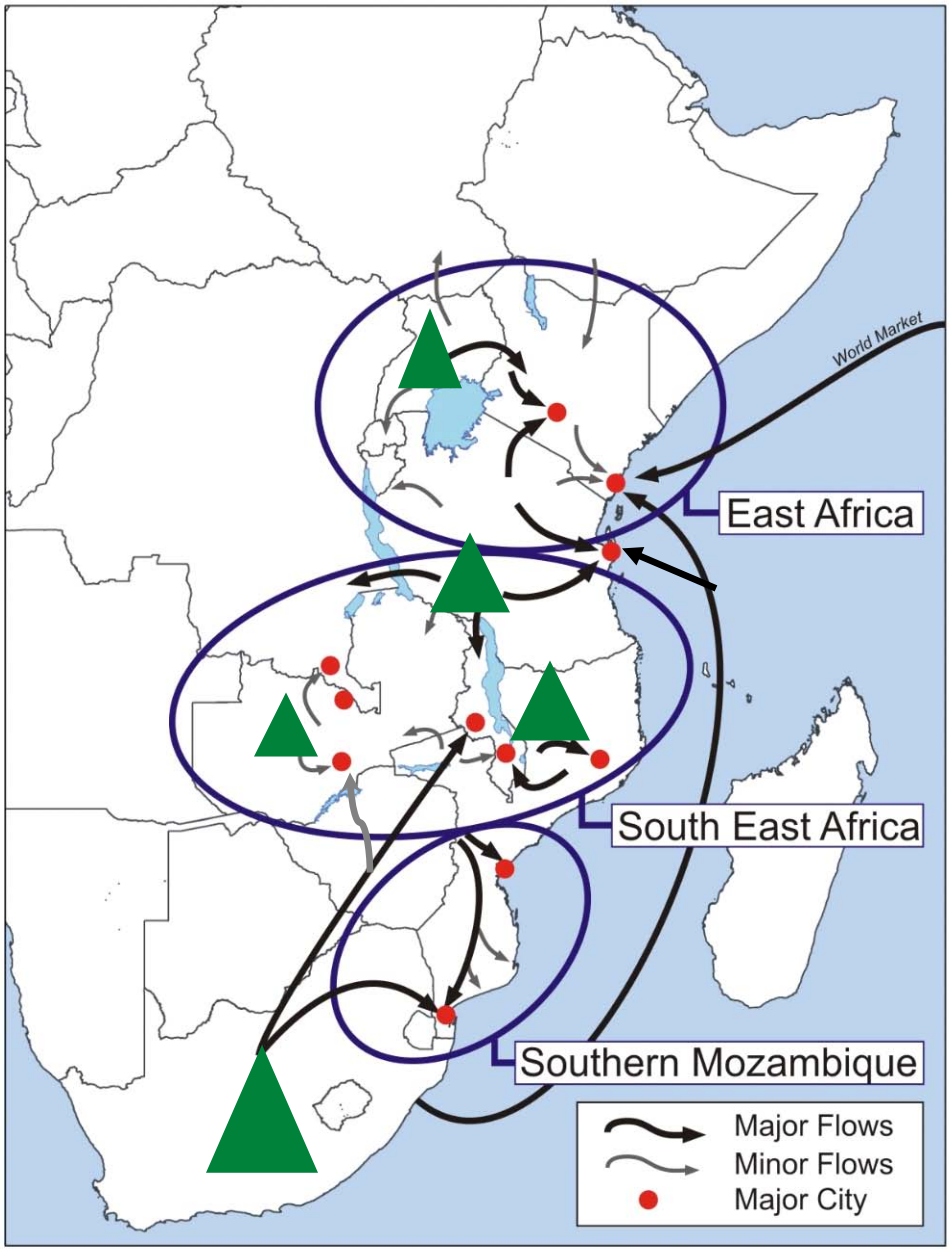
(i) mapping market sheds

Deficit markets



Surplus food production zones

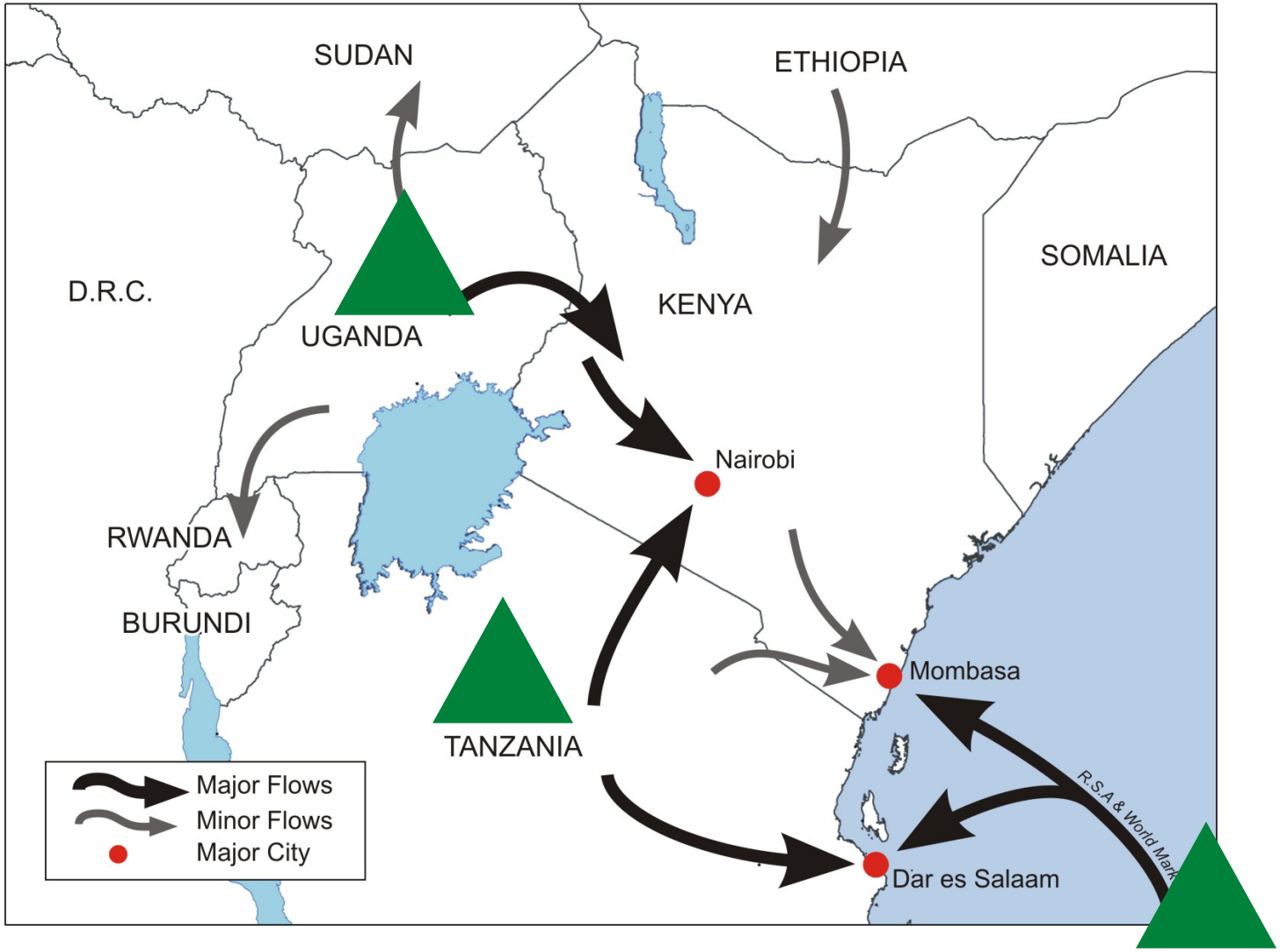
Market Sheds in ESA



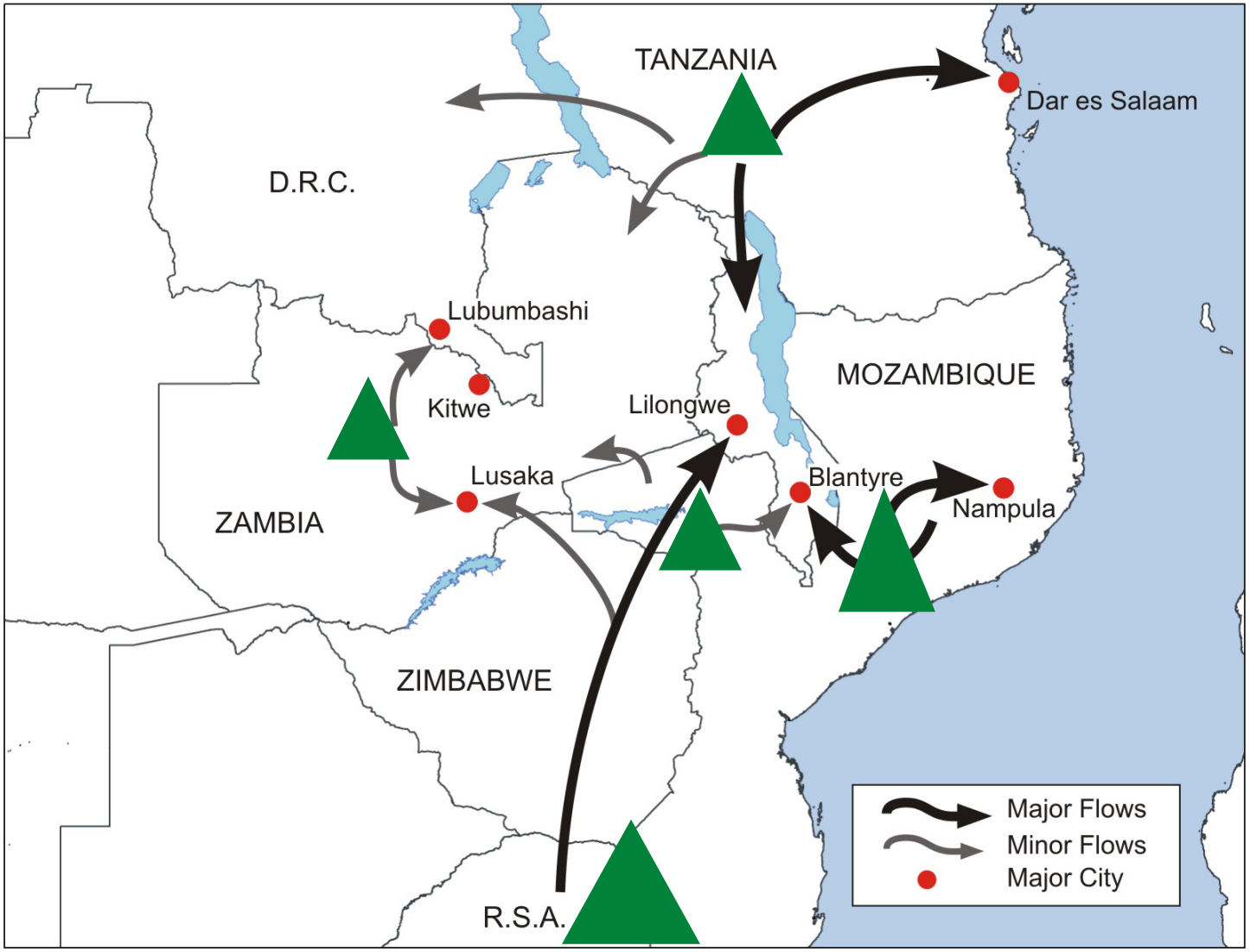
Maize market flows cut across national borders

Surplus Zones	Deficit Markets They Serve
Northern Mozambique	Malawi
Southern Tanzania	Malawi, DRC
Eastern Uganda	Kenya
South Africa	Zimbabwe, S. Mozambique, Malawi, Kenya

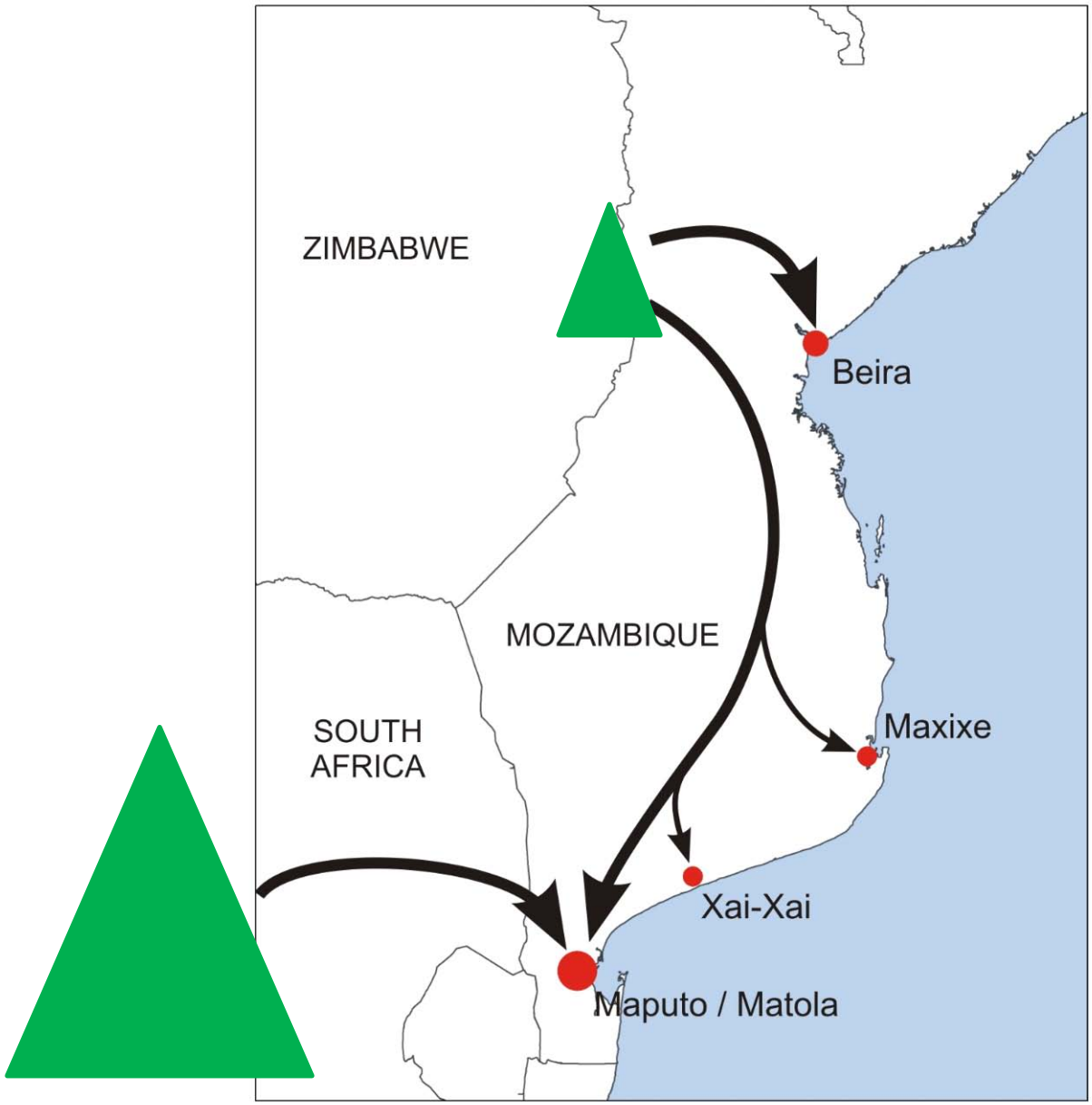
East Africa Maize Market Shed



South East Africa Market Shed



Southern Mozambique Maize Market Shed



Discussion Question: What do we need to map?

- Production:

(ii) GIS concepts and tools: two types of spatial data

- Rasters
- Shapefiles

Rasters

- Grid (digital) data
- Each pixel in the grid has a value
- Examples: rainfall, population

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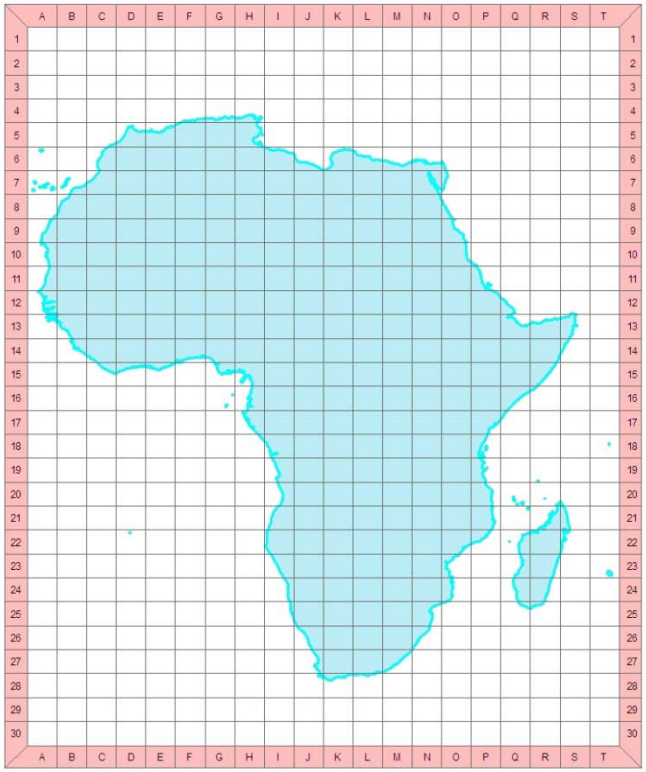
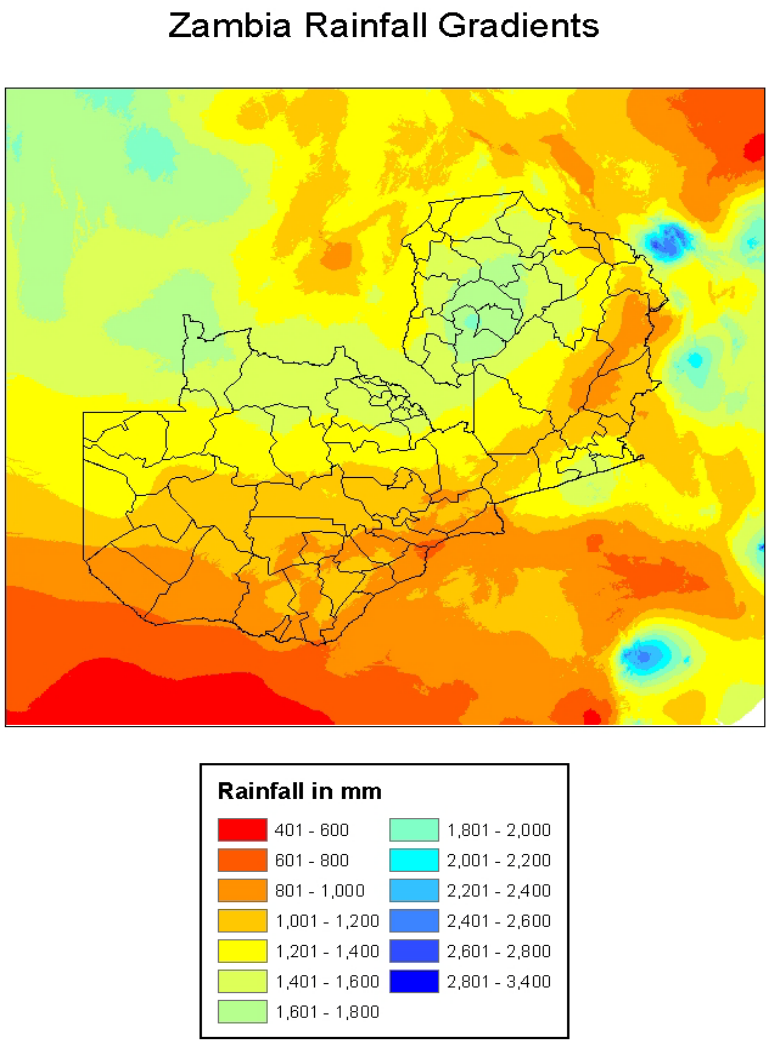
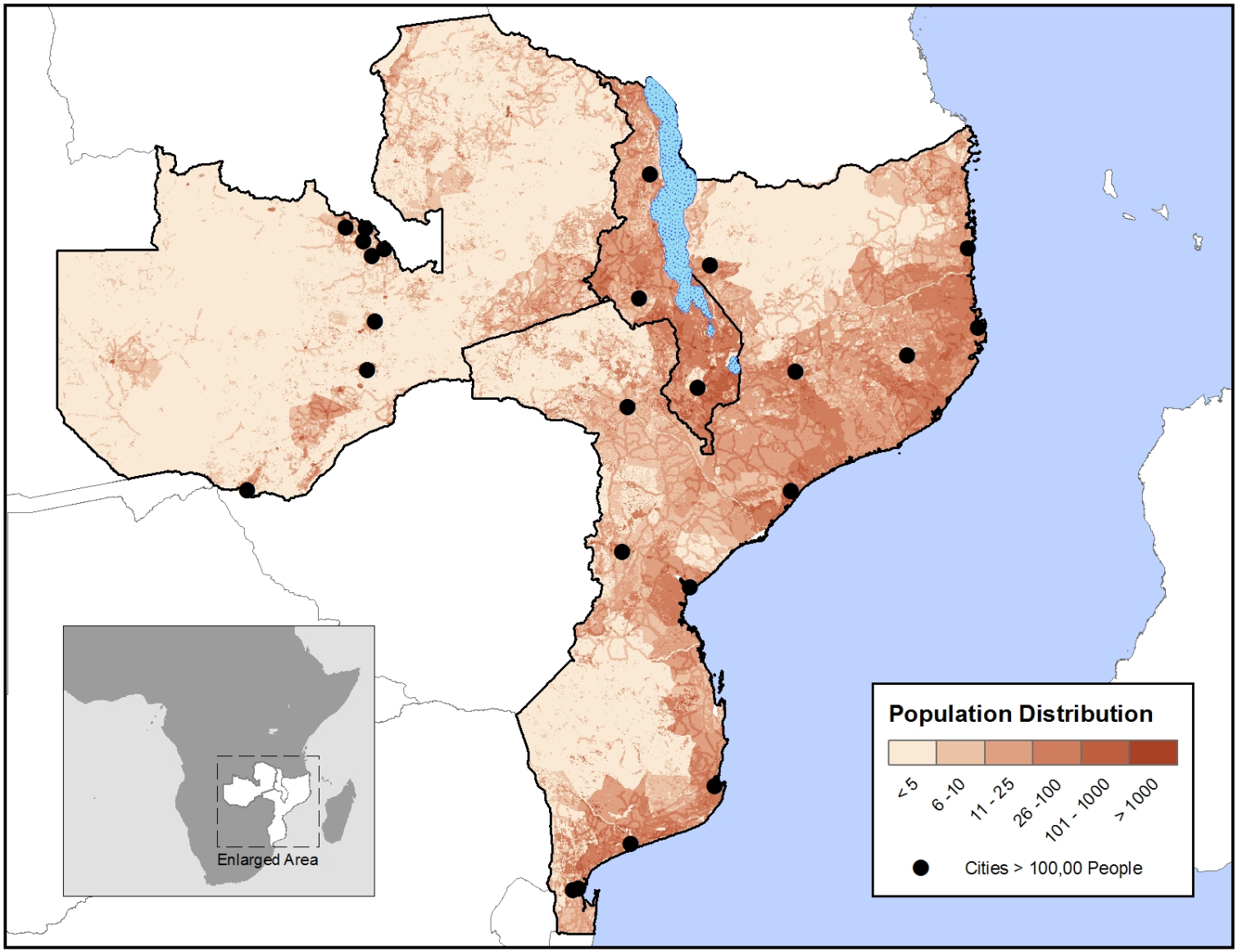


Rainfall raster



Population raster

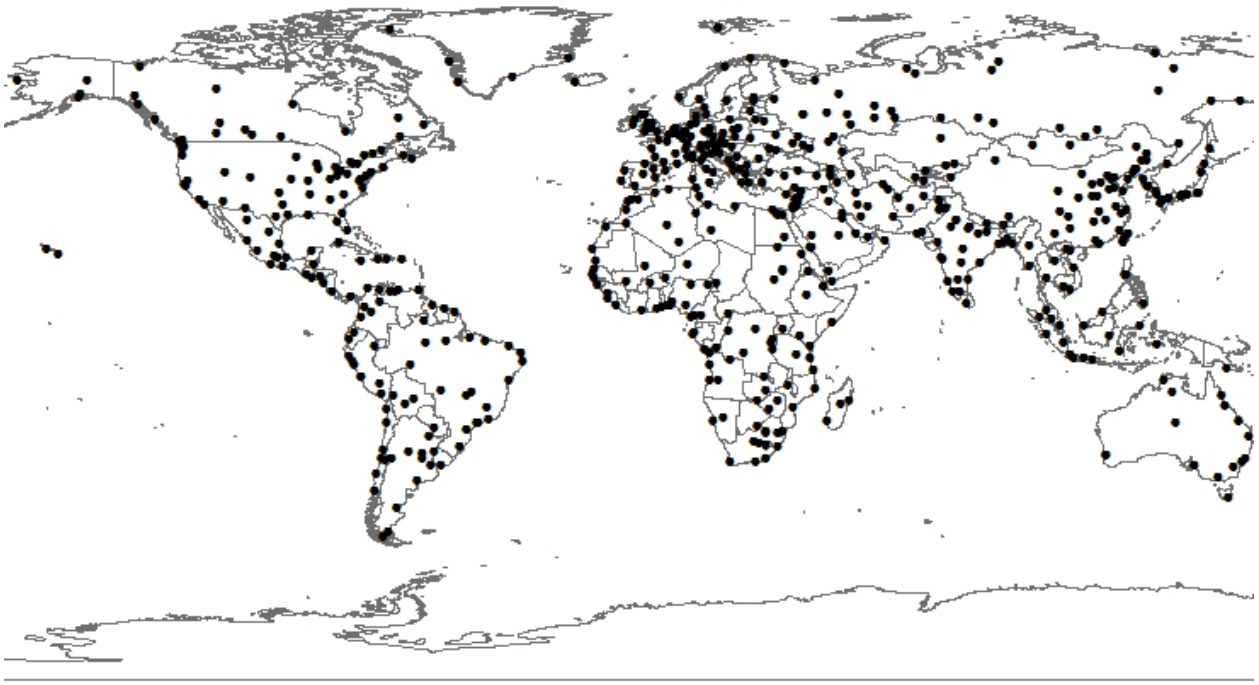


Shape files: three types

- Points: cities, school locations
- Lines: roads, river
- Polygons: districts, lakes

Shape files: Points

Shape files: Points



Shape files: lines

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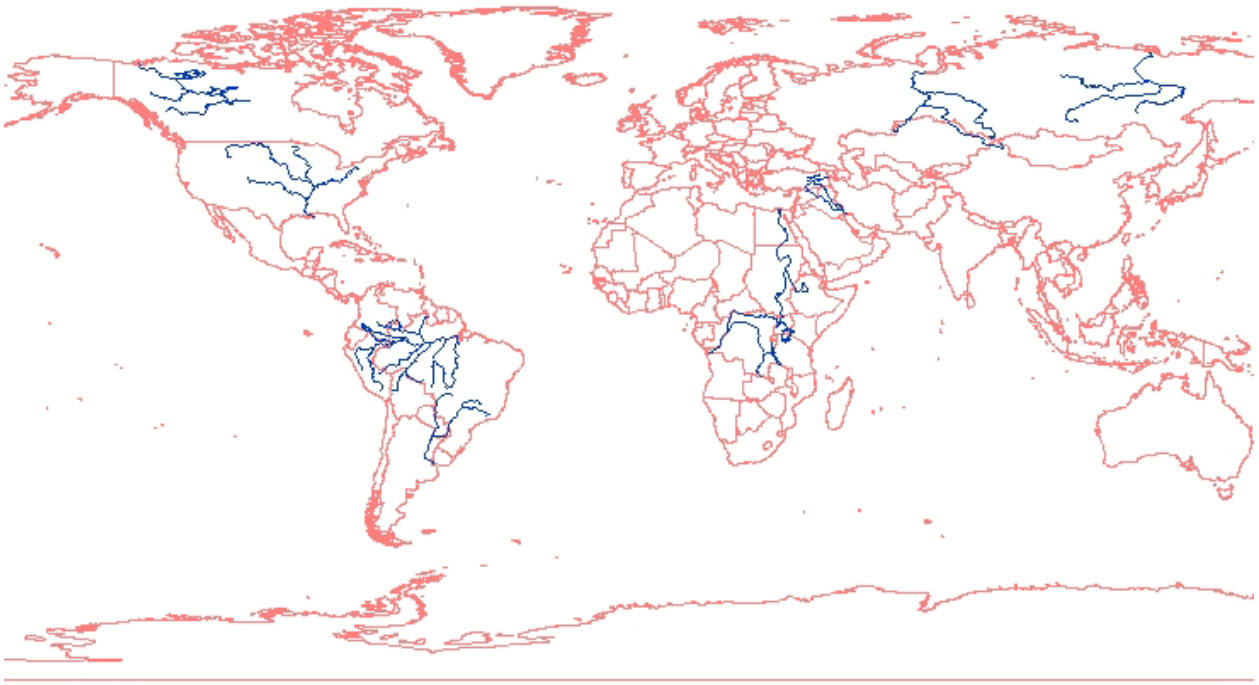
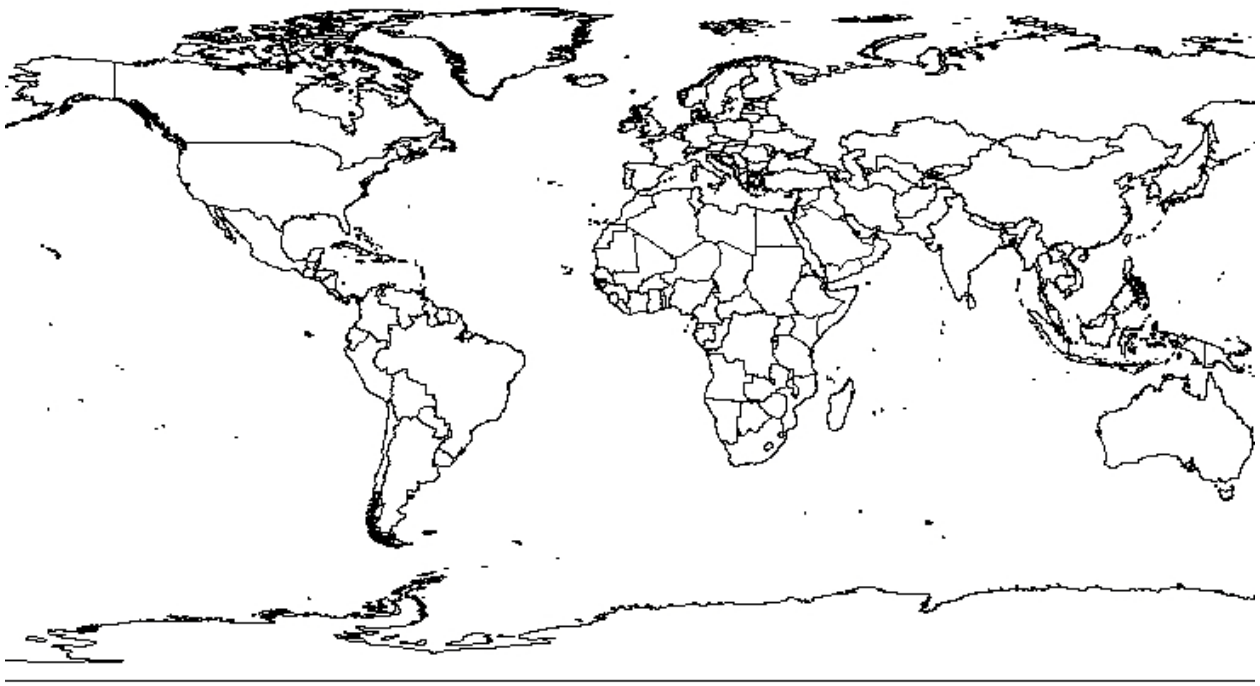
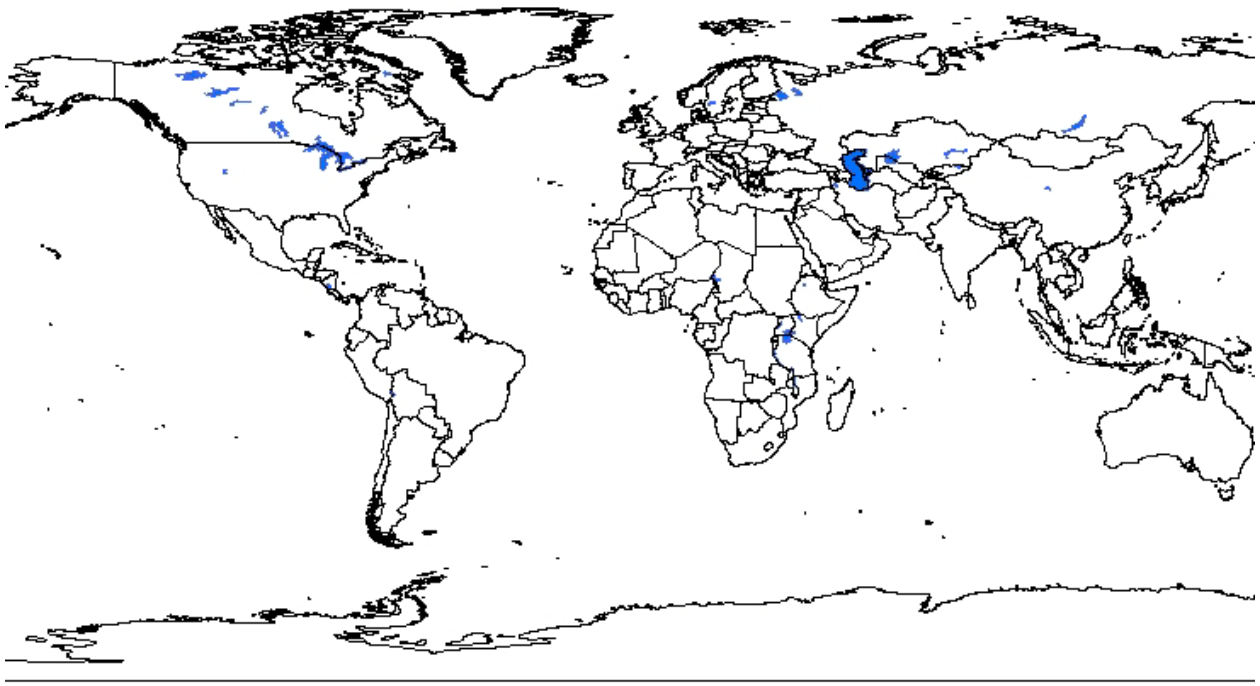


Shape files: polygons



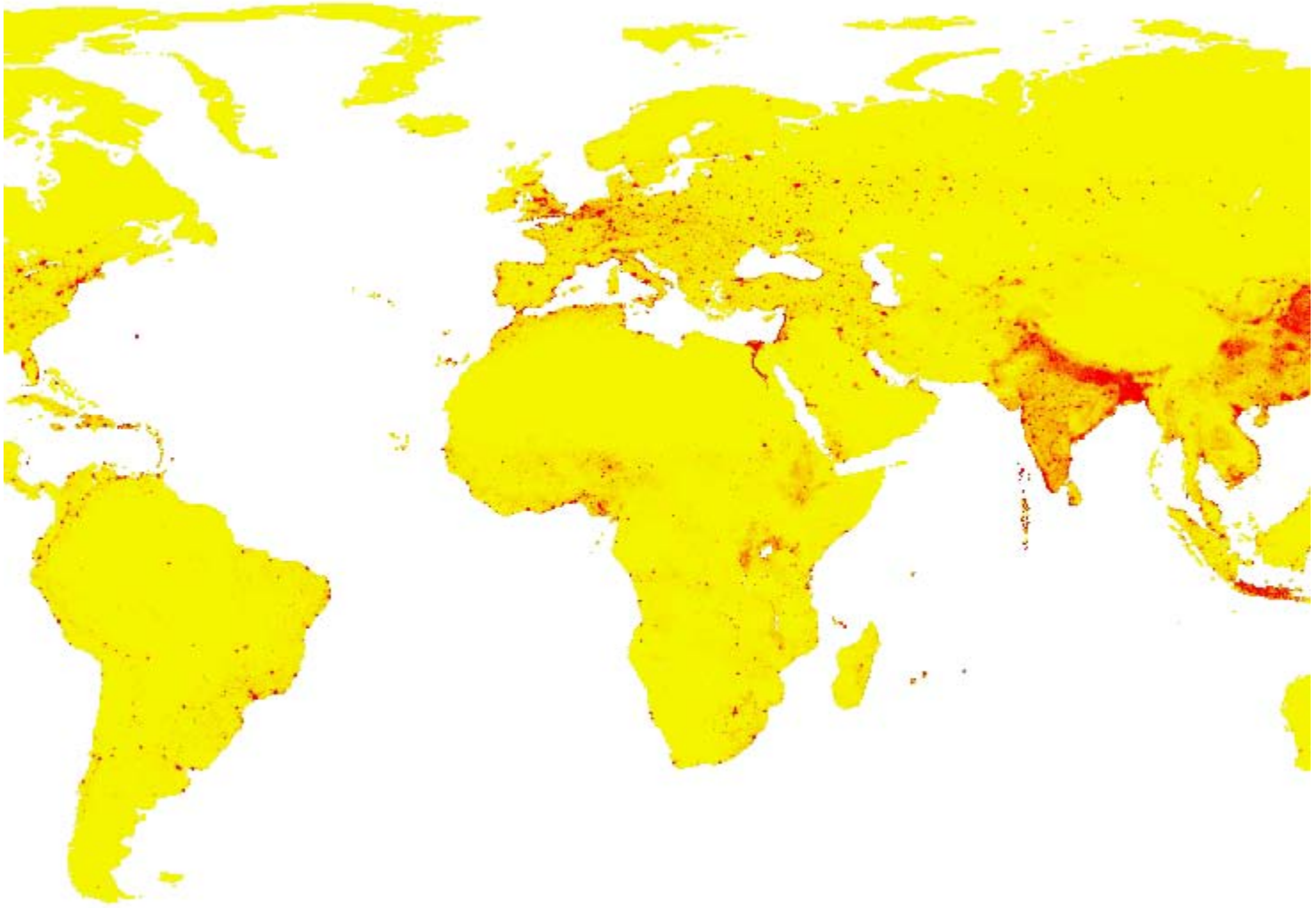
Shape files: polygons



Pop Quiz: Raster or Shape?

- Rainfall
- Districts
- Elevation
- Length of growing period
- Country boundaries

(iii) Raster File: Population

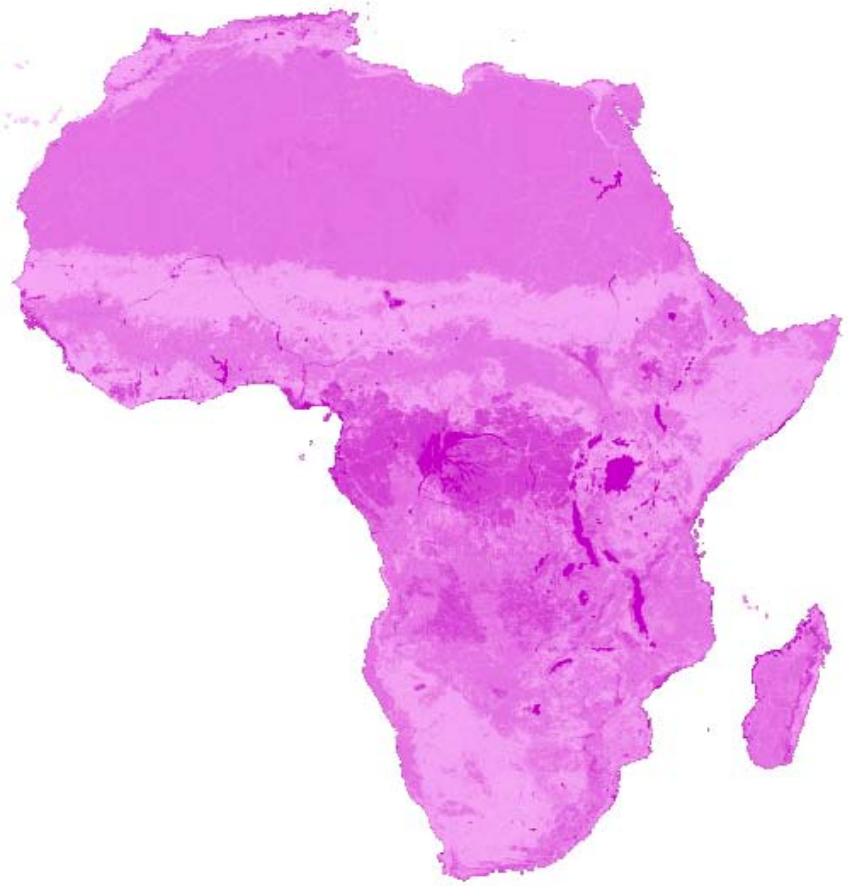


Raster File: Travel Times

- Travel time to market town: what affects travel time?
- Distance
- Road quality
- Frequency of transport

Africa Roads

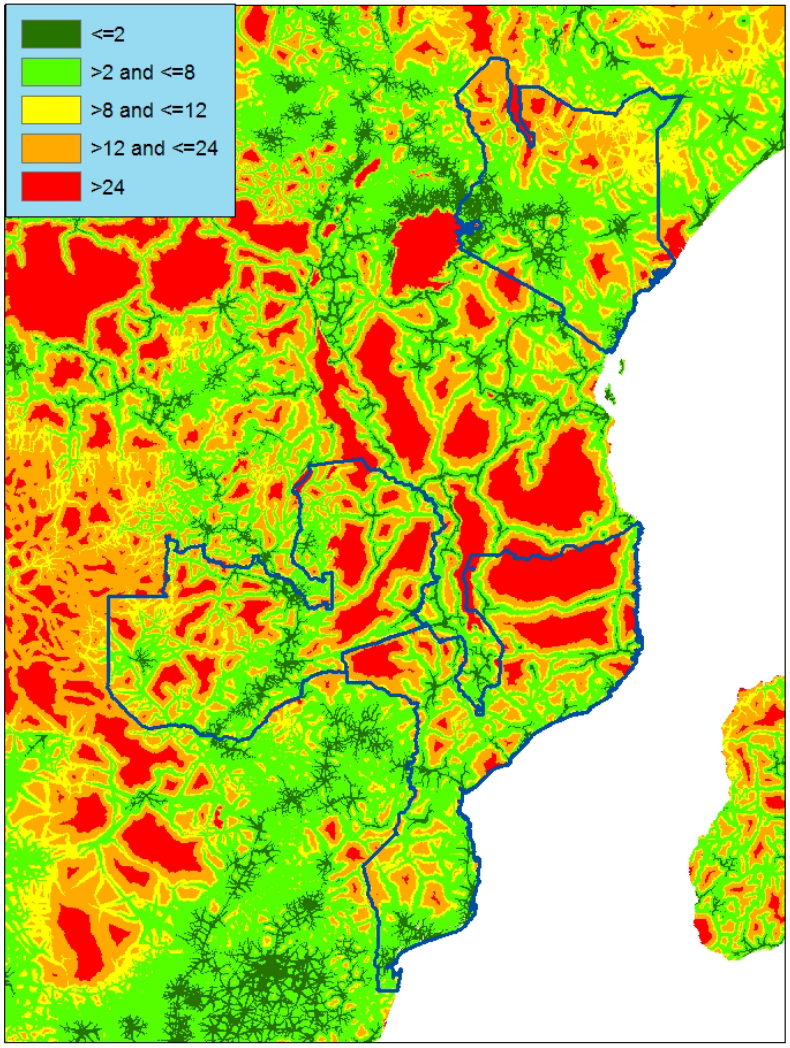
Africa Impedance Raster



Travel Time Raster

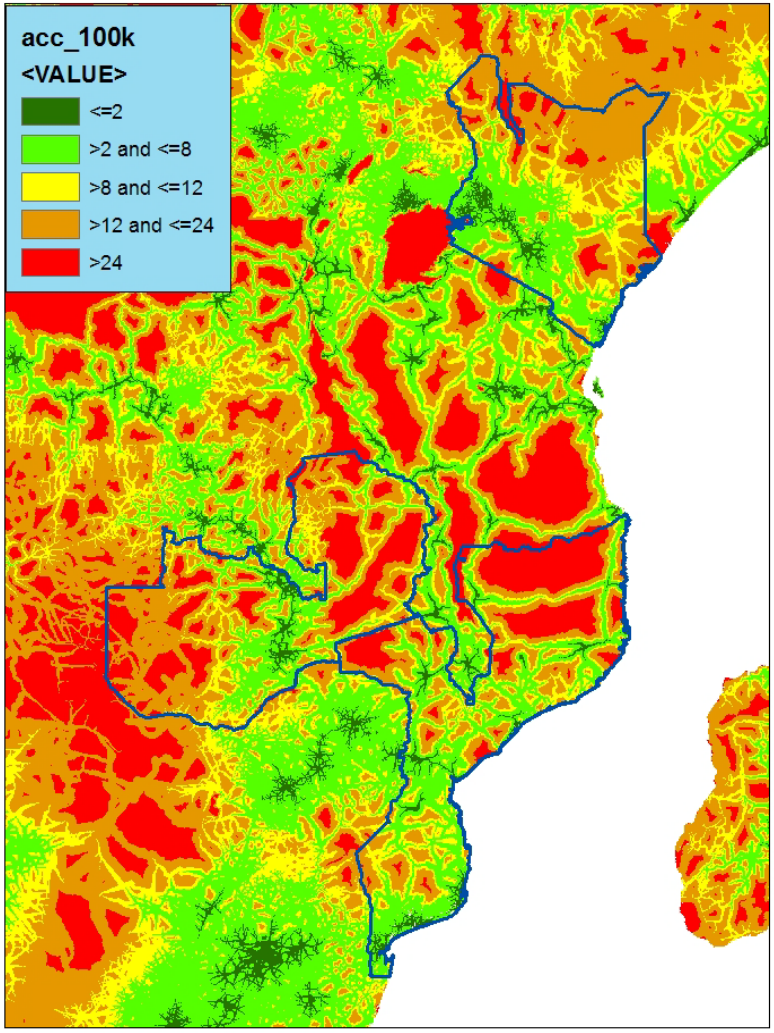
- Select target (cities of specific size)
- Use impedance raster to compute time required travel from each pixel to the target (nearest city of a given size)

Travel time to cities of 20K



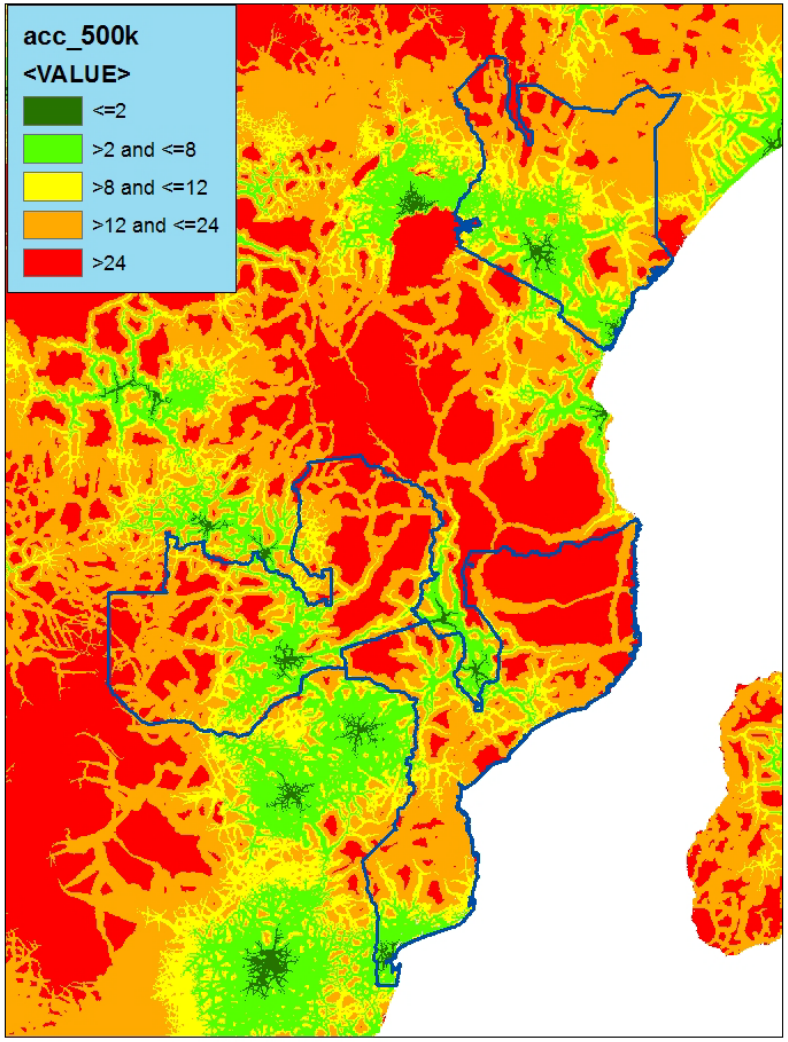
Travel time to cities of 100K

Regional Travel Times to 100k City Size (hours)



Travel time to cities of 500K

Regional Travel Times to 500k City Size (hours)



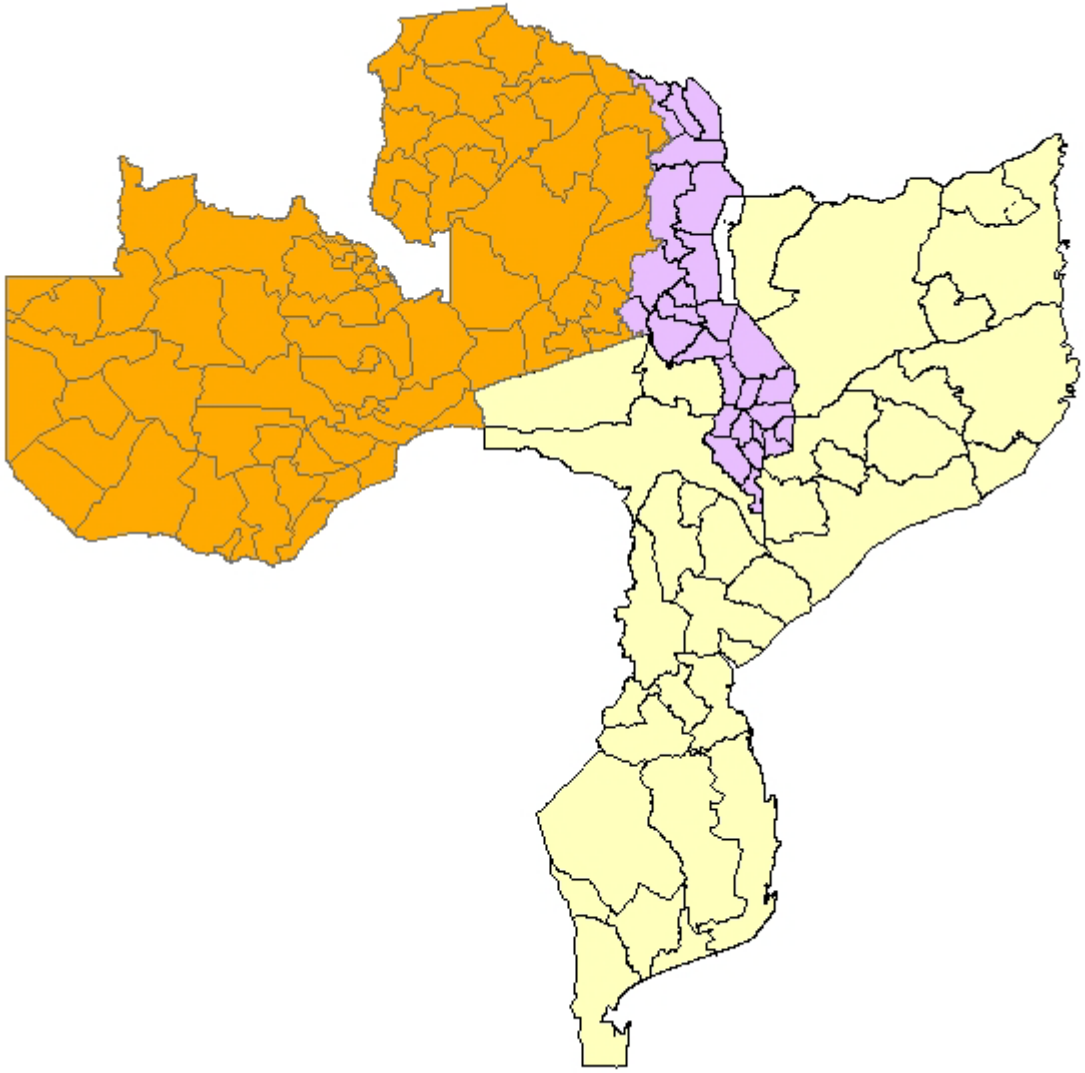
Discussion questions

- For what sorts of analysis might raster data be useful?

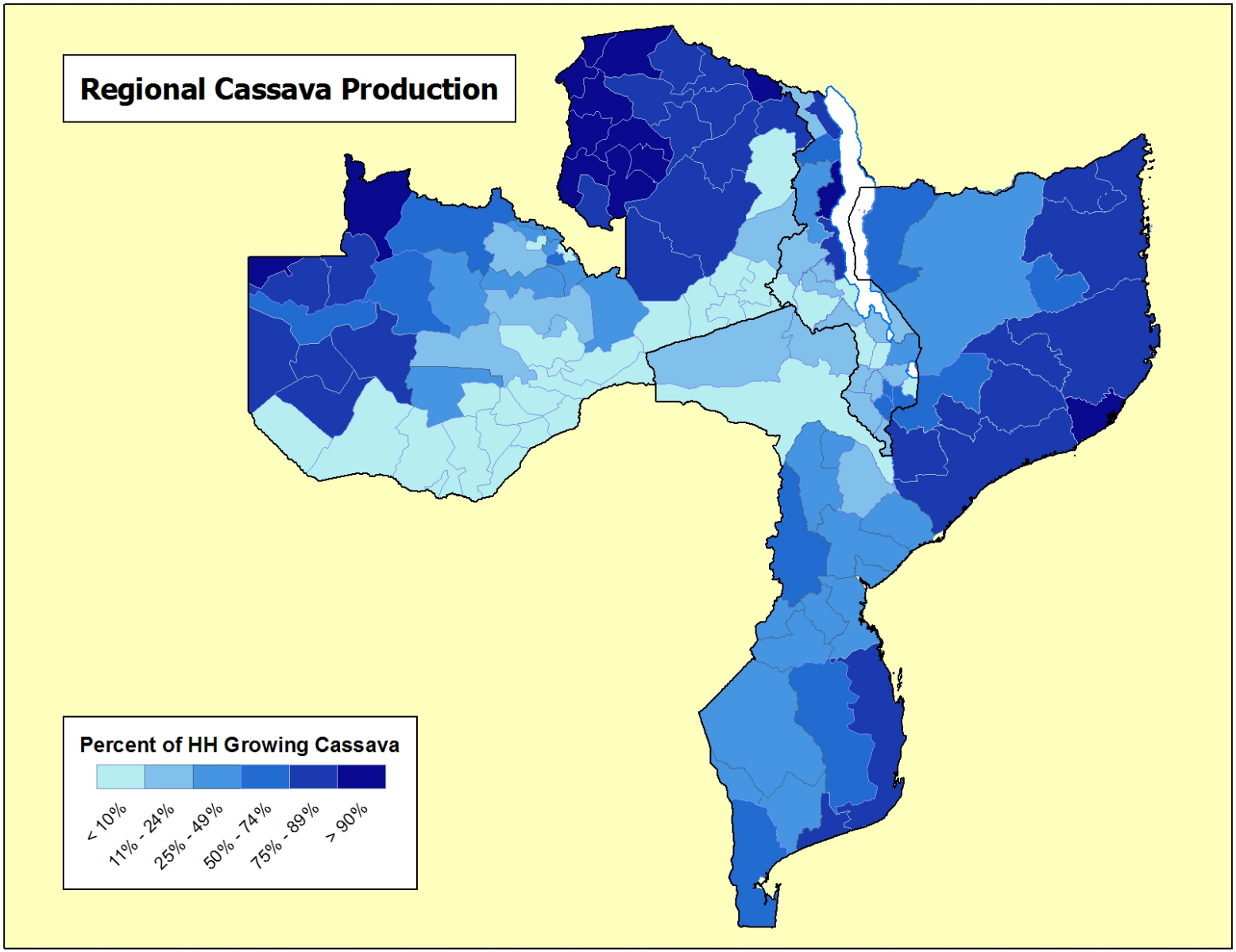
(iv) shape files: mapping food staple zones

- Maize production
- Cassava production
- Define maize belt, cassava belt, and dual staple zones
- Surplus and deficit districts

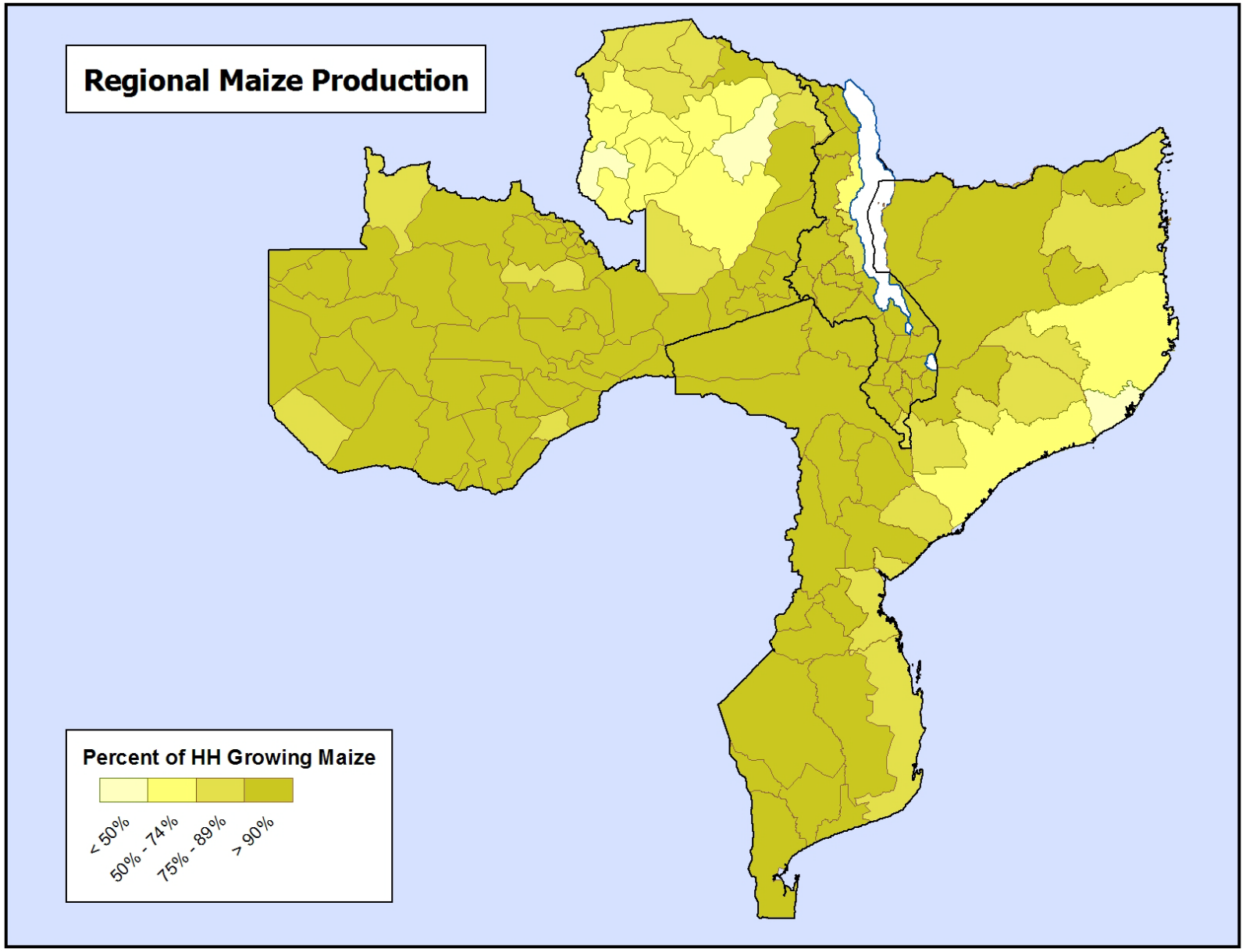
Shape files: polygons



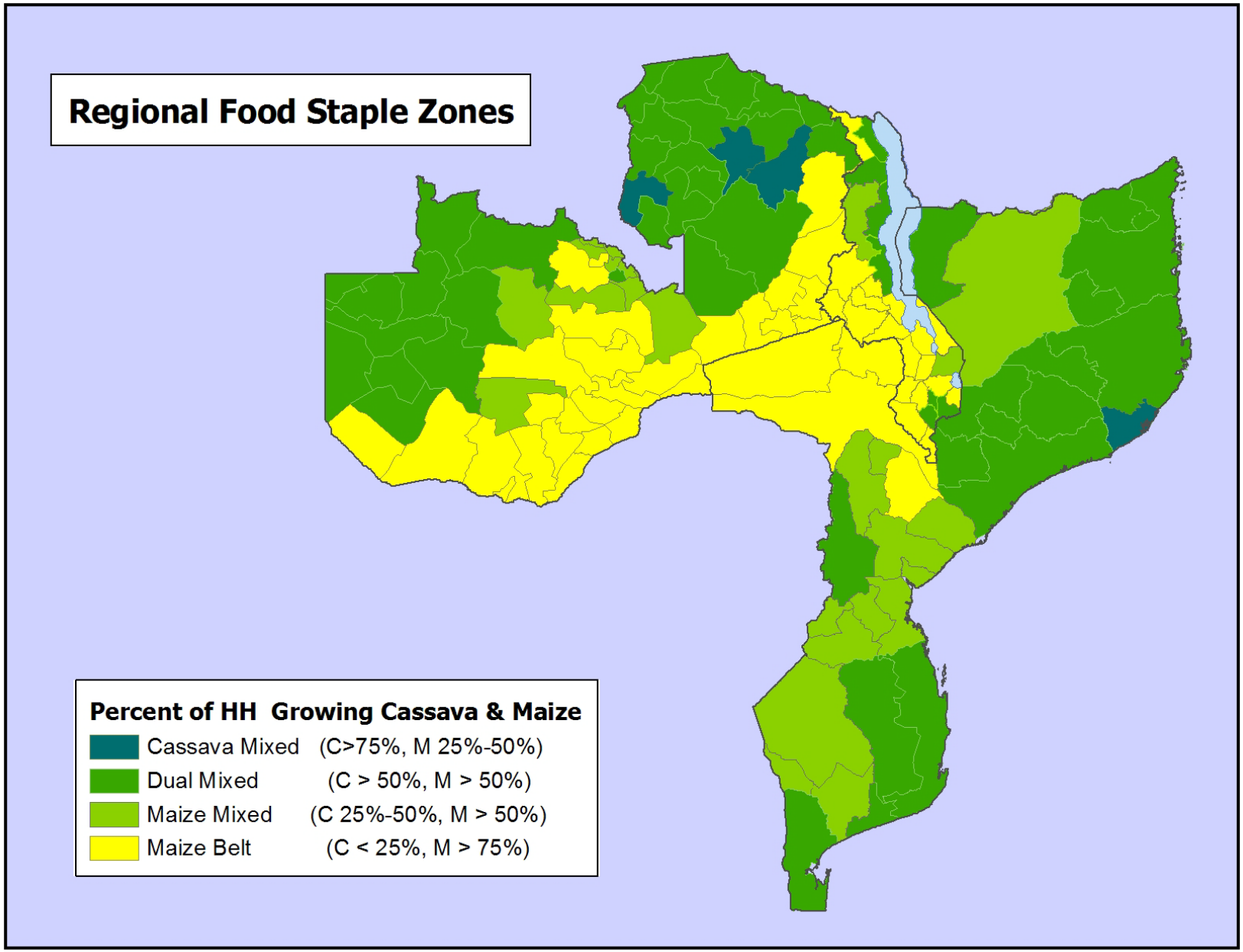
Cassava production



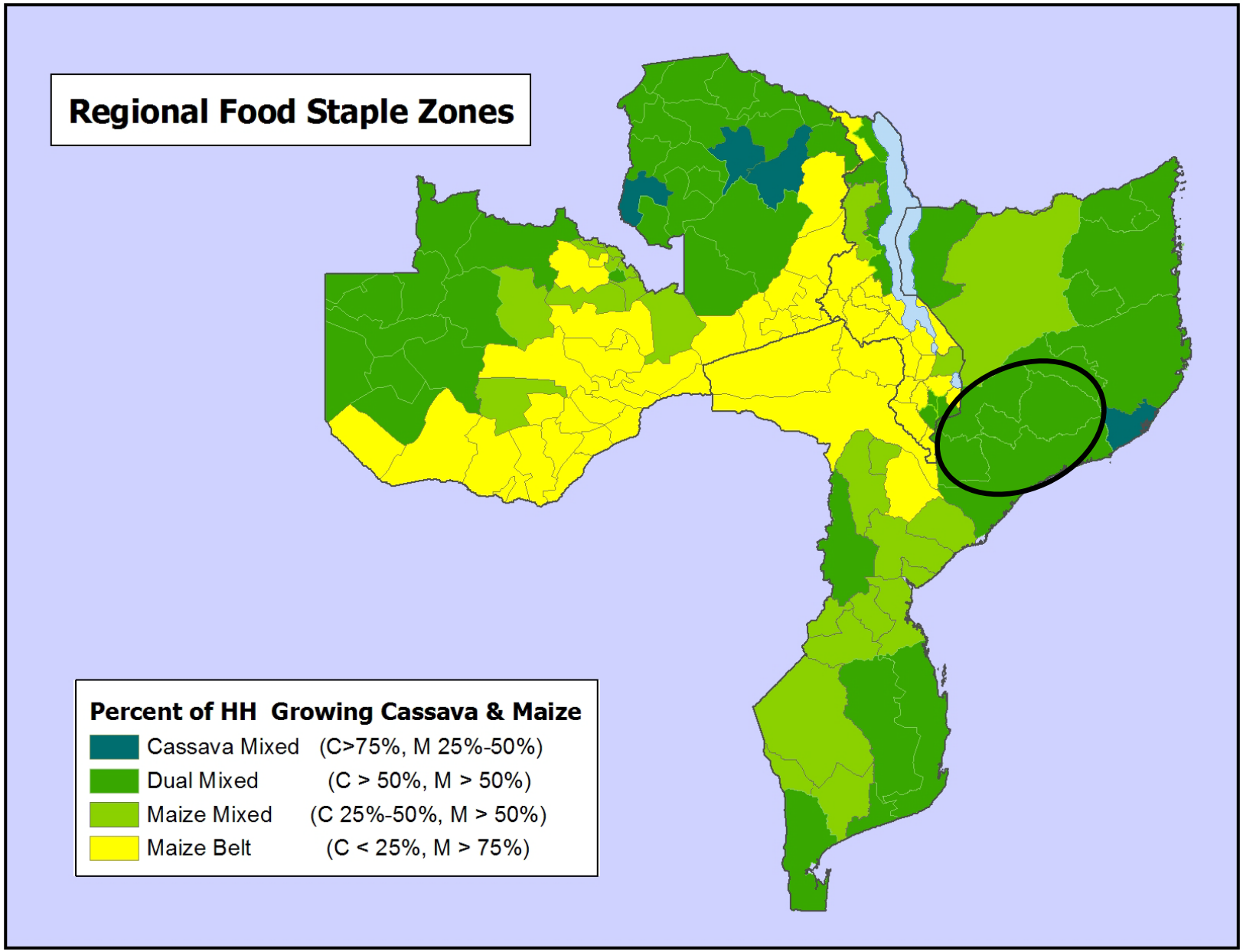
Maize production



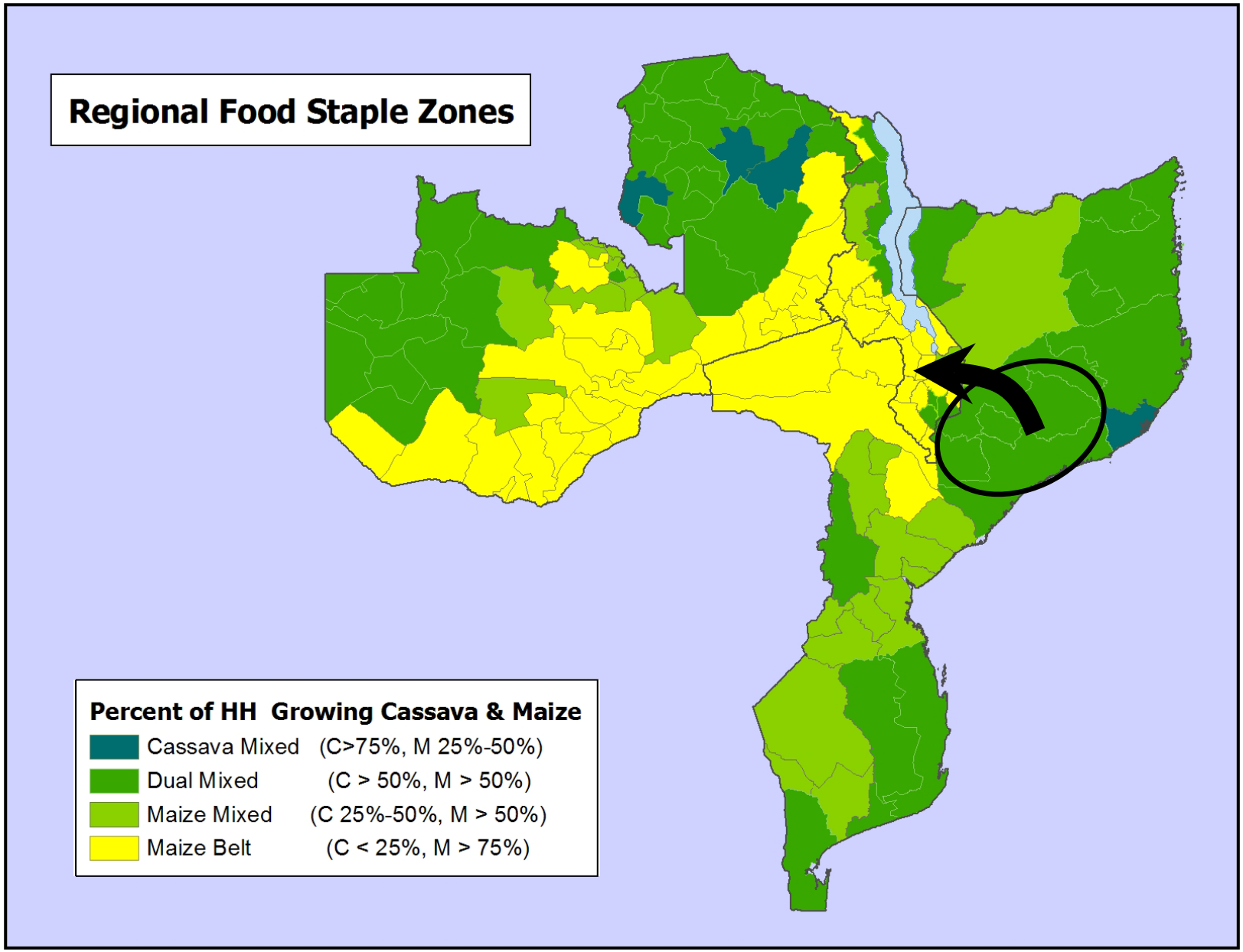
Food staple zones



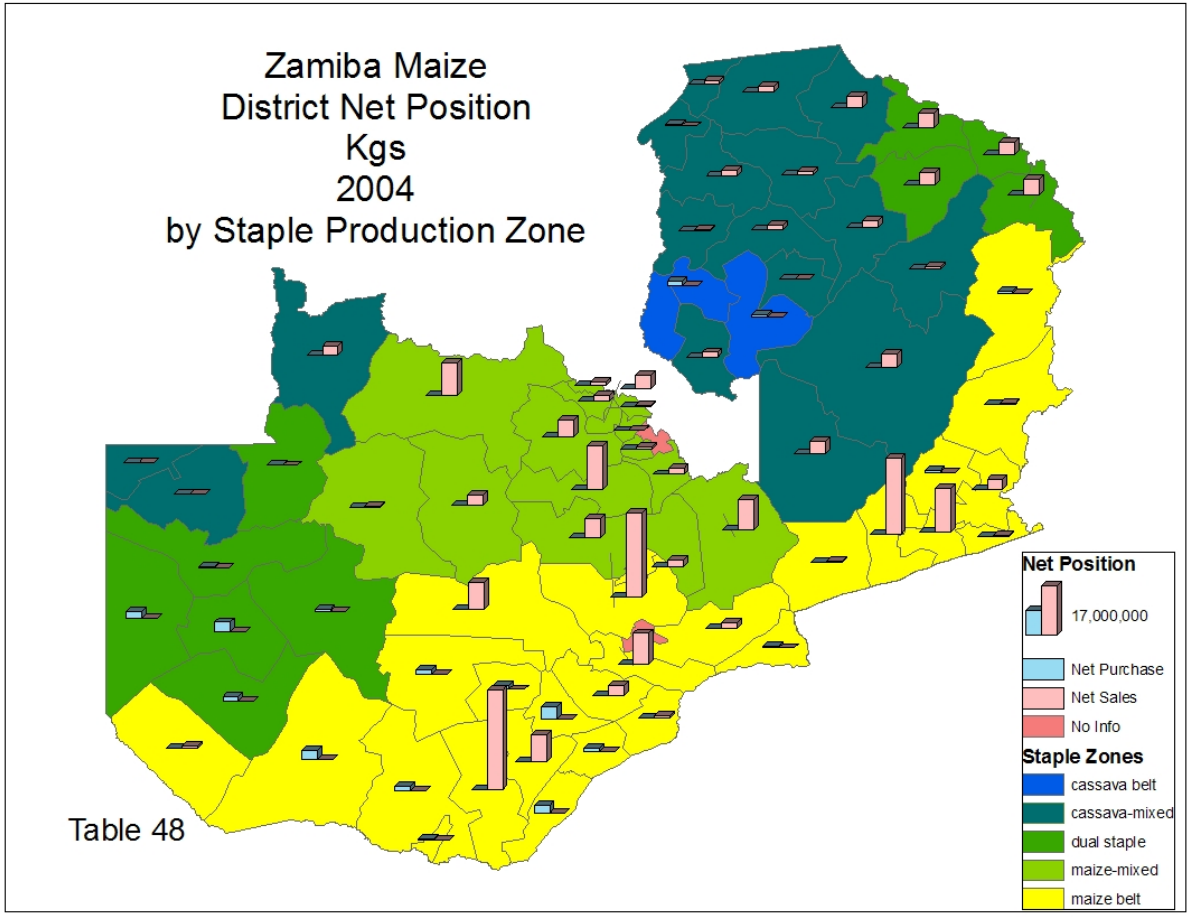
Dual staple zones



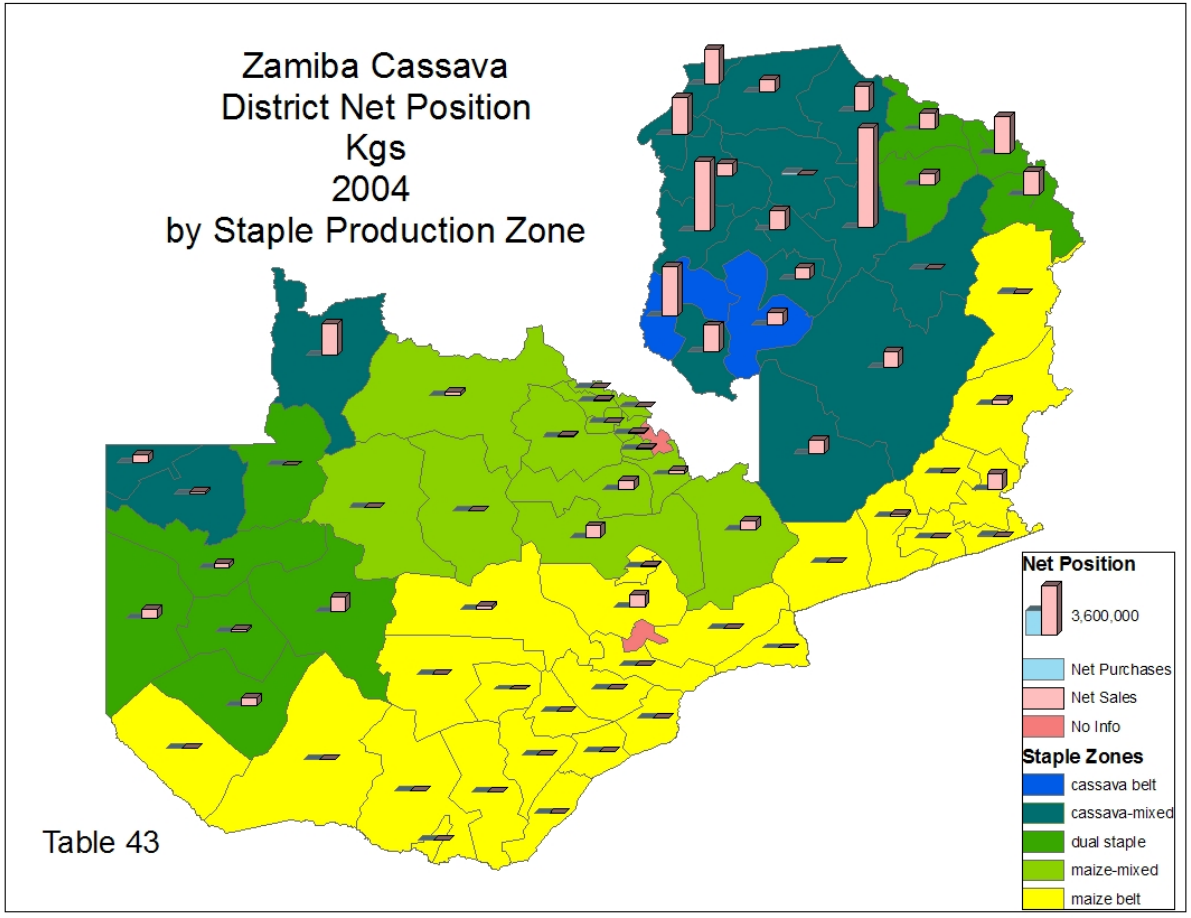
Dual staple zones



Net Maize Surplus, by District



Net Cassava Surplus by District



Final Examination

- What is a raster?
- What is a shapefile?
- Propose a specific spatial food policy question from your home country.
- Specify what types of GIS data you would need to conduct such an investigation?