Demographic Trends and Current Living Condition of an underpopulated area

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Purposes

To analyze the current and future demographics of the settlements of underpopulated town in Japan.

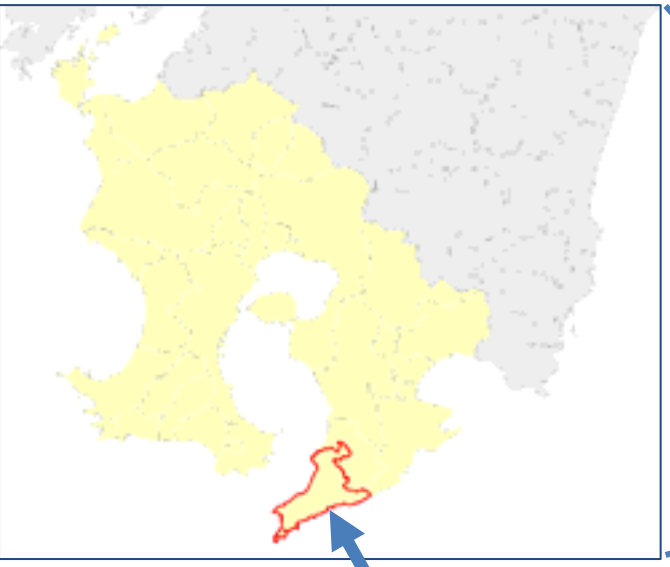
Introduction

- “Minami-ohsumi town”, located in the southernmost of Mainland Japan, is outstanding in aging population combined with the diminishing number of children
- More than half of its 109 settlements are called “Genkai-Shuraku (marginal settlement)” which means more than 50% of its residents are older than 65.

Where is Minami-Ohsumi ?

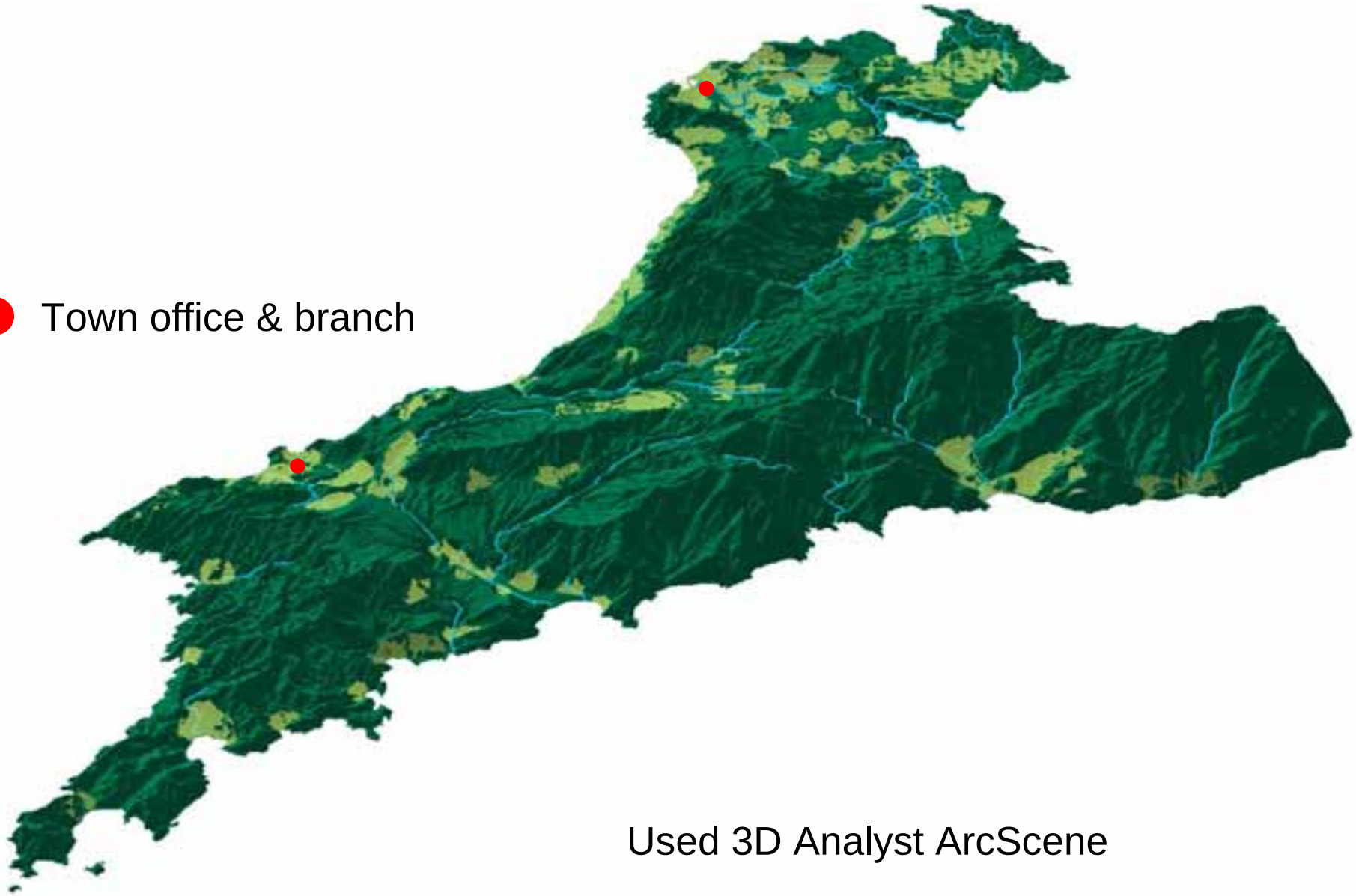
Japan

Kagoshima Prefecture (yellow)



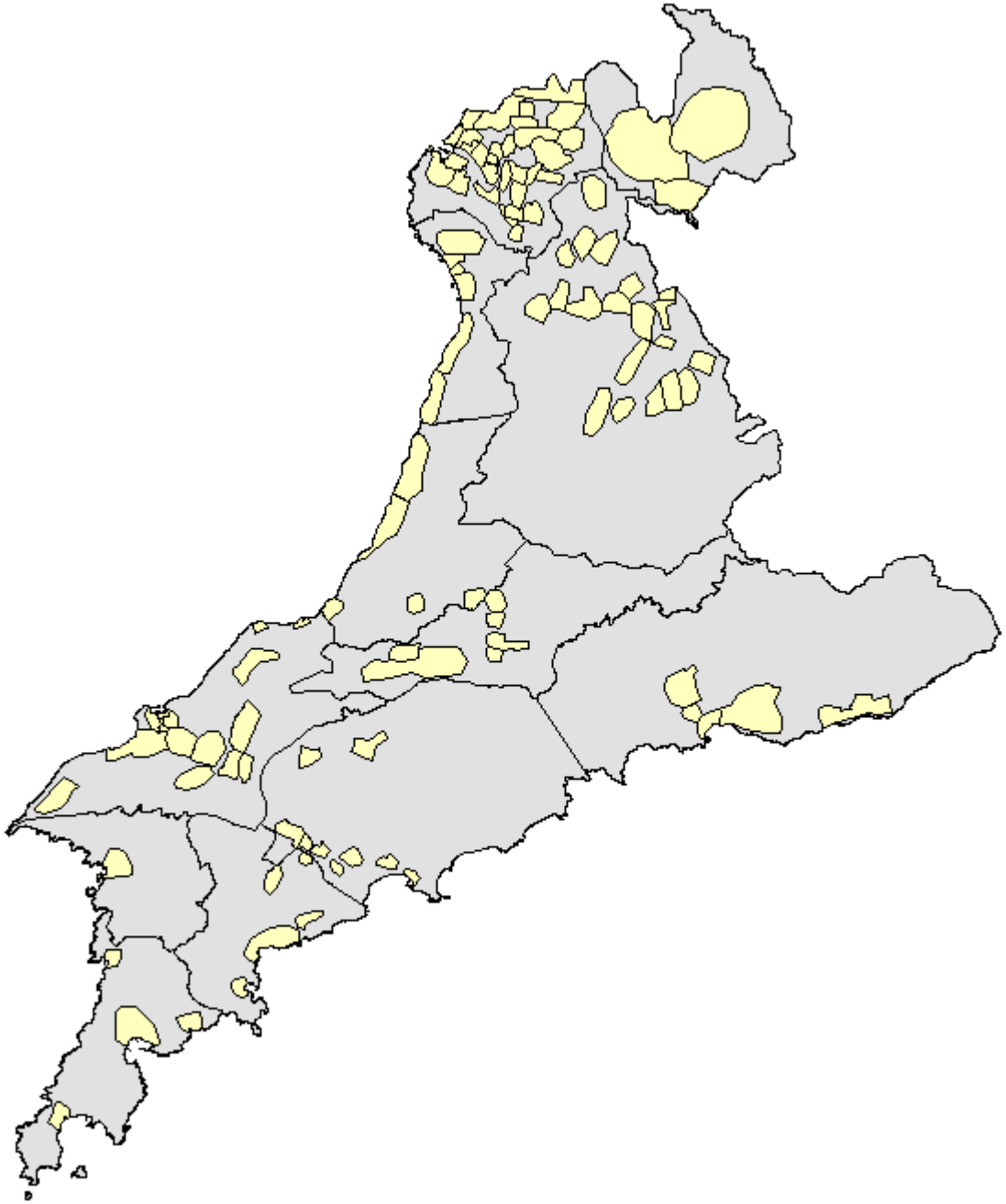
Minami-ohsumi

Topography & Settlements of Minami-ohsumi



Used 3D Analyst ArcScene

Map of Settlements in Minami-ohsumi



About Minami-Ohsumi

- Main Industry
  - Agriculture and Forestry, livestock farming and fishing industry
- Demographics
  - 9,027(as of April 2009)
  - Ratio of elderly people aged 65 or over ：43.1%(the highest graying municipality in Kagoshima Pref.)
  - Significant population decrease
    - no. of fatalities > no. of live births
    - no. out-migrants > no. of in-migrants

Method

- Reseach site
  - Minami-Ohsumi, a town located in the southernmost of mainland Japan
- Data collection
  - Demographic data (2008)
    - Population, no. of households, no. of households with elderly only, no. of households with single elderly
  - Estimation of future population (2010 - 2030)
  - Road distance between each neighborhood & town office
- Classification of settlements
  - Principal component analysis
    - 10 demographic variables → 4 principal components

Method(continued)

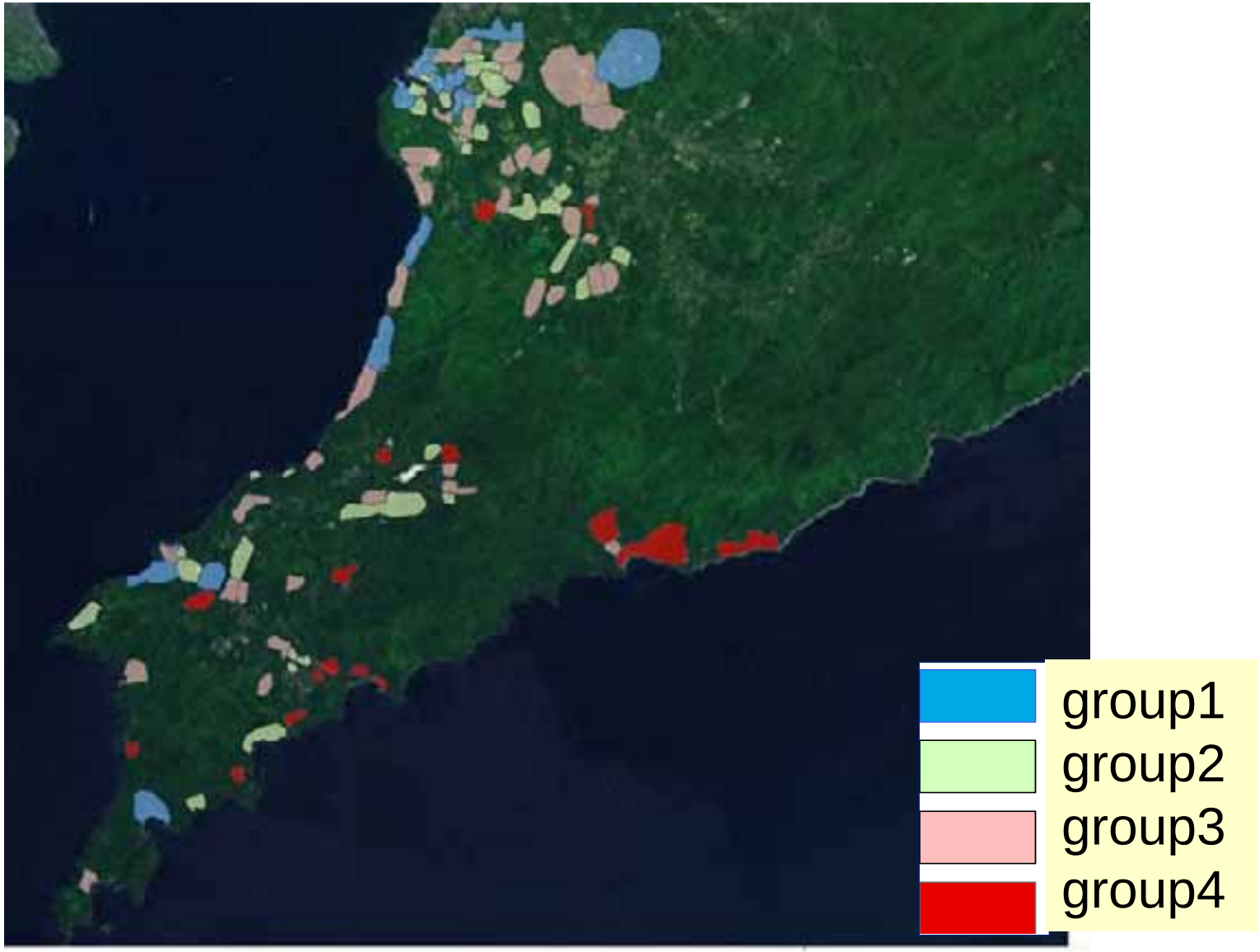
- Multiple regression analysis
  - Explanatory variables: 4 principal components
  - Dependent variable: population aging rate
  - 3 principal components(age, population, household size) are sorted.
  - Age accounts for 60% of variation of population aging rate
- Cluster analysis
  - Use 3 principal components
  - Classified settlements into 4 groups
    - group1: low average age & thickly-populated
    - group2: low average age & thinly-populated
    - group3: high average age & thinly-populated
    - group4: high average age, thinly-populated & large elderly households

Methods(continued)

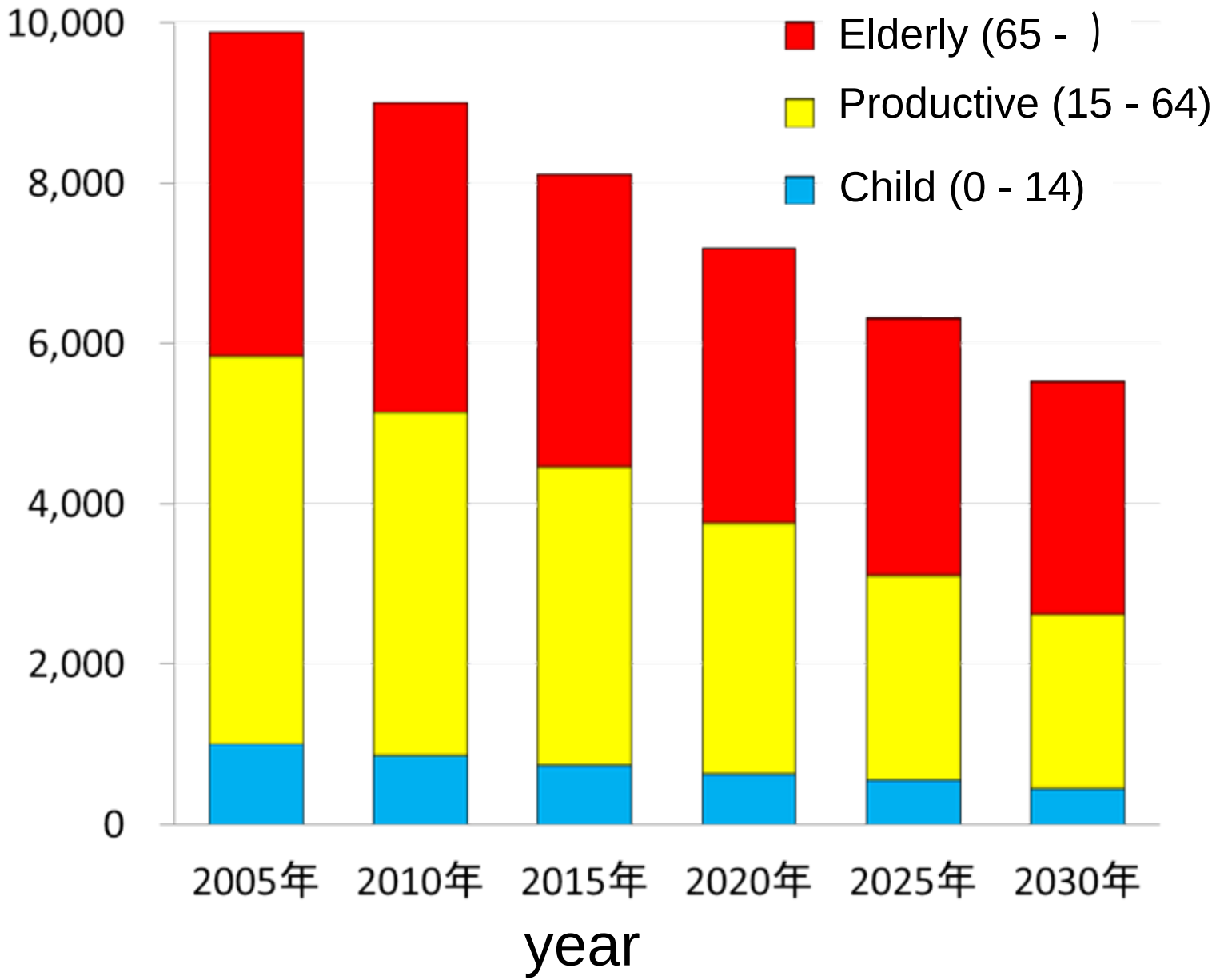
- Estimation of future population (2010 -2030)
  - Use “cohort-component method”
    - use survival rate, birthrate, migration rate and sex ratio of newborns
  - Population of male and female, 5-years age brackets
  - Estimate for 2010, 2015, 2020, 2025 and 2030

Results

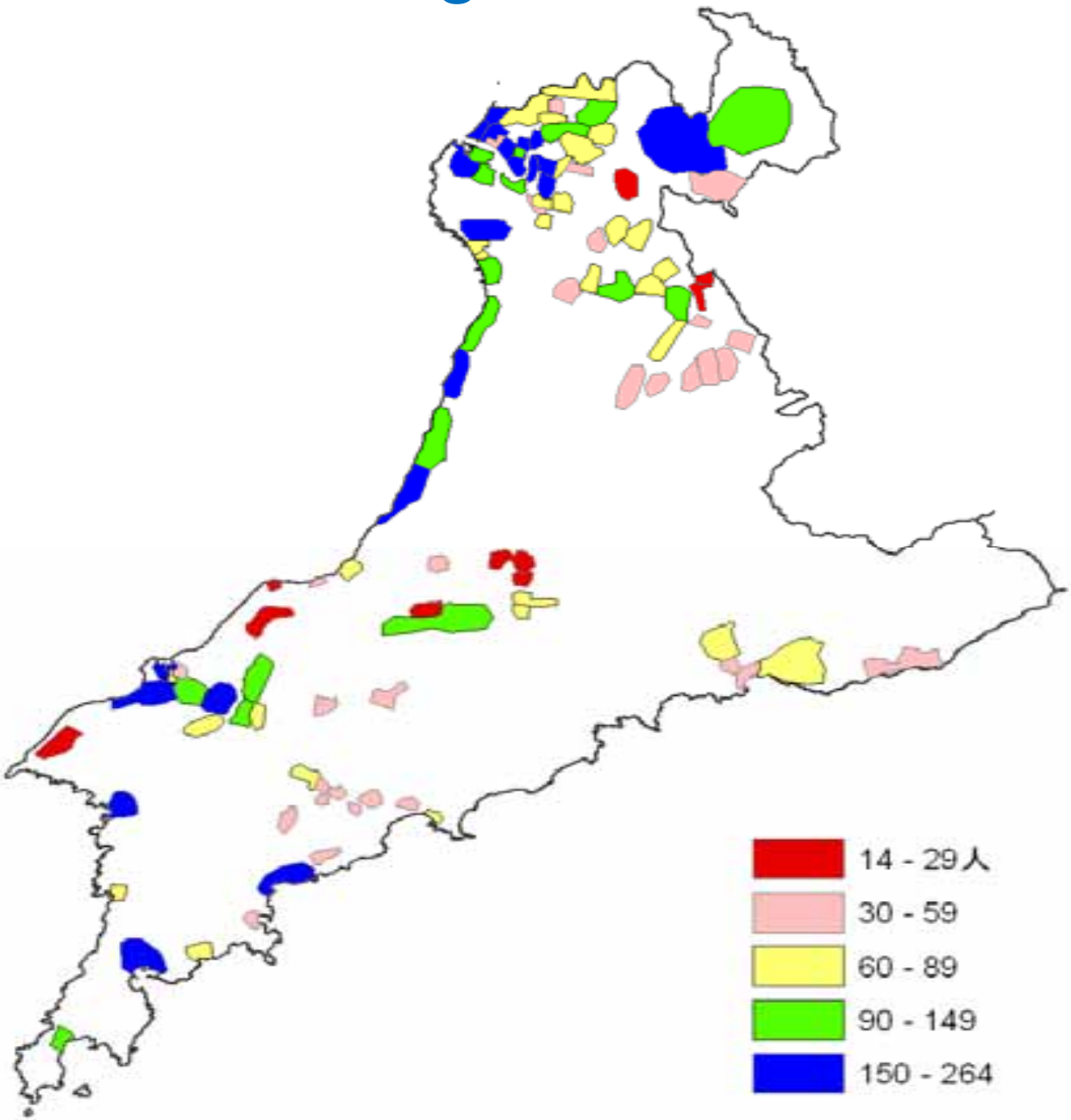
Settlements classified into 4 groups



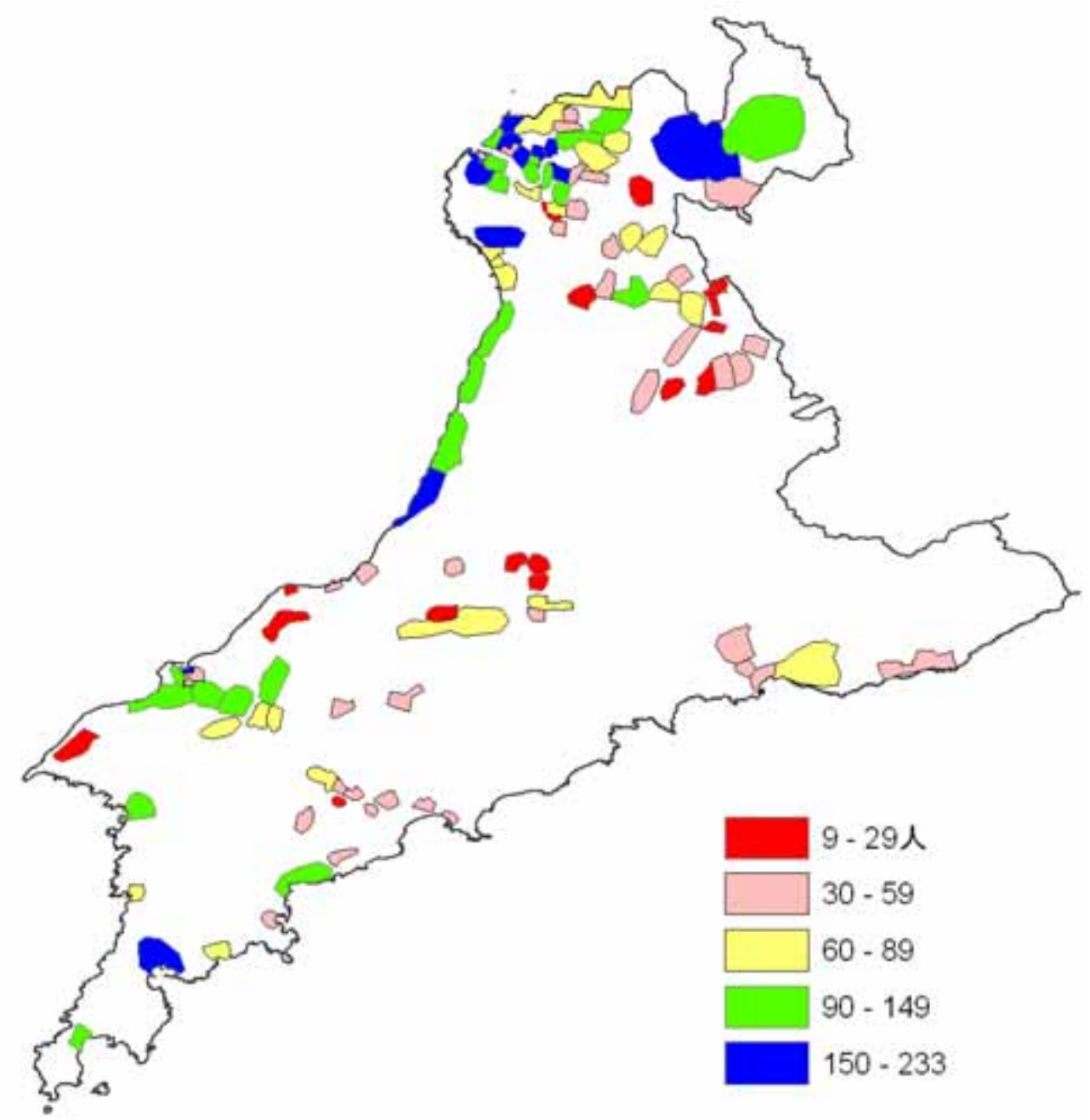
Changes in population of Minami-ohsumi



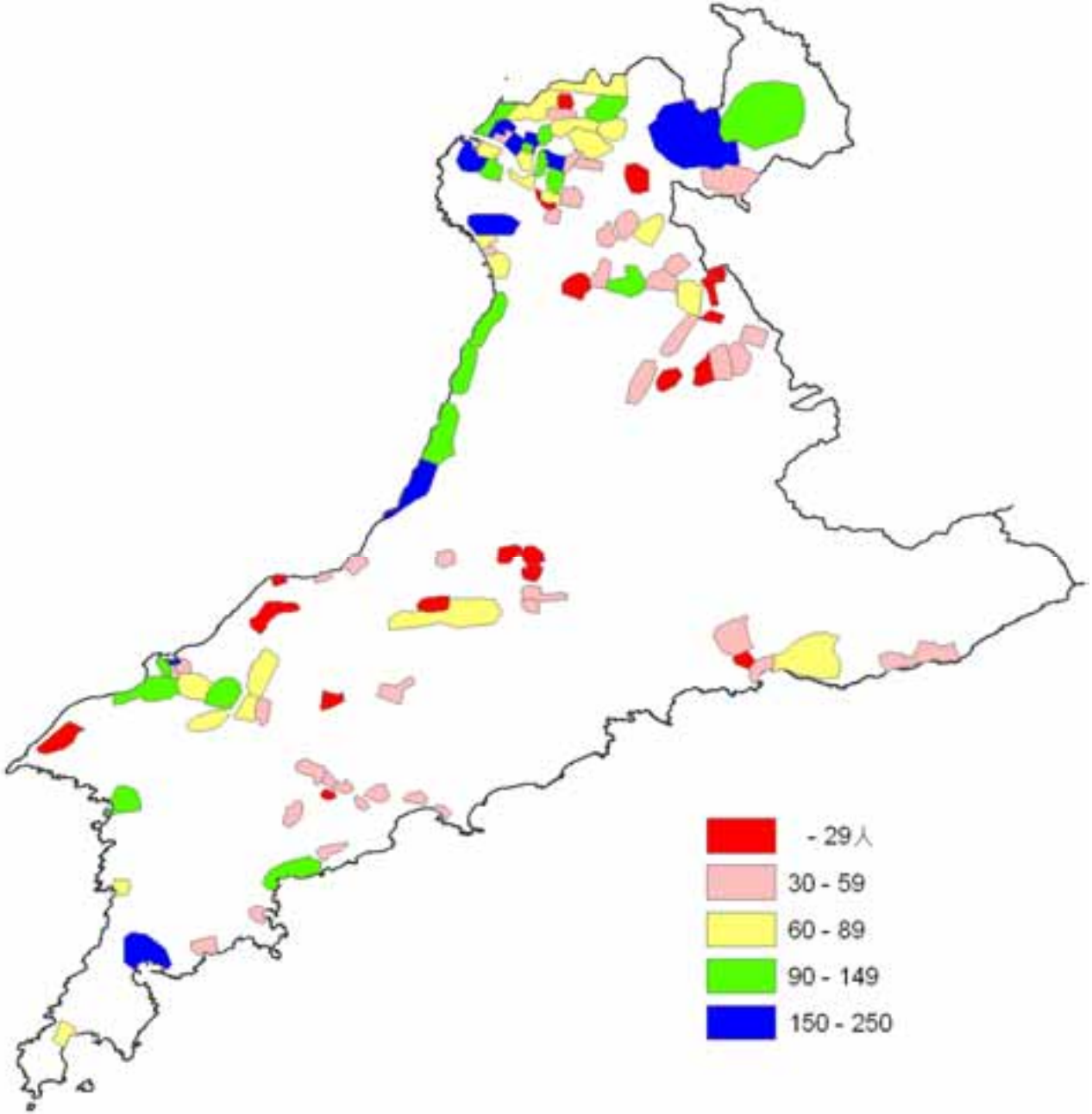
Population change for each settlement



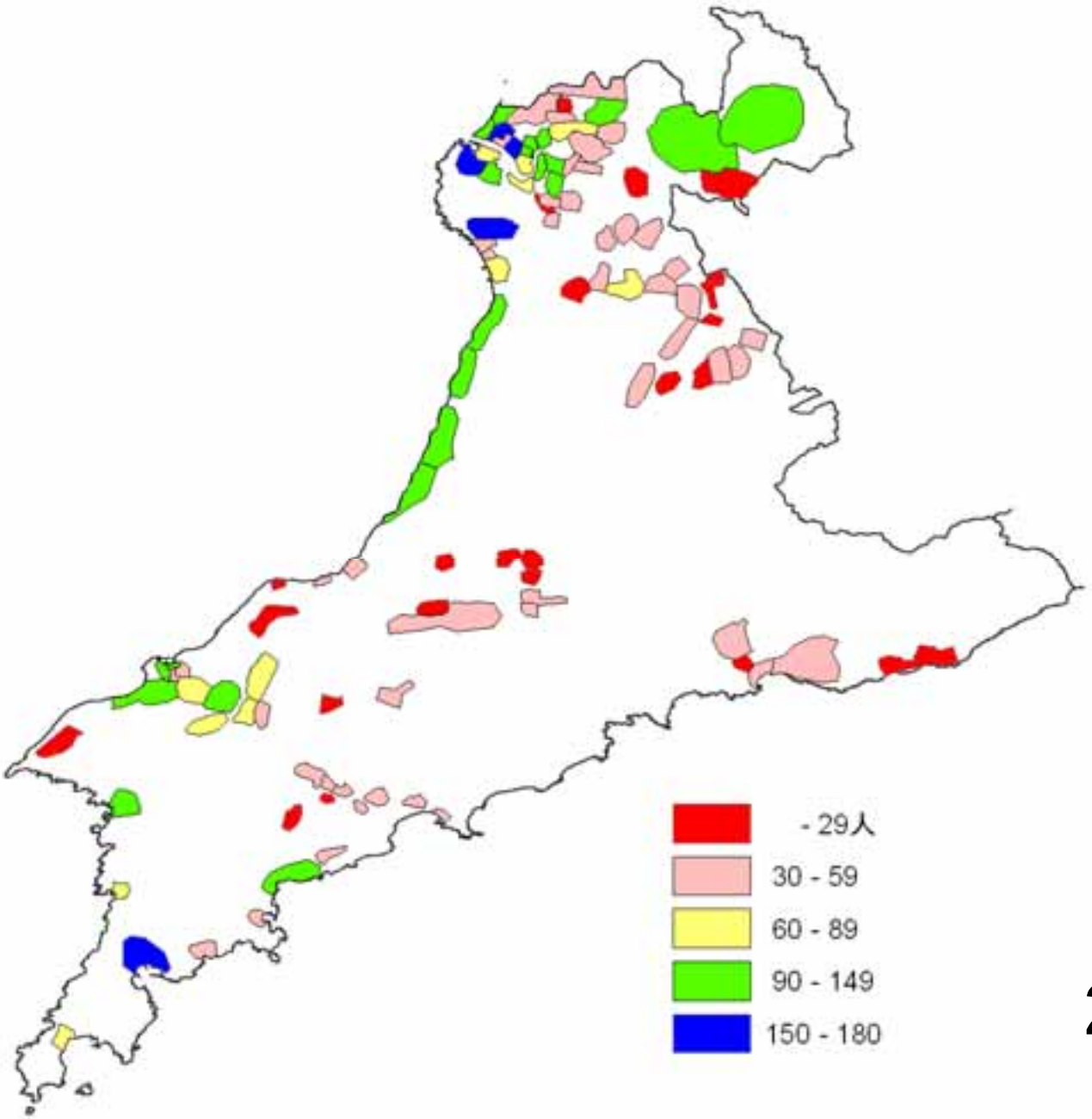
2005



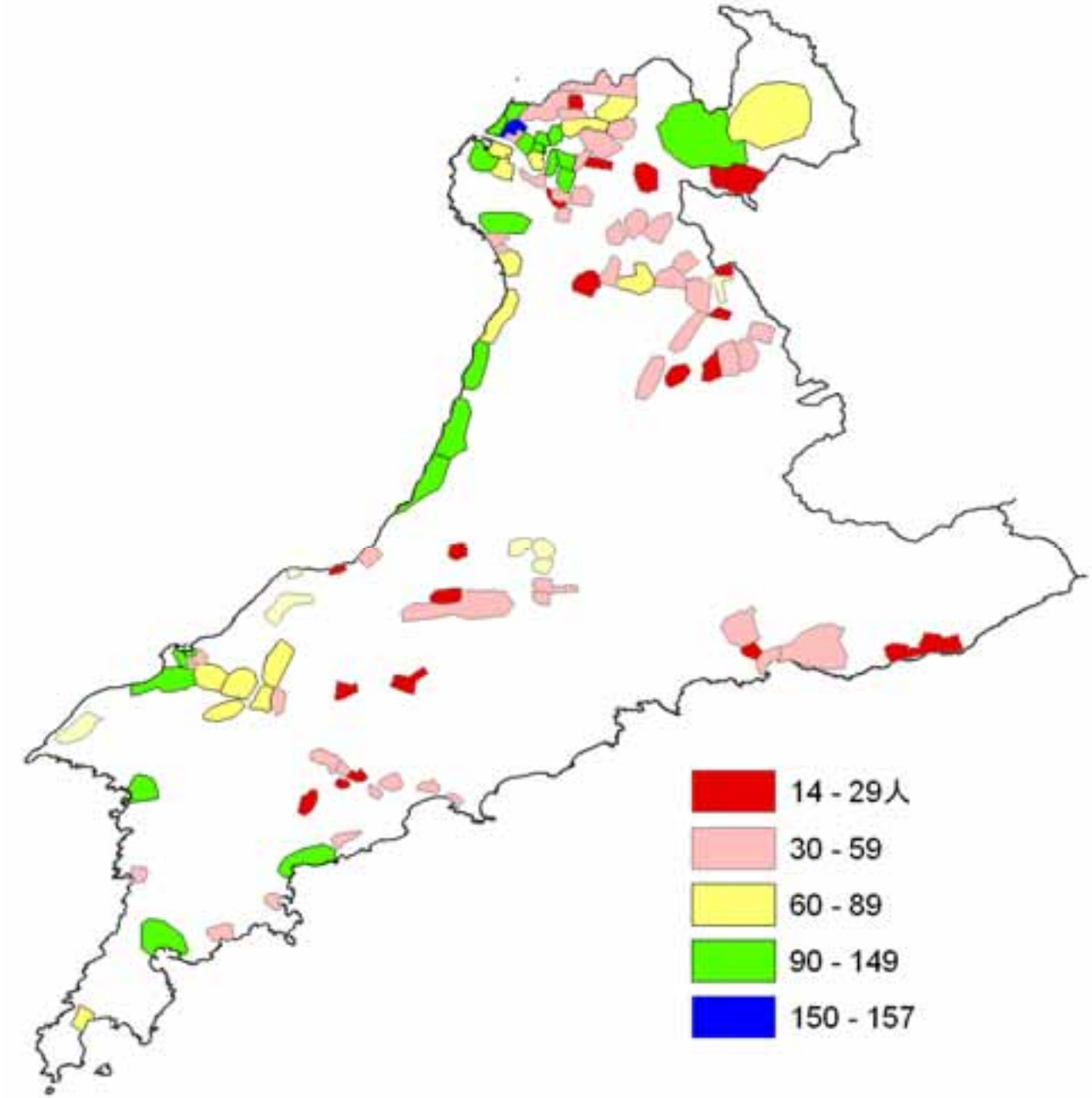
2010



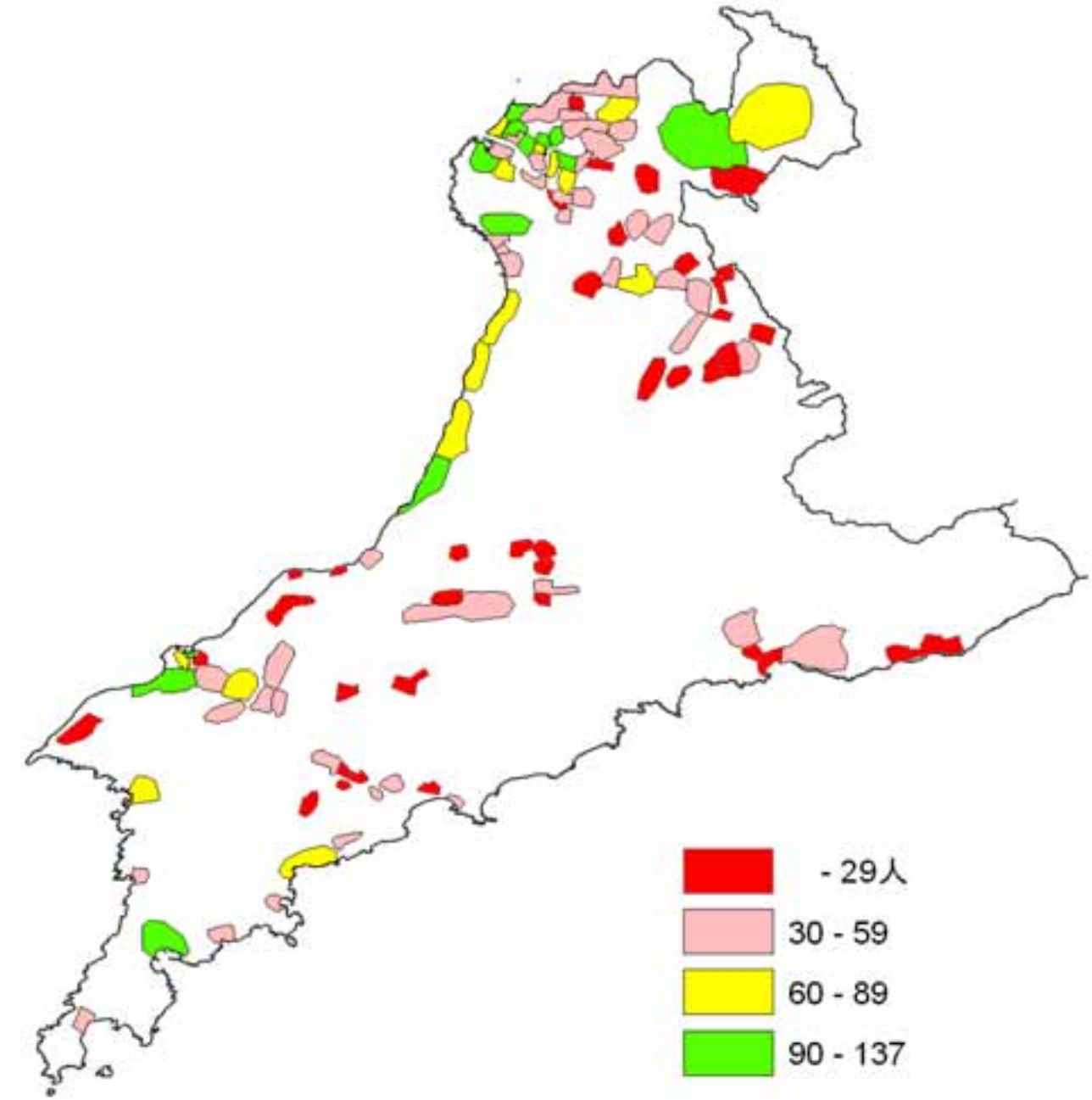
2015



2020

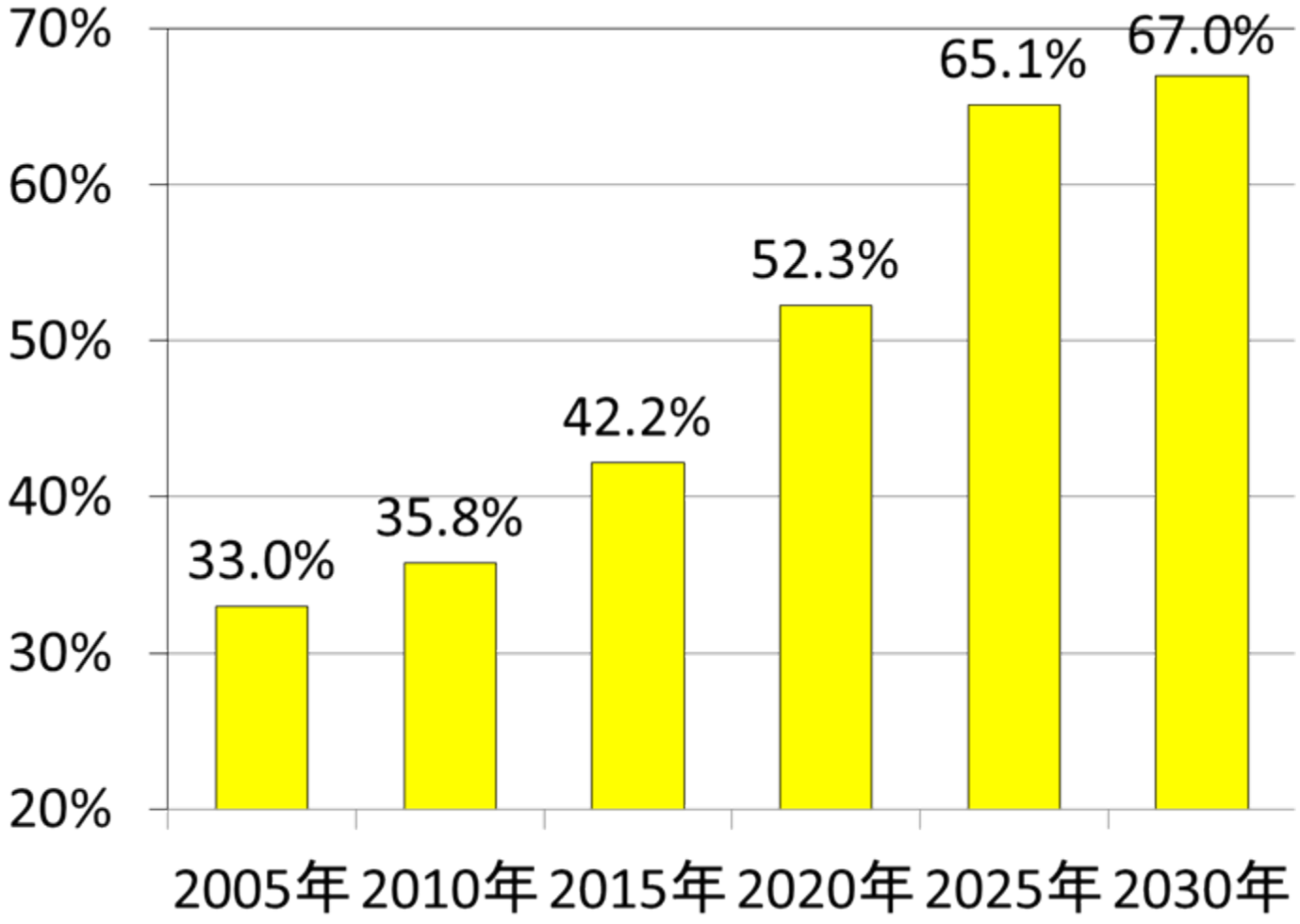


2025



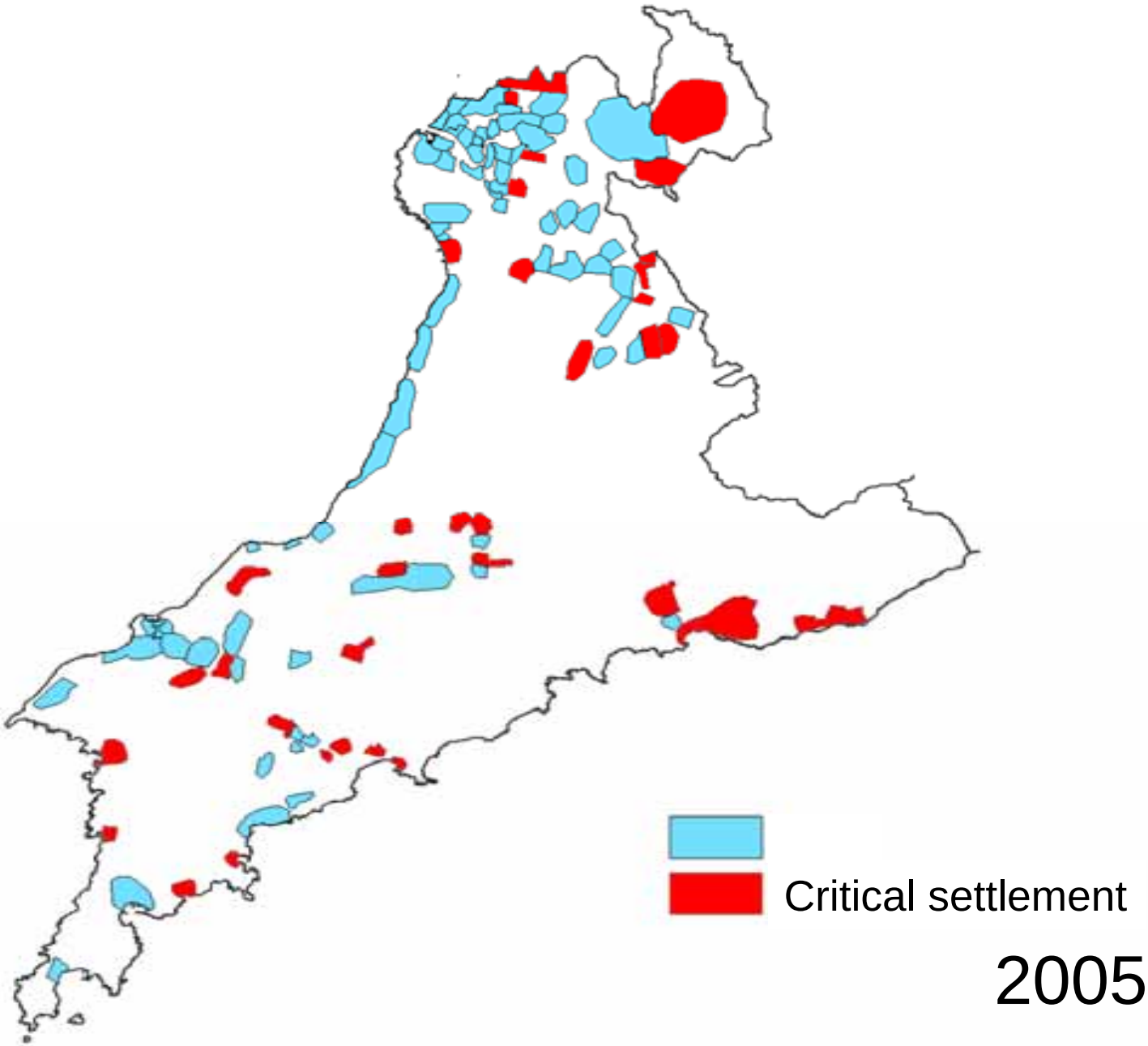
2030

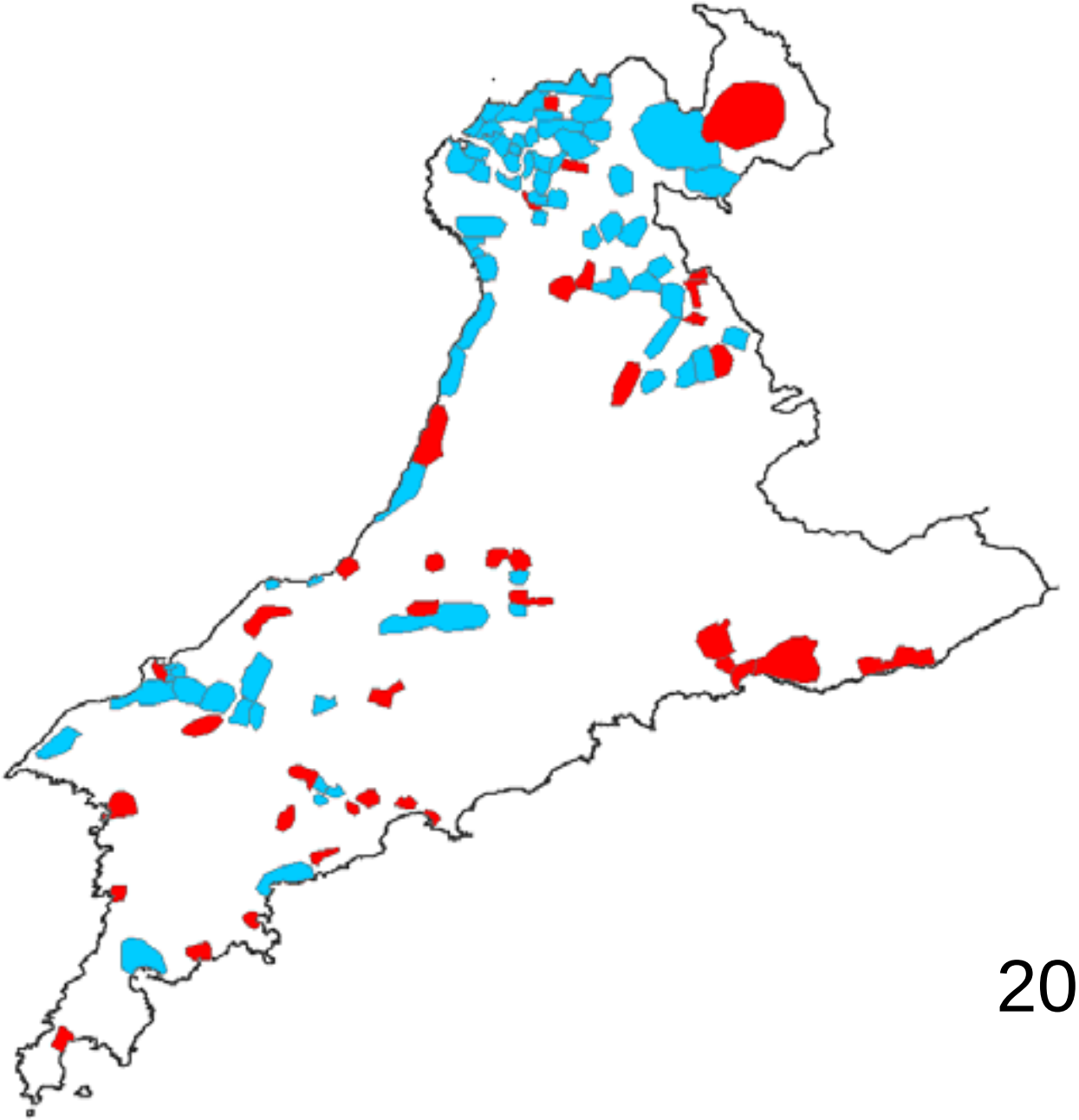
Changes in the ratio of critical settlements



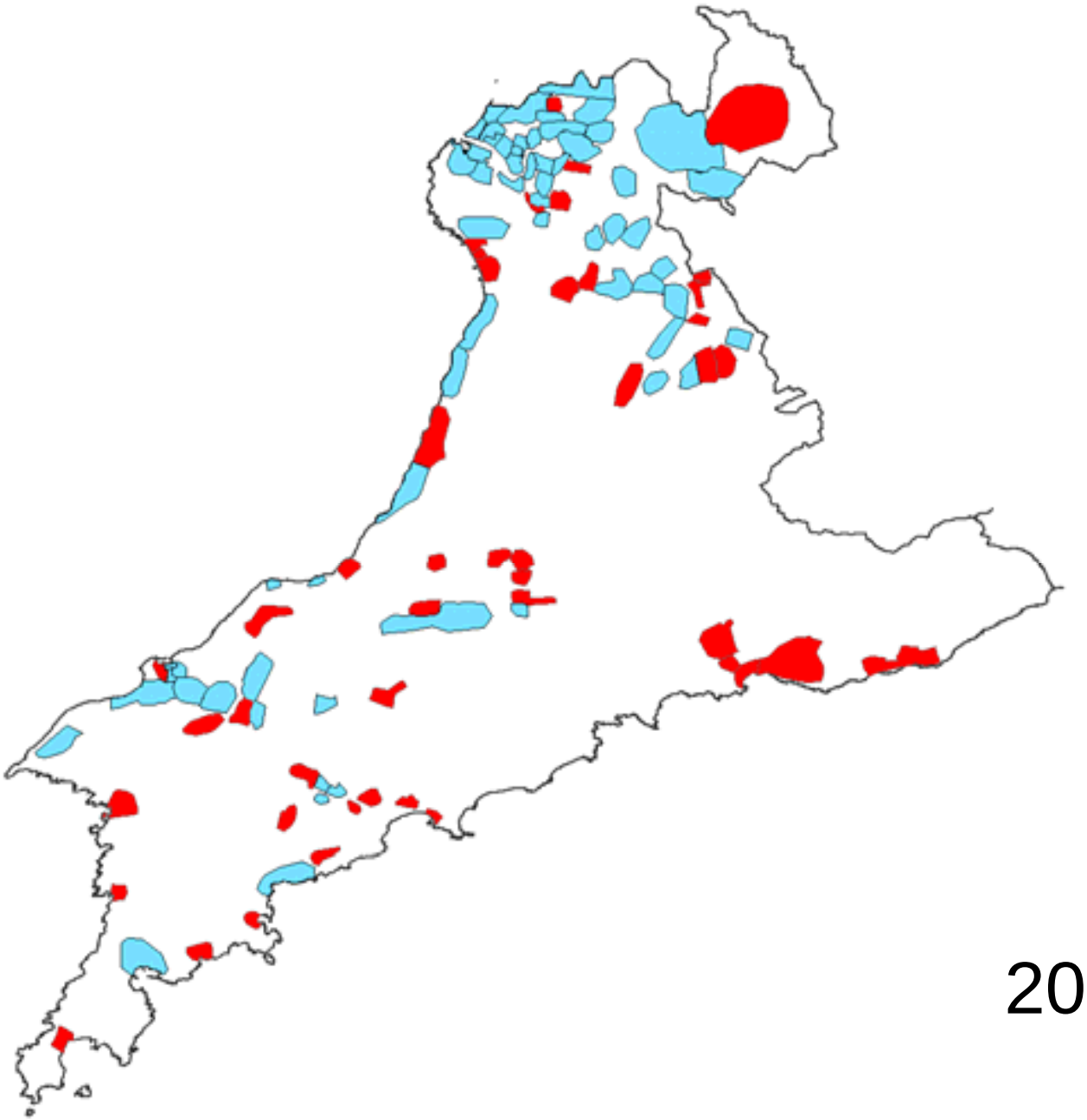
※critical settlements: >50% of the residents is older than 65.

Emerging critical settlements

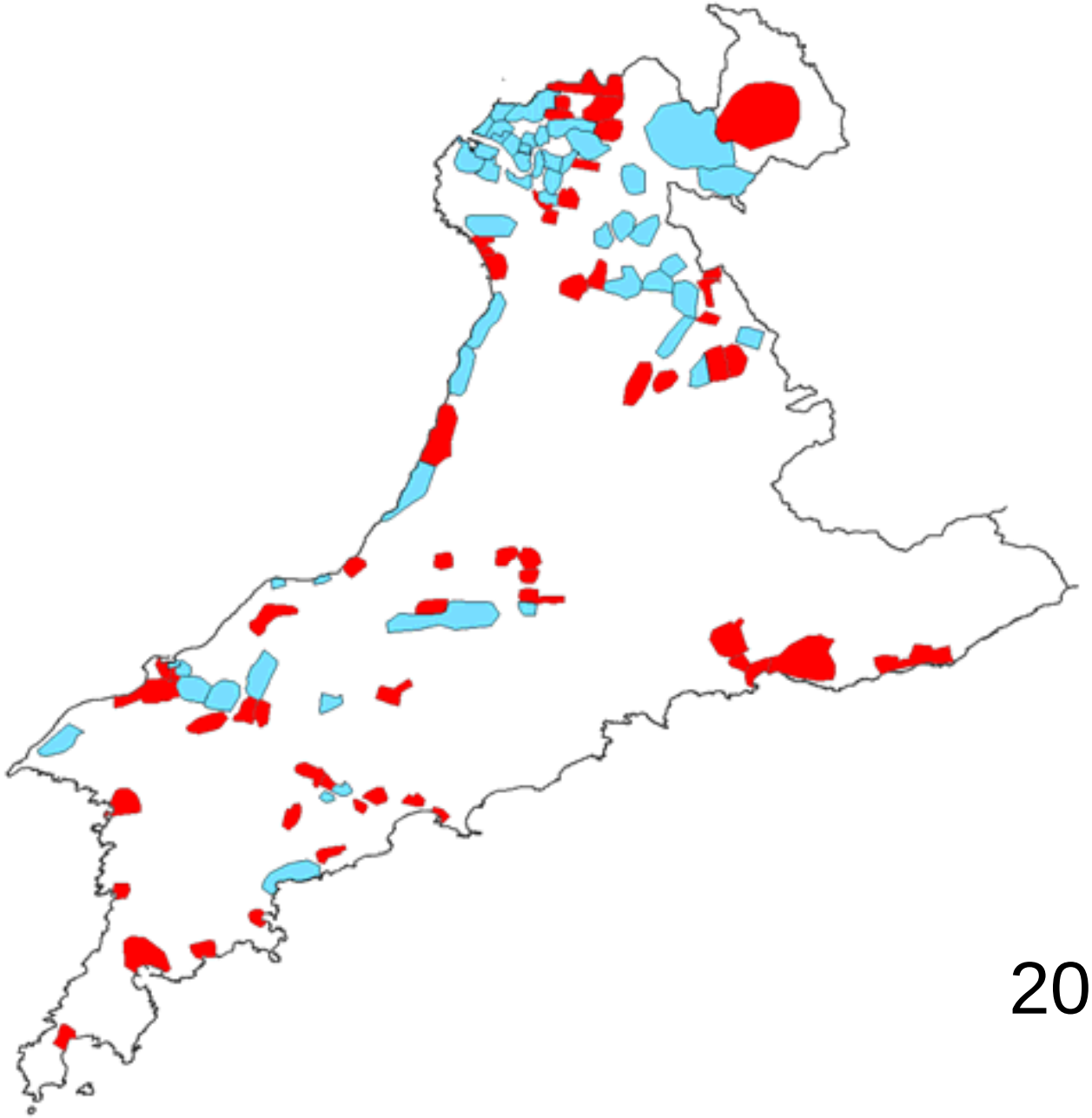




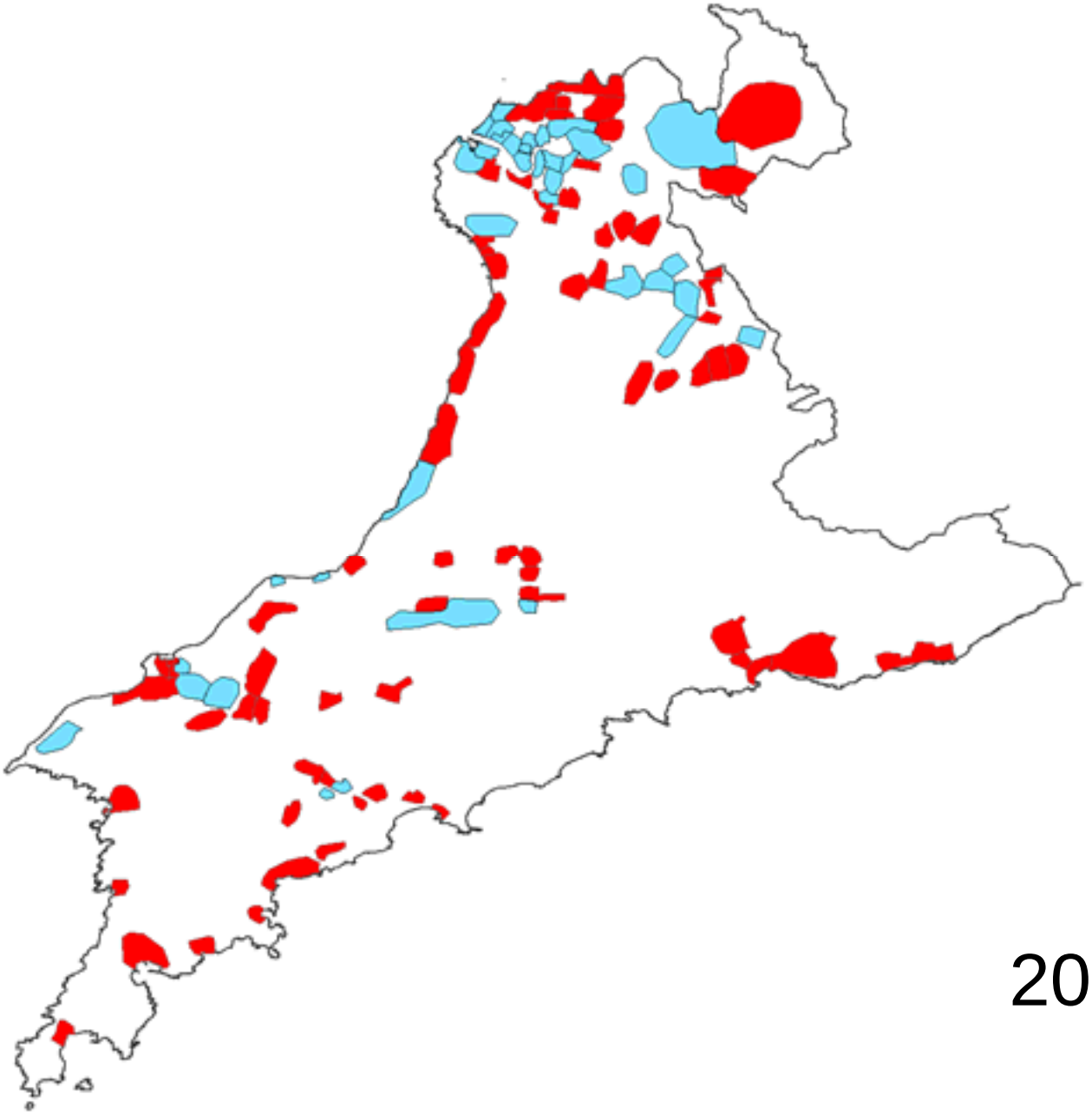
2010



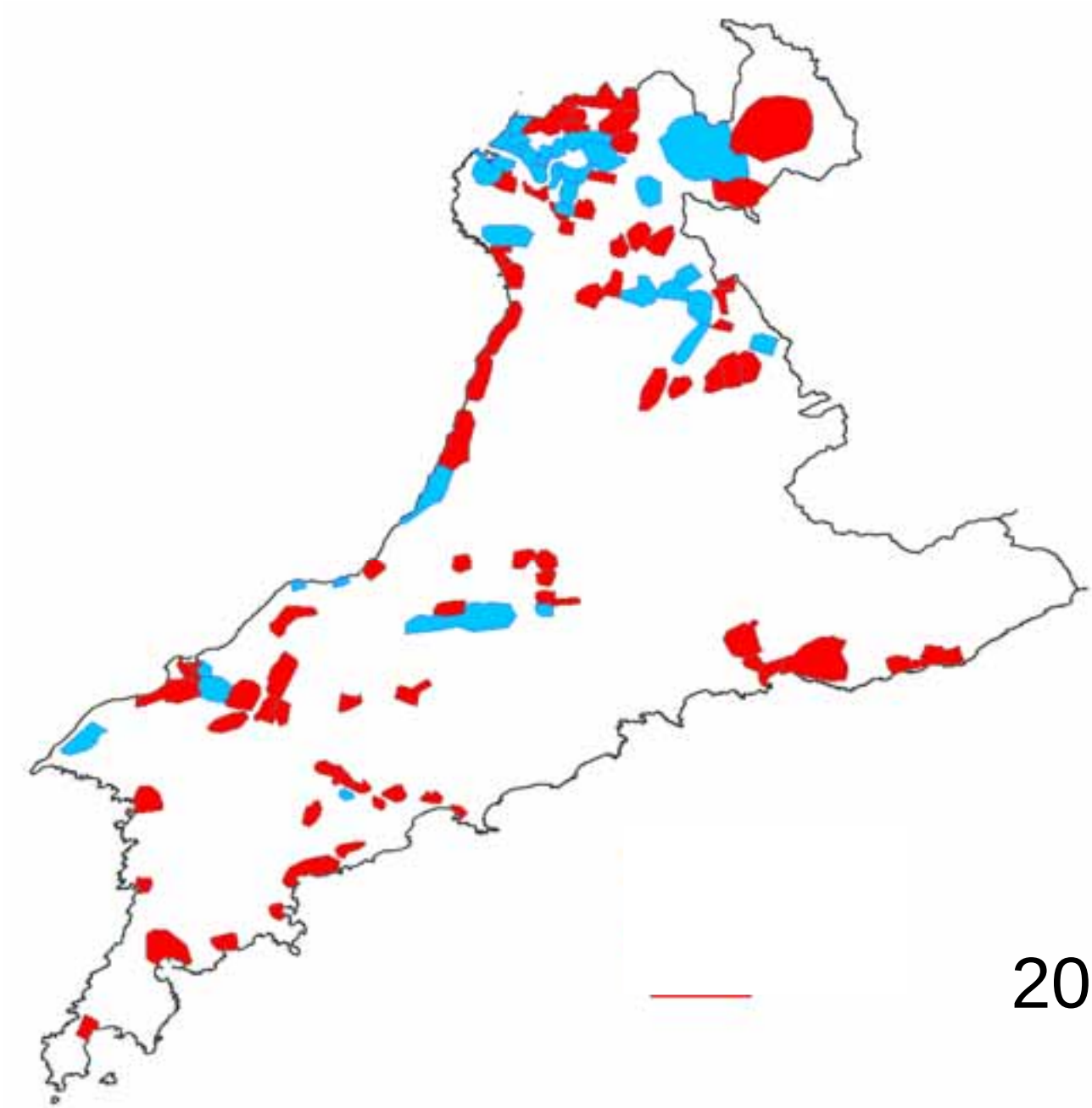
2015



2020



2025



2030

Conclusions

- 109 settlements are classified into 4 groups as a result of cluster analysis using demographics of the town.
- The settlements that are classified as “group4” will be most likely to disappear in the near future.
- The population will decrease at a faster rate and about a third of the settlements is expected to disappear by 2030.
- Two thirds of the settlements will be likely to fall into “critical settlement” in two decades ahead.