Back-casting Population Grids to Assess Long-term Urbanisation and Depopulation Trends in Europe

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Abstract

Geospatial data about the location of population is essential for policy support and scientific assessments in many fields, including regional science and urban analysis. Since the early 2000's, the European Commission acknowledged the usefulness of population grids, and pushed for the improvement of their coverage and quality. Specifically, the Joint Research Centre and Eurostat have made substantial contributions to advance the mapping of population distribution at fine spatial scales.

The current state-of-the-art includes the census grids for 2011 and 2021, compiled by Eurostat with input from National Statistical Institutes. These grids are based on the aggregation of address/point-based population counts to the reference European 1 km grid system. However, these so-called "bottom-up" grids are not available for earlier census years due to the lack address/point-based population counts for most EU countries. "Top-down" grids have been produced for previous census or intra-census years by downscalling aggregate municipal counts of population to the 1 km grid cells in a conventional, dasymetric fashion. However, because of the inconsistency between the top-down and bottom-up methods, time-series analysis is not warranted.

Here, we present a novel, chain-linked dasymetric back-casting approach to generate consistent, decennial population grids going back to the year 1961 for Europe. The approach combines known population from the 2011 census grid with historical population at municipal level and land use changes derived from Earth Observation. Independent validation corroborates the superiority of the approach *vis-à-vis* static dasymetric approaches. The oral presentation will describe the method and validation results and illustrate their application to assess long-term urbanisation and depopulation trends in the EU.