

## Supplementary Materials:

### Supplement 1. Results and accuracy assessment of population spatialization

#### *Population spatialization results*

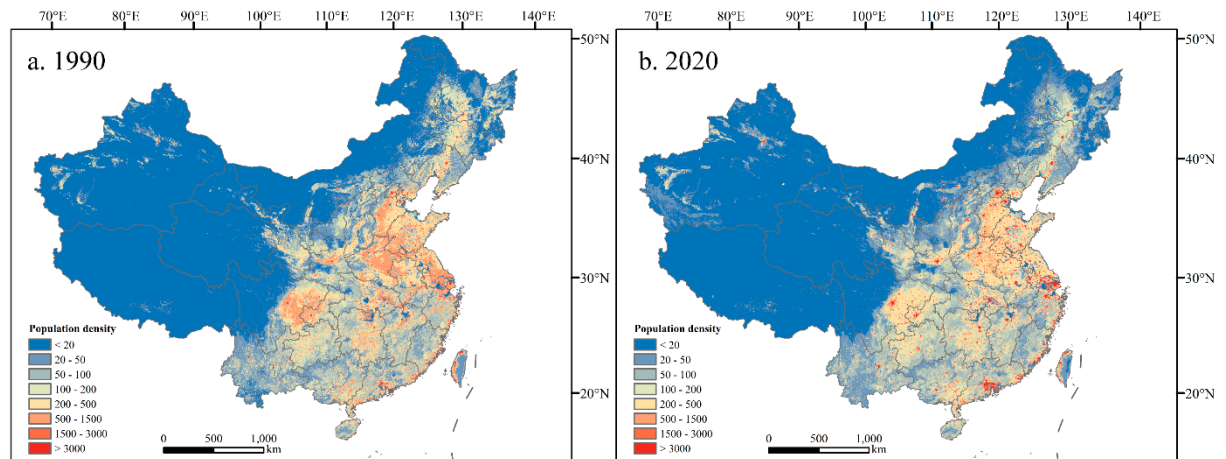


Figure S1 Population spatialization results in 1990 and 2020 (in 1-km spatial resolution).

#### *Accuracy assessment*

The census data of 1858 towns/sub-districts in 2020 were used to verify the population simulation results. The towns/sub-districts included 9 provinces (Beijing, Anhui, Guangdong, Hunan, Jilin, Ningxia, Shanxi, Shaanxi, and Zhejiang), covering urban and rural areas. As is shown in Figure S2, the results of the population simulation show a significant positive correlation with the census data, and the determination coefficient of the fitting is 0.86, indicating that the population spatialization results are satisfactory.

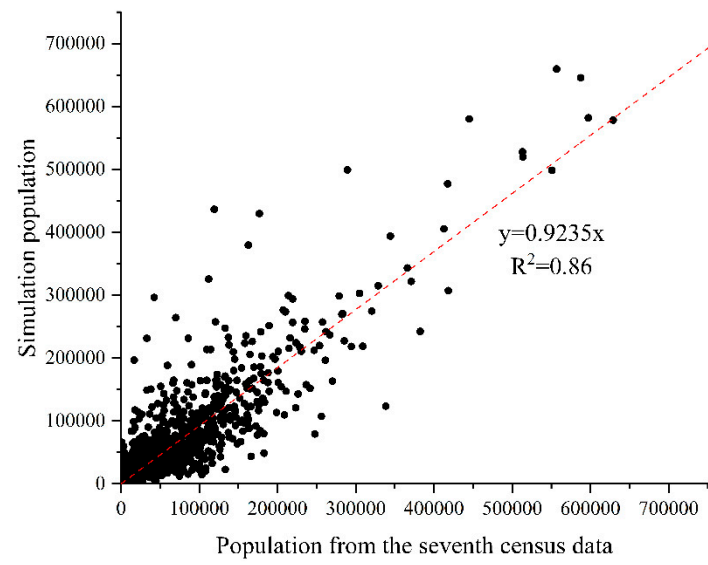


Figure S2 Accuracy assessment of the population spatialization in 2020.