



Population Distribution along the Silk Road in the Northwest China

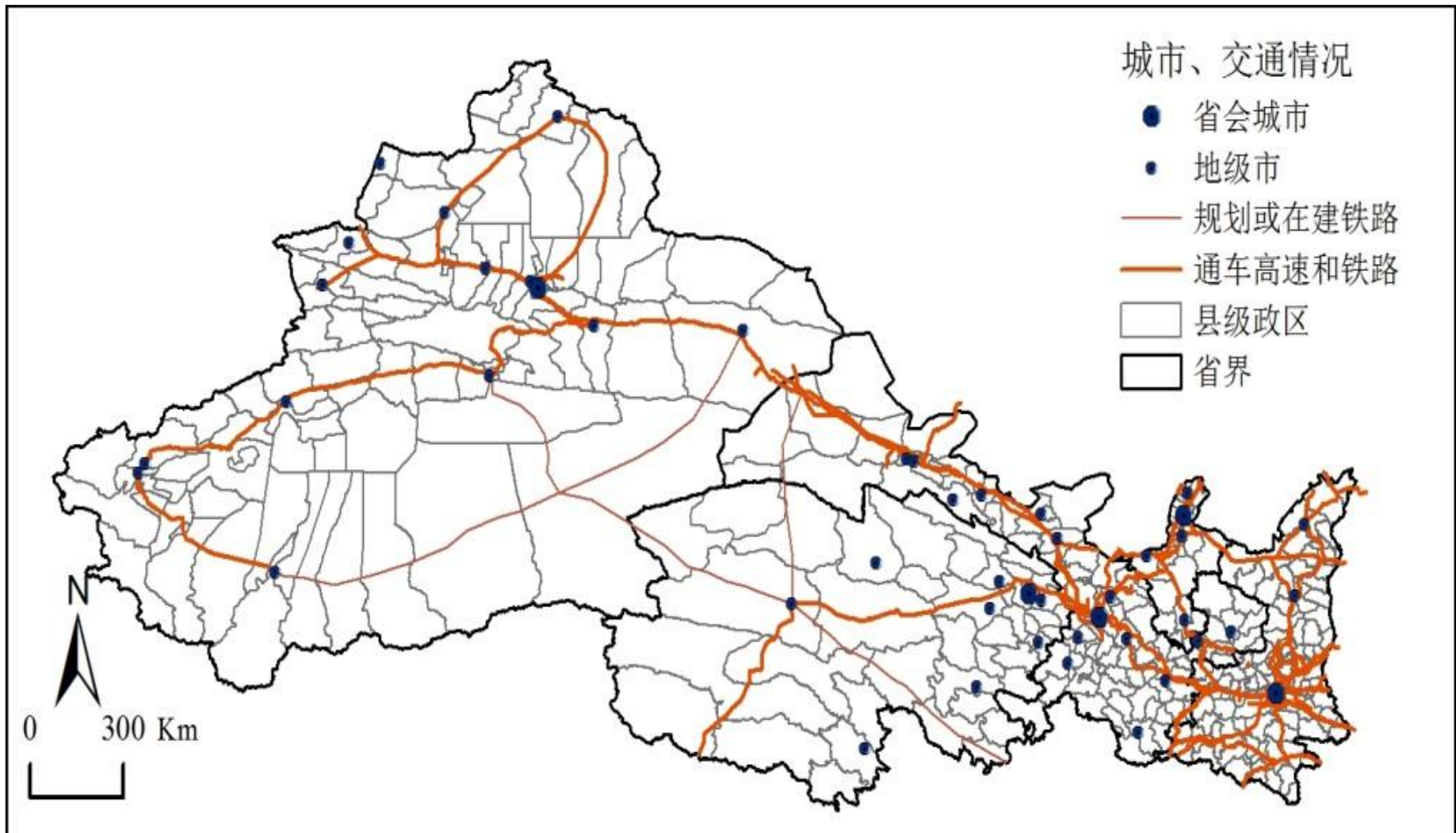


Ruihua MI

*College of Economy and Management,
Yanan University, Shaanxi, China*



The administrative region in prefecture and district level along the Northwest Silk Road in China



The main lines of the High speed, Railroad and the distribution of the cities and administrative region in the Silk Road Economic Belt



Contents

- (1) Population **Density** Distribution;
- (2) Population **Characteristics** Distribution ;
- (3) Population Distribution **Cluster Analysis**;
- (4) Population Distribution **historical Changing Process** ;
- (5) Population Distribution **Prediction**.



Contents 1

- **(1) Population Density Distribution;**
- (2) population Characteristics Distribution ;
- (3) Population Distribution Cluster Analysis;
- (4) Population Distribution historical Changing Process ;
- (5) Population Distribution Prediction.

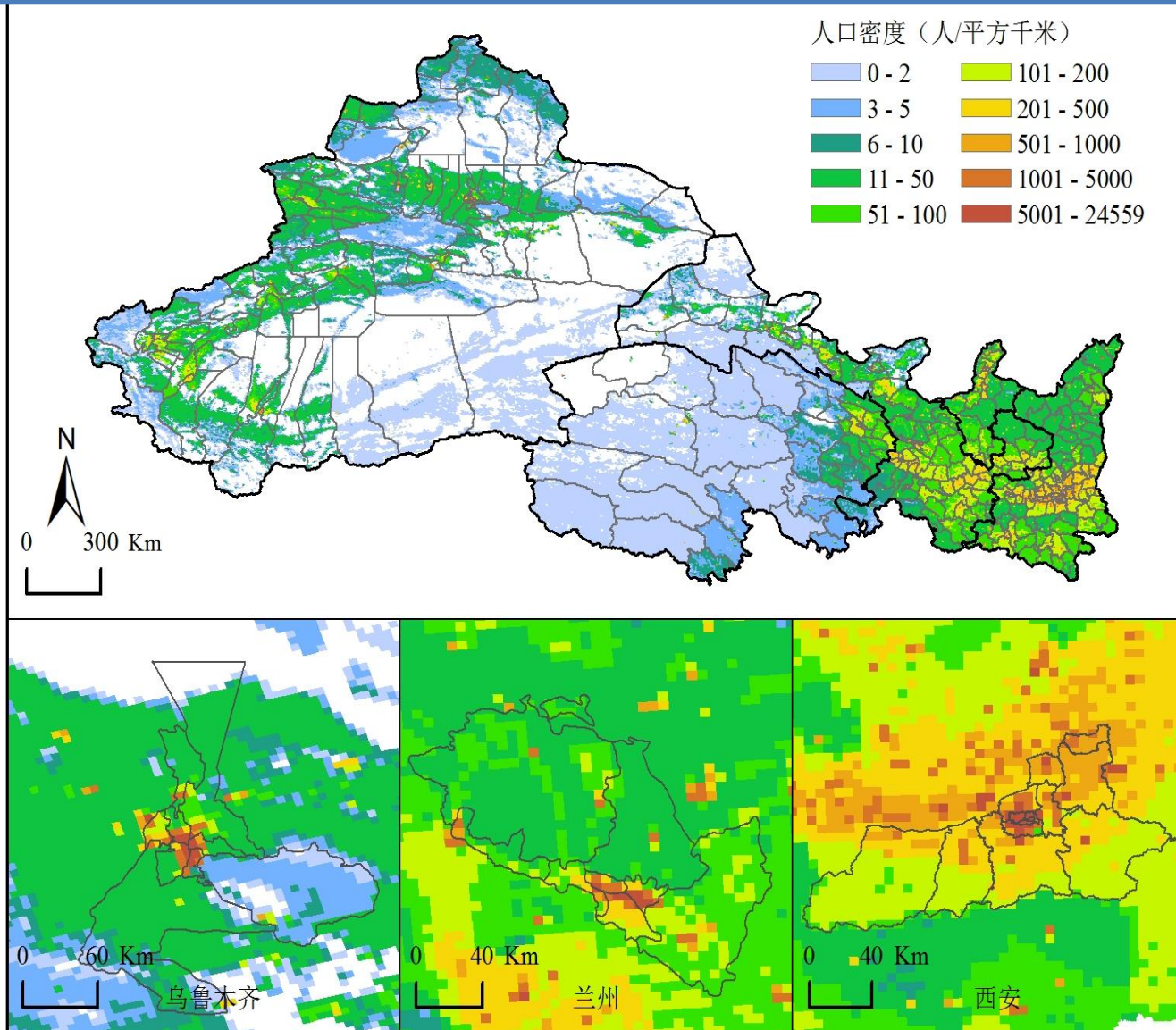


Data and Methods

- (1) **Census Data** of China in 2010 ;
- (2) **Data of Land Use Type**;
- (3) **Method of Gridding** of Population Data.

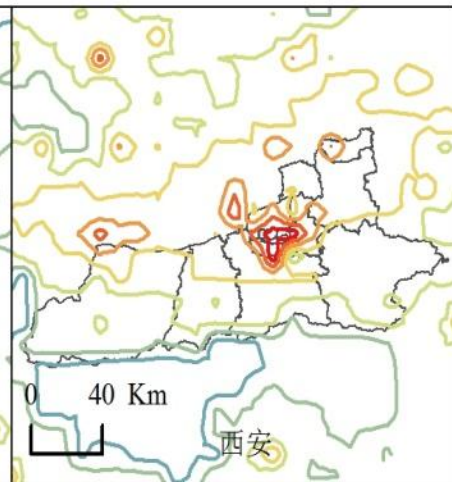
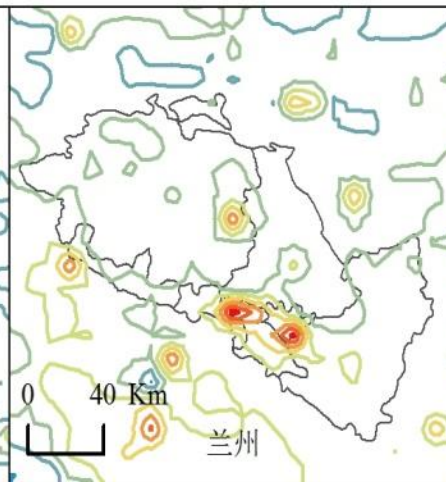
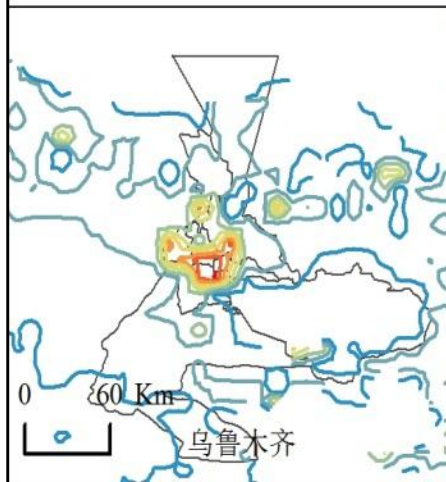
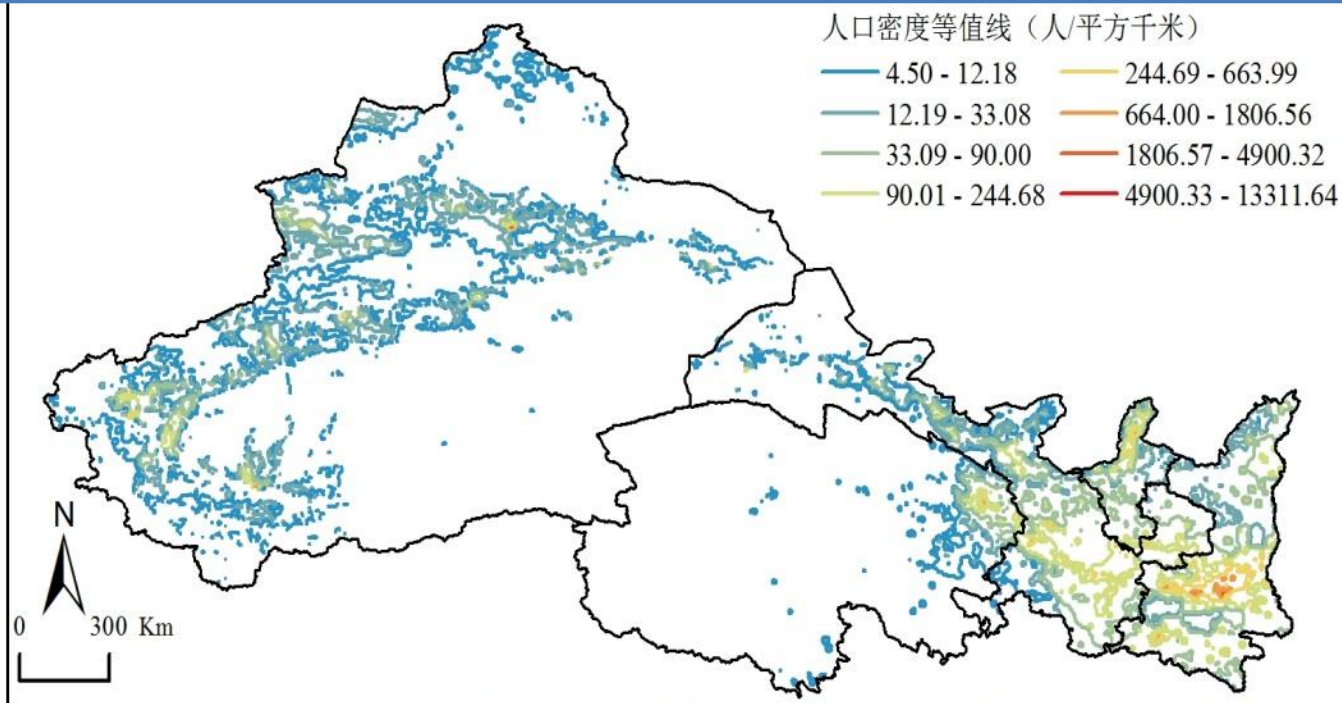


5km Gridding Population Density Map in 2010





Contour map of population density in 2010



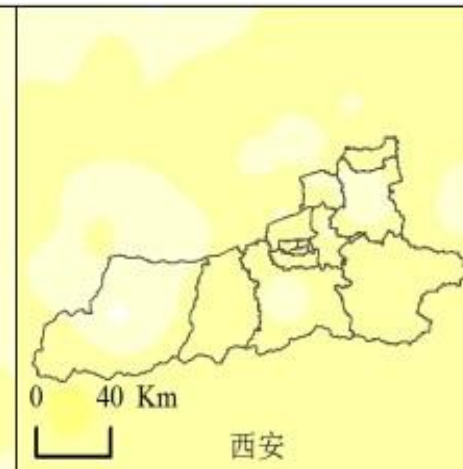
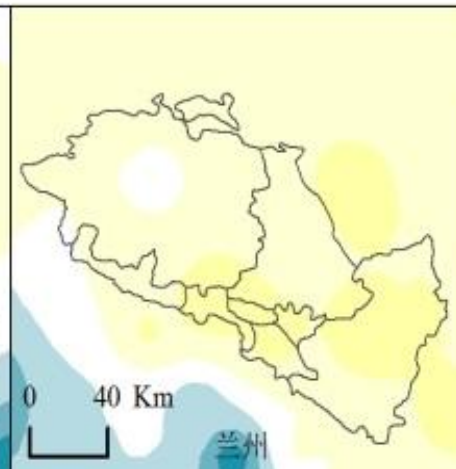
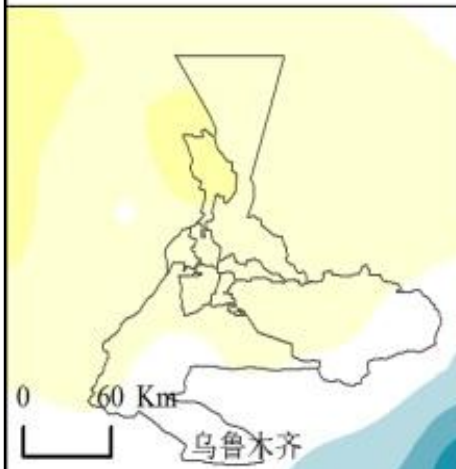
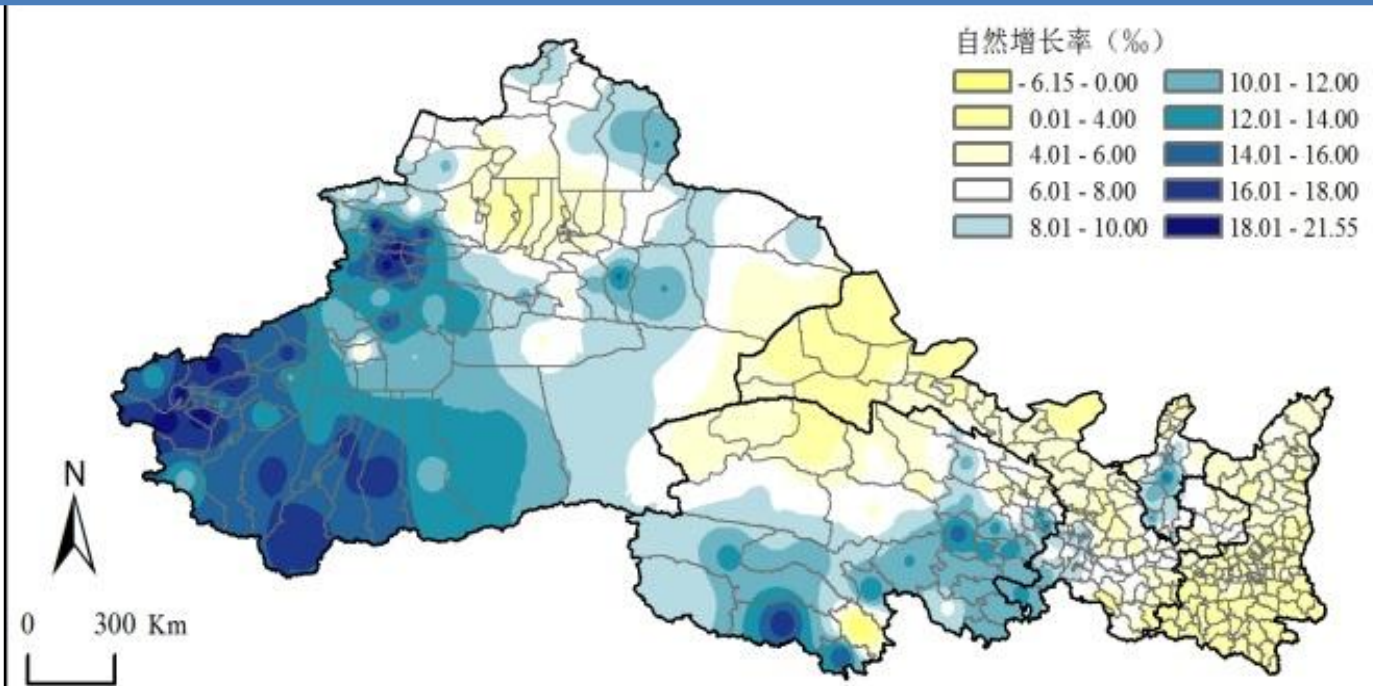
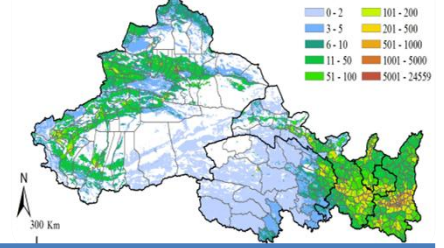


Contents 2

- (1) Population Density Distribution;
- **(2) Population Characteristics Distribution ;**
- (3) Population Distribution Cluster Analysis;
- (4) Population Distribution historical Changing Process ;
- (5) Population Distribution Prediction.

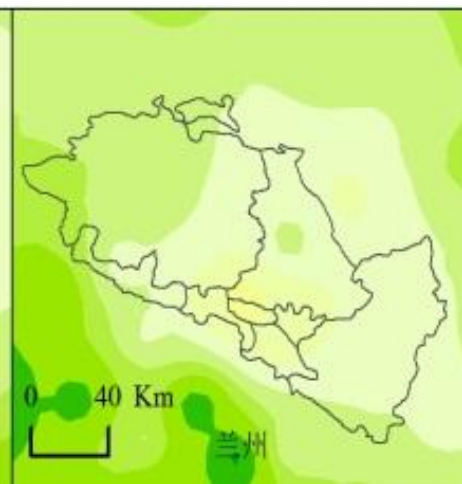
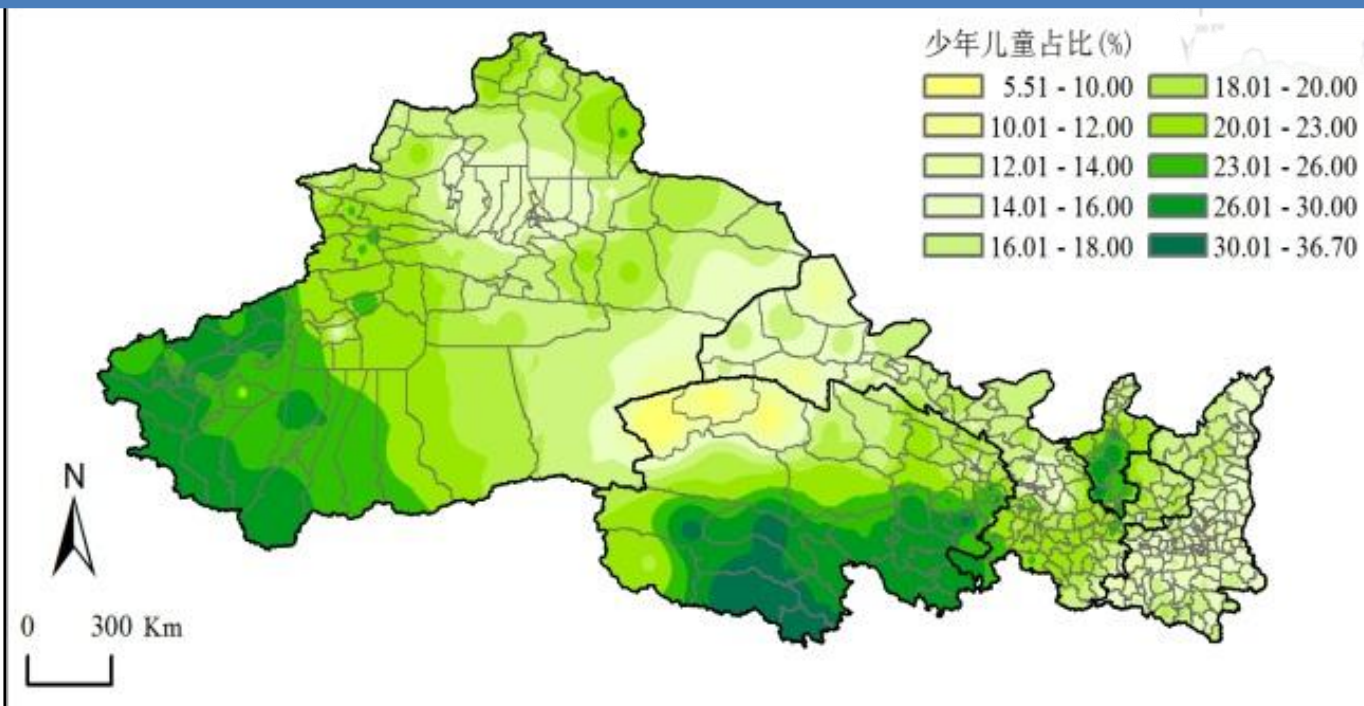
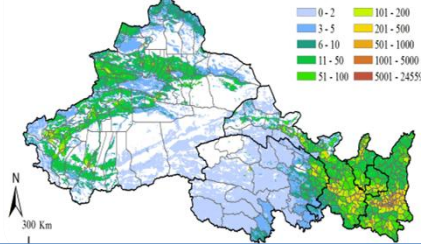


Natural Increase Rate (%)



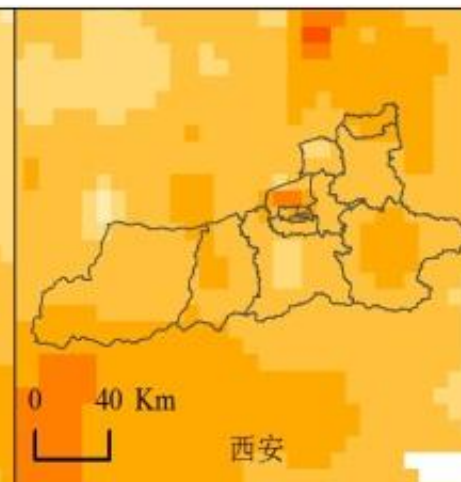
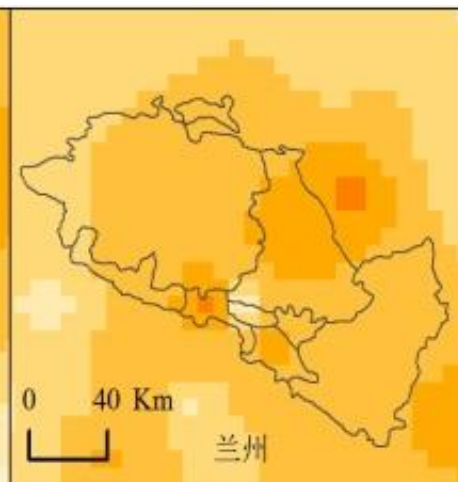
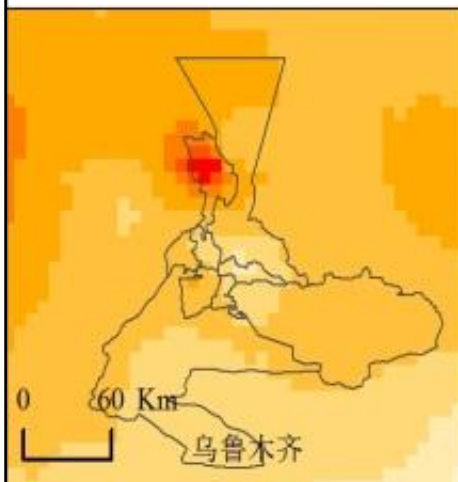
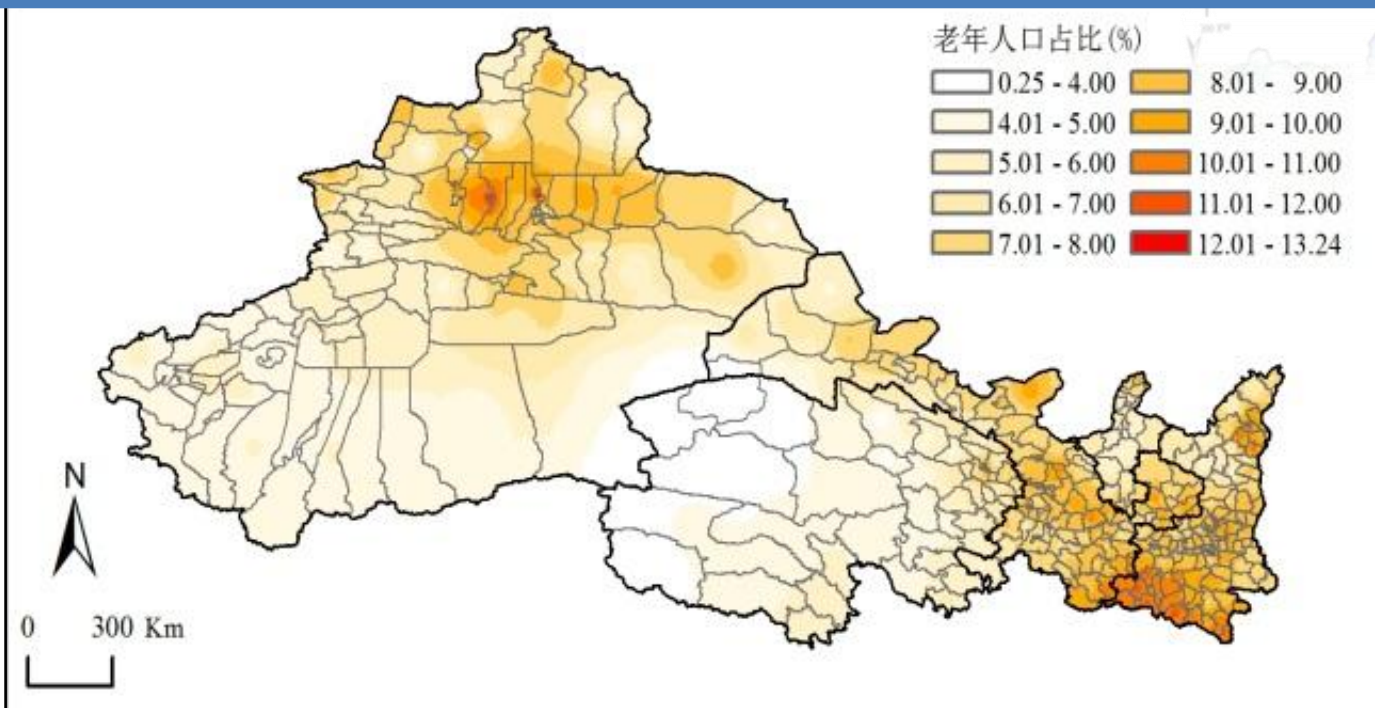
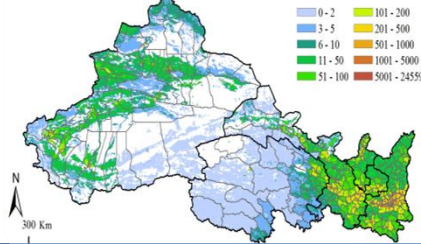


Proportion of Children and Youth(%)



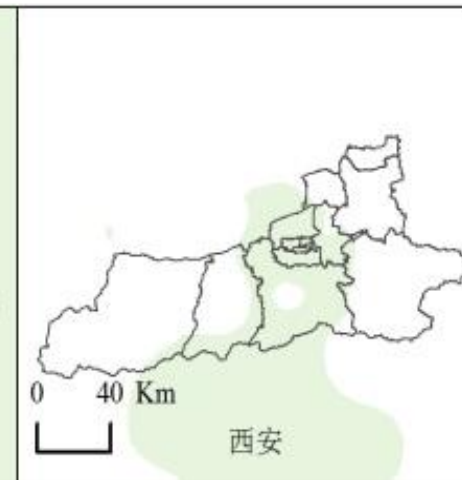
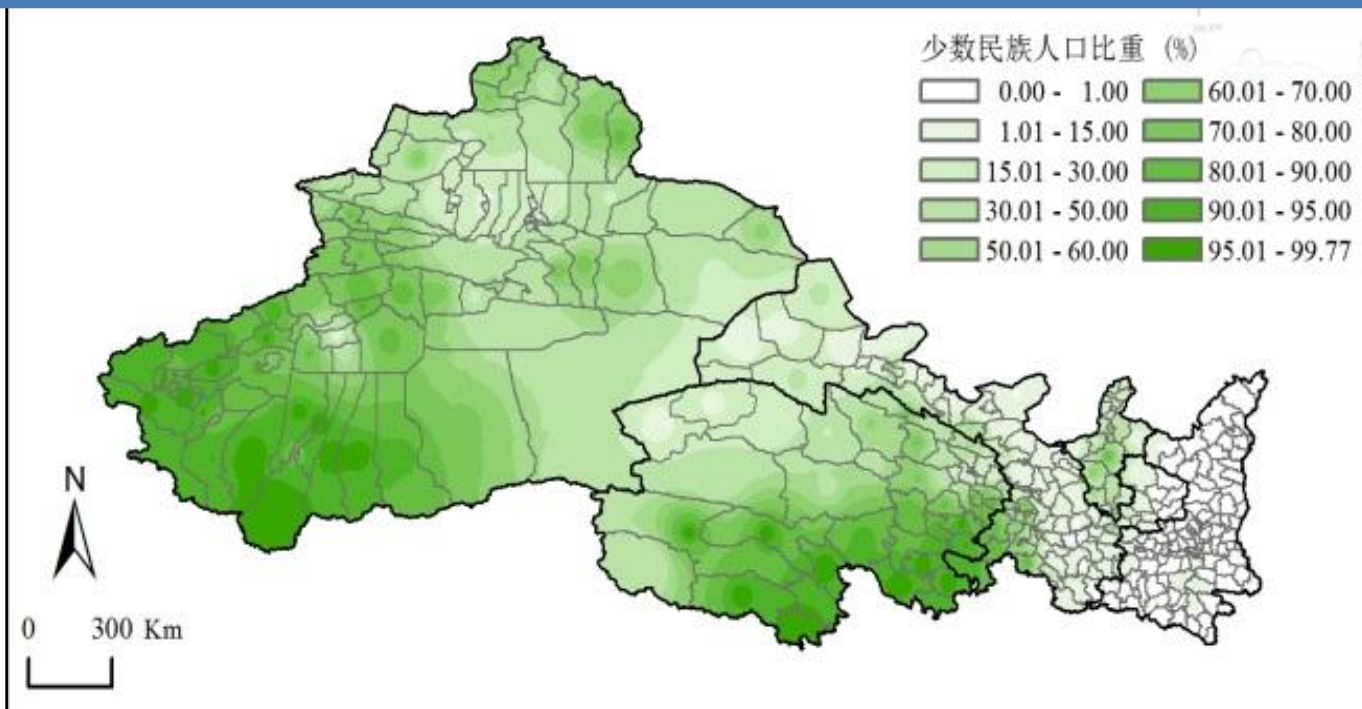
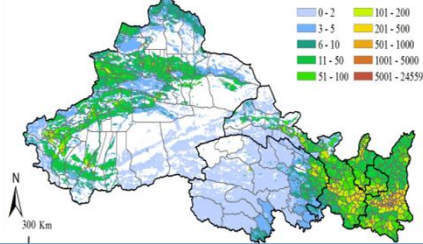


Proportion of elderly population (%)



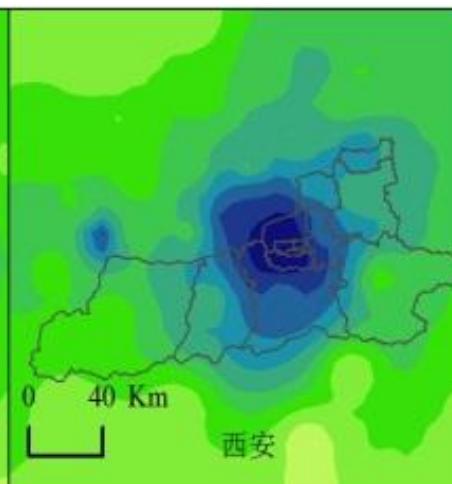
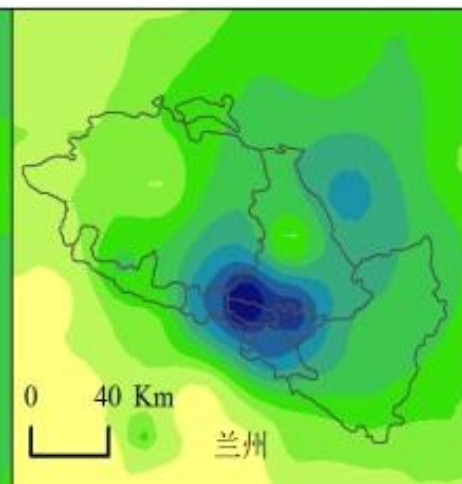
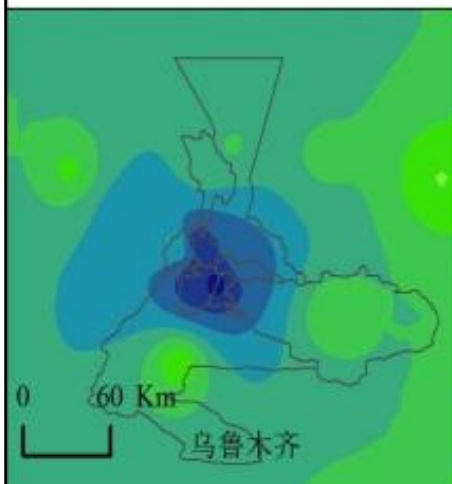
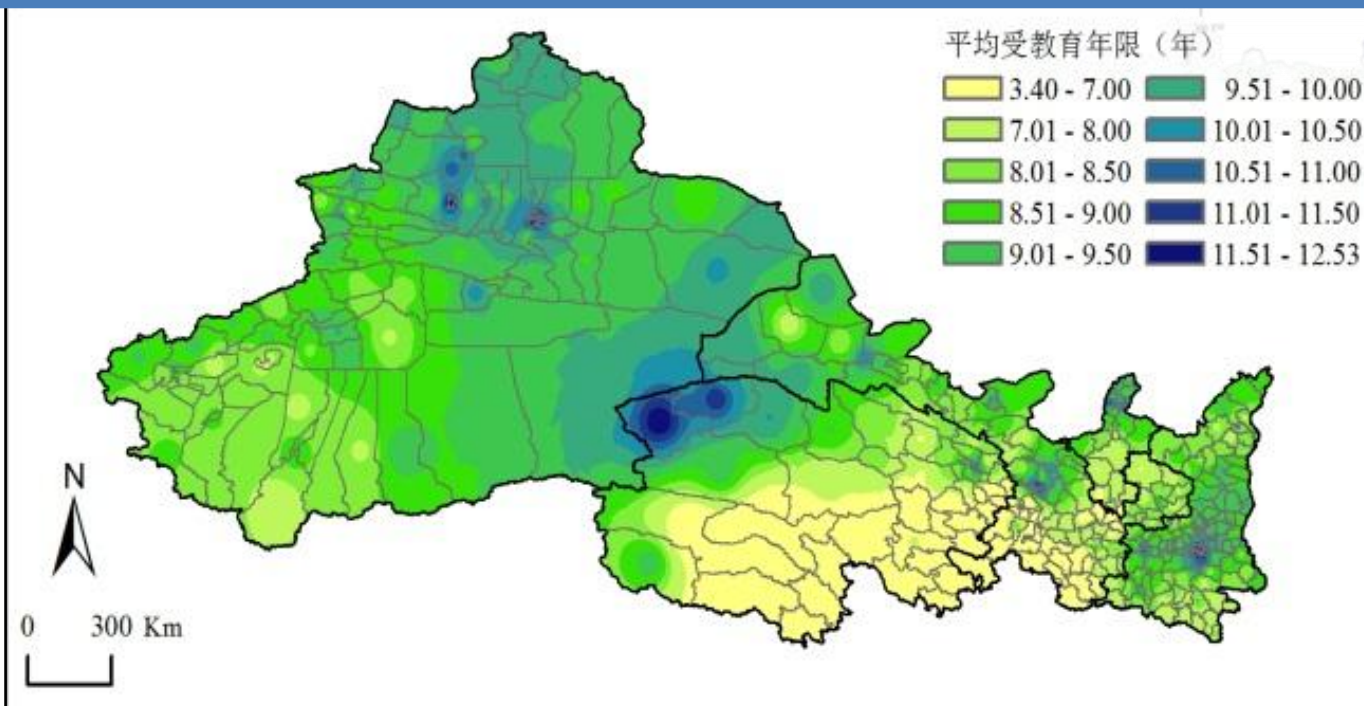
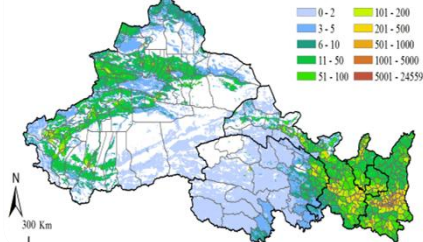


Proportion of ethnic minorities (%)



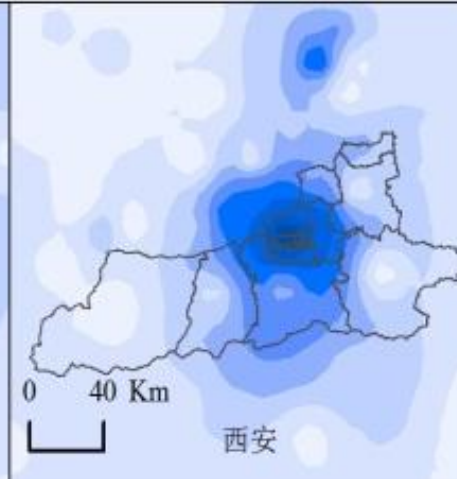
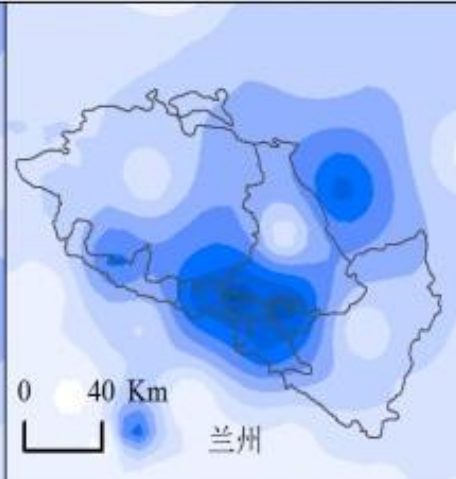
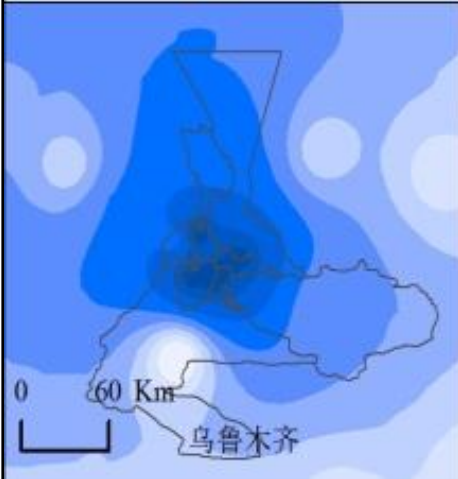
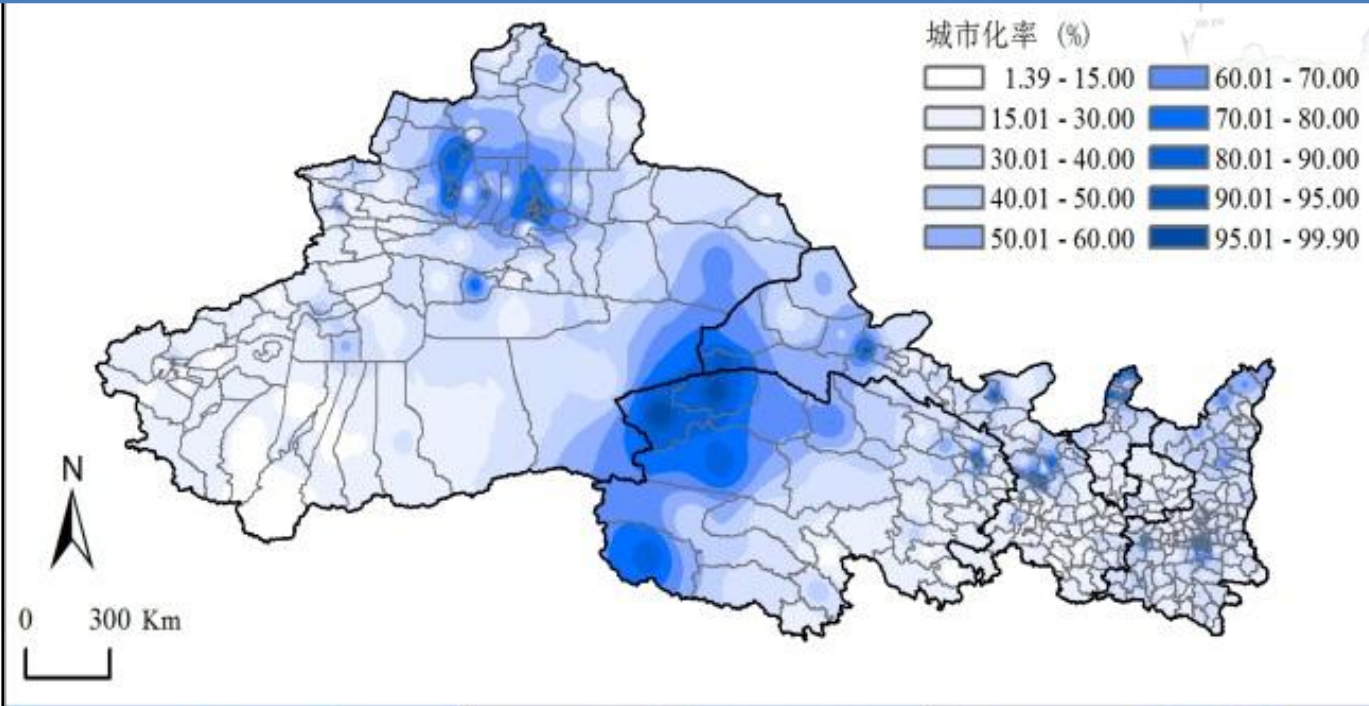
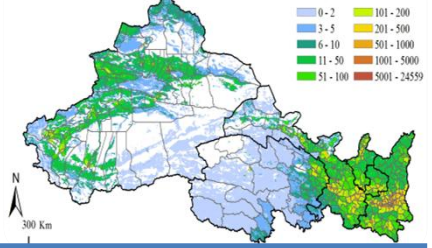


Average education years



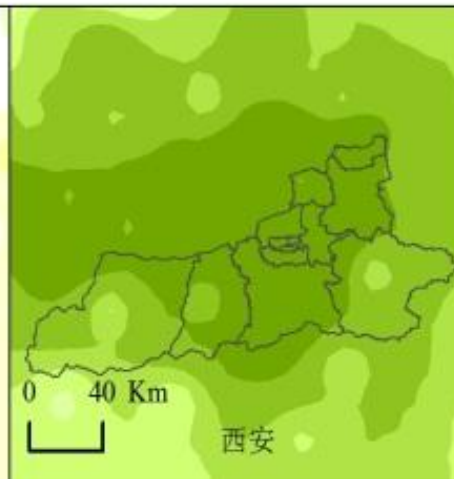
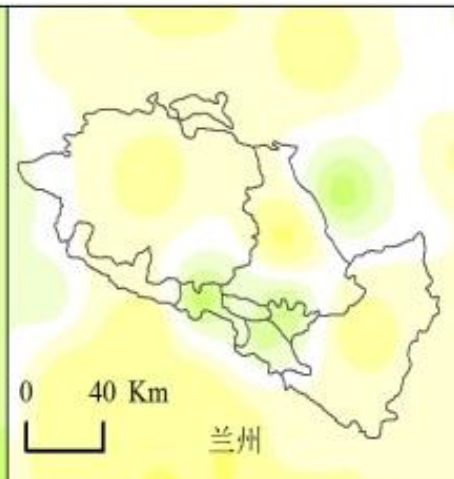
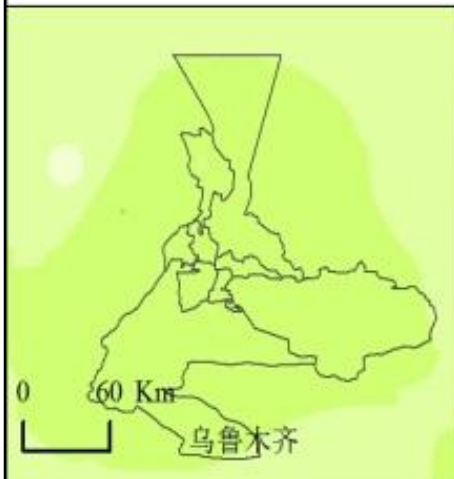
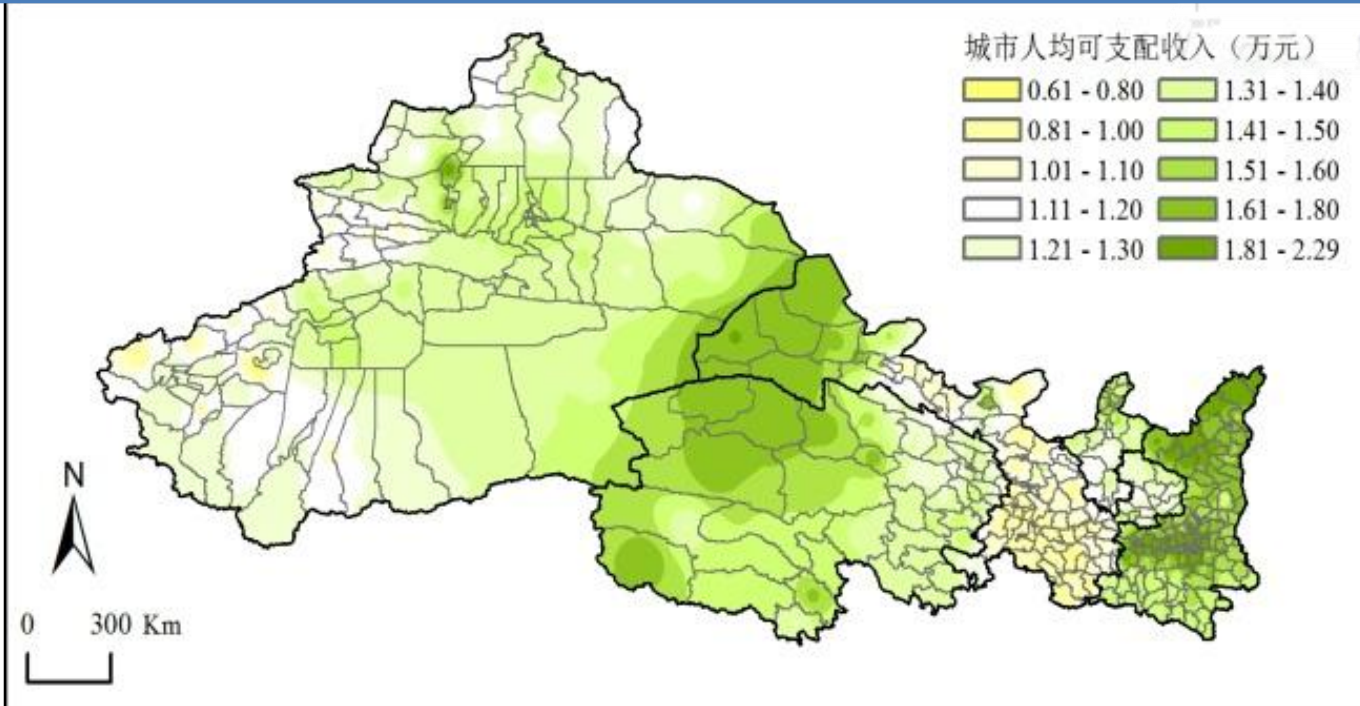
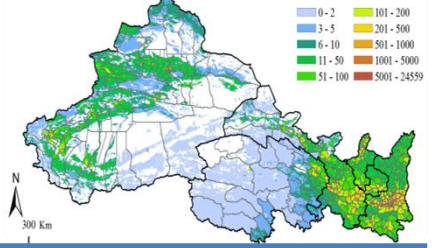


Urbanization Rate (%)



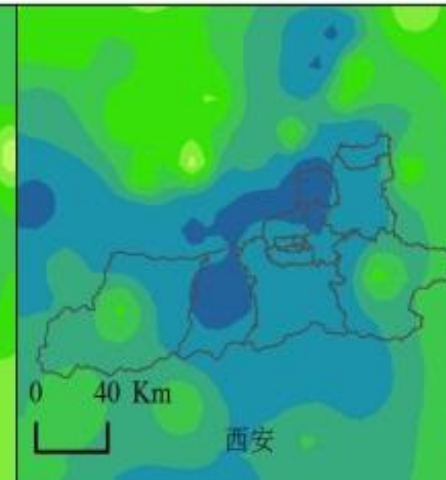
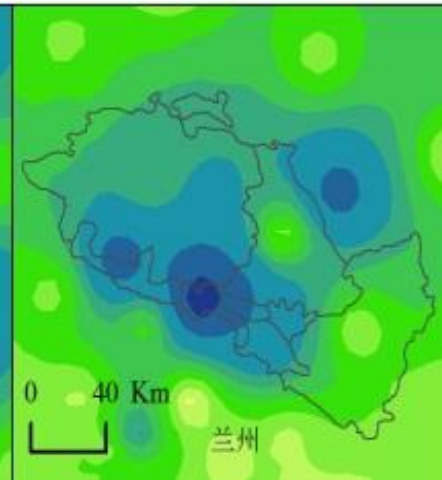
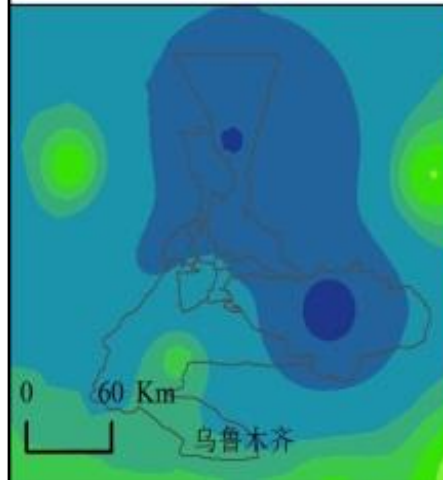
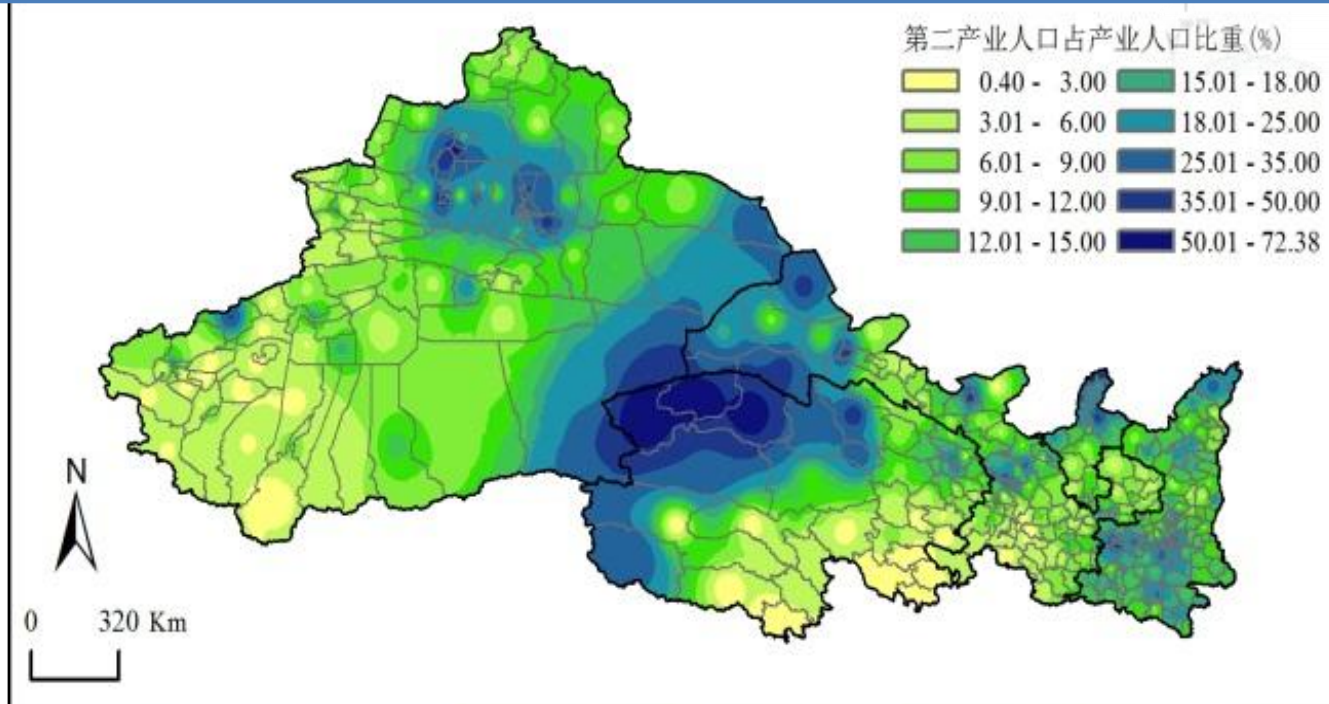
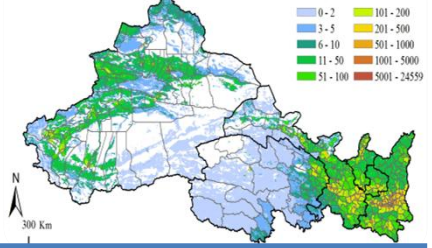


Urban per capita disposable income (ten thousand yuan RMB)



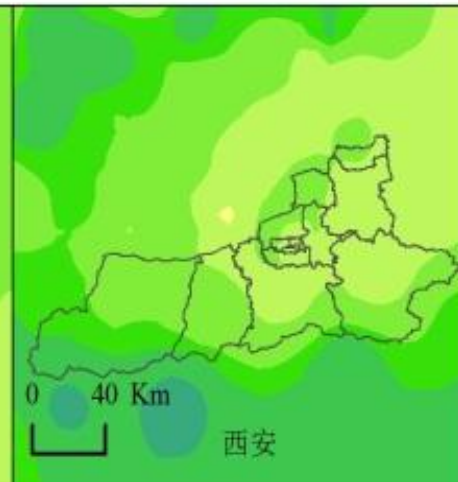
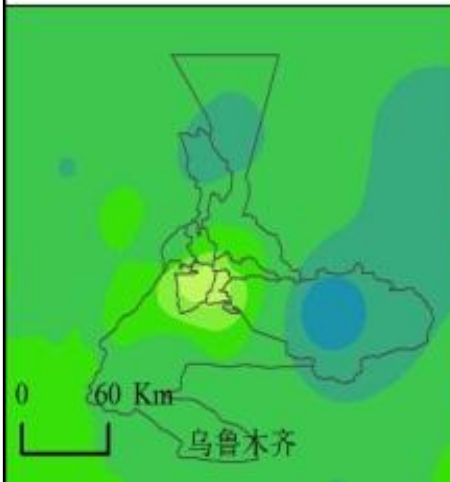
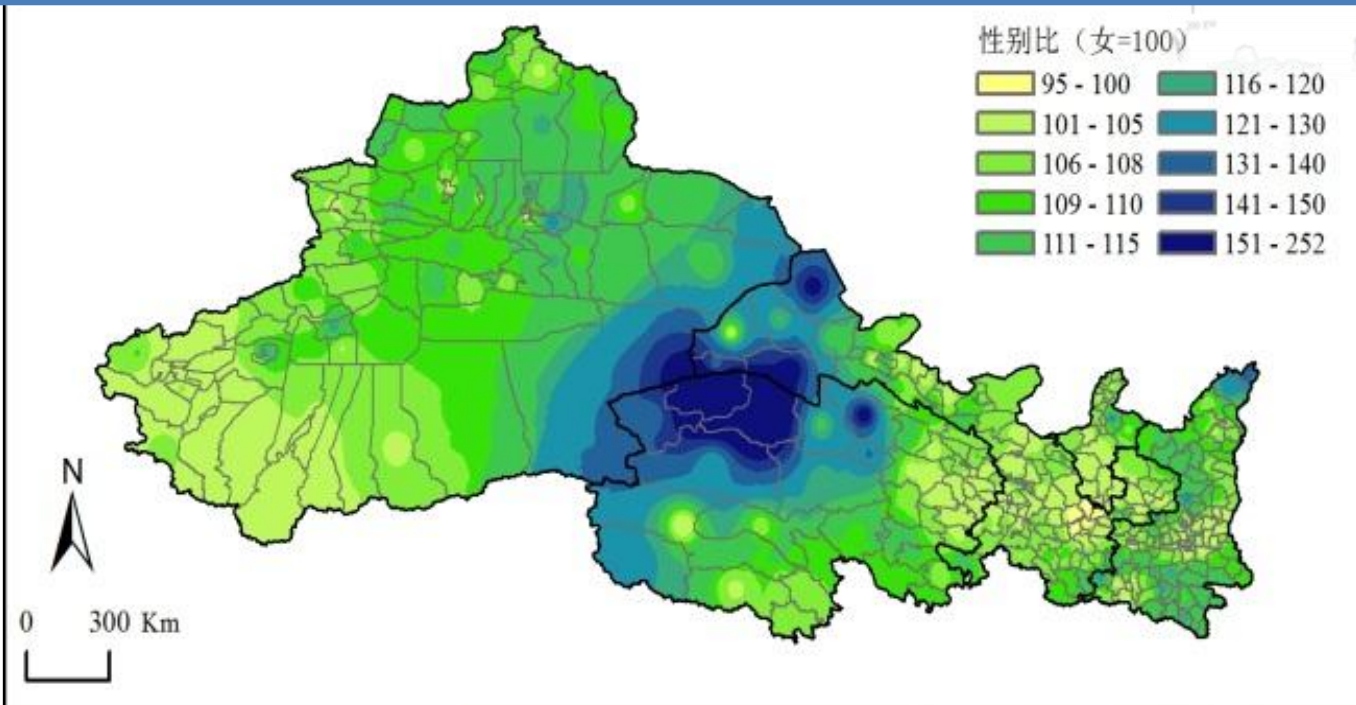
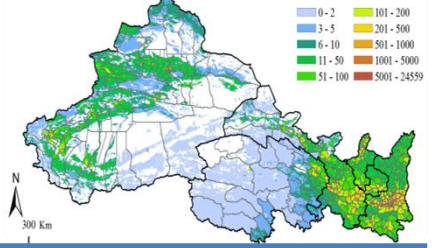


Proportion of secondary industry population (%)





Sex ratio (women = 100)



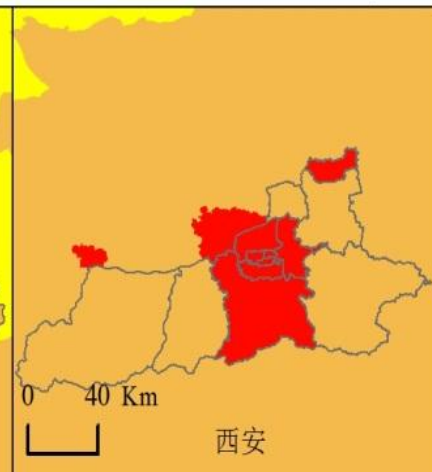
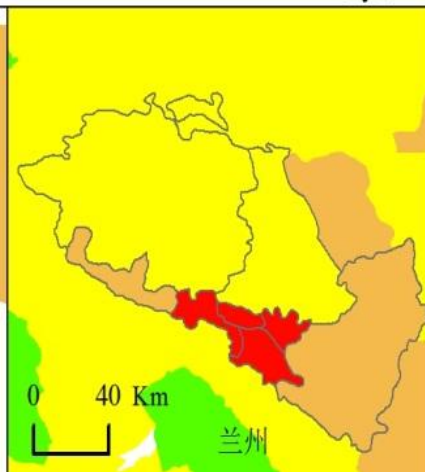
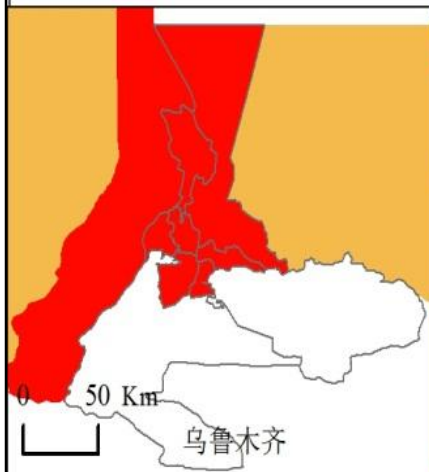
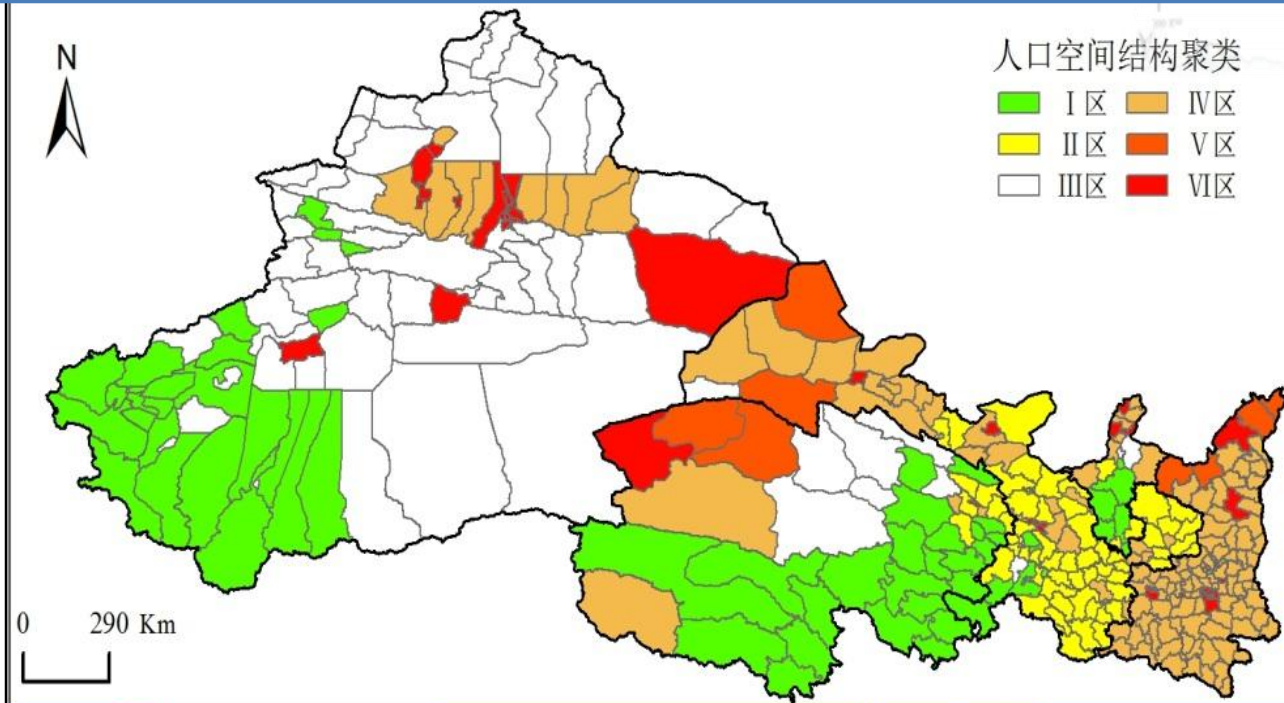
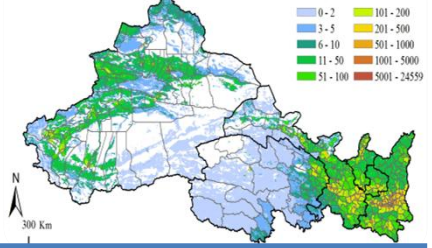


Contents 3

- (1) Population Density Distribution;
- (2) population Characteristics Distribution ;
- **(3) Population Distribution Cluster Analysis;**
- (4) Population Distribution historical Changing Process ;
- (5) Population Distribution Prediction.

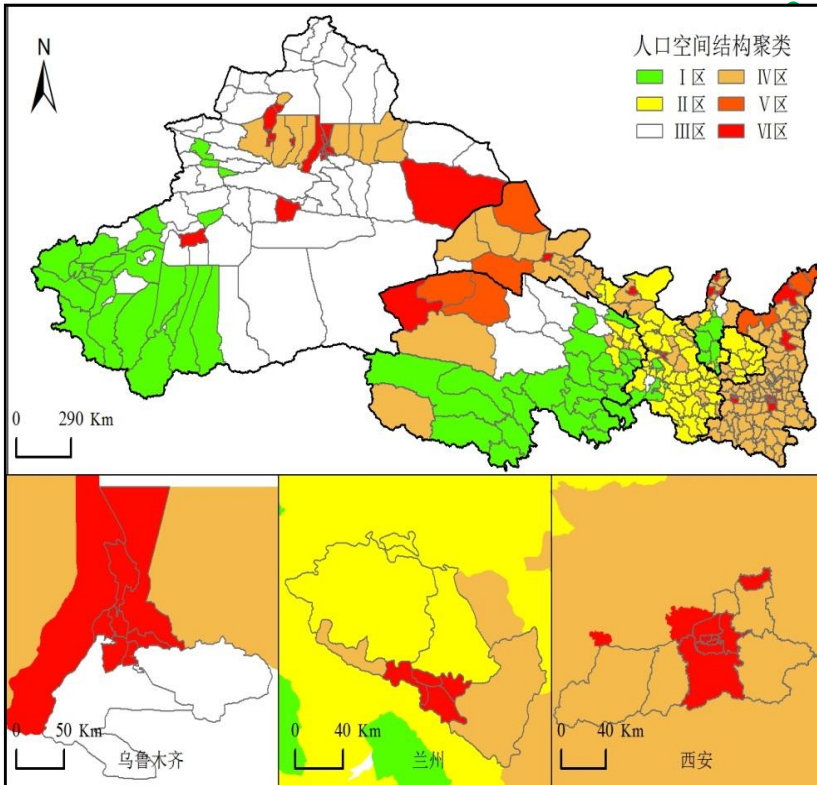
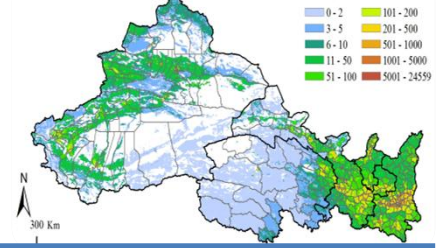


Cluster results of Population Characteristics & Distribution





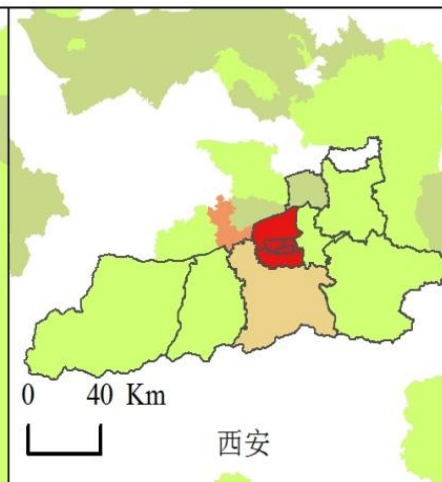
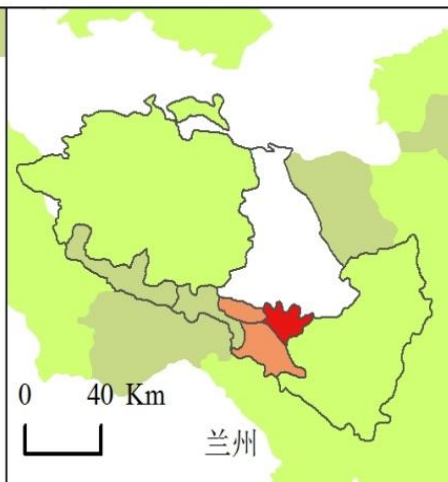
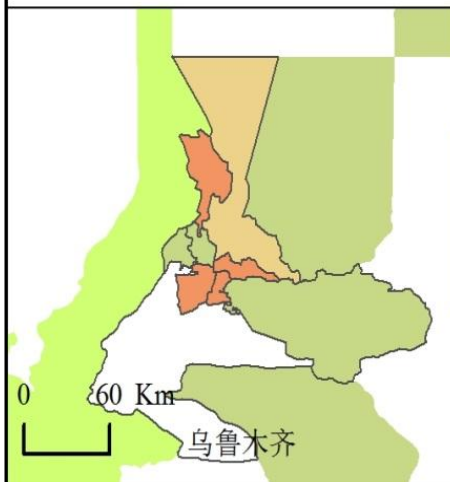
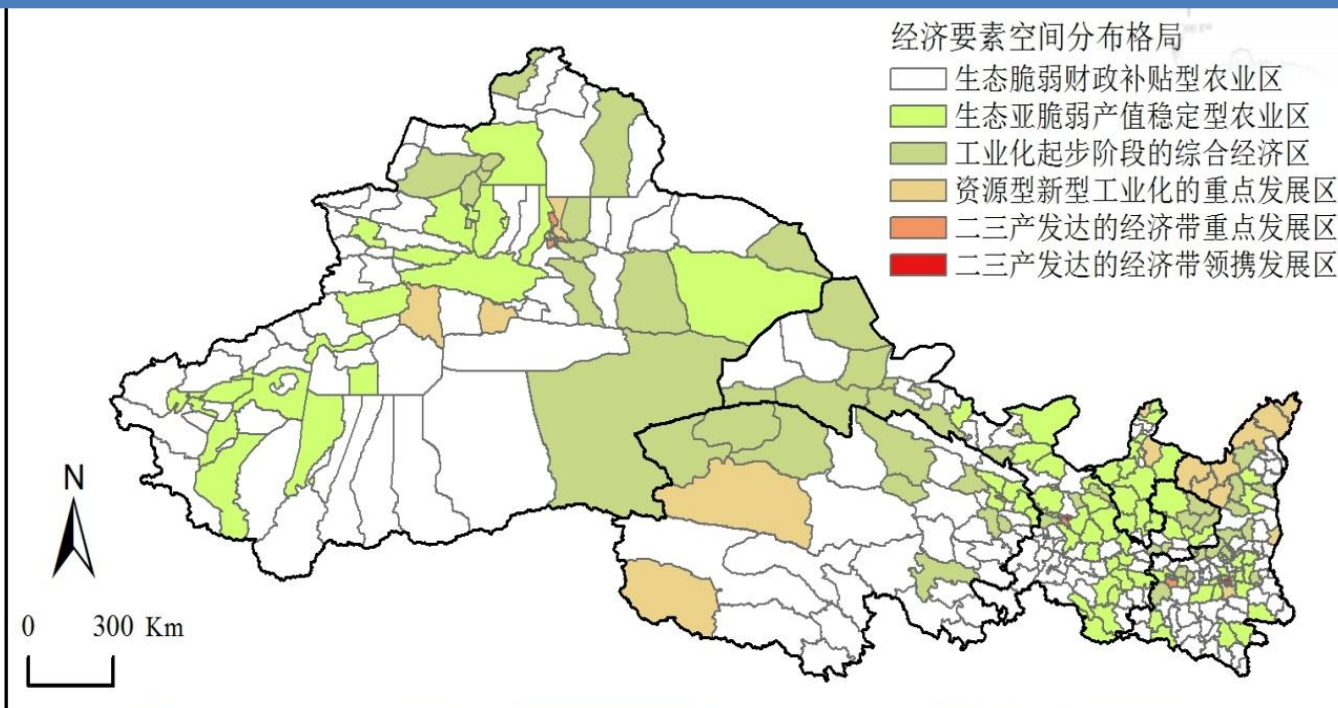
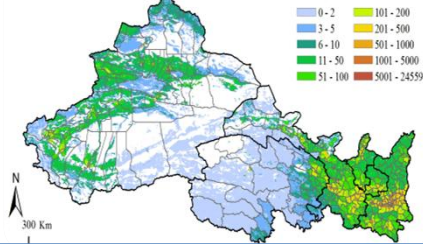
Name of population divisions



- I:** Poverty Agricultural Area with Rapid Increased Population ;
- II:** Agricultural District with Soil Erosion & Population Out-Migration;
- III:** Rapid Growth Population & less Developed Agricultural Zone
- IV:** Aging & more Developed Area
- V:** High Income Resource Area with Floating Population Gathering
- VI:** Objective Area of Population Urbanization & Most Developed Area



cluster result of economic and social development



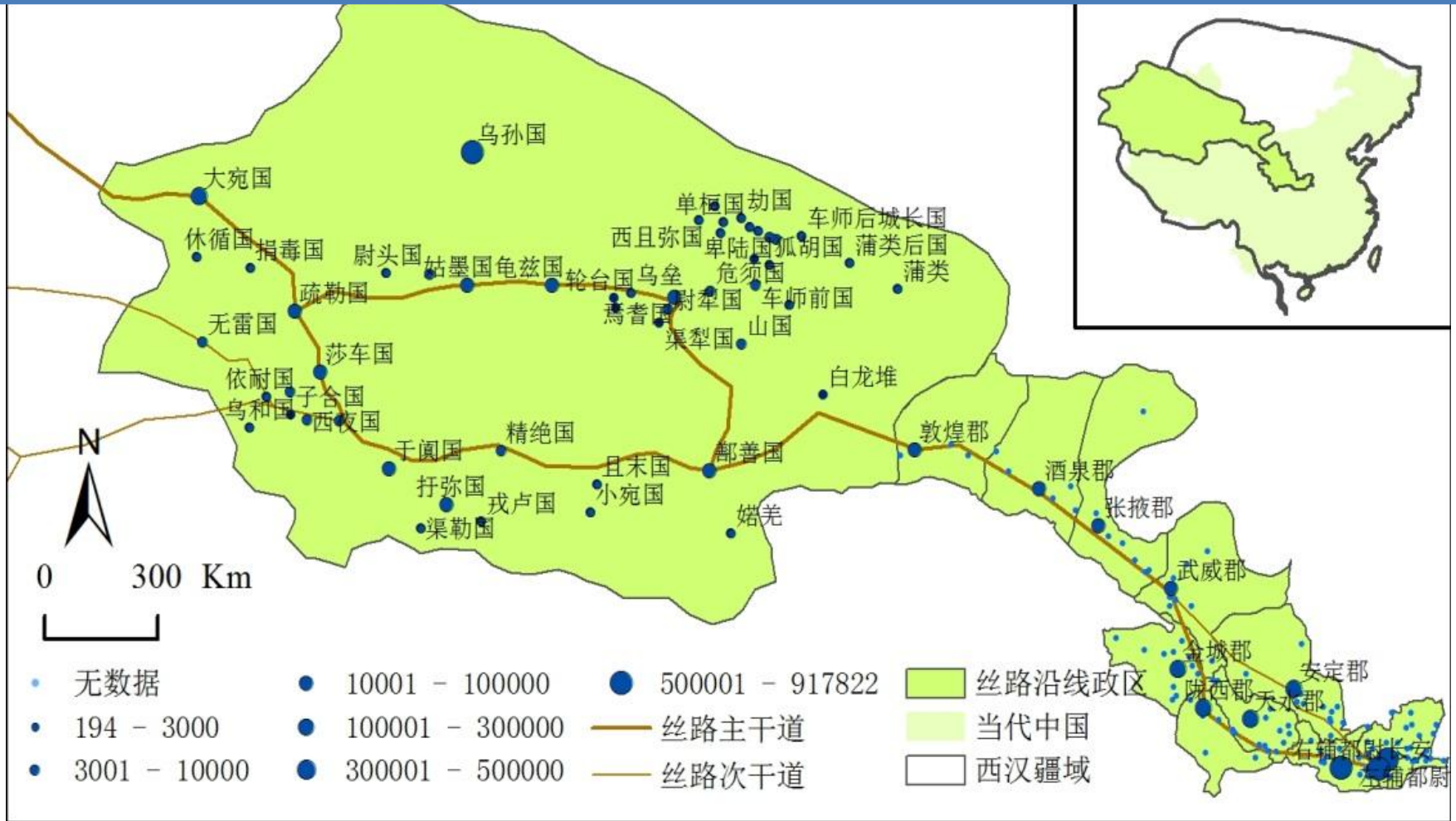


Contents 3

- (1) Population Density Distribution;
- (2) population Characteristics Distribution ;
- (3) Population Distribution Cluster Analysis;
- **(4) Population Distribution historical
Changing Process ;**
- (5) Population Distribution Prediction.

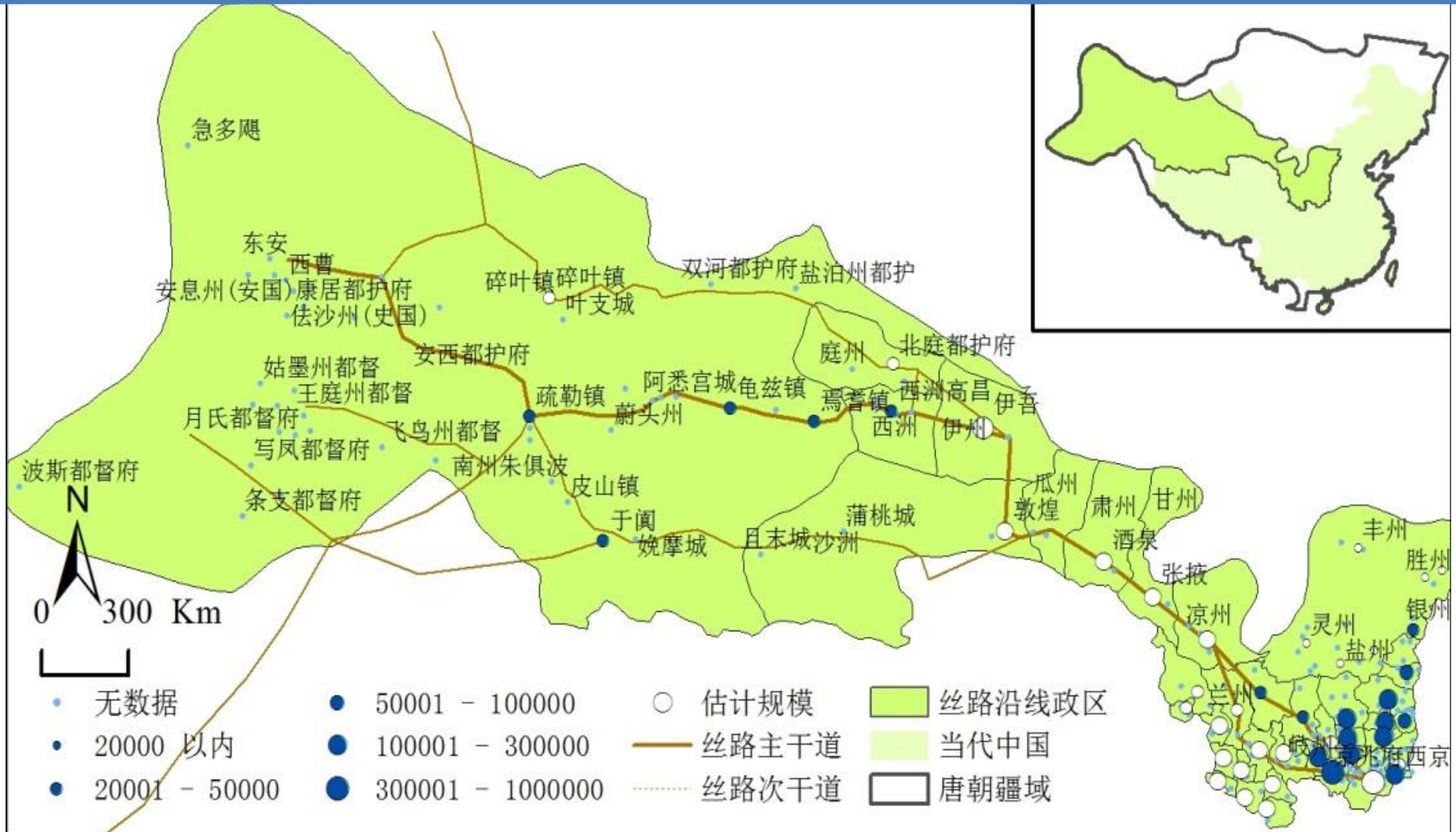


The population distribution *in Han Dynasty* along the Silk Road in The Northwest China



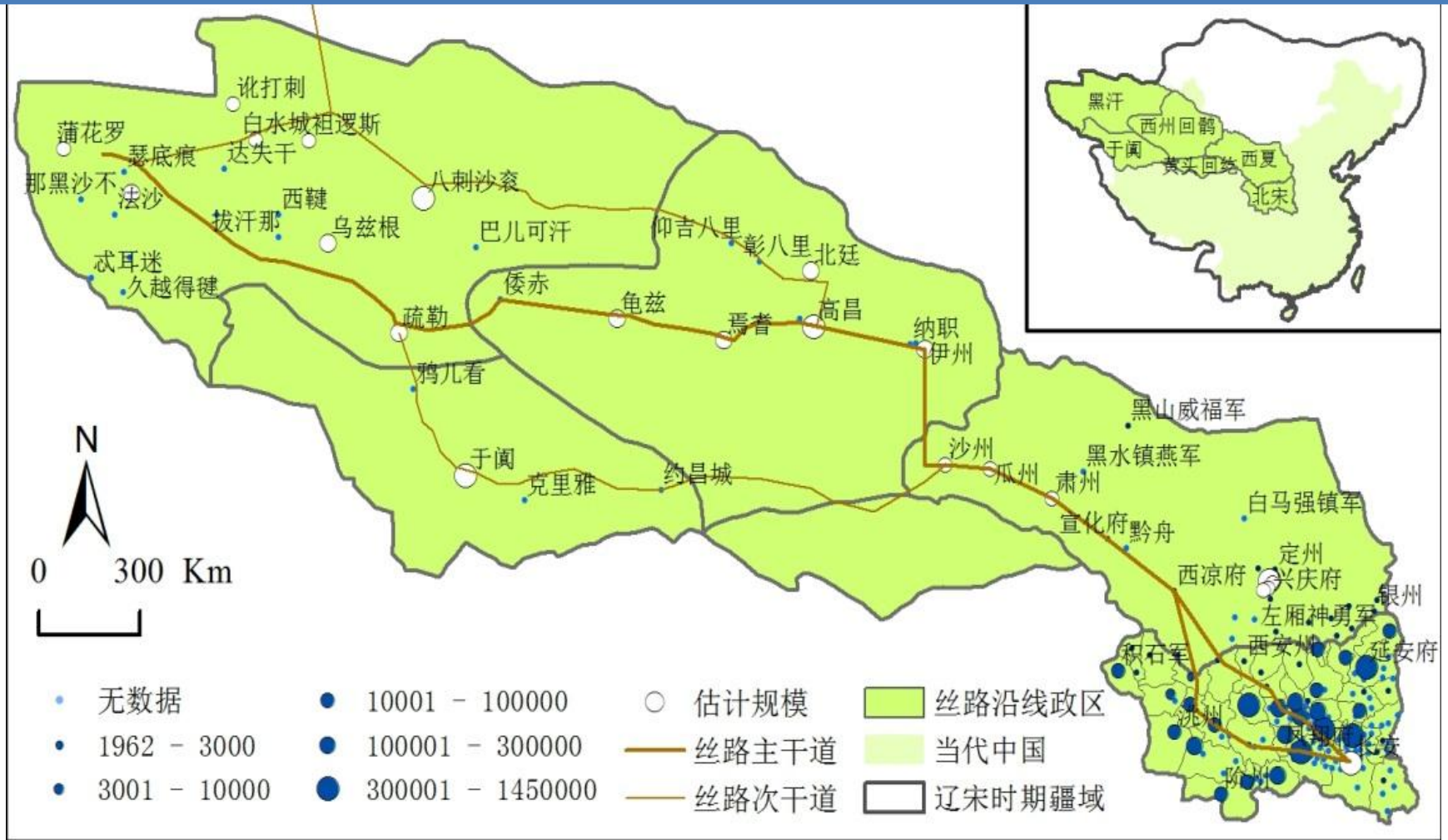


The population distribution *in Tang Dynasty* along the Silk Road in The Northwest China





The population distribution *in Song Dynasty* along the Silk Road in The Northwest China



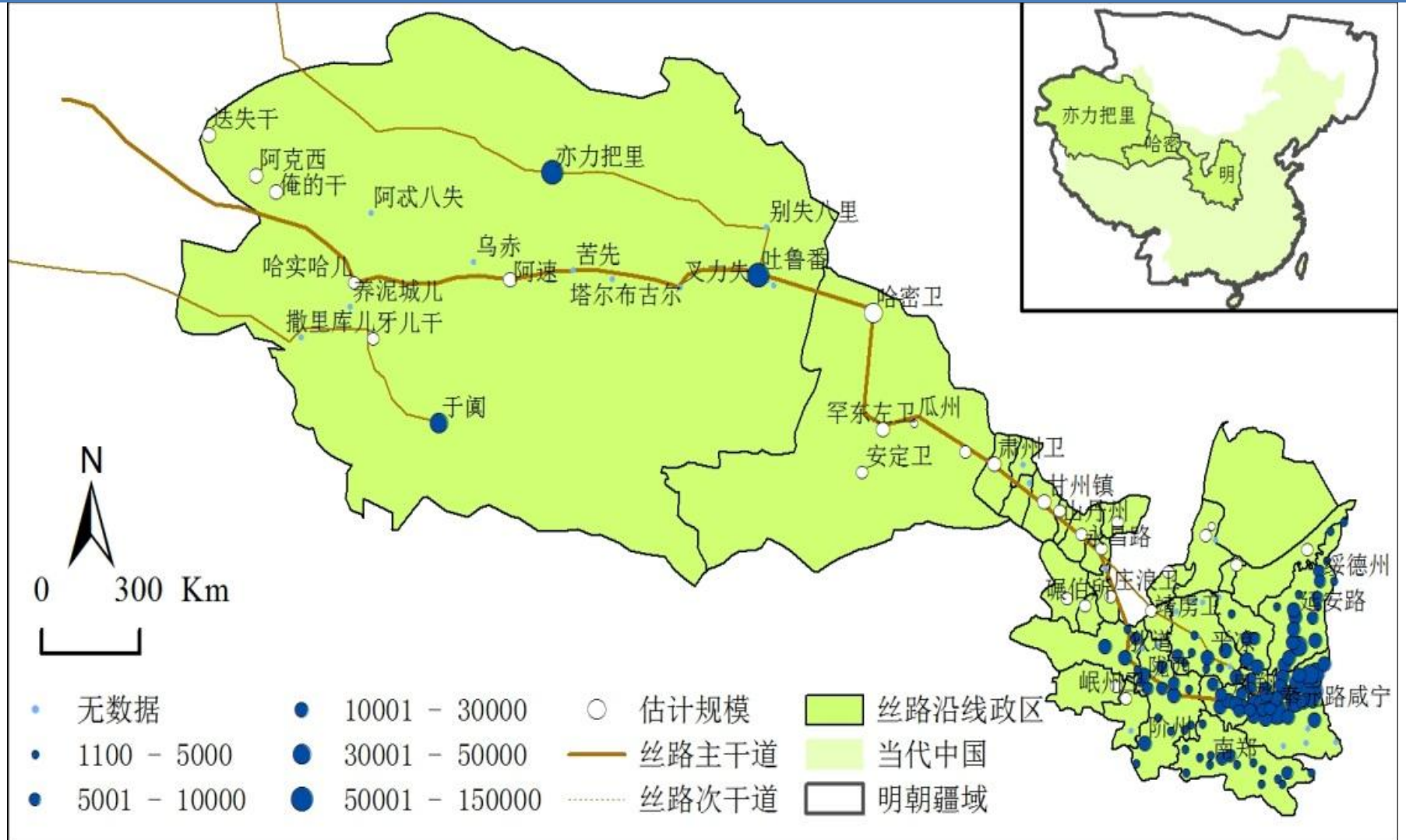


The population distribution *in Yuan Dynasty* along the Silk Road in The Northwest China





The population distribution *in Ming Dynasty* along the Silk Road in The Northwest China



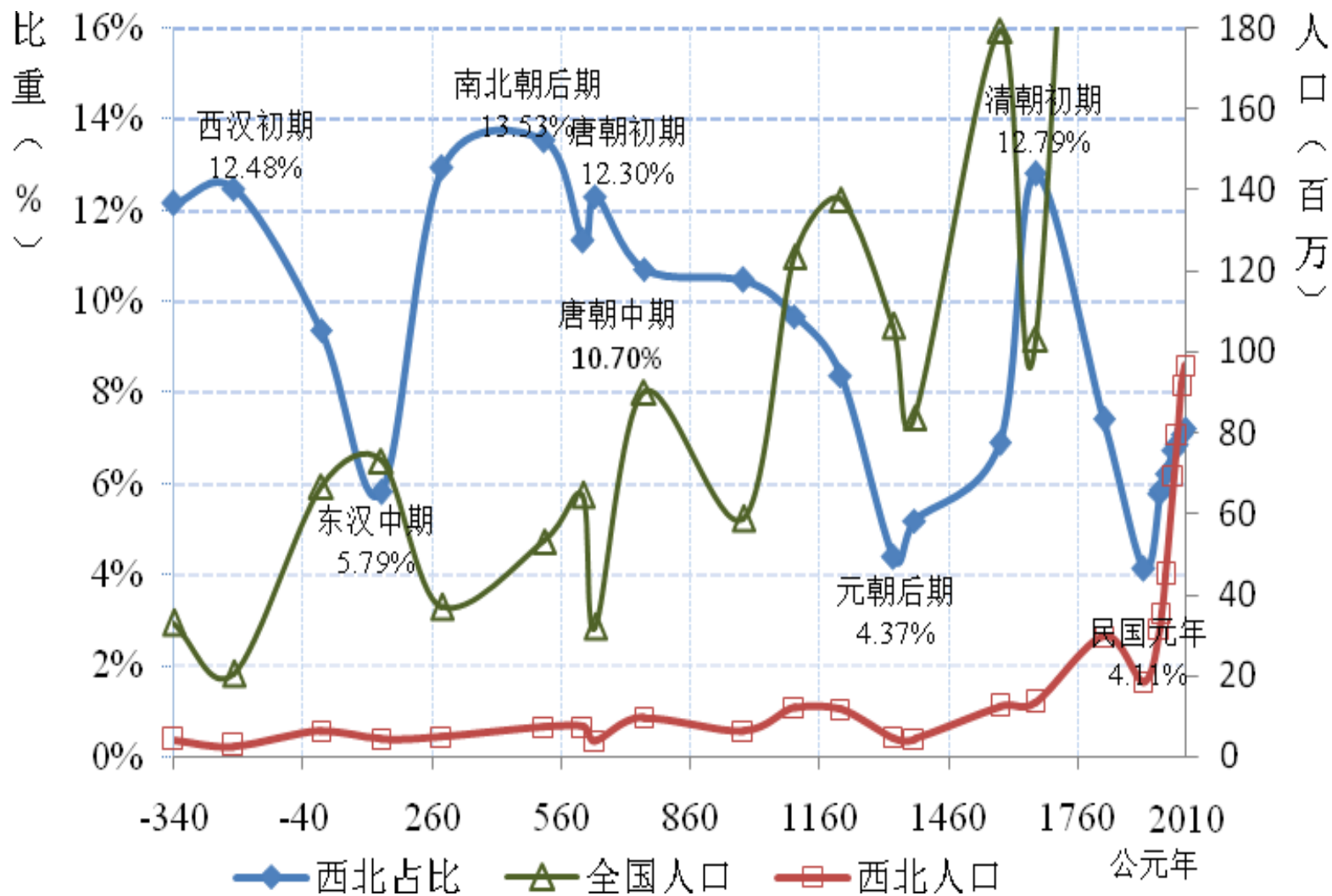


The population distribution *in Qing Dynasty* along the Silk Road in The Northwest China





Population Changes (340 B.C. – 2010 A.C.)





The Main Factors of Population Distribution Change in this area

- (1) Wars**
- (2) Ethnic Separatism**
- (3) political cycle**
- (4) governance capacity**
- (5) foreign-trade policy**
- (6) climate change**
- (7) ecological deterioration, etc.**



Important conditions need to be guaranteed for the Silk Road

- (1) Starting and ending cities and other important **cities should be advanced** in productivity or culture;
- (2) **Transportation** should be **relatively convenient**;
- (3) Counties along the Silk Road should **trust each other** and adopt **an opening trade policy**.



Contents 5

- (1) Population Density Distribution;
- (2) population Characteristics Distribution ;
- (3) Population Distribution Cluster Analysis;
- (4) Population Distribution historical Changing Process ;
- **(5) Population Distribution Prediction.**

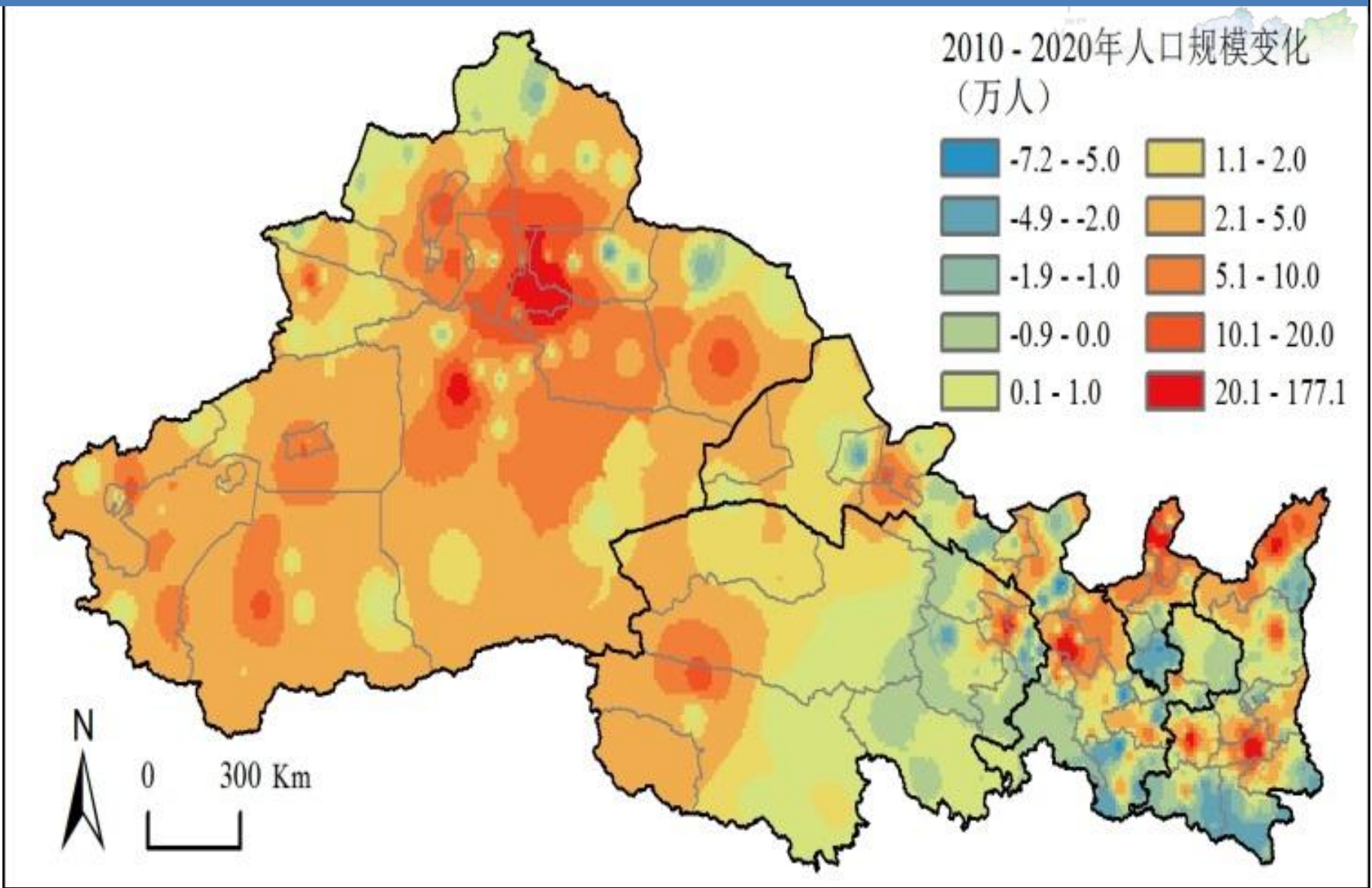
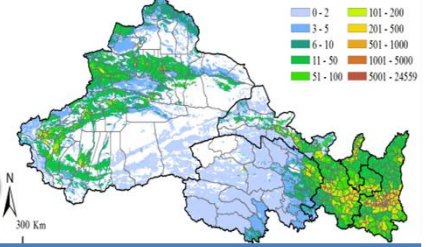


Methods of Prediction

- (1) Predicting the **Population Size** by using the method of **Grey theory** based on **the Census Data**;
- (2) Realizing the **Visualization** of Population Distribution by using the method of **Gridding** Distribution Based on **the Land Use Type**.

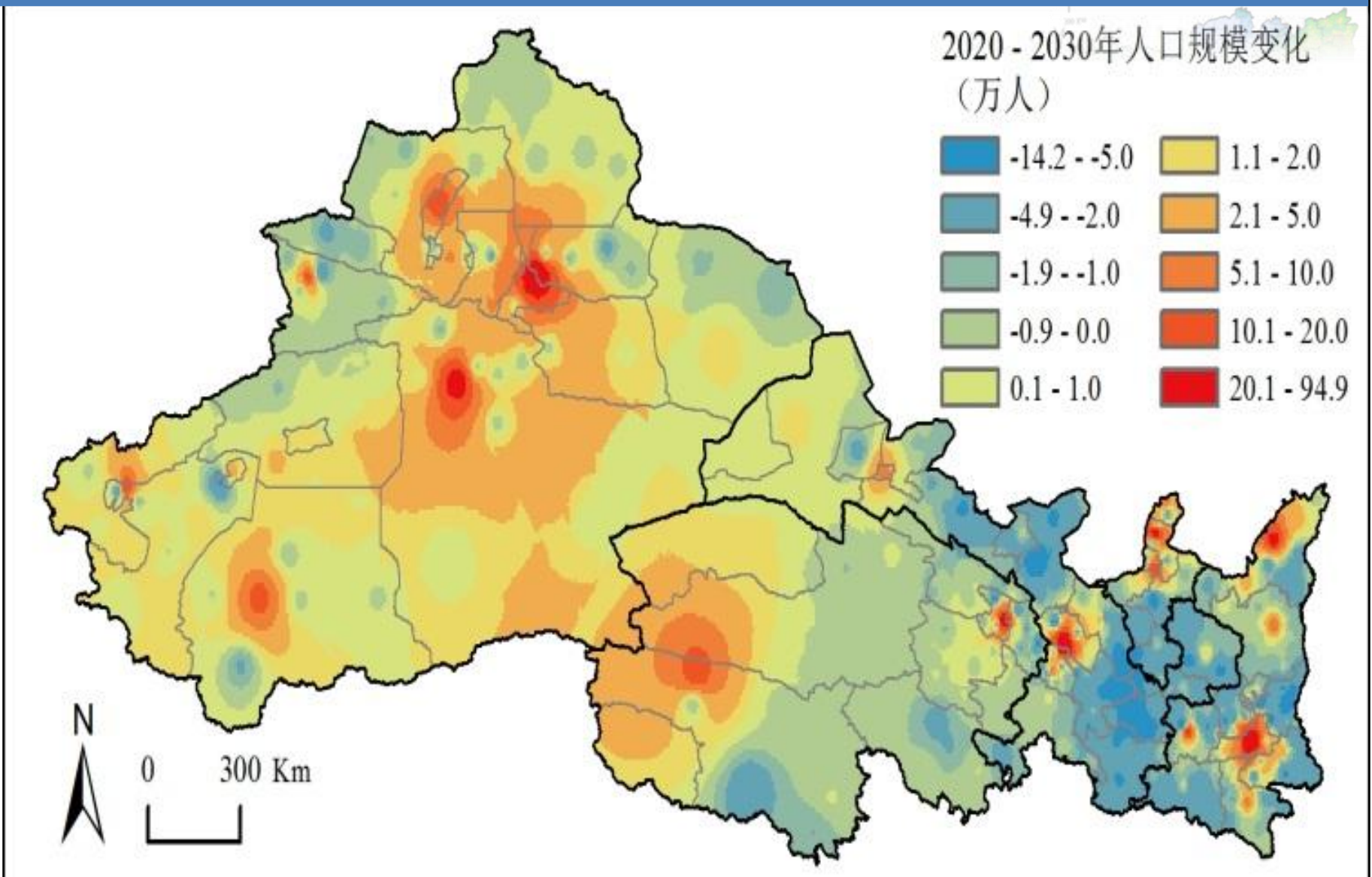
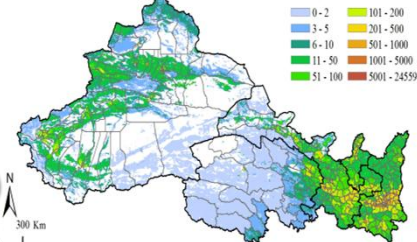


Trend surface map of the population change (2010 - 2020) (ten thousands person)



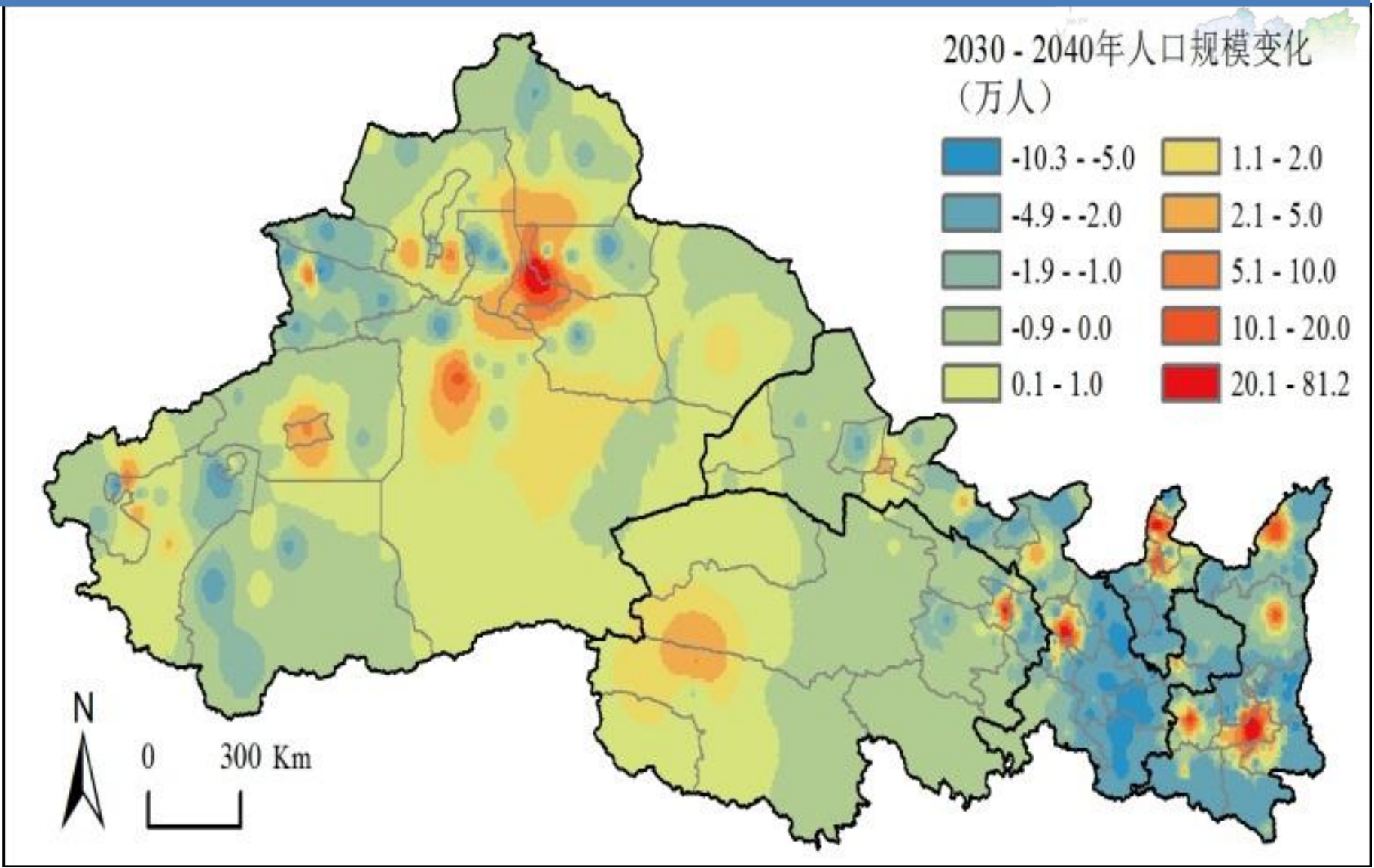
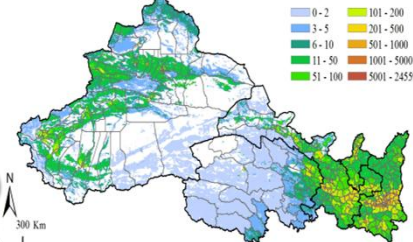


Trend surface map of the population change (2020 - 2030) (ten thousands person)



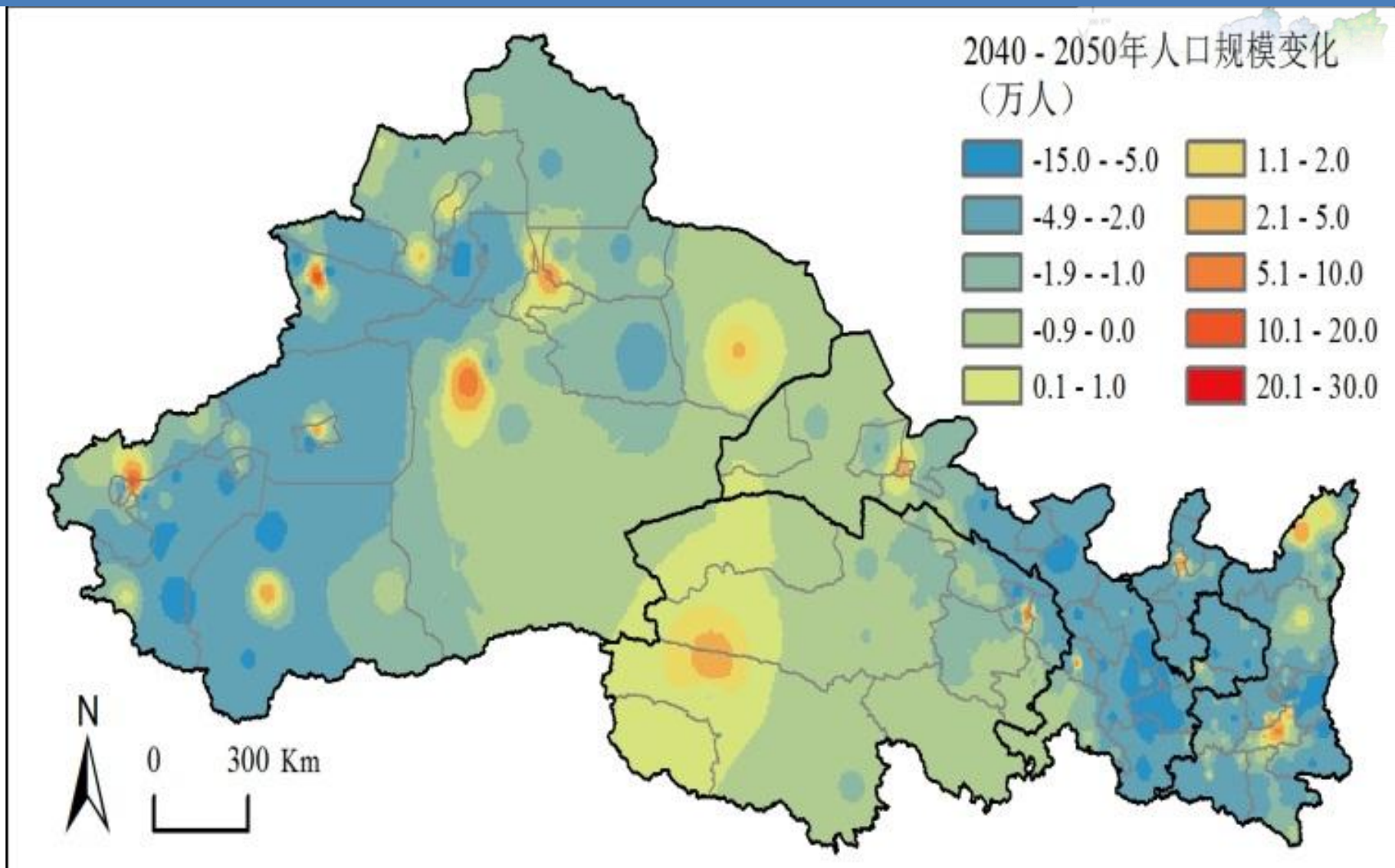
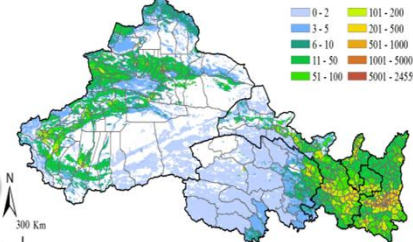


Trend surface map of the population change (2030 - 2040) (ten thousands person)



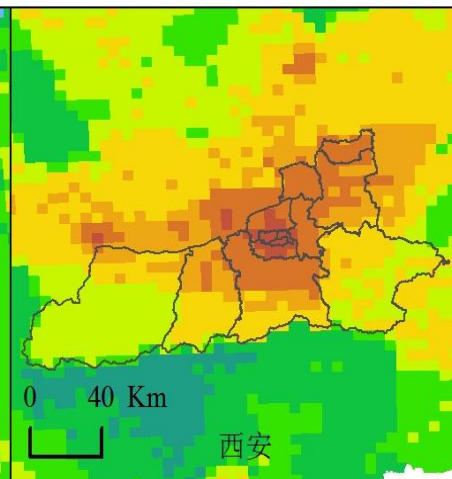
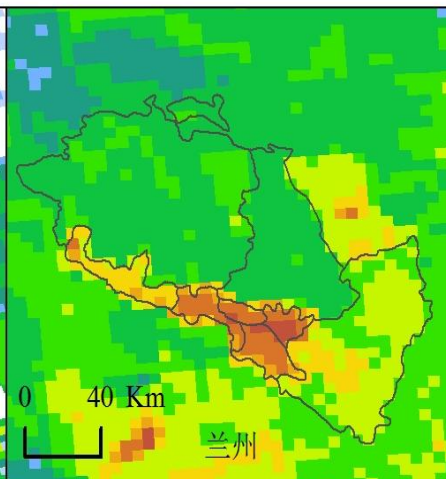
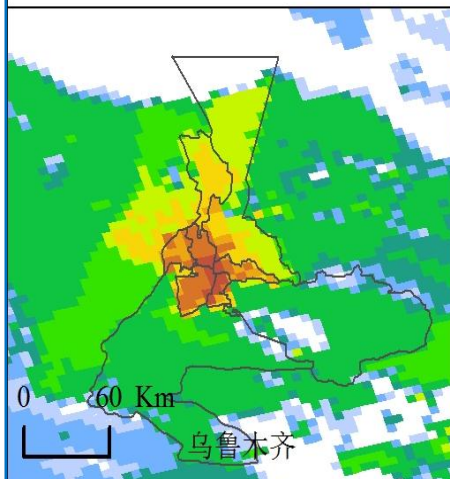
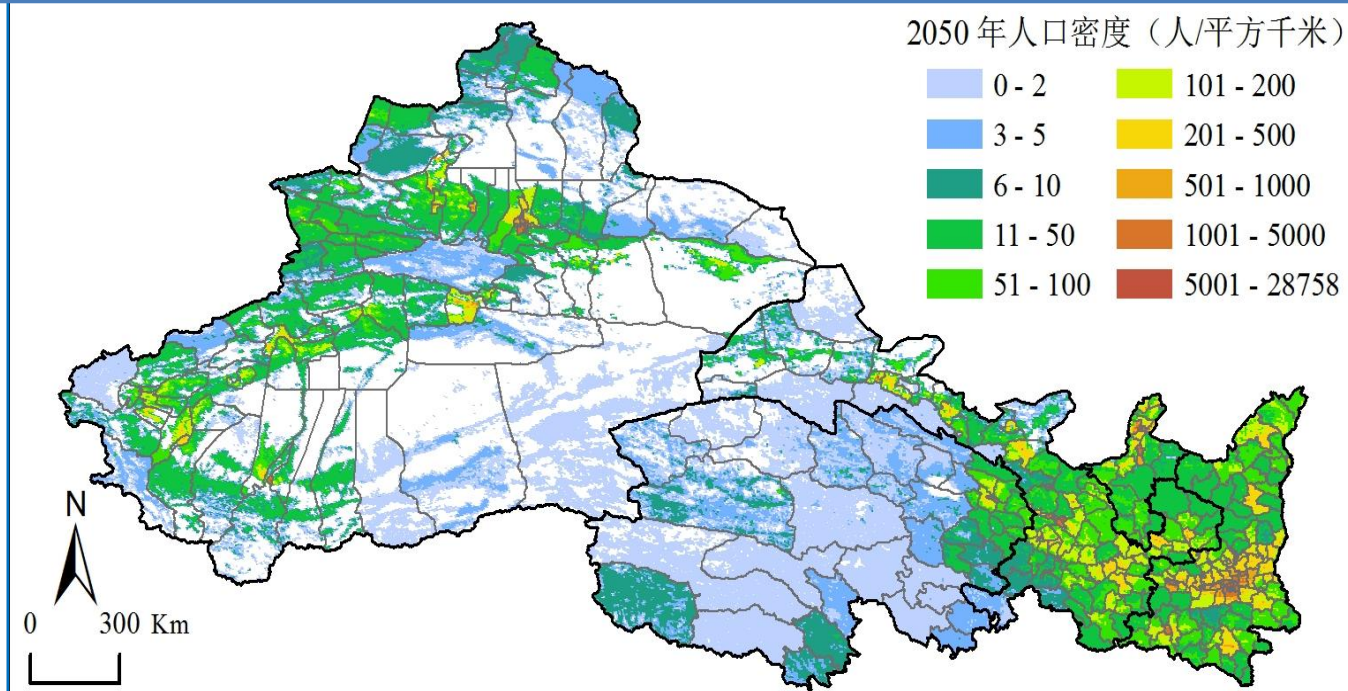


Trend surface map of the population change (2040 - 2050) (ten thousands person)



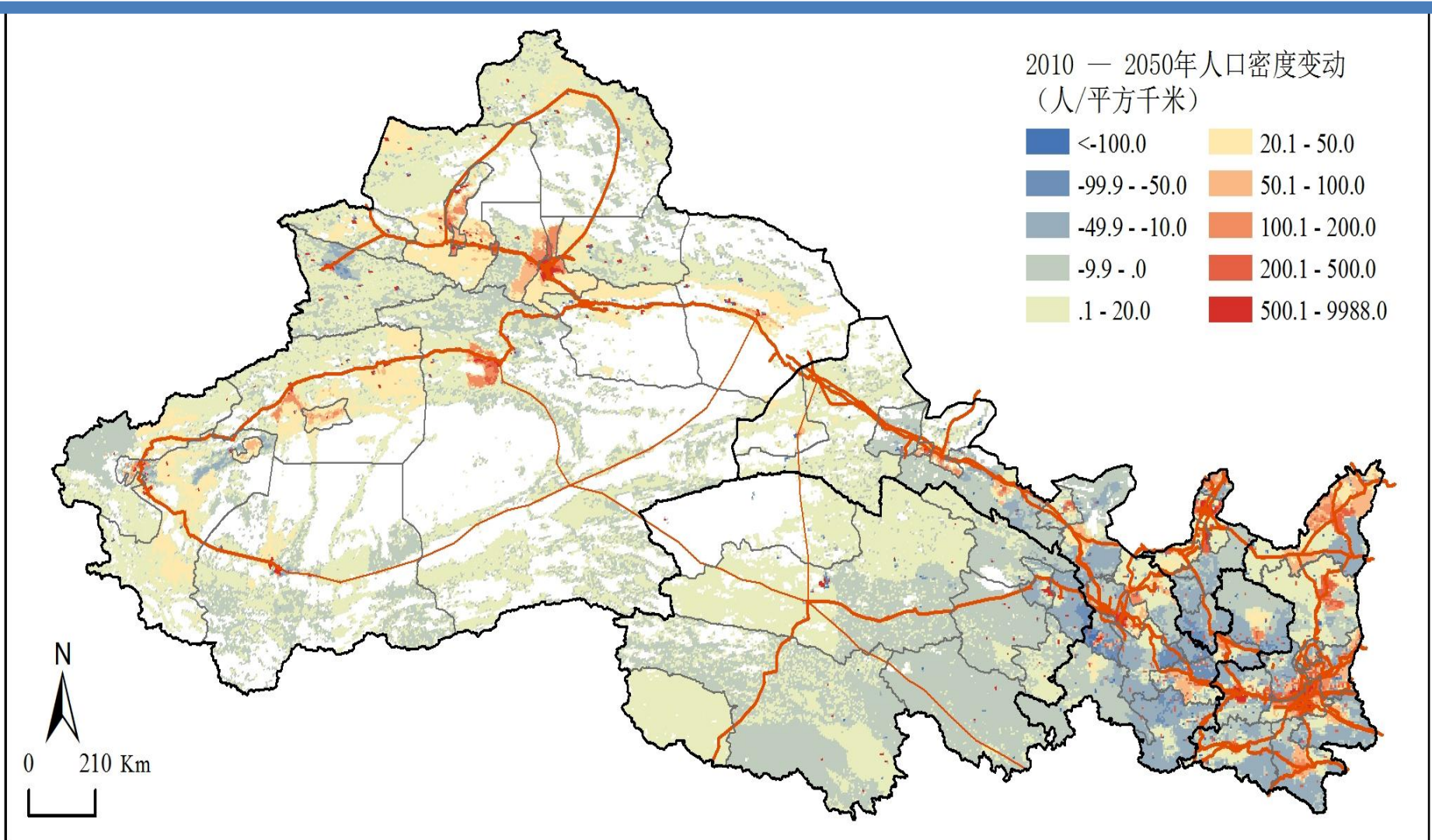


5km Gridding Population Density in 2050





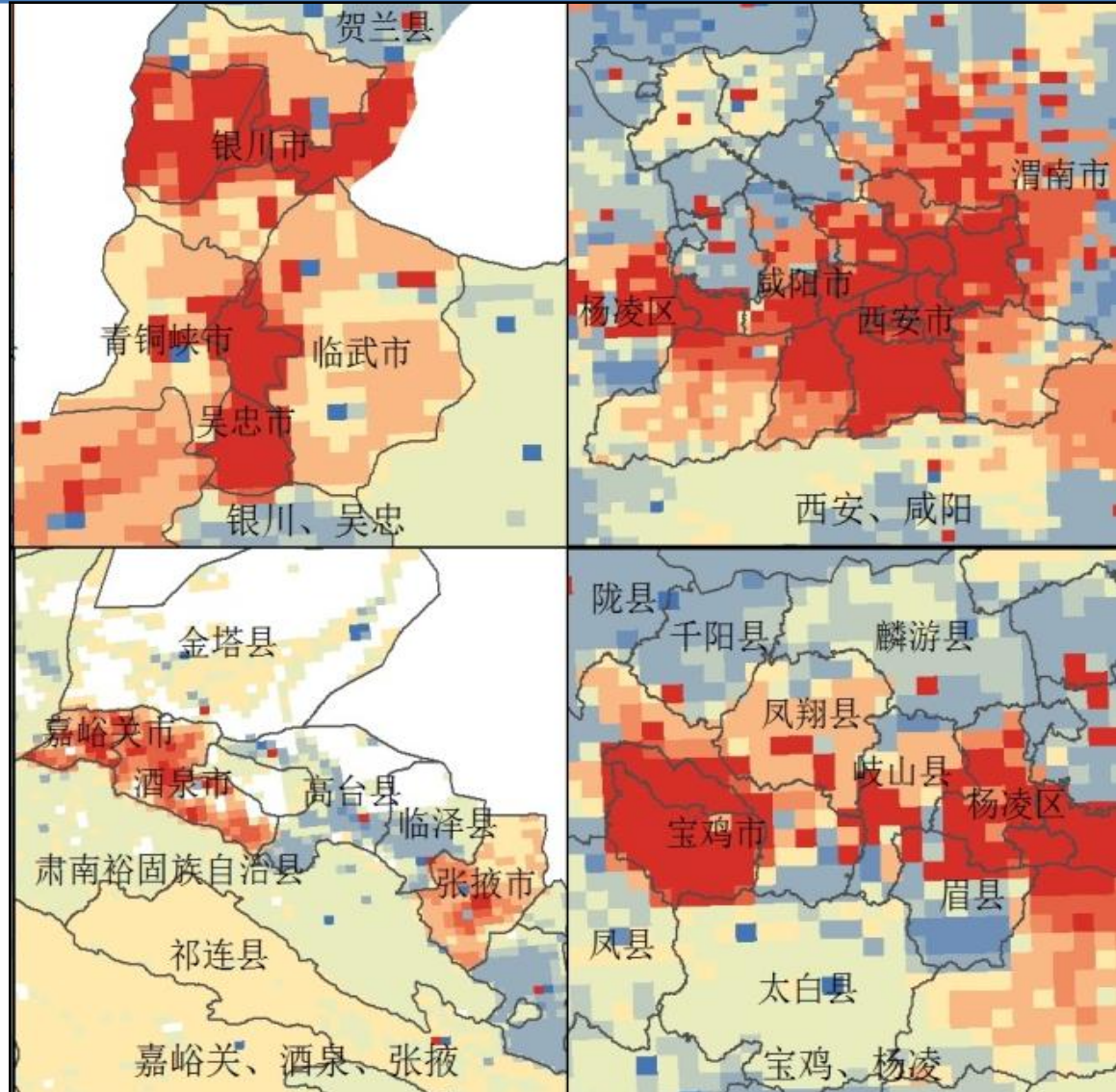
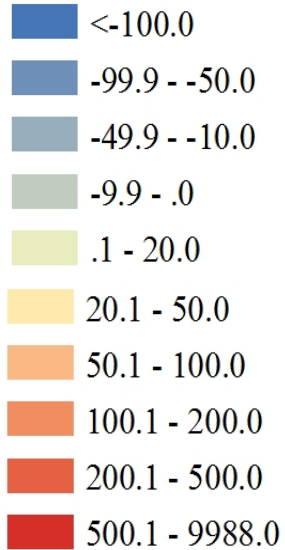
Population Density *Changes between 2010 to 2050* Based on the *5km Grids*





Population density *Changes between 2010 to 2050* in several important cities

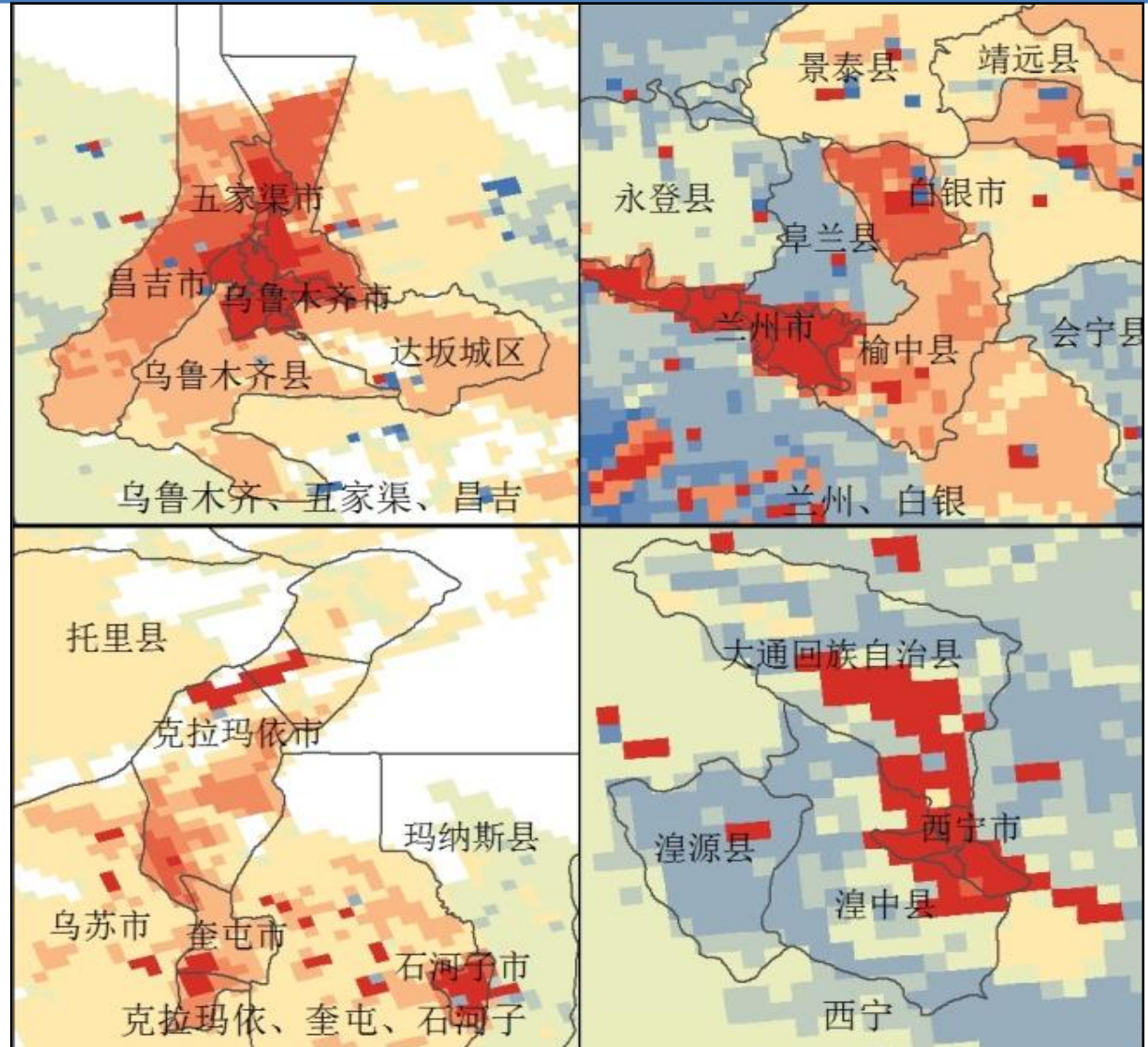
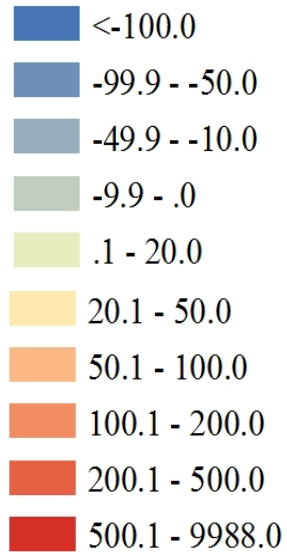
2010 — 2050年人口密度变动
(人/平方千米)





Population density *Changes between 2010 to 2050* in several important cities

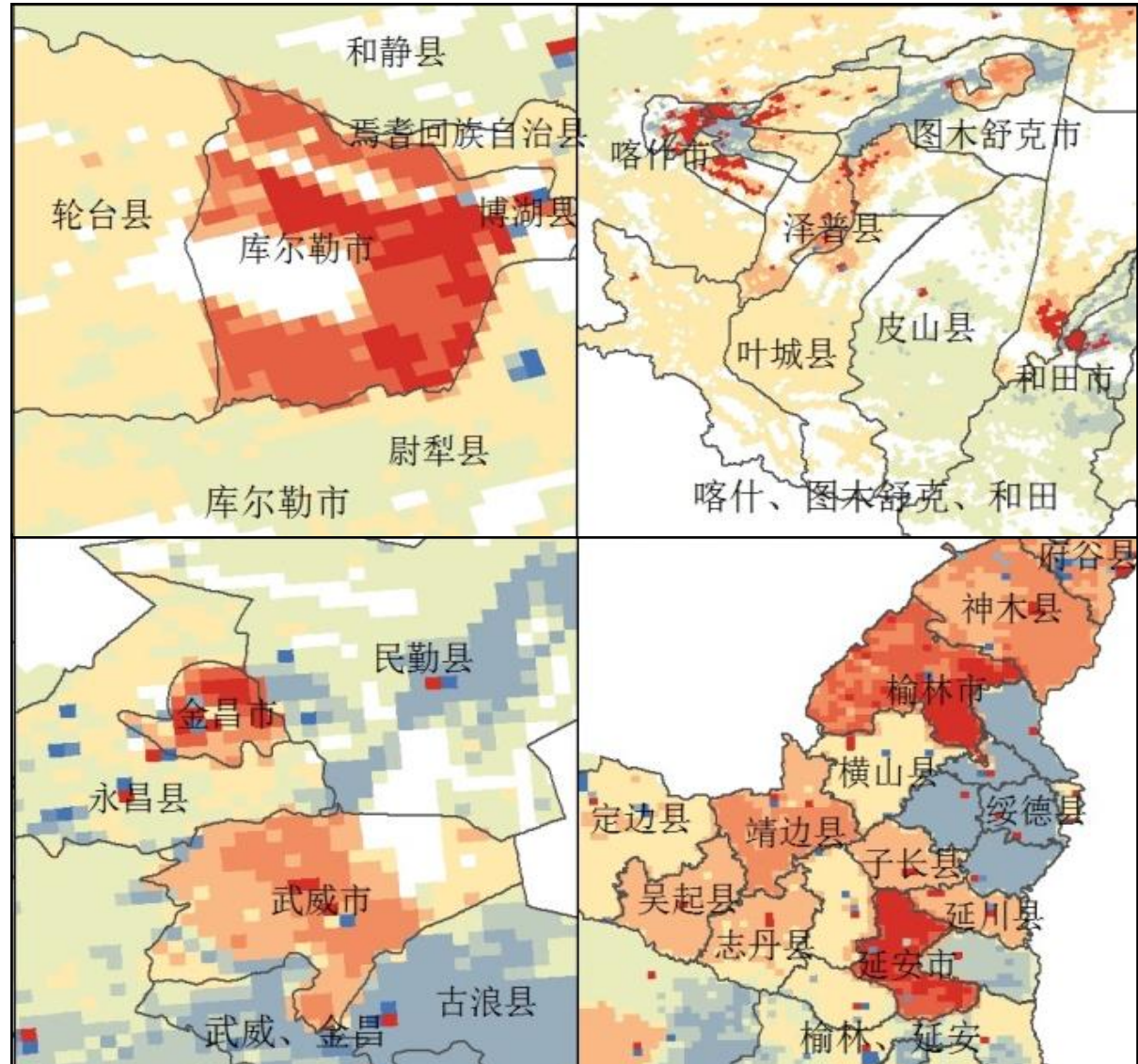
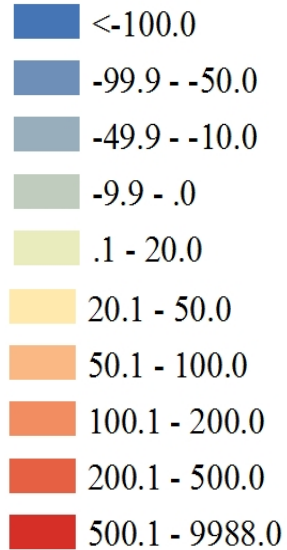
2010 — 2050年人口密度变动
(人/平方千米)





Population density *Changes between 2010 to 2050* in several important cities

2010 — 2050年人口密度变动
(人/平方千米)





Implication and Further research direction

Implication:

(1) reflect the interaction between population and economic-social development;

(2) help to understand and guide our judgments and choices;

(3) planning of public facilities and business location.

Further research direction:

(1) Population distribution in Central Asia, Mongolia, Russia, and other countries along the Silk Road;

Thank you !



- **Email: rice221@163.com**
- [1] Ruihua MI. Study of the population spatial structure in the Silk Road Economic Belt (Domestic segment).[D]. Shannxi Normal University, 2015.