

4.2 Influence of urbanization on climate change

We use SPSS software to analyze the correlation coefficients between each urbanization index and meteorological elements in Nanjing, and we found that the total population (X_7) is the index which affects the annual average temperature greatest, and the urban consumer price index (X_{15}) is the weakest one, according to the absolute value of the correlation coefficient, influence the level of the order from largest to smallest is as follows: $X_7 > X_{10} > X_8 > X_{12} > X_{11} > X_2 > X_6 > X_4 > X_3 > X_{13} > X_1 > X_9 > X_{14} > X_5 > X_{15}$, the agricultural population (X_9) and the urban consumer price index (X_{15}) were found to be negatively correlated with the annual mean temperature (Y_1), and the correlation coefficient pass through 0.01 significant test, except the urban consumer price index (X_{15}). There is a certain effect on urban temperature from the population growth; the same regional change in land surface also had a very important influence on urban temperature.

As the same to annual average temperature, the total population (X_7) is the index which affects the extreme minimum temperature greatest, and the urban consumer price index (X_{15}) is the weakest one, according to the absolute value of the correlation coefficient, influence the level of the order from largest to smallest is as follows: $X_7 > X_{13} > X_{10} > X_{12} > X_8 > X_2 > X_{11} > X_6 > X_4$ $X_3 > X_{14} > X_1 > X_5 > X_9 > X_{15}$, only the correlation of the total population (X_7), road length (X_{10}), green coverage area (X_{12}), land area (X_{13}) and extreme minimum temperature (Y_2) pass through 0.05 significant test, but its correlation coefficient was not large, which explain the effect of urbanization on extreme minimum temperature is not significant.

The extreme maximum temperature is most affected by the road length (X_{10}), followed by green coverage area (X_{12}), the correlation coefficients were 0.435 and 0.425, both pass through the 0.05 significant test, which explain that it is significant for the influence of the regional change in land surface due to urbanization on extreme maximum temperature.

The effect of urbanization on precipitation and sunlight hours is not obvious.

5 Conclusions

In the context of climate warming, urbanization affects local climate change, which causes a series of urban environmental quality problems. With the analysis in this article, we found that the warming trend in Nanjing is very weak, the mainly temperature change is a rising temperature in winter, while it was not obvious in summer, reduce the heat wave phenomenon, the average year temperature has increased slightly; over the years, precipitation increased by 17.43mm every 10 years, but it was volatile during different periods; With the trend continues, the sunlight hours was decreasing by 66.28h every 10 years, which reflects the effect of city dark island, and this may be related inseparable to fog haze caused by environmental pollution in the course of urbanization. Also through the analysis of the relationship between urbanization and climate factors, we found that the total population, agricultural population and urban green area are close to annual average temperature, and it is significant; and the effect of urbanization on the extreme minimum

