Analysis on the change of Yubei District construction land in ChongQing

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Abstract. With the development of economy, countries all over the world are experiencing urbanization at different speeds. As the largest developing country in the world, China is experiencing long-term and sustained rapid economic growth and large-scale urbanization. Chongqing, China is a municipality directly under the Central Government of the People's Republic of China. It is also a world-famous mountainous city and a comprehensive industrial city. As the main urban area of Chongqing, the population and land use scale are rapidly expanding, and the urban infrastructure construction is further promoted. This paper analyzes the land use change of Yubei District in recent 20 years, which is of great significance to guide the urban planning scientifically and rationally, control the scale of urban land use, and protect the limited arable land resources and ecological environment.

1. Introduction

Urbanization (urbanization/urbanisation), also known as urbanization refers to as a country or a region of the development of social productive forces, science and technology progress and industrial structure adjustment, It is a historical process of gradual transformation from a traditional rural society dominated by agriculture to a modern urban society dominated by non-agricultural industries such as industry (secondary industry) and service industry (tertiary industry) [1]. In demography, urbanization is defined as the process by which rural population transforms into urban population; in geography, urbanization is defined as the process by which rural or natural areas transform into urban areas; in economics, urbanization is defined from the perspective of economic model and production mode. According to ecology, urbanization process is the evolution process of ecosystem. Sociologists define urbanization from the perspective of social relations and organizational changes. Urbanization is a multi-dimensional concept, and its connotation includes population urbanization, economic urbanization (mainly industrial structure urbanization), geographic space urbanization and social civilization urbanization (including the urbanization of life style, ideology and culture and social organization relations).

With the development of economy, countries all over the world are experiencing urbanization at different speeds. As the largest developing country in the world, China is experiencing long-term and sustained rapid economic growth and large-scale urbanization. The Statistical Yearbook of China's Urban Construction shows that from 1981 to 2016, the urban built-up area in China surged from 7438 square kilometers to 54,331.5 square kilometers, an increase of 6.3 times, showing an exponential growth [2-3]. The dynamic evolution and development of a city leads to the diffusion of a large amount of information in the city, which leads to changes in the nature of the countryside around the city, thus
affecting the material, cultural and lifestyle renewal, and gradually generating a new spatial layout. The essence of the dynamic evolution of a city is the expansion process used for urban construction.

In ChongQing, China, abbreviation, and ChongQing, nickname, mountain city, ChongQing, Bridges, foggy city, municipality directly under the central government of the People's Republic of China, national central cities, large cities, of hot springs, the Yangtze river upstream areas of the world economic center, financial center and innovation center, politics, culture, science and technology, education, art center, the international metropolis positioning under the State Council. Water, land and air integrated transportation hub in central and western China. ChongQing is a world famous mountain city, but also a comprehensive industrial city, its main city includes ChongQing core city and other 9 administrative areas, covering an area of 5479 square kilometers, the area of mountain peaks, countless ravines. In 1997, ChongQing became the fourth municipality directly under the Central Government in China. ChongQing began to develop from an old industrial base to an economic and cultural center in the upper reaches of the Yangtze River. The urbanization process was accelerated, the population kept growing, and the city size continued to expand\[4-5\].

Yubei District is the main urban area of ChongQing, one of the metropolitan areas of ChongQing, located in the northwest of ChongQing. It is a new district established on the basis of abolishing the original Jiangbei County system with the approval of the State Council on December 17, 1994. In 2008, ChongQing Liangjiang New Area was established, which rapidly expanded ChongQing's urban population and land use scale, and further promoted the construction of urban infrastructure. However, the encroachment of agricultural land on its surrounding areas has intensified, which has profoundly affected the surrounding environment of the city. How to effectively obtain the spatial distribution of construction land, dynamically monitor the process of urban expansion, and analyze the driving force mechanism of urban expansion are of great significance to guide urban planning scientifically and rationally, control the scale of urban land use, and protect the limited arable land resources and ecological environment.

2. Research methods
In this paper, using spatial information technology on chongqing Yubei District nearly 20 years in the process of the construction land scale of different land use types spatial distribution and temporal variation characteristics of remote sensing of the earth's surface parameter and evaluate the spatial and temporal evolution of urban ecological environment quality, simulation, and on the basis of exploring human dominant mechanism for the responses of the ecological environment, This paper provides decision support for scientific development and management of Chongqing city, and also provides reference for land use planning and ecological environment management of mountainous towns in southwest China. This can improve and enhance the level of urban planning and management, guide and control the future direction of urban development reasonably, so as to promote the coordinated development of cities\[6\].

 Landsat5TM and Landsat8TMS image data were used in this study, with the row numbers 137/039 and 137/040. In order to better study the change of Yubei District construction land in ChongQing in recent 20 years, all image data were analyzed according to the available image images and the purpose of obtaining accurate inversion data. As far as possible, image data with less cloud cover, good imaging quality and in summer were selected. Finally, image images of seven time phases were selected from 2001 to 2020, namely, 2001, 2004, 2007, 2011, 2014, 2017 and 2020, and the image time of each year was from May to September when the temperature was high\[7\].

After the available remote sensing images were obtained, the spatial and temporal changes of Yubei District land use were systematically analyzed by using parameter construction method. The parameter construction method makes full use of GIS technology to construct some simple parameters, which can be used to describe the characteristics of land use and land change, so as to obtain more clear information of land use change. In terms of land use structure, land use change amplitude, land use dynamic attitude and other methods are used to analyze. The range of land use change is the difference between the late
and early land use areas of various types, which is used to compare the change degree of various land use types.

3. Result analysis
ArcGIS10.0 was used to conduct classified statistics on the land use/cover status data of the study area in 7 years from 2001 to 2020, and all kinds of land use types were classified and the area of each type was counted. As shown in the figure below(Fig. 1-Fig.7)
The statistics of Yubei District land use types are shown in Table 1.

| Land use types  | 2001   | 2004   | 2007   | 2011   | 2014   | 2017   | 2020   |
|-----------------|--------|--------|--------|--------|--------|--------|--------|
| Arable land     | 884438 | 776864 | 892264 | 771136 | 772509 | 707936 | 726310 |
| Woodland        | 378556 | 485920 | 378359 | 430853 | 386488 | 397403 | 345494 |
| The grass       | 93300  | 70002  | 15870  | 42623  | 8378  | 21720  | 31487  |
| Waters          | 19268  | 23143  | 16234  | 15792  | 16686  | 21311  | 24040  |
| Construction land| 33251  | 68248  | 119900 | 158910 | 242820 | 267626 | 288251 |
| Unused          | 18250  | 2886   | 4436   | 7749   | 182   | 11067  | 11481  |
| Background      | 132718 | 132718 | 132718 | 132718 | 132718 | 132718 | 132718 |

4. Conclusions
As can be seen from the analysis chart of land use type change, the area of construction land has increased year by year in recent 20 years, while the cultivated land, woodland and grassland have decreased year by year. Therefore, with the development of urbanization, people gradually use cultivated land, woodland and grassland as construction land, which may have some impact on the ecological environment. However, the specific impact remains to be further studied by scholars.

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