ISSN: 2710-0588

Application of Arcgis Software in Integration of Land Engineering Survey and Land Status Map

Lu Zhang[1, 2, 3, 4, 5], Jing Zhang[1, 2, 3, 4, 5]

[1]Institute of Land Engineering and Technology, Shaanxi Provincial Land Engineering Construction Group Co., Ltd.; China

[2]Key Laboratory of Degraded and Unused Land Consolidation Engineering, Ministry of Natural Resources; China

[3]Shaanxi Engineering Research Center of Land Consolidation; China

[4]Land Engineering Technology Innovation Center, Ministry of Natural Resources; China

[5]Key Laboratory of Cultivated Land Quality Monitoring and Conservation, Ministry of Agriculture and Rural Affairs, China

Abstract

The rapid development of the economy and society has led to a rapid expansion of the volume of territorial and resource data in China, which has brought certain difficulties to the development of the land engineering industry. However, ArcGIS software not only overcomes many inconveniences in land data statistics, but also can be applied to all aspects of land use change. It can modify, organize and output the final change statistics summary table of the huge volume of territorial data in land engineering one by one. The operation is simple and the query is convenient. This article analyzes the application of ArcGIS software in the analysis of unused land reserve resources, the production of standard sheet maps, and the superimposition of surveying and mapping and land use status maps in land engineering one by one, and points out that the development prospects of ArcGIS software in the field of land engineering are huge, ultimately achieving the goal of efficient utilization and development of land resources in China.

Keywords

Arcgis software; Reconnaissance survey; Land status map; registration.

1. Introduction

With the rapid development of social economy and the continuous advancement of urbanization, China's demand for construction land is increasing, and the area occupied by agricultural land is increasing. In the four years from 1997 to 2001, the country's construction projects occupied 73.73hm2 of cultivated land, and the reduction of agricultural land has threatened the security of food production. Faced with such a severe situation, the state put forward the national policy of "sticking to the red line of 1.8 billion mu of arable land", and it is imperative that non-agricultural land becomes agricultural land. The ways of transforming non-agricultural land into agricultural land engineering include land development, land consolidation, homestead reclamation and other related land improvement activities. As a new term put forward in recent years as a land and resources system, land improvement is more of a general concept. It includes the renovation of agricultural land, the renovation of rural construction land, the renovation of abandoned urban industrial and mining land, land reclamation and the development of reserve land suitable for agriculture. China's land use is facing a serious problem, that is, the development of reserve land resources is limited by poor quality, difficult reclamation and ecological environment constraints. Therefore, it is an

ISSN: 2710-0588

inevitable trend of land engineering development to develop and manage non-agricultural land such as sandy land, desert land, saline-alkali land, abandoned old river channels and abandoned residential land in a scientific and rational way, so as to improve blood supply for agricultural land [1].

From the existing rural land use status management and urban cadastral management system software, there are some shortcomings: first, the running speed is slow, the computer hardware configuration requirements are high; Second, it lacks many elements of 3D GIS. These bring a lot of inconvenience to land registration, statistics, change, summary and comprehensive analysis in land engineering [2]. Arcgis software integrates ownership management with land use management, and establishes a unified rural and urban cadastral management system with unified software, data structure, organization and management mode, which can also meet the current situation of rural land use and urban cadastral management requirements. A powerful software that integrates land consolidation and development to achieve seamless and integrated management of rural land and urban cadastre.

2. Integration of Land Engineering Survey and Land Status Map

Arcgis can not only present the unused land well, but also produce standard framing maps for land engineering. It also has a powerful function of integrating some maps in survey and measurement into known maps of land use status, so as to see the overlapping relationship between these maps and known maps in survey and measurement in engineering.

In order to export survey and measurement map blocks in Arcgis software, it is necessary to know the longitude and latitude code prepared for this map block, and import it into the known land use status map in txt format through "text generated graph" in "Processing Function" in Arcgis software. Figure 1 is a combination map of engineering survey and survey map and land status map, and the blue line in the figure is the engineering survey and survey map block. The combination of the two maps can make the specific operation and implementation of land engineering clear, understand what kind of land use type is in the specific construction area, and can better guide the project construction.

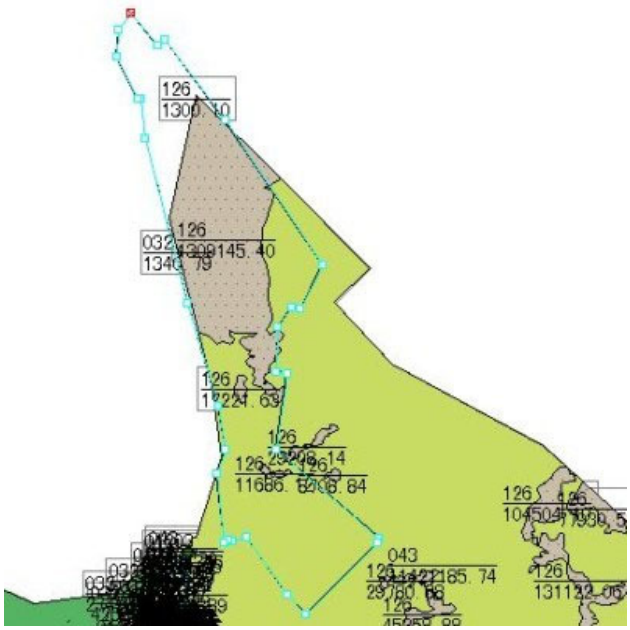

Figure 1. Integrated map of engineering survey and land status

ISSN: 2710-0588

The extensive application of Arcgis software in land engineering is not only a tool in the operation of land engineering, but also the need for the development of information technology in the application field of land engineering [3].

Arcgis software is not only a map compilation software, but also can be applied to scientific research. Combining computer software with experiments is nothing new, but combining Arcgis software with land engineering experiments and making them mutually applicable is a long and arduous task. Arcgis software can well combine land regulation, land leveling and land reclamation in land engineering with their respective soil physical, chemical and biological experiments, so as to facilitate the conduct and inquiry of experiments, so that Arcgis software can better serve the land engineering industry in terms of scientific research.

We believe that Arcgis software with powerful computing and processing functions will play a more important role in the field of land engineering, providing a strong technical guarantee for the effective and rational use of land resources and enabling the land engineering industry to flourish.

3. Funding

This research was supported by Technology Innovation Center for Land Engineering and Human Settlements, Shaanxi Land Engineering Construction Group Co., Ltd and Xi'an Jiaotong University (2024WHZ0241).

References

[1] Han Jichang. Introduction to land engineering [M].2013.

[2] Zhang Jifu, Xiao Linping, Zou Renjun. Discussion on Some Problems of Cadastral Management Information System [J].Surveying Mapping,2013,36(2):72-75

[3] Luo Zhengguang. Analysis on the application of GIS in the evaluation of land resources [J]. Information and Computer,2010,10:141.