Mathematical and Computer Modelling 54 (2011) 1204–1212

Contents lists available at ScienceDirect

Mathematical and Computer Modelling

journal homepage: www.elsevier.com/locate/mcm

Assessment for soil improvement benefit of land rehabilitation in dump areas

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ARTICLE INFO

Article history:
Received 12 September 2010
Accepted 4 November 2010

Keywords:
Improvement benefit
Gray relational analysis
Land rehabilitation
Assessment

ABSTRACT

Land rehabilitation can affect the environment of dump areas prominently. For example, it can improve the chemical properties of the soil in the dump. In order to discover the quantitative relationship between land rehabilitation and soil improvement, firstly, 14 kinds of physical and chemical properties of the soil in dumps are compared and analyzed, such as the soil's organic matter content, thickness of the soil layer, total nitrogen, available phosphorus, calcium, magnesium, sulphur and boron, rapidly available potassium, iron, copper, zinc and manganese, and pH. Secondly, according to different waste ages and different rehabilitation ages and based on the theory of water and soil conservation and soil science and ecology resumption, the soil improvement benefit of land rehabilitation is studied by using the method of space as a substitute for time. Finally, this paper discusses the soil improvement benefit evaluation system of land rehabilitation in dump areas initially, then builds a soil improvement benefit evaluation model utilizing the gray relational analysis method. This research can provide the necessary test data, scientific basis and evaluation method for land rehabilitation projects in dump areas. The results show that the soil improvement benefit is directly proportional with the different waste ages and the different rehabilitation ages. In addition, human activity is also an important factor for the improvement benefits of land rehabilitation.

1. Introduction

Land rehabilitation in dump areas is an ideal ecological rehabilitation project and a new research direction in the field of ecologic reconstruction in coal mine areas, and land rehabilitation for mine waste areas has been an important task in recent years [1,2]. During the process of land rehabilitation in dumps, the particularity, variability and extremely abominable conditions of the environment are the main limiting factors. Now in the field of land rehabilitation in dumps, evaluation on soil improvement still benefits from some existing problems. Solving these problems becomes an urgent matter in the research field of land rehabilitation in dump areas. Developing the scientific research of land rehabilitation in dump areas, especially studying the improvement action to the conditions of dumps after land rehabilitation [3,4], will be important to establish the perfect dump land rehabilitation and ecological reconstruction science technology model In addition, it will have scientific significance and play an important role in ecologic environment protection and economic development.

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doi:10.1016/j.mcm.2010.11.054