



A STUDY ON CUMULATIVE EFFECTS AND SECURITY PROBLEMS OF NATURAL RESOURCES AND ENVIRONMENT IN MINING AREA

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ABSTRACT

The development of mine resources provides essential mineral raw materials for industrial and economic developments in China, but mining seriously damage the land, water, isotopic heterogeneous resources and environment in mining area. It has become one of the severe problems to protect the natural resources and ensure the environment security.

From the view of sustainable development, this research systemically investigates the producing mechanism, evolutionary laws, assessment methods and models of cumulative effects and security problems of natural resources and environment in mining area.

Firstly, the concept and perspective of natural resources and environment security in mining area are given; the models of natural resources and environment cumulative effects in exploitation and utilization in mining area are built; and the producing mechanism of security problem is discussed.

Second, the cumulative effects and security problem induced by the exploitation and utilization on the system of natural resources and environment in mining area are analyzed and assessed based on GIS. The effects on regional water and land resource security by the cumulative effects are studied.

Third, the restriction mechanism of agro-economic economic system evolvement caused by the natural resources and environment security in mining area are analyzed from aspect of integrative system; the cusp model of natural resources and environment evolvement in mining area is set up according to the catastrophe theory; the conditions of producing cusp are analyzed, and their basic control theory are given.

Forth, the model of synthetic evaluation of natural resource and environment security in mining area based on fuzzy logic inference is set up; and the sensitive factor analyzing method is discussed. Final, a case study is given.

Key words: mining area, natural resources and environment, security, cumulative effects, dissipative structure, synthetic assessment.