

Technique, Theory and Government's Policy of Land Reclamation in China

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Abstract

There was abandoned land about 13.33×10^6 ha in china . The number of abandoned land by mining and other industrial enterprises increases 47×10^3 ha per year . The land reclamation rate of mining area reaches 12% from 5% 1990, task of land reclamation is huge. The article has studied land reclamation in china from technique, theory and government policy, the aim is that made people know land reclamation in China.

Land reclamation in China started about 1950, China government constructed departments of administration since that has formulated the *Rules on Land Reclamation* Oct. 1988. According to *Law on Mineral Resources* and *Law on Environment Protection and Law on Coal and Law on Water and Soil Conservation*, according to *Technique Regulations on Land Reclamation* Jul.1995 and emended *Rules on Land Reclamation* Oct. 1998, base on standard "how much abandoned, compensates how much ", utilize the funds of Center Finance and local government, and carry on land reclamation.

The reclamation theories on coal mine are many in China, such as forecasting theory about surface subsidence by underground mine exploiting, and the fathering theory about building land and resuming land in subsidence area; and the theory about non-soil planting crop and vegetable and woods...etc..

China has formed land reclamation technique system of non-filling and filling and ecological project and biological project. Non-filling comprises reclamation of farmland and fish pool, reclamation of dredging- outpouring- falling. Filling reclamation comprises reclamation of waste stone filling. Planning technique and biology project of land reclamation progress fast now.

Introduction

Know to all, and the land is a precious nature resource, and is mankind to exist with the development's root. But since there are mankind, mankind of every kind of activity continuously of breakage land. Early until this century, mankind abandoned land already and far ahead land of ego instauration with regulate ability, at the same time the population of the world scope inflation, make the person occupy the obvious decrease, person farmland area have already come to the unprecedented sharp degree. Accompany with the land's breakage, soil erosion, land desert, sliding, mire-stone flowing, air pollution, water pollution ...etc. the nature disaster within the scope of world occurs, for the sake of existing of mankind with development, and mankind adopt to rectify the measure for abandoned land the environment problem, land reclamation appeared. Because the social productivity exists obvious difference, land reclamation's contents, theories,

technique, policy all countries contain obvious difference.

1 Comparison of land reclamation, land sorting, land development

In China, Mine and Land Resource Department of State Department is responsible for management Land reclamation land sorting and land developing (By 1986, there is not united land organization in China to manage the land, in 1986 later on, the National Land Management Bureau unify domestic various land management. Now, land is managed by the Mine and Land Resource Department that has established 1998), but the concrete contents of land reclamation, land sorting, land developing is different.

Land reclamation. Basis on State Department' s *Rules on Land Reclamation* Oct. 1988, land reclamation is to the abandoned land which are result in digging, surface subsidence by underground mine exploiting, pressing to share ... etc. in the produce process, to adopt

measure, and make its instauration can be provided as use, and the land can be used as the agriculture, wood, herd, and also can be used as the work sideline, and can still be used as the building, tour, amusement, but should have the initiative to used for the farmland.

Land developing. It is for land that did not make use of and abandon of or make use of lowly land. Guiding by the land use planning, throught the engineering, life-span or comprehensive measure, make it become higher land in economy, society and synthesize ecosystem, and make into use of reasonably. According to the use, the land is divided into the agriculture land developing and building land developing.

Land sorting. According to the China country situation, current land sorting generally is the land sorting in village region, by the total planning according to the land at the certain district, and adopt the administration, economy, law and technique means, proceeds to handle mountain, water, farmland, wood, road, village...etc., and adjust land relation, increase the land area, increase land utilization and output rate. Its main contents includes to adjust land use construction, Amalgamation small land to large piece, neat land, fix the road and ditch ...etc..

Textual land reclamation only is the first contents of upper.

The total number of Chinese abandoned land is great, the quantity that needs reclamation is much. According to statistics, every kinds nature or artificial factors result in to abandoned land now roughly total 13.33×10^6 ha, occupying 10% of Chinese farmland, among them, mining activity result in the breakage is 6000 ten thousand acres, these lands all need the reclamation. In recent years Chinese western region there are many land need reclamation. According to study by the National Environmental Protection Bureau and Chinese Academy of Sciences and Qinghai province... etc with the method of surveying and mapping, 12 provinces and districts of western part of China, until 1999, abandoned land area that result by mining resources (not contain Guizhou and Tibet) is amount to 2750 ten thousand acre, thereinto, according to statistic about Qinghai, Ningxia, Neimenggu and Shanxi province, breakage by mining

resources is 1.2 times than 1986. The activity that constructs railroad, highway...etc. result in the breakage is roughly 3000 ten thousand acre, agriculture constructing and abandoned land all around village abandon roughly 1.1 hundred million acre. In addition, breakage farmland by nature disaster ruin is roughly 200 ten thousand acre whole per year. Along with the economy development, from now only the state-owned coal mine the abandoned land increases roughly 47×10^3 ha per year, the task of land reclamation is huge.

2 Management Policy of Land Reclamation

The main basis of Chinese land reclamation is State Department's *Rules on Land Reclamation* Oct. 1988. It is the first more completely laws policy of the land reclamation in China. It indicates Chinese land reclamation can depend on law. It is definite that "who break, who reclamation" and "how much abandoned, compensates how much". Land management department has right to manage and supervise land reclamation work according the *People Republic of China land management Law* and *Rule on Land Reclamation*, the duty and obligation is definite to mine enterprise and direct department, land reclamation fund's source is definite. They are law term for use the breakage land and accelerate work of land reclamation.

After Chinese State Department's *Rule on Land Reclamation* has practiced, many law have rules about land reclamation, such as the *People Republic of China Land Management Law*, *Mine Resources Law*, *Law on Environment Protection*, *Law on Coal*, *Railroad Law*, *Law on Water and Soil Conservation...etc.*, there is 25 province governments established *Land Reclamation Provision to Practice Way*, many counties also established *Land Reclamation Management Way*. It is definite" who reclamation, benefit who " and discount agriculture tax, the aim is encourage land reclamation.

National Land Management Bureau distributed *Technique Regulations on Land Reclamation* Jul.1995 and implement. Now, there is many reclamation organization and full-time people in mine enterprise. The local government and farmer also come in sight of the land reclamation's potential bigness, and land

reclamation become new economy increasing point in mine diggings.

3 Reclamation theories Model in the Different Type of abandoned Land

In the last decade, forecasting theory about surface subsidence by underground mine exploiting and anti-distortion theory about building design and construction by Chinese Coal Academy of Sciences Tangshan Branch extensively apply in many coal mine planning, design and practice. They bring up " the coal mine subsidence to reclamation land synthesize research", this theory is suitable for Chinese eastern mine area, such as coal waste stone filling, coal ash filling, digging deep filling shallow technique. Chinese University of Mining and Technology Beijing Campus, Chinese university of Nanking agriculture, Chinese university of Shanxi agriculture and Chinese Coal Academy of Sciences Tangshan Branch bring up some new theory on farmland subsidence by underground mine exploiting and land reclamation. Such as:

One is that they design the fixed agriculture experiment point, and processes soil and product inspect in different subsidence time, in different subsidence place and continue three years, they announce regulation that subsidence by underground mine exploiting influences soil physics and chemistry features, the reason that subsidence farmland productivity drops is definite.

Two is that they announce breakage character and regulation about farmland landscape and related relation about surface subsidence and anti-distortion, they are definite that soil erodes serious position to subsidence farmland. Making use of the misty mathematics method, they establish evaluate and sort model with the predominant factor and misty synthesize evaluation for breakage degree of subsidence farmland, and bring up breakage boundary of farmland affecting cape and give out method of its define.

Three is that they announce development and distribution regulation of the surface crack that arise by surface subsidence by underground mine exploiting from indoor imitate experiment system, especially crack distribute regulation's dynamic calculation model, they analyzed the influence to soil productivity from crack.

Four is that announces many countermeasures for reasonable land resource use and land reclamation management and technique, and Bring up reasonable collocating model of land resources for subsidence by coal mine exploiting and reclamation management model, and Bring up principle and method of soil construction, such as " layering removal, the interleave return to fill", and counteract formula to describe, and Bring up the problem and character because use "Digging deep and filling shallow" reclamation method, and bring up the new craft process and the technique mode with mud pump heavy ,and bring up calculation formula and economy evaluate method of engineering's cost and benefit with the mud pump reclamation.

Chinese University of Mining and Technology Beijing Campus, Chinese Coal Academy of Sciences Tangshan Branch and Pingdingshan city's Land Management Bureau in Henan province has introduced misty synthesize judging and clustering analysis method ...etc. in drawing up land reclamation and investigating and evaluation.

4 Technique of Land Reclamation

Land reclamation work pushed the land reclamation technique development.

More than 10 years, reclamation methods have developed reclamation technique system, it includes simple technique project that is " one digging two even three reform", and developed technique project reclamation, such as the fish pool reclamation, dredging-outpouring-falling non-filling reclamation, and waste stone and waste coal ash filling reclamation, ecosystem project reclamation, biology reclamation...etc..

Planning and biology technique is hotspot of the reclamation at now, the mud pump reclamation and the coal waste stone filling to solid technique are mature.

Planning technique of land reclamation. Reclamation planning is important special planning of the land total use planning, there is three parts includes that foregoing investigation and reclamation evaluation and planning. Predicting abandoned land shape by digging and regulation of physiognomy changing and landscape structure are key techniques.

Project in biology technique of land reclamation. The study about ecosystem project and ecosystem agriculture technique, and biology technique that soil improves, and on technique that waste stone cultivate quickly now all still experiment in biology reclamation technique. Huaibei Mine Bureau, Chinese University of Mining and Technology Beijing Campus, Beijing Academy of Metallurgy Mine, Chinese University of Shanxi Agriculture, Chinese Coal Academy of Sciences Tangshan Branch and Chinese University of Beijing Teacher has four main productions.

The first is filtrating reclamation material and selecting vegetation species technique. The second is the genus structure and community character of the vanguard plant and root growth regulation. Third is the moving regulation of tantalum and salinity. The forth is land character constructing by waste.

In addition, they use imitating nature original shape principle, dissipation construction principle, landscape pattern optimizing principle, person and nature keeping on development principle ...etc. in ecosystem rebuild in the opencast vestige land, the theories and practice of ecosystem rebuild and land reclamation are put together, and it expanded the concept of land reclamation, pure land reclamation arrive ecosystem rebuild in whole mine area.

Coal waste stone is biggest solid waste of industry, the quantity reaches 1 hundred million ton per year, total is roughly 30 hundred million ton. Making use of the Coal waste stone to fill coal mine subsidence area is the hotspot at now in China.

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