

Engineering Practice of Comprehensive Treatment Project of Coal Mining Subsidence Area

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Abstract

Chengcheng County is a key mineral resource development zone in Weinan City. It has rich coal resources underground. It has a long history of coal mining, a large amount of coal, and a large area of mined out. While making great contributions to the country and the local area, it has also accumulated many questions. Due to the chaotic and disorderly mining of the township and village collective private enterprises, it has caused great environmental hazards. Comprehensive management is urgently needed to improve agricultural production conditions and the agricultural environment, while improving the quality of existing cultivated land, and improving farmland water conservancy and roads. Infrastructure such as transportation provides necessary conditions for the large-scale and intensified agriculture and the realization of the dynamic balance of the total arable land. Through engineering practice, this paper puts forward specific measures for the improvement of coal mining subsidence area, in order to provide a basis for related projects.

Keywords

Coal Mine; Subsidence Area; Land Remediation; Land Reclamation; Engineering Measures.

1. Introduction

The sustained and rapid development of the social economy has led to a surge in demand for land use. According to China's basic national conditions at this stage, at the first meeting of the 13th National People's Congress, Premier Li Keqiang proposed that the transformation of dilapidated houses in urban and rural areas and the transformation of shanty towns still need to be increased to support mining Relocation and reconstruction of coal subsidence areas, independent industrial and mining areas, and old industrial areas in urban areas, adhere to the management of landscapes, forests, fields, lakes and grasses. While ensuring regional economic development, it is necessary to adhere to regional land restoration and adhere to the "red line of 1.8 billion mu of arable land". The pressure of "double protection" for the development and protection of cultivated land is increasing. Due to long-term ineffective use of land in coal mining subsidence areas, large areas of good land have been reduced to swamps, tidal flats, and potholes. Vegetation growth is poor, soil erosion is serious, the ecological environment is destroyed, the benefit of extensive aquaculture on the water surface is low, and slopes are seriously abandoned. The groundwater pollution is serious, the agricultural output rate of the entire subsidence area is extremely low, the farmers in the subsidence area are gradually becoming impoverished, the pressure of government subsidies is increasing, and the industrial materials are gradually scarce.) Sustainable development, there are serious economic, social and ecological problems in the coal mining subsidence area, which is a difficult problem that the current government and enterprises have to face.

2. Project location profile

The construction site of the project area is located in Yinan Village, Chengcheng County, with geographic coordinates between 35°10'37"~35°13'31" north latitude and 109°44'29"~109°54'33" east longitude. The project area has a warm temperate semi-humid continental monsoon climate. The annual average temperature is 12°C, the frost-free period is 204 days, the annual sunshine time is 2616 hours, the annual average rainfall is 533mm, the maximum frozen soil depth is 35cm, and the annual dominant wind direction is northeast wind and maximum wind speed. 40m/s. Due to insufficient investment, the unused land has not been developed, restored and utilized. For counties where the area of arable land is already in short supply, it has severely affected the local agricultural production capacity and the people's living standards.

The drought situation in the project area is severe, and a long-term production method of reusing, light-feeding and predatory management has been formed, which has caused land degradation, low organic matter content, poor comprehensive soil fertility, poor ability to effectively prevent various natural disasters, and insufficient intensive use of land, The scale of land operation is subject to certain restrictions. Due to the lack of field supporting facilities and capital investment in the existing arable land in the project area, most of the existing arable land is low-yield land with a wide range of crops and low yields. The project area is rich in labor resources. With the development of the economy and the continuous improvement of production technology, the local government has also done a lot of work in comprehensive management, and the effect is very good, which has won unanimous praise from the masses. However, due to insufficient capital investment, small scale, and low standards, it cannot meet the needs of local social development. Some plots are large and the cost of supporting facilities is high. The local people have plenty of heart and energy, and they urgently need to be solved through the project.

3. Project construction content

3.1 Land reclamation project

Land reclamation projects include land reclamation projects and land consolidation projects. Land reclamation projects include house demolishing projects, courtyard wall demolishing projects, cement road demolishing projects, earth leveling, soil plowing and soil improvement. Level 175,100 m³ of earth, 42,000 m³ of adobe houses, 85,900 m³ of brick structures, 28,700 m³ of courtyard walls, and 32,400 m³ of brick walls; 27.43 hm² of soil plowing, 27.43 hm² of soil improvement, and planting of Chinese Sophora japonica 861 strains. The land consolidation project includes land leveling, ridge and ridge restoration projects. The amount of earthwork moved by land leveling is 68,600 m³, the ridge restoration is 79.59km, and the ridge restoration is 79.59km.

3.2 Land Reclamation Project

Land restoration projects include land leveling projects, irrigation and drainage projects, field road projects, farmland protection and ecological environment preservation projects, and park fence projects. The topsoil in the three villages of Duanzhuang and others was stripped of 1,124,200 m³, and the earthwork was moved 1.578 million m³. Zhang Zhuoyin moved the earthwork of 357,000 m³; 1 new pumped well was used with 250QJ50-540/27 pumps, and 2 current pumped wells were selected with 250QJ50-540/ 27 pumps and 250QJ50-520/26 pumps, a new 1000 m³ reservoir; dn200mmPVC pipe length 2566m, dn180mmPVC pipe length 387m, dn160mmPVC pipe length 665m, dn140mmPVC pipe length 246m, dn125mmPVC pipe length 6595m, dn110mmPVC pipe length 4923m , Dn90mm PVC pipe is 2460m long, dn75mmPVC pipe is 100m long, dn63mmPVC pipe is 12792m long, 4 type I gate valve wells, 35 type II gate valve wells, 41 type III gate valve wells, 41 drain wells, 691 outlet piles; 200 KVa 3 transformers, 0.981 km high-voltage lines and 1.590 km low-voltage lines; Duanzhuang and other three villages built 1.751km of trunk roads, totaling 3, newly built field roads of 6.279m, totaling 10, and newly built production roads of 13.349 km, totaling 41. Zhang Zhuoyin newly built 1.150km field roads, totaling 4 roads, and newly built production roads

1.560km, totaling 13 roads. A row of Chinese Sophora japonica (diameter at breast height 3cm) is planted on both sides of the field road with a plant spacing of 3.0m, and a total of 7515 Chinese Sophora japonica trees are planted. The fence of the park is constructed with an iron net fence with a length of 22.03km.

3.3 Infrastructure restoration project

Infrastructure restoration projects include road restoration projects, water supply pipe network restoration projects, and site restoration projects. The village roads were repaired at 9199m, totaling 9; the village roads were repaired at 22337m, totaling 86; the road protection forest was planted with 3cm Chinese locust tree 4245; the water supply pipe network repair project newly drilled a pumped well, dn200PE pipe length is 271m, dn180PE pipe length is 50m, dn140PE Pipe length 2154m, dn125PE pipe length 922m, dn110PE pipe length 528m, dn90PE pipe length 568m, dn75PE pipe length 357m, dn63PE pipe length 594m, dn50PE pipe length 23925m; 1 set of 200kva transformer, erect high-voltage line 0.051 km, erect low-voltage line 0.530 km ; The site restoration project planted 392 2cm amorpha, and 7m wide cement hardened 487m.

4. Engineering benefit analysis

4.1 Social benefit analysis

Through the implementation of this project, on the premise of improving the infrastructure, the leveling of fields, the supporting of field road facilities, the construction of farmland shelterbelts, and the scale of farmland management will greatly improve the land use conditions in the project area and increase farmland. 24.21hm², improve the production efficiency of land, drive the development of the local economy, and promote the development of rural leading industries. Through the implementation of contiguous planning, centralized management, and improving the level of scientific farming, it has played a good role in promoting the development of the local economy. After the project is completed, it will promote the dynamic balance of the total cultivated land in Chengcheng County and provide strong support for the sustainable development of agriculture in Chengcheng County.

4.2 Ecological benefit and environmental impact analysis

Through comprehensive management of the project area, the water storage capacity of the soil in the project area can be improved, the soil structure will be improved to the greatest extent, and the soil fertility will be increased. Through the construction of the project, the inherent quality of the land has been improved, the physical and chemical properties of the soil have been optimized, the ability to resist natural disasters has been enhanced, and soil erosion has been reduced. After the comprehensive treatment of the project, the increase in vegetation coverage will definitely change the field microclimate in the project area, reduce wind speed, reduce evaporation, increase humidity, effectively resist the invasion of crops by dry and hot wind, and have great resistance to natural disasters. Benefits have been brought into full play, and the regional ecological environment has been improved.

5. Concluding remarks

Through the construction of the project, the key obstacles restricting agricultural production in the project area have been lifted, and the ability to withstand natural disasters has been significantly enhanced. The comprehensive production capacity of agriculture, especially grain, has been steadily improved to achieve the goal of ensuring harvests from droughts and floods; the project area's farmland infrastructure has reached a high level, and the fields are level and fertile. The field road is unblocked; the project area achieves the goal of high-quality, middle-yield and high-efficiency, achieves high economic, social and ecological benefits, realizes agricultural efficiency and farmers' income, and lays a solid foundation for the development of modern agriculture and the construction of a new socialist countryside.

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