

On the Coordination Between Mine Economic Development and Environmental Protection -- a Case Study of a Mine in Guizhou Province

Xiaodong Lu

Guizhou Vocational and Technical College, Guiyang 550023, China

Abstract: Based on the mine past production activities caused by mining subsidence area caused by the mine geological disaster and geological environment problems continue to deteriorate, in order to improve the mine geological environment, ecological environment, eliminate its geological disaster hidden danger, to achieve the green development concept of "green mountains are gold and silver mountains". In this paper, based on its geographical and resource advantages, a mine in Guizhou province using comprehensive governance model of "landscape reconstruction", through the study of the stripping of mining coal mining subsidence area, excavation, reveal mined-out area, the residual coal recovery, backfill, flat, turns the soil, soil reconstruction, fertilizer, comprehensive control measures, such as planting trees and grass will control gradually built agricultural garden, industrial park, such as economic project area, In order to achieve mutual coordination between mine economic development and environmental protection.

Keywords: Abandoned mine; Comprehensive environmental management; Economic development; The environmental protection

1. Introduction

According to the relevant documents of the National Development and Reform Commission, the Five Ministries, Commissions and Bureaus of the State, the Ministry of Finance, the former Ministry of Land and Resources, the former State Environmental Protection Administration, the documents of the Fifth Department of Guizhou Province and local meeting minutes, combined with the current situation of the mining subsidence area, in order to protect the mine environment and resources, and prevent and reduce disaster, Reduce the goaf formed by the coal mine well versed in mining subsidence caused by geological environmental issues and geological disasters, improve the mine geological environment and the ecological environment at the same time, realize economic sustainable development in mines, mine of Guizhou province to carry on the comprehensive control of coal mining subsidence area, the plantation will gradually build agricultural garden, industrial park, such as economic project area, In order to achieve mutual coordination between mine economic development and environmental protection.

2. Project Overview

2.1 Geological environment, ecological environment and geological disaster of the project area

Through the investigation, the early coal mine, small coal kiln underground coal mining for a long time, with the passage of time, the mine environmental problems in the mine are increasingly prominent. According to the collected data and field investigation, the mine environmental problems in the project area are mainly a series of mine environmental problems induced by previous mining activities, including: goaf and its induced geological disasters, water and soil environmental pollution, land resource damage, geomorphic landscape damage, biodiversity damage, etc.

The coal outcrop line of the mining area is relatively dense, and the coal outcrop in the shallow surface is seriously overmined by private excavations. The large area of surface land and vegetation resources in the mining area are seriously damaged, resulting in the high and steep slopes in the project area, piles of coal gangue, landslides, debris flows and other geological hazards that seriously

threaten the life and property safety of local residents. In addition, due to the damage of land and vegetation resources on the surface and the disorderly piling of coal gangue, the cross flow of surface sewage and groundwater pollution in the project area become more serious day by day when it rains. When the weather is dry, the dust flies freely and seriously endangers the health of local residents. At the same time, due to the damage of the land surface, soil hardening or annihilation, local residents are also unable to cultivate, and the crop yield is severely reduced (see figure 1).



Figure 1: Current situation of surface vegetation damage in mining area

2.2 Necessity and urgency of governance

According to the present situation of geological environment, ecological environment and the present situation of geological disaster survey and management within the scope of present situation of mine geological environment conditions, due to the early coal mine in mining area, the small mines underground coal mining for a long period of time, with the passage of time, formed in a large number of goaf subsidence in the mining areas, and coal seam outcrop area in the mining areas, dig mining serious early mine private, Now form a large area of open pit, the surface overburden was damaged, vegetation destruction, bedrock and contain coal bed naked, the mining area surface water and groundwater pollution is serious, serious soil and water loss, land resources to tie up and badly damaged, the project area geological environment status quo seriously affect local residents farming, agricultural production is serious, to the health of local residents, the production and living has caused severe damage, Detrimental to local economic development and social harmony. Therefore, in order to safeguard zone land resources, vegetation resources efficient recovery of geological disasters, and permanent eliminate hidden danger which make the residents and staff in the area of life and property security, area residents living environment get effective governance, geological environment, ecological environment in mining area and geological hazards problems on management has the necessity, urgency.

2.3 Purpose of governance

According to the present stage of geological environment and the serious problem of ecological environmental impact, the establishment of comprehensive control of coal mining subsidence area project implementation plan, maximize the governance existing coal mining subsidence area geological environment and the ecological environment problems, realize the geological environment and the effective recovery and protection of ecological environment, combined with the local industrial and residential planning layout, optimize the industrial structure, Through the reclamation of characteristic land, the construction of ecological agriculture projects and the construction of poverty alleviation projects (photovoltaic power generation), the mining and local economic development will be promoted, local villagers will be driven out of poverty and become rich, and beautiful villages will be built.

3. Implementation plan of comprehensive treatment of geological environment in the project area

3.1 Governance Principles

General Secretary Xi Jinping pointed out that Guizhou should keep the bottom line of development and ecological protection, correctly handle the relationship between development and ecological and environmental protection, take the lead in the reform of the system and mechanism of ecological civilization construction, implement the proposed action plan into concrete actions, and

realize coordinated progress of development and ecological and environmental protection. The comprehensive management project of geological environment is a measure to realize the green development concept of "green water and green mountains are gold and silver mountains".

Therefore, enterprises should, in accordance with the requirements of developing green mining and building green mining, take green development as the goal, fulfill the obligations of environmental protection, land reclamation, vegetation restoration and water and soil conservation in accordance with the law, strictly implement the principle of laying equal stress on mineral resources exploitation and environmental protection, and promoting both governance and restoration and environmental protection. Minimize or avoid the deterioration of environmental problems caused by development, as far as possible to achieve low-carbon mining, green mining, sustainable development road.

The specific management principle is: with the person this, the principle of disaster prevention and mitigation; Principle of scientific development; Principle of safe development; Principle of harmonious development; Principle of sustainable development; Who breaks, who governs principle; The principle of adjusting measures to local conditions, comprehensive improvement and paying attention to actual results.

3.2 Comprehensive treatment scheme

According to the mine record documents, combined with the mine geological environment status, the mine mining subsidence area of the comprehensive treatment area of 305.9426hm² (4589.14 mu), a total of nine blocks are divided into three administrative areas for treatment. 1 control area 1796.5 mu (564 mu in block 1, 500 mu in Block 2, 500 mu in Block 3, 232.5 mu in temporary waste disposal field and temporary topsoil piling field), 2 control area 1442.5 mu (500 mu in block 4, 442.5 mu in block 5, 500 mu in block 6), The third administrative area is 1350 mu (500 mu in block 7, 515 mu in block 8 and 335 mu in Block 9), and the first administrative area is block 1.

Mining stripping on the project area, the excavation, exposing mined-out area, the residual coal recovery, backfill, flat, turns the soil, soil reconstruction, fertilizer, environment comprehensive control measures such as planting trees and grass, and set control gradually built 300 mu of a property area for local residents returned placed with 150 mu, a property park, 1000 mu of vegetable greenhouses area, 2812 mu of photovoltaic power generation area. Through the introduction of industries, the mining subsidence area will be turned into clear waters and green mountains, and the clear waters and green mountains will be turned into gold and silver mountains, so that the gold and silver mountains will benefit the people, drive the upgrading of demand, lead the consumption orientation, achieve poverty alleviation of villagers, promote rural revitalization, and give new vitality to the development of enterprises.

The implementation plan of comprehensive treatment engineering in mining subsidence area is divided into four sub-treatment projects, including mine step stripping, mining, residual coal recovery; Step slope treatment; Land reclamation; Setting of waste disposal (dirt) site.

3.3 Overall deployment plan of the administrative area

According to the geological environment, ecological environment and geological disaster status of the administrative area, combined with the surrounding environmental conditions, the administrative area and its influence division is divided into administrative area, industrial facilities (including site) construction area, waste slag and waste discharge area and other functional areas.

4. Governance effect

4.1 Governance Effect

Mine comprehensive control of coal mining subsidence area plan actively response to the local industry structure adjustment, fully fit after ecological management and the actual situation of landscape environment, through repair after the governance, built 300 mu of a property settlement area for local residents returned placed with 150 mu, a property park, 1000 mu of vegetable greenhouses area, 2812 mu of photovoltaic power generation area (backfill, covering first, (2,812 mu of photovoltaic power generation area was built, with an installed capacity of 18.7 MW. Local sunshine duration was calculated as 4 hours per day, 18.7 MW × 4 hours = 74800 degrees × 365 days = 27302,000 degrees. According to the recovered electricity price of State Grid 27302000 × 0.3515 yuan = 9596653 yuan, the economic benefits generated after governance are considerable), providing local employment opportunities, increasing the income of local people, and playing a huge role in rural revitalization. The treatment effect is shown in Figure 8.

织金县龙井煤矿片区采煤沉陷区综合治理工程效果图



Figure 2: Effect diagram of comprehensive control engineering in mining subsidence area

4.2 Social, environmental and economic benefits

4.2.1 Social benefits

After comprehensive treatment of mining subsidence area, the main social benefits are as follows:

1. Ensure the safety of people's lives and property and actively promote the construction concept of "harmonious mine".
2. Increase the income of local people, solve the employment problem and boost poverty alleviation.

Set up green development thinking, enhance the whole society's awareness of ecological civilization.

After the successful implementation of the project, it will form a demonstration effect on the restoration and management of the ecological geological environment of mines in Guizhou Province, and provide new ideas for the rural revitalization and construction of beautiful villages in Guizhou province.

5. Conclusion

The mining enterprises actively respond to the local industrial structure adjustment, fully fit the actual situation of the landform after ecological governance, after comprehensive management of the coal mining subsidence area built 300 mu back resettlement area for local residents back resettlement, 150 mu back residents vegetable park, 1000 mu vegetable greenhouse area, 2812 mu photovoltaic power generation area, through industrial import, On the one hand, the mining subsidence areas will be turned into clear waters and green mountains, and the green mountains will be turned into mountains of gold and silver. The mountains of gold and silver will benefit the local people, drive the upgrading of demand, lead the consumption orientation, and not only lift the villagers out of poverty, but also promote rural revitalization, and give new vitality to the development of enterprises. On the other hand, the comprehensive utilization of existing resources and technology, the effective implementation of comprehensive control of coal mining subsidence area in mines, improving ecological environment of mining area, at the same time, promote rural rejuvenation the mines, regional economic sustainable development, to mine coal mining subsidence area gradually built agricultural garden, industrial park project area such as economy, considerable economic benefit, The mutual coordination between mine economic development and environmental protection has been reached.

Reference:

- [1] Zhang Y S. Thinking on the coordination of the relationship between environmental protection and economic development. China Economy and Trade, February 2016, No. 320.
- [2] Li Xingxing, Ji Shujin, DING Li. Comprehensive environmental management planning of abandoned mines -- a case study of Chuanshan Mine in Zhenjiang [J]. Jiangsu Urban Planning, 2019, (The 7th issue).

About author:

Xiaodong Lu (1984-), Male, Master, First class constructor of mining engineering, Engaged in teaching and research of mining engineering and safety engineering.