

Study on the Impact of Mining on Ecological Environment and the Core of Ecological Restoration in Mining Areas

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Abstract: *Under the background of the rapid development of our society, the demand for resources in various industries is increasing day by day. Mineral resources are one of the main energy sources used in China's multi-industry production. In order to better meet the production demand, it is necessary to carry out large-scale mining, which will inevitably have a negative impact on the ecological environment in the surrounding areas. Doing a good job of ecological restoration in mining areas can not only effectively protect the ecological environment in mining areas, but also help build a harmonious society. Based on relevant research results and practical experience, this thesis analyzes and discusses the influence of mining on ecological environment, common problems in ecological restoration of mining areas and corresponding optimization strategies from multiple angles. Finally, I hope that through the analysis and discussion of this thesis, more mining units can be inspired.*

Keywords: *Mining; Ecological environment; Influence; Mining area; Eco-restoration*

1. Introduction

In the mining work, the common problems are exposed mountains and vegetation destruction, which easily lead to different types of natural disasters in the region, such as landslides and rock collapses, which pose a great threat to the mining work and the safety of life and property of local people. After entering the new era, China has put forward the strategy of green development, which puts forward brand-new requirements for mining and ecological restoration in mining areas. Based on this, mining units in the new period need to grasp the impact of mining on the local natural ecological environment, and establish a sound management policy plan according to the actual situation of mining and the demand of ecological restoration, so as to reduce the impact of mining on the natural ecological environment and thoroughly implement the sustainable development strategy.

2. Analysis of the impact of mining on the ecological environment

2.1 Mining subsidence

Mining subsidence is a common phenomenon in mining projects, which has many negative effects on the ecological environment in the region. The cause of this influence is that the mining project will destroy the strata in the surrounding area to varying degrees in the implementation process, which will cause some surface subsidence in the area. In the whole stratum, the seam is one of the main components inside, and mining projects will have a direct impact on the seam, which will reduce the stability of the whole stratum. At this time, goaf will be formed in the stratum, and collapse will be formed under the action of external force. Some mining units have not adopted reasonable mining methods or established scientific mining plans when implementing mining projects, which will also cause the stability of strata to be more seriously affected. Such measures not only improve the probability of natural disasters such as landslides and mudslides, but also affect the hydrogeology in the mining area.

2.2 Soil erosion

Mining projects may also lead to soil erosion, and then damage the original ecological environment. When mining is carried out, there will be uneven settlement of the surface in the area, which will

change the original surface morphology. In this process, the surface slope will also change. When it continues to a certain extent, the overall slope of the mountains in the region will have a serious tilt problem, which will lead to soil erosion. A comprehensive evaluation of the mining project area shows that the surface and geological environment in the area have undergone extremely obvious changes, mainly in the form of inclined zonal distribution of the surface, serious destruction of vegetation, soil erosion, etc., which makes the mountain and land unable to obtain the protection of plant roots. When there is extreme rainy weather, there will be debris flow disasters. Because mining will also cause a large number of cracks or deformations in the soil, when rainwater enters the soil, the cracks will further expand and soil erosion will occur.[1].

2.3 Water pollution

Mining projects need to use a lot of water resources, which can easily lead to water pollution in the local area. Some mining units fail to deal with water resources in time when carrying out mining work, or directly discharge polluted water resources to surrounding areas at will, which will pollute local surface water resources and affect the production and life of people in surrounding areas. In mining projects, water pollution is usually not limited to the pollution of surface water resources, but also causes different degrees of pollution to groundwater resources. The main cause of this kind of pollution is that water resources will flow directly into the goaf through soil cracks, which will make the aquifer in the stratum lose a lot of water resources, and then lower the groundwater level, which will lead to the imbalance of water resources in the whole region and threaten the safety of people's lives and property.

2.4 Biodiversity loss

Mining projects will also cause losses to local biodiversity, which is particularly important for mining units. Because mining projects are mostly located in remote mountainous areas, there are often a large number of animals and plants that grow and breed in a stable environment because they are not overexploited. When mining units carry out mining in such areas, it will directly affect the growth environment of internal organisms, such as land resources and water resources, so that animals and plants lose their living environment. If there is agricultural industry or forestry industry in the local area, mining projects will also have an impact on the growth of crops and trees. Therefore, mining units also need to pay attention to the impact of ecological diversity and adopt various measures to protect the natural ecological environment.

3. The common problems in the ecological restoration of mining areas

3.1 The relevant participants did not pay corresponding attention to the ecological restoration of the mining area

According to the actual working situation and investigation, it is found that some participants in mining projects have not paid corresponding attention to the ecological restoration work in mining areas, which directly hinders the orderly development of this work. The reason for this problem is that the participating units of this part of the mining project pay more attention to the economic benefits brought by the mining project, so they will not make effective plans for the ecological restoration of the mining area in the actual mining work, and will not follow the mining principle of adapting measures to local conditions, resulting in the miners can only implement the surface restoration work, such as surface soil landfill, garbage cleaning, etc., and cannot fundamentally restore the ecological environment in the mining area. What the relevant participants in this part of mine mining projects don't realize is that ecological environment protection is a key component of mine mining in the new period. Obviously, such measures are not conducive to the rapid recovery of the ecological environment around mining projects.[2].

3.2 Only a single repair method can be adopted

A considerable number of mining units can realize the important role of ecological restoration in mining projects, but they can only adopt a single restoration method, which will also make the effect of ecological restoration in mining areas unsatisfactory. In the mining projects with this problem, the mining unit can't analyze the natural environment and ecological characteristics of the mining project area in depth, and can only copy the ecological restoration schemes of other mining projects, so that the

ecological restoration schemes of the mining area can't be implemented in the actual working environment. When implementing ecological restoration work in mining areas, such mining units can only achieve their work goals by planting a large number of vegetation and applying fertilizers, so that vegetation and fertilizers do not meet the actual restoration needs of the ecological environment in mining areas. After the restoration work is completed, these mining units will not carry out high-quality post-maintenance management work, which directly reduces the quality of ecological restoration work in the mining area.

4. The optimization strategy of ecological restoration in mining areas

4.1 Vegetation restoration

Vegetation restoration is an important part of ecological restoration in mining areas, which is closely related to biodiversity in mining areas. The main purpose of this link is to restore the vegetation environment in the mining project and prevent soil erosion, so as to ensure the rapid restoration of ecological engineering in the area where the mining project is located. Mining units should deeply analyze the characteristics of natural ecological environment in this area in combination with the preliminary field survey data of mining projects. At the same time, it is also necessary to carry out special ecological investigation work in mining areas, make clear the types of vegetation, and then calculate the vegetation restoration area according to the damage degree of mining projects to the natural ecological environment. The types of vegetation that can be used should have the functions of strong resistance, developed roots, water and soil conservation, such as Bermuda grass, ryegrass, big shrub, Erythrina, etc., and leguminous plants and gramineous plants should be selected as far as possible to improve the quality of ecological restoration in mining areas.

4.2 Agricultural and forestry restoration

The ecological restoration of mining areas in mining projects also includes the restoration of agriculture and forestry, which can have a positive impact on the development of local agriculture and forestry. In this link, the mining unit should make clear the damage degree of mining projects to the development of local agriculture and forestry, and then formulate a perfect restoration plan according to the development needs of local agricultural production. When the mining project does not damage the local agricultural and forestry land to a large extent, a relatively simple restoration method can be adopted. If the damage degree is moderate, special treatment should be carried out to ensure that the local agricultural production can be quickly restored to the previous situation. When the degree of damage is extremely serious, it is necessary to carry out a deeper and broader assessment work in conjunction with local government departments, and provide corresponding compensation to the local people according to the scale of damage. After completing all reclamation work, we should adopt modern agricultural production mode and develop economic forest areas to realize the healthy development of regional economy.[3].

4.3 Landscape development and utilization

With the continuous improvement of people's quality of life in China, more and more people regard tourism as their main leisure and entertainment activities. Based on this feature, mining units can landscape the mining areas that have been developed, and create special tourist attractions for mining projects with special landscape development and utilization planning, so as to promote the development of local tourism industry while improving the quality of ecological restoration in mining areas. In this process, mining units should cooperate with professional tourism institutions, formulate a perfect landscape transformation plan according to the actual situation of mining projects, and establish a special exhibition area within mining projects. At the same time, it is necessary to strengthen safety management during the transformation, install more safety protection devices in the mining area, and build a safe environment for the mining landscape. It can not only quickly complete ecological restoration, but also promote the development of tourism.[4].

4.4 Pay attention to follow-up maintenance and nursing

Mining units also need to pay attention to the follow-up maintenance and nursing work to ensure the sustainability of the ecological restoration work in mining areas. First of all, the mining unit should

send a special ecological restoration team to enter the mining project area regularly to carry out inspection work, and should carry out regular inspection work in weekly, monthly, quarterly and annual units to comprehensively inspect the restoration status and the restoration status of the ecological environment. It is also required to focus on checking soil fertility, vegetation survival rate and ecological diversity, etc. In case of vegetation death or fertility reduction, special restoration work should be carried out in time. Secondly, establish the management system of ecological restoration in mining areas, provide institutional guarantee for this work, clarify the responsibilities and obligations of all staff, and strengthen the assessment work. Finally, set up a professional team of repair and maintenance personnel, hire high-quality personnel to participate in related work, and carry out business training for existing staff to truly achieve a virtuous circle.

5. Conclusion

To sum up, it is a key measure to protect the natural ecological environment of the mining area to do a good job in ecological restoration of the mining area. Only by grasping the relationship between mining and ecological environment changes, mining units can implement high-quality ecological restoration work in mining areas according to the mining conditions and local natural ecological environment characteristics, and minimize the impact of mining areas on the surrounding environment. In this process, mining units should adopt various means and brand-new mining production concepts to ensure the restoration effect of mining areas and continuously strengthen the ecological functions of mining areas. At the same time, mining units also need to establish a perfect operation management mechanism and adopt a professional team of restoration personnel according to the characteristics of mining area restoration work, so as to realize the harmonious coexistence between man and nature.

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