

A QUALITY EVALUATION METHOD OF ENVIRONMENTAL MANAGEMENT IN THE COAL MINING ACTIVITIES IN COMPANIES OF VIETNAM NATIONAL COAL - MINERAL INDUSTRIES CORPORATION (VINACOMIN)

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Abstract: Coal mining activities have adverse effects on the environment, health, society and animals. To minimize negative impacts, coal-mining companies have implemented different environmental management measures, based on decentralized management. To manage environmental impacts successfully, functional departments make initiative in proposing, implementing measures such as improving mining technology, constructing environmental protection facilities, conducting educational programs and so forth. However, a system measuring the contribution to secure the essential principles of environmental management, which is to guarantee the sustainable development, has not been evaluated but only reflected on goal fulfillment according to each content of the environmental management tasks. This article proposes an evaluation method to assess the quality of environmental management of mining activities in coal mining companies of Vietnam National Coal - Mineral Industries Corporation (Vinacomin). This is based on the harmonized benefits of the environment, society and economy, through which, the annual environmental management of coal mining companies is classified into 4 classes in descending order A⁺, A, B and C. The article also shows the application of this method to assess the quality of environmental management at Cao Son Joint Stock Company in the year 2014. Data of the company indicate that its quality of environmental management is graded B (average).

1. Introduction

Coal mining industry is an important economic driver of Vietnam, providing the primary fuel source to serve domestic sectors such as power generation, construction materials, chemicals, and for food cooking (very small ratio) and to export. In recent years the coal mining industry is growing fast in response to the growing demand from domestic consumption and international market. Currently, besides Vinacomin as the major producer and supplier of coal for overseas markets, there are also other entities such as Dong Ba Corporation, 319 Corporation, Vietminco (an FDI company).

Coal mining have caused negative effects on the environment and society such as dust, loud noise, water pollution, the declining of ecosystem, adversely affecting the health of workers and the living around the exploitation area. With quantity of product over 30 million tons yearly, the environmental management of mining activities in Vinacomin and its subsidiaries become crucial issue. Companies have launched numerous environmental management measures during coal mining to minimize the adverse impact on the environment. However, Vinacomin as well as its companies have not implemented any assessment method on quality of environmental management. Thus, managers do not understand the situation of the management of the business environment in terms of its limitations and achievements.

2. Assessment process on quality of environmental management from coal mining in subsidiaries of Vinacomin

Assessment method on quality of environmental management is the collection of criteria to assess the implementation of environmental management and measure those criteria to compare with objectives of environmental management. Assessment the quality

of environmental management in exploitation activities provides managers of advantages and disadvantages of environmental management, evaluating the quality of environmental management, adjusting organizational functions and measures to reach the objectives of environmental management.

Assessment process on quality of environmental management in mining activities includes five steps:

Step 1: Determination the objectives of assessment on quality of environmental management

Step 2: Identification criteria system and ranking criteria for each objective of the quality of environmental management

Step 3: Classification of completion degree for each criteria to assess the quality of environmental management

Step 4: Ranking the quality of environmental management

Step 5: Building mechanism of reward and sanction

2.1. Determination the objectives of assessment on quality of environmental management

According to the development strategy of the Vietnamese coal industry until 2015 and outlook to 2025, the objectives of exploitation, processing and effective use of domestic coal resources must be assured. The development of the coal sector has to be integrated with protecting and improving the environment and the landscape of mines, contributing positively to the socio-economic development and consolidating security and defense in the area, especially in Quang Ninh coal area. To achieve these objectives, environmental management in mining activities must comply with the principles of sustainable development on environment, economy and society.

- Environmental objectives: to minimize the adverse impact on the environment, overcoming the environmental recession and recovering environmental pollution; preventing the environmental incident from occurring; saving natural resources and bringing the environmental benefits such as the renovation and restoration of environmental quality after implementation of the project; contributing to the conservation of natural resources and biodiversity

- Economic objectives: to ensure economic efficiency in production, enhancing capital, ensuring liquidity, utilizing coal resources; applying new technology for cost savings and limiting the negative impact on the environment. Environmental management should aim to save costs and assure the economic interests of companies.

- Social objectives: environmental management must focus on increasing social benefits, such as: creating stable employment ratio, ensuring the health of workers and residents of surrounding areas, securing safety for people inside and outside the exploitation area.

2.2. Identification criteria and ranking system according to each objective of quality of environmental management

2.2.1. Identification criteria system to evaluate quality of environmental management

Principles of sustainable development ensure harmonious benefits among the environment, economy and society. Therefore, the objectives of environmental management in coal mining activities are also to achieve and enhance the harmonious benefits among the environment, economy and society. Clearly, the fulfillment degree of these objectives can be assessed by using various evaluation criteria. In the framework of this article, criteria are proposed as follows:

+ Group of environmental criteria:

Results of implemented regulations on environmental protection are assessed through company's cases of violation of State regulations on environmental protection, such as warning, administrative violations, and violations of civil and criminal law.

- Ensuring environmental quality in mining areas is assessed through the observation results of environmental quality in mining areas.

- Minimizing environmental incidents is assessed through number of environmental incidents occurred during mining and incidents' damages.

+ Group of economic criteria:

Criteria to assess economic objectives are defined from legislative documents such as decrees, circulars and instructions regarding to financial management of companies regulations instructing effectiveness evaluation of State-capital companies and practical experience, the evaluation criteria of economic objectives include:

Assurance of effective business: This criterion is evaluated by the profit on equity ratio. If the criterion is positive, company has profit, otherwise the company lost.

$$\text{Return on equity ratio} = \text{Profit before tax} / \text{Average equity} \quad (1)$$

- Preserve or increase capital: This criterion is evaluated by the ratio of capital preservation (H). If ratio $H > 1$ the company has increased the capital, if $H = 1$, company can preserve its capital and if $H < 1$ company fails to preserve capital.

The preserving capital ratio is stipulated in the guidance of Circular No. 220/2013/TT-BTC of the Ministry of Finance. The formula is presented as follows:

$$H = \text{Equity at the time of evaluation} / \text{Equity at the end of period preceding the time of evaluation} \quad (2)$$

- Ensure liquidation: This criterion is evaluated by overdue liabilities and ability to pay liabilities when due.

Overdue liabilities: The determination of overdue liabilities based on the payment deadline indicated in loan agreements, economic contracts or other documents.

The ability to pay liabilities when due: The ability to clear liabilities is the current liquidation, which is the ability to pay the current liabilities and is determined by the ratio

between short-term assets with short-term liabilities. The higher this ratio represents the better ability of paying short-term liability. The ratio of paying current liabilities less than 1 means short-term assets are not enough to compensate for short-term debt. The ratio that equals to or bigger than 1 shows short-term debt's sufficiency to cover short-term liabilities. This ratio is calculated by the following formula:

$$\text{Liquidity of maturity debt} = \frac{\text{Current assets}}{\text{Current liabilities}} \quad (3)$$

+ Group of social criteria:

- Improving living standards staff: This criterion is assessed through the annual average income of staff compared with the previous year.

- Ensuring workers' health: This criterion is assessed through classification of employees' health condition from periodic health examination of companies.

- Ensuring safety for workers: This criterion is assessed through the number of accidents occurred in the companies in terms of economic and human damage.

2.2.2. Ranking the criteria of individual objective of environmental management quality

a. Environmental objectives

+ Criteria 1: Implementation of State policies and laws on environment protection

- Business are not claimed by competent authorities for violence of environmental policies or not warned by the competent authorities for its poor implementation of policies but not yet to the extent of being administratively sanctioned: Graded A.

- Companies violated one of the following cases will be graded C:

* Being fined by the competent authorities in terms of administrative violations (other than warning) or financially fined

* Being prosecuted as criminal of environmental issues

- Company is graded B: the remaining cases.

+ Criteria 2: Environmental quality of excavation areas

- All observation places meet environmental quality standards: Graded A

- Minimum of 90% of observation places meet environmental quality standards:

Graded B

- Less than 90% of observation places meet environmental quality standards: Graded C

+ Criteria 3: Occurrence of environmental incidents

- No recorded environmental incident: Graded A

- Recorded environmental incident without harm to people: Graded B

- Recorded environmental incidents with harm to people: Graded C

b. Economic objectives

+ Criteria 1: Ratio of return on equity

- Company is graded A when the ratio of return on equity equal to or higher than the in the delivered plan.

- Companies are graded C when they make lost

- Companies are graded B: the remaining cases.

+ Criteria 2: Ratio of capital preservation

- If the ratio $H > 1$, then companies have increased capital: Graded A

- If the ratio $H = 1$, then companies preserve capital: Graded B

- If the ratio $H < 1$, then companies fail to preserve capital or indicate inefficient capital use: Grade C.

+ Criteria 3: Overdue liabilities and ability to pay due liabilities

- Companies with no overdue liabilities and the solvency ratio of due liability is greater than 1: Graded A

- Companies with no overdue liabilities and the solvency ratio of debt maturity from 0.5 to 1: Graded B

- Companies have overdue liabilities and the solvency ratio of due liability is less than 0.5: Graded C.

c. Social objectives

+ Criteria 1: The average income of workers

- If the current average income of workers is larger than that of previous year: Graded A

- If the current average income of workers is equal to that of previous year: Graded B

- If the current average income of workers is lower than that of previous year: Graded C

+ Criteria 2: Ensuring workers health

- Health conditions in Vinacomin are evaluated from 1 (the best) degrading to 5. Companies with more than 50% of workers with health ranking of 1 and 2; and less than 10% of workers with health category 4 and 5: Graded A

- Companies with 30% of workers with health ranking of 4 and 5: Graded C

- The remaining cases: Graded B

+ Criteria 3: Ensuring workers' safety

- No accident at work: Graded A

- Accident at work without death tolls: Graded B

- Accident at work with number of death tolls: Graded C

2.3. Grading the fulfillment degree of individual objective in evaluating the quality of environmental management

The quality of environmental management in companies is graded A when 2/3 criteria are graded A, and the remaining criteria are graded B or higher.

The quality of environmental management in companies is graded C when there are two criteria are graded C or higher.

The quality of environmental management in companies is graded B: the remaining cases.

2.4. Explanation of grading system used in evaluating the quality of environmental management

The quality of environmental management in coal mining activities is assessed by 3 objectives (environmental, economic and social), in which, group of environmental objectives is the first priority. Criteria are proposed for grading individual objective. However, one of managers' concerns is to reach the conclusion about environmental management quality. Some recognition criteria are as follows:

- The environmental management quality is graded (A+): The quality of environmental management is excellent. Companies not only achieve economic and social objectives but also ensure environmental protection. Grading A+ happens when environmental objectives are graded A, and socio-economic objectives are graded B or higher.

- The environmental management quality is graded (A): The quality of environmental management is good. However, the companies do not achieve the socio-economic objectives or the results of environmental protection are on average and socio-economic objectives are at the medium level or higher. Companies are graded A when environmental objectives are graded A, and at least one of two other objectives (economic and social) is graded C or environmental objectives are graded B and socio-economic objectives are graded B or higher.

- The environmental management quality is graded (C): The quality of environmental management is poor. Companies violate State regulations or law, leading to occurrence of serious environmental incidents and do not achieve socio-economic objectives. Being graded C when environmental objectives are graded C and at least one of the two remaining objectives is graded C.

- The environmental management quality is graded (B): The quality of environmental management is at average level. Companies do not achieve the socio-economic objectives or the environmental management is poor. However, companies achieve economic and social objectives. Grading B is the remaining case when the quality of environmental is not graded A+, A, and C.

The method of assessing the quality of environmental management is proposed here with flexibility, and can be adjusted according to the development strategy and according to objective conditions, which directly affect companies' performance.

2.5. Reward and sanction mechanism

To strengthen the environmental management of excavation activities, companies must implement the mechanism for rewarding and powerful sanction, which should be directly pointing out responsibility of each department such as the Deputy Director for environmental issues or Chief of Environmental Department (or Chief of Investments and Environment Department in some companies). Assigning responsibility to each manager can encourage

environmental protection practice in companies. Based on the classification results of environmental management, managers can offer rewards and punishments as follows:

a. Deputy director in charge of the environment will be dismissed in the following cases:

- Companies' environment management quality is graded C (low)
- Environmental management quality is graded B (average), and his company is prosecuted according to criminal law for environmental issues.

b. When environmental management quality is graded B in consecutive 2 years, income of the deputy director will be impacted by lower salary, no reward, besides being disciplined due to the violation degree.

c. When environmental management quality is graded A⁺, the deputy director in charge of environment will get bonuses or salary increase consideration.

3. Application of the evaluation method to assess the quality of environmental management in mining companies of Vinacomin

Cao Son Joint Stock Coal Mining Company is one of the biggest opencast mining companies in Vinacomin with the coal output of nearly 4 million tons per year. Therefore, production activities of the company affect very badly on environment, such as noise, dust, waste gas, and waste water, etc. Thus, the task of environmental management is of high importance. The evaluation method to evaluate the quality of environmental management in exploitation activities is applied for Cao Son by the data of 2014 to assess the quality of environmental management.

3.1. Environmental objectives

a. The implementation of policies and laws on environmental protection was flawed: the company was fined 280 million VND for violations of environmental protection. Therefore, this criterion is graded C.

b. Environmental quality of the mining area: there were 114 observation places, 7 of which exceeded permitted standard, the rest met environmental quality standard (93.86%). Therefore, this criterion is graded B.

c. The occurrence of environmental incidents: There was no environmental incident happen. Therefore, this criterion are graded A.

Consequently, environmental objectives are graded B as explained before.

3.2. Economic objectives

a. Return on equity ratio: Return on equity ratio of the company was 0.004 in comparison with 0.446 in the proposed plan. Thus, the criterion is graded B.

b. Ratio of capital preservation: The company's capital preservation ratio is 0.9, smaller than 1. Therefore, this criterion is graded C.

c. Ability to pay due liabilities: The company has no overdue liabilities and the liquidity to pay back liabilities of the company is 0.554, and this criterion is graded B.

In general, economic objectives of Cao Son Coal Company are graded B.

3.3. Social objectives

a. Income of employees: The average income of employees in the company (VND 6,863,000) was lower than that in 2013 (VND 6,880,000). Thus, this criterion is graded C.

b. Ensuring workers' health: The percentage of workers at health level of 1 and 2 is 51.74%; at 4 and 5 is 9.3%. Therefore, this criterion is graded A.

c. Ensuring workers' safety: There was a fatal accident with one death. Therefore, this criterion is graded C.

To summarize, social objectives of Cao Son Coal Company are graded C.

From the above results, to Cao Son Joint Stock Coal Company, environmental, economic and social objectives are graded B, B and C respectively. It can be said that the environmental management quality of this company in 2014 is graded B, i.e., the environmental management quality is at medium level.

4. Conclusions

The method to assess the quality of environmental management, especially environmental management in excavation activities provides information for managers with current situation of environmental management. In addition to the evaluation results, the grading of quality of environmental management can help managers to adjust the organization activities and handle problems for the fulfillment of the objectives of environmental management. From the situation of environmental management in mining companies of Vinacomin, the article has developed a method for assessing the quality of environmental management in excavation activities. The method can help managers to be able to understand better the situation and to offer solutions for enhancement the quality of environmental management in excavation activities, and minimizing negative impacts on the environment.

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