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Optimal extraction policy when the environmental and social costs of the opencast coal mining activity are internalized: Mining District of the Department of El Cesar (Colombia) case study



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ABSTRACT

Several articles have confirmed the social and environmental consequences of opencast coal mining. The main purpose of this study is to simulate the optimal extraction policy of coal mining with and without the internalization of the environmental and social monetary costs that occur in the Mining District (located in the central part of the Department of El Cesar) using discrete dynamic programming (backward recursion, discrete state Markov decision model and Bellman equation). Results indicate that the private optimal of the overproduction policy for the terminal phase of the resource extraction program can be reduced once the negative externalities produced by mining practices are internalized into the cost function of the mining investment companies in Colombia. This means that if there is an increase in the total cost of extraction to offset the environmental and social impacts generated, the negative externalities would be less than or equal to the current level. Likewise, profits would continue being positive for the mining firms at the Mining District.

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