

Assessing the Economic and Environmental Impacts of Utilizing Bioremediation in Mining Site Contamination Management

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Abstract : Environmental pollution caused by substances released during mining activities is one of the most significant environmental challenges in the country, particularly in southern regions. Bioremediation, as an efficient and practical method for removing hazardous and toxic compounds from the environment, utilizes the potential of living organisms to eliminate or reduce pollutants. This study aimed to analyze the economic and environmental impacts of bioremediation implementation in contaminated mining sites. The research is applied in its objective and descriptive survey regarding nature and method. The statistical population includes all employees of the Khuzestan Province Department of Environmental Protection (N=413), from which a sample of 200 individuals was selected using Cochran's formula. Data were collected using a researcher-designed questionnaire consisting of six dimensions and 20 questions. The validity of the questionnaire was confirmed through construct validity and confirmatory factor analysis, and its reliability was determined with a Cronbach's alpha coefficient of 0.808, indicating adequate reliability. The hypotheses were tested using structural equation modeling techniques and LISREL 6.0 software. The results showed that bioremediation has significant positive effects both economically and environmentally. Finally, the study discusses the findings and emphasizes the importance of bioremediation as an environmentally friendly method.

Keywords : bioremediation, mining, environmental pollution, economic and environmental impacts

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