EVALUATION OF REHABILITATION METHODS FOR POST-MINE CLOSURE: A CASE OF KURUNEGALA IN SRI LANKA

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DECLARATION

I declare that this is my own work and this thesis/dissertation does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

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The above candidate has carried out research for the Masters thesis under my supervision. I confirm that the declaration made above by the student is true and correct.

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ABSTRACT

The mining industry is unable to afford to contact designing processes for the mine's closure using the same mentality and perspective as in the past, especially given the recent rise in global awareness of the environmental impact of mineral extraction. Minimal mine rehabilitation is rarely carried as mine closure in the local context. Most people don't even continue with adequate recovery, and as a result of that post mine lands are neglected with unstable rock, open craters and barren lands are a common feature at the stage of mine closure as abandoned mine sites. The results of the situational analysis in Sri Lanka and reviewing international practices of mine rehabilitation reveal possibilities of establishing appropriate rehabilitation. It is necessary to consider many different rehabilitation levels with appropriateness to re-use the mined lands in a sustainable manner. A survey questionnaire was develop with expert opinion based on the identified criteria and alternatives of appropriate rehabilitation as mine closure. The judgments of criteria weights are collected from a group of experts that are using questionnaires with Delphi method. The survey questionnaire was administered to officers of GSMB. A total of 20 expert panels was selected to determine the criteria and weights of the rehabilitation level of post mine closure. The overall ranks of the hierarchy priorities of criteria and alternatives of rehabilitation levels were a result of the AHP analysis to build the framework. The result of the research is a methodological framework accordance with weightage for each criterion and its respective alternatives. Clearing Hazards, Compatibility and Future Developments are the different rehabilitation levels that can be achieved the most appropriate rehabilitation activities according to the expert's opinion. The proposed framework can be utilized as a decision making tool in mine closure prioritization models, or it can be used when planning to rehabilitate abandoned mines where what distinguishes them from mining activities.

Keywords: Rehabilitation, Mining, Mineral, Appropriateness, Mine Closure

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

Abbreviation	Description
AHP	Analytical Hierarchy Process
MCDA	Multi Criteria Decision Analysis
GSMB	Geological Survey and Mines Bureau
MSC	Mineral Survey of Ceylon
IML	Industrial Mining License
UDA	Urban Development Authority
PEA	Provincial Environmental Authority
CEA	Central Environmental Authority