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Legislative analysis on quarry rehabilitation in Selangor, Malaysia

Zaharah binti Yahya, Mariani Ariffin*, Sabrina Ho Abdullah

Department of Environmental Management, Faculty of Environmental Studies Universiti Putra Malaysia, Serdang, Selangor Darul Ehsan, Malaysia

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ABSTRACT

The Malaysian State of Selangor has been blessed with an abundant reserve of granite rocks located in the districts of Kuala Langat, Hulu Selangor, Gombak, and Hulu Langat which supply raw materials to develop physical infrastructures including highway roads, building, airports, and townships particularly in Cyberjaya and Putrajaya and supply raw materials to the buildings of the Klang Valley. An active industry, however, comes with shortcomings related to the atmosphere, hydrosphere, lithosphere and biosphere of the ecosystem. In 2009, there were 314 active quarries in Malaysia of which only 12 practiced the best greening effort. Quarry rehabilitation prevents pollution and leads to a cost-effective measure for sustainable quarrying. At present, there is a need to enhance the existing law and policy to ensure the rehabilitation of quarries. Quarry rehabilitation can strike a balance between the need for development, economic aspect, environment, and social aspects in the long term that produces a sustainable quarrying industry that can benefit the Selangor State Government as well as the Federal Government. Generally, this paper aims to identify factors hindering quarry rehabilitation in Selangor. The specific objective of this research is to identify the present status of quarry rehabilitation implementation and examine what the existing legislative framework provides on quarry rehabilitation. By using a qualitative approach, it focuses on Selangor as a case study. A Doctrinal Approach produced by the World Business Council for Sustainable Development (WBCSD) established in 2011. The seven parameters are a vital tool to ensure legal frameworks and policies related to quarry rehabilitation are effective.

1. Introduction

The quarry industry in Malaysia is an important industry contributing to the manufacturing and construction sectors (Minerals and Geosciences Department of Malaysia, 2016). Granite is identified as one of the 33 types of world class minerals. These metallic and non-metallic minerals play an important role in the chain of demand and supply of manufacturing and construction (Goh and Effendi, 2017). The mineral industry contributed 8.9% of the nation Gross Domestic Product (GDP) in 2015 (Bank Negara Malaysia, 2016). In 2016, it contributed another US\$1.8 billion to Malaysian Gross Domestic Product (GDP) (Ministry of International Trade and Industry Malaysia, 2016).

In order to abide to the Sustainable Development Goal (SDG 2030) introduced by the United Nations in 2015, Malaysia must adapt its principles in the quarrying practices by embracing quarry rehabilitation. The quarry industry is closely related to industry innovation and infrastructure, sustainable cities and communities, responsible consumption and production and life on land as well as the rock extracting industry.

The 9th goal of the SDG 2030, *industry innovation and infrastructure*, suggests that limited access to health care and education due to undeveloped infrastructures affects the social, economic, and political goals of a nation. As quarry products such as granite, limestone, sand, and gravel, just to name a few are used as a raw material to build infrastructures, the industry gives access to markets, jobs, education and businesses thus contributing to the further economic growth of the nation and society (Goh and Effendi, 2017). SDG 2030's 11th goal of *Sustainable Cities and Communities* states the importance of having adequate, safe, and affordable housing and transport system particularly in the cities, towns, and village. It needs a sustainable approach in the stages of planning and management. The quarry industry, if carefully planned and managed, can prevent from sterilizing natural resources by identifying a zone with rock resources and optimize land use even after the quarry ceases operation (Yundt and Messerschmidt, 1979). The 12th goal is *responsible consumption and production* which aims at “doing more and better with less” by increasing net welfare gains while reducing the use of resources thus lessening pollution and increasing the quality of life. This means the extractive industry produces and uses mineral in a responsible manner,

* Corresponding author.

E-mail address: marianho@upm.edu.my (M. Ariffin).

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thus increasing welfare gains including rehabilitating the site where minerals are extracted. It stresses that stakeholders including policy makers, business, consumers, and researchers, among others need to implement a 10-year framework that instills sustainable consumption and production. Reporting cycle must also include this concept. Sustainability needs to also be included in public procurement in this aspects, as it relates to the licensing and permit application of quarry from relevant authorities. The 15th goal of SDG 2030 is *life and land* which promotes sustainable management of all types of forests. Selangor has a total of 250,129 ha gazetted to Forest Reserve which has already located eight quarries around Bukit Lagong, Sg. Lalang, and Gombak. Thus, there is an urgent need to instill sustainability management to protect these forest as there are people including the Orang Asli living in these areas, who rely on traditional plant species and food supply to survive. As the world is moving towards sustainability, Malaysia needs to adopt the 4 SDG goals. The quarry industry needs to ensure that rehabilitation is done to sustain itself and continue to contribute to the development of the country. Without the implementation of quarry rehabilitation, the industry will certainly unable to sustain itself and contribute to the economic and social sectors.

Quarry operations in Selangor mainly produce granite to cater demands which contribute greatly to the building of physical infrastructures including the construction of airports and highways, upgrading of existing roads and ports, and establishment of two townships like Putrajaya and Cyberjaya (Ministry of Primary Industries, 2002). Quarries often concentrate near the areas where demands and supply are at their greatest like the urban areas (Yundt and Messerschmidt, 1979). Naturally, rocks are non-renewable resources, including granite. Utilizing available resources to prevent sterilization is important to cater demands with the outward expansion of urban centres. This industry is also important with the evolving land uses (Baker and Hendy, 2005). Land uses may include industry, recreation, housing, commercial, establishment or agriculture (Yundt and Messerschmidt, 1979).

Quarrying activity, though important for economic development for some countries, has environmental consequences that need to be solved. Continuous and unmonitored quarrying contributes to the rising number of quarries that cease operation but is left without rehabilitation. This includes the disruption of flora and fauna, adverse visual impact, road damage and water pollution (Baker and Hendy, 2005). Polluted soil, water and air can enter human's nervous system and also result in mental disorders (Usman, 2016). It also becomes a financial burden for the state government and an eyesore to the lush greenery in Selangor, thus giving an unfavorable image to the quarry industry. In some countries, the extractive industry is so vital that shutting down the industry can lead to socio-economic problems including unemployment and difficulties in livelihood leading to poverty, family disunity and even early death of ex-employees after the exhaustion of income (Angyobore, 2017).

Rehabilitation and reclamation is the process to restore the mine or quarry site into a safe, sustainable and environmentally friendly condition of post mining or quarrying activities (Ministry of Natural Resources and Environment, 2013). According to the Ministry of Natural Resources and Environment (2014b), quarry rehabilitation involves the management of all of the property natural resources during and after the extraction process. Therefore, rehabilitation in Malaysia refers to the progressive restoration of quarry site to a safe, sustainable, and environmentally sound site during and after extraction. The word rehabilitation is derived from the Latin prefix 're' which means again and 'habitare', which means make fit. When something falls in to disrepair and needs to be restored to a better condition, it needs rehabilitation. Thus, it is the act of restoring something to its original state or former condition.

Quarry rehabilitation is practiced in order to sustain the environment and ecosystem of a used site and prevent disadvantages of the current and future generations. Moreover, quarry rehabilitation is

important to ensure available supplies for future generations (Baker and Hendy, 2005). It also prevents the unacceptable image given to the quarry industry (Yundt and Messerschmidt, 1979). A rehabilitation plan should be based upon the specific characteristics of the extraction site and reflect legislative requirements, health and safety, environmental and social characteristics of the surrounding area, biodiversity in the area, and ecosystem services provided within the site ecological boundaries, operating plan of the quarry, characteristics of the deposit, impact arising from the operation of the site and post-closure use plan (Warhurst and Noronha, 2000).

Progressive rehabilitation is done with the commencement of an operation until the end of its operation of a quarry (Ministry of Natural Resources and Environment, 2010a, 2010b) that does not address the afteruse of the quarry site. While this might be beneficial in a short term, an integrated quarry closure planning takes into account the environmental, social, and economic aspects throughout the lifetime of the mine or quarry (Angyobore, 2017). This means that the management as well as the land used for the quarry is monitored throughout the phases of exploration, feasibility, planning and designing, construction, operational phase and the decommissioning and closure phase (Australian Department of Industry, Tourism and Resources, 2006). Therefore, the objective of this paper is to identify the present status of quarry rehabilitation implementation and examine what existing legislative framework provides on quarry rehabilitation for Selangor.

2. Methodology

The purpose of this case study is to understand quarry rehabilitation legislation and implementation among stakeholders including the federal and state governments, industry players, enforcement agencies and community in the State of Selangor, Malaysia. Quarry rehabilitation is defined as the restoring of a quarry into a safe and secure site based on the subsequent land use.

As Qualitative Case Study emphasizes on complex description and analysis of a bounded system (Merriam and Tisdell, 2015) the quarry industry in Selangor, Malaysia is the Unit of Analysis. Selangor quarry industry has been in the past and continues to contribute to the development of Selangor itself and the Klang Valley. This qualitative approach is especially suitable for this research as the researchers act as an agent to explore the quarry scene in the state using a doctrinal approach. This approach develops a framework that identifies the characteristics of the present laws and policies, which will be further discussed in the result section (Diagram 1).

This framework is used to extract legislations and policies that are related to quarry rehabilitation. It includes the Federal and State Government Laws and policies namely the National Land Code 1965, Selangor Quarry Rules 2003, Second National Mineral Policy 2009 and National Land Council of Malaysia illustrated as follows:

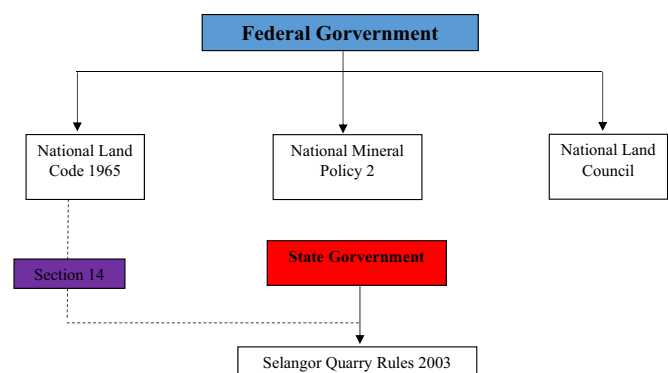


Diagram 1. Federal And State Legislation And Policy.

Source: Ministry of Natural Resources and Environment, 2011 and 2014

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