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RETHINKING THE COEXISTENCE OF QUARRYING AND BIODIVERSITY

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ABSTRACT

Since the primitive age, humans have naturally relied on the earth's resources. The abundance and diversity of these natural resources illustrate the economic growth potential that further motivates infrastructure development and advancement in human civilization. Inevitably, although this entails a threat to biodiversity, quarrying plays a vital role in society's development. This study discusses the benefits of quarrying to the economy, and its effects on and coexistence with biodiversity.

Keywords: Quarry, Biodiversity, Natural Resources, Infrastructure Development.

1. INTRODUCTION

The Earth continually enters a transformation phase. Natural resources form and remodel the Earth's surface, through the biogeochemical cycle. However, disruptions due to human impacts tend to accelerate and confuse this cycle. Since time immemorial, humans have taken everything they need from Earth with little regard for the latter's beauty and biodiversity. Even so, humans acknowledge their errors and establish mitigating measures through a strategic political approach to land management. (Talento, K., Amado, M., & Kullberg, 2020)

Roads, bridges, and buildings, among other infrastructures, are the basic essential elements in a country's development. Realizing that these elements are the hallmarks of economic growth and advancing human civilization, it is indubitable to pose that quarrying is an inevitable vital industry as it provides necessary raw materials for their construction (Wang, Zhang, Bai, & Shi, 2018). Nonetheless, just like all human modification, quarrying's negative impact on biodiversity has always been present. This includes the following: (1) pollutants on natural resources such as air, water, and soil, (2) excessive noise, (3) damage to natural habitats, and (4) visual impact on the landscape (Fugiel, Burchart-Korol, Czaplicka-Kolarz, & Smoliński, 2017).

As more countries are progressing to their economic maturity, the infrastructure, housing, and land developments cannot be satiated, and it continues to progress exponentially. This relentless advancement will not come to cease anytime soon. The rapid growth of demand for quarry resources has a direct effect on the increase in its extraction rate, relatively affecting biodiversity (Salgueiro, Prach, Branquinho, & Mira, 2020).

Evidently, the richness and vastness of these raw materials on Earth reflect the growth potential of the economy that further urges infrastructure development. This research aims to speculate the following: (1) the benefits of quarrying to the economy, (2) the effects of quarrying on biodiversity, and (3) the coexistence of quarrying and biodiversity.

2. METHODOLOGY

The study locale is in Davao City, and the data used were gathered through one (1) focus group discussion (FGD) with the key informants consisting of civil engineers, a geologist, and a college instructor. FGD is a widely used approach to capture thorough understanding of societal issues (O. Nyumba, Wilson, Derrick, & Mukherjee, 2018). Moreover, online data collection was conducted as an adaptive means of data gathering in lieu of face-to-face interviews and actual surveys (Torrentira, 2020). The researcher utilizes Google Forms to create a free-internet-based approach electronic questionnaire. It consists of semi-structured questions, and it was purposely distributed to research participants from fields of mining, construction, academe, healthcare, and business, and a resident living nearby a cement manufacturing plant. Afterward, a qualitative review of the gathered data was done.

3. RESULTS AND DISCUSSION

The Benefits of Quarrying to the Economy

Quarrying and mining have played a vital role in societal advancement. Through resource exploration and exploitation, data and specimens were discovered that support the progress of geoscience. It also led to the discovery of resources, which would otherwise not exist, for scientific study, academe, training, and tourism. (Prosser, 2018)

Quarry resources such as sand and gravel, earthfill, and limestone are the essential materials used in infrastructure development. This includes the improvement of our roads, bridges, buildings, etc. The gathered data reveals that due to these advancements, employment and businesses in the construction industry increased. All the way from the

primeval age up to the present day, the resource extraction industry has been a foremost provider of employment (Prosser, 2018).

Given the large income generation of resource exploitation industries, the host communities could have flourished, but most of the time it has proven otherwise. When it comes to sharing its benefits, the stakeholders are compromised – thus, the so-called "resource curse". (Xing, Awuah-Offei, Long, & Usman, 2017)

The Effects of Quarrying on Biodiversity

The rising demand for infrastructure development through the extraction of its high-quality resources entails risk to biodiversity (Wang, et. al., 2018), and this is more daunting if it is near protected and conservation areas (IDIS, 2020). The gathered data implies that quarrying undesirably affects biodiversity. It contributes to the imbalance in the ecosystem, disrupts natural geological formations, and creates pollution. These are aligned to the findings of IDIS (2020) during their site inspection in Davao City's quarry-affected areas. Consequently, aside from the effects of quarrying to the natural features of land and river, communities living near quarry sites became susceptible to flood and soil erosion due to the disturbances caused by such activities.

As expected, the extraction of these non-renewable resources significantly modifies the Earth's surface, soil, plants, and wildlife. Not to mention, the effects of chemicals used during the extraction activities which can result in occupational hazard, and serious respiratory and health concerns. Thus, these tainted sites challenge restoration practitioners. (Salgueiro, et. al., 2020)

The Coexistence of Quarrying and Biodiversity

Undeniably, mineral resources are feasibly located in all vital biodiversity areas and conservation zones. Subsequently, technological advancement and population growth magnify the pressure on biodiversity conservation (Sonter, Ali, & Watson, 2018). The gathered data reaffirm the urgency to limit and regulate resource extraction, impose higher penalties and sanctions on offenders, devise and enforce effective environmental management programs within quarry-affected areas, and delineate permitted quarry areas.

On May 5, 2015, Davao City Ordinance No. 0325-15 known as "An Ordinance Closing Off the City of Davao to Mining Operations" was enacted. This ordinance imposes a halt to all kinds of mining operations, except extraction of quarry resources defined in Republic Act (RA) No. 7942 or the "Philippine Mining Act of 1995", within the city. The Ordinance's purpose is to conserve the richness of the city's biodiversity, not compromising it for the economy and development, and with high regard for environmental sustainability.

Offenders of RA No. 7942 continue to exist in the city, the Department of Environmental and Natural Resources (DENR) under its enforcement office – Environmental Law Enforcement and Protection Service (ELEPS), have arrested people due to illegal quarrying activities (Argosino, 2022). To monitor the quarry activities in the city, the City Environment and Natural Resources Office (CENRO) established manned stations to conduct checking of quarry tickets during their transport (CGO Davao, 2022).

Moreover, Executive Order (EO) No. 54 series of 2022 – An Order creating an Inter-Agency Task Group to address issues and concerns on all commercial and illegal quarrying operations within Davao City, such as, but not limited to, earthfill, sand and gravel, and limestone quarry materials, was signed by City Mayor Sebastian Z. Duterte on October 6, 2022. This is in response to the written and verbal complaints received by CENRO pertaining to unregulated and illegal quarry activities of permittees and other individuals.

Despite all these efforts, there is still a need for improvements on the enforcement of the law and the development of a conservative approach and mindset of the miners/quarriers, the government, and the general public. Furthermore, although information on the restoration process of the quarry-affected areas is still deficient, the sites entice the attention of ecologists (Salgueiro, et. al., 2020). With utmost regard to restoring these areas, the process does not have to require a replica of their unspoiled condition as these broken pieces of nature signify hope for recreation. The bald and disrupted nature can be formed as new habitats for vegetation and creatures (Talento, et. al., 2020). Nevertheless, the demand for quarry resources should not triumph over biodiversity, especially if the restoration conditions cannot compensate for the lost natural resources (Salgueiro, et. al., 2020).

4. CONCLUSION

Oftentimes we see quarrying on its negative side in the form of air, water, soil, and noise pollution, disturbed natural habitats, and undesirably spoiled landscapes. However, this study uncovers that the quarrying industry has played a vital role in our economic growth, not just for raw materials needed in infrastructure developments but also in employment and business opportunities. It is also important to note, that despite these benefits we can get from quarrying, its threat to biodiversity is ever-present, especially if its restoration is not taken with the highest regard. Moreover, since the restoration process is highly critical and defined in various ways, there is a need for an in-depth

understanding of the geological being of the quarry-affected areas to tailor-fit its rehabilitation program. In the unending realm of societal development, there should be a consistent motivation of the present generation to strive for improvements yet biodiversity conservation should not be overlooked, as the primary challenge for the quarry industry is to prove it is beneficial to its well-being. With an urgent call, there is a need to rethink the existing rules and regulations before we exhaust our depleting natural resources.

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