



PALAWAN MINING: A PROPOSED PHYSICAL LANDSCAPE CONSERVATION MODEL

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ABSTRACT

This study examined the mining operations of the three largest Mining companies in Palawan and undertook a thorough and broader outlook into the environmental implications of mining on the island of the Province as well as to its people. Descriptive-evaluative method of research was utilized. A total of 181 respondents were contacted for relevant information through questionnaire administration; seven officials from institutions and organizations that hold stake in the mining and related environmental issues were interviewed to gather relevant data. A combination of quantitative and qualitative methods of research were employed to analyse findings of the problem investigated. Findings shows that the community members are aware that mining companies employs surface mining as their method of mineral extraction. Surface mining causes land degradation, air/noise pollution, water pollution and siltation of rivers which primarily being caused by the presence of tailings dam and the use of heavy machines. Mining companies have attempts on re-forestation of the mined out areas, resettlement of affected communities and other measures, provided livelihoods, employment and other benefits. However, findings revealed that several attempts were not sufficient to eradicate the adverse impact of mining operations. It is therefore being recommended that the mining companies in Palawan must strictly employ progressive rehabilitation and use the proposed physical landscape conservation model as a supplementary tool to restore back degraded lands to its proximate state after mining activities. These will not only reduce the adverse environmental impacts but also land would be available particularly to farmers for agricultural purposes.

Keywords: *Mining, environmental impact, Island of Palawan, Large-Scale Mining, Physical Landscape conservation Model*

1. INTRODUCTION

To achieve economic development, many countries resort to various activities to exploit natural resources. One of such activities is mining. Consequently, mining is an important economic activity which has the potential in contributing to the development of areas endowed with resource. Mining is the extraction (removal) of minerals and metals from earth's crust in the service of man (Abdullah, 1995). Mining activities are indispensable in the economic development of any country endowed with mineral resources. This is due to the economic benefits that are made available to countries that are involved in the extraction of mineral resources, both internal and external. Internally, there is the creation of employment and revenue generation. Externally, a substantial foreign exchange is available to such countries. In the Philippines, mining has a very poor record as a result of the massive social and environmental problems it has caused historically. Records kept by the United Nations Environmental Programme (UNEP) reveal the Philippines to be among the worst countries in the world with regard to tailings dam failures (CTDFP, 1982-2002) whereby the surface impoundments containing the toxic waste from the mining process failed with disastrous consequences for local people and the environment. In spite of this, since 1992, the Government of the Philippines has been pursuing an aggressive policy to revitalize the mining industry, potentially opening 30 per cent of the country's land area to mining (MGB). It has promised that mining will be carried out to full international standards and that environmental and social problems will be addressed effectively.



Palawan is an archipelagic Province, composed of 1,768 islands or 16% of the Philippines' 7,107 islands. It is situated in the southwestern part of the country's island chain. In terms of geomorphology, Palawan mainland is a narrow strip (625 km long and 40 km at its widest). Its terrain is 63% hilly to mountainous, with only 37% flatlands. Palawan islands have become a haven of rich biological diversity, mineral resources and cultural diversity (SPER, 2015). Furthermore, Palawan also has rich deposits of minerals. Acknowledging the economic contributions of mining, however, several economies lost sight of environmental effects associated with mining activities. Researches that have been undertaken lately to look into the environmental effects of mining have found mining activities to be more hazardous to economic development than a blessing. Accordingly, several mining companies in the country claim to have responded to this by instituting and implementing several measures to reduce the negative environmental effects of their activities on the land and its people. Whether some of these measures have or are capable of reducing the negative impacts of mining on the environment and physical landscape is a matter of great concern.

This study examined the mining operations and ore extraction of the three largest Mining firms in Palawan, its effect in the environment and in the physical landscape where mining operations exist. At the same time, this identified the government regulations and policies related to mining operations executed in the Philippines by which these firms might or might not following. This study also sought answers to some questions and proposed a model that will help the mining companies, the government, and the community to at least mitigate the possible adverse impact of mining operations in the physical landscape of the Province. There is no similar research that has been conducted since this type of topic is made feasible for the first time in Palawan.

2. MATERIALS AND METHODS

2.1 Research design

The specific design used in this study is a descriptive-evaluative research method while using a combination of quantitative and qualitative methodology. The combination of methods yields a composite picture of the impact of mining in the physical landscape of Palawan.

2.2 Research site

The study was conducted in the four Municipalities of Southern Palawan, particularly in Bataraza, Sofronio Española, Narra, and Quezon, Palawan. These geographic locations were identified as locations of the three largest mining companies in the Province where the mining operations directly affects the community. Likewise, they are easily accessible.

2.3 Participants

This study randomly selected respondents from the surrounding community where mining sites can be found such as in the municipalities of Bataraza, Sofronio Española, Narra, and Quezon, Palawan and purposively chose officials that are directly concerned in the mining operations. After randomly selecting the community members near the mine sites, One hundred eighty one people from four municipalities (subgroups) were reached to participate in the conduct of the study by answering the questionnaire. The researcher further purposively selected two mining officials, and five government officials for the administration of a detailed questionnaire using the interview method to ensure a hundred percent completion rate.

2.4 Instrumentation

A researcher-made questionnaire was used which consists of five parts for quantitative and one for qualitative questions with a total of 72 items and 5 items respectively. There is only one set of quantitative



questionnaire designed for the surrounding community of the mining firms, and another one set for qualitative questionnaire designed for the Government officials and some officials from the mining firm.

First to fifth parts of the quantitative questionnaire were designed using close-ended. First part is designed for the mining activities and its impact in the environment; second part consists of the mining activities and its impact on people, specifically in livelihood, employment and other benefits and in health. Third part contains the compliance of mining companies to mining regulations imposed by the government agencies with a five-point likert scale. The fourth part consists of the Roles of Legal Regulating Agencies and other Stakeholder Organization within the Mining Sector, and lastly, the possible physical landscape conservation methods. The qualitative questionnaire consists an open-ended questions regarding the impact of mining in the physical landscape of Palawan and mining effects on land and its people. It consists questions that will match with that of the quantitative questionnaire for the surrounding community.

2.5 Validation of the instrument

In the validation process of this study, copies of the questionnaire and copies of the research questions was handed to three experts that went through the research questions and questionnaire carefully to ascertain the appropriateness and adequacy of the instrument. After editing the questionnaire based on the experts' comments and suggestions, the questionnaire was tested to ten reliable individuals such as educationists, government employees and students that answered all the given questions. Afterwards, it was analysed and validated using Cronbach's alpha. The Cronbach's alpha obtained for the instrument is 0.90, interpreted as excellent internal consistency. Likewise, qualitative questions were validated by three educationists, made some comments and recommendations that made the questions more appropriate and accurate in getting answers that will answer the research questions.

2.6 Data analysis

Data collected were summarized and stored in statistical tables. This study used weighted mean and ranking for the treatment of the data. Explanations of the analyses were done qualitatively and quantitatively.

2.7 Research ethics protocol

For this study, ethical review was sought from Holy Trinity University Research Committee for clearance to go through data collection. Likewise, letters of permission to conduct study was sent to the Heads of the Local Government Units of all Municipalities. The dignity and wellbeing of respondents were protected at all times. The research data remained confidential throughout the. The respondents participated on the basis of informed consent. The researcher provided sufficient information and assurances about taking part to allow individuals to understand the implications of participation and to reach a fully informed, considered and freely given decision about whether or not to do so, without the exercise of any pressure or coercion. Any deception or exaggeration about the aims and objectives of the research were avoided. Anonymity of organizations subjected to the research was ensured as well.

3. RESULTS AND DISCUSSION

3.1. The level of awareness of the people of Palawan on the mining activities in the area

The respondents' level of awareness falls to partially aware on the mining activities of the mining companies, the causes of land degradation, noise/air pollution, the causes of siltation of rivers, causes of erosion/sedimentation and the different attempts made by firms, but they are well aware on the possible environmental issues brought about by mining operations in the environment.

3.2. Perceived impacts of the mining activities in terms of livelihood, employment, and health



It revealed that community members agreed that mining activities has provided livelihood activities, has satisfactory crop compensation, offers scholarships, employment opportunities, etc.; and has build health facilities in the community for the service of both workers and people in the community as revealed by an average mean of 2.87 (see table).

Table 1 Perceived impacts of the mining activities in terms of livelihood, employment, and Health of the people

Activities	Weighted Mean	Agreement	Rank
A. Livelihood	2.85	Agree	2
B. Employment and other benefits	3.22	Agree	1
C. Health of the People	2.53	Agree	3
Overall Rating	2.87	Agree	

The respondents agree that there are crop compensations in times when their livelihood activity are being affected by the mining operations. Also, they agree that mining companies ensures that there is short access to farms and that the crops that the farmers yield remains high. *“The mining companies have the responsibilities to comply with the SDMP. They need to provide infrastructures and the 1.5% share from their operating costs”*, (participant 7). Participant 3 also stated that *“the mining companies in Southern part of Palawan have spent a lot of budget in the health. This is the primary responsibility of the companies that their operations will not adversely affect the local communities”*. Overall, the study revealed that respondents from different communities agrees on its impact mining activities on land and the people. Specifically, first in rank is the employment and other benefits (wx=3.22), livelihood (wx=2.85) as second and lastly, health (wx=2.53). With an overall rating of 2.87, it is enough to say that mining has a positive impact on environment and people.

3.3. Compliance of the mining companies in different government regulations

Table 2 Compliance of the mining companies in different government regulations

Government regulations	Weighted Mean	Description	Rank
1. Philippine Mining Act of 1995 (RA 7942)	3.67	Compliant	2
2. Strategic Environmental Plan for Palawan (RA 7611)	3.61	Compliant	3.5
3. Local Government Code of 1991 (RA 7160)	3.79	Compliant	1
4. Indigenous Peoples Rights Act of 1997 (RA 8371)	3.61	Compliant	3.5
Overall rating	3.67	Compliant	

Mining firms are compliant in terms of RA 7160 (3.79), RA 7942 (3.67), RAs 7611 and 8371 (3.61). But the government agencies are encouraging the mining companies to strive more to be proactive more than just being compliant.

3.4. Roles of Legal Regulating Agencies and other stakeholder organization within the mining sector

As revealed in the results of the study, the respondents agrees that the legal regulating bodies and other stakeholder organizations are regulating the activities of the mining sector in the Province with a weighted mean of 3.04 or agree, Ensuring that mining companies undertakes their operations in conformation with the laws and Implementing and supervising social support programmes in mining area (3.03), monitoring the activities of the mining sector in the Province (3.02), addressing mining-related environmental and socio-economic problems, and fostering the efficient and effective regulation and management and utilization of Palawan’s Mineral resources (3.01).



3.5 Proposed Physical Landscape Conservation Model

A survey revealed that most community members prefer Progressive rehabilitation as a means of physical landscape conservation at a weighted mean of 4.07 (Agree).

4. CONCLUSION

Mining activities have resulted in land degradation that is caused by the presence of tailings dam and the use of heavy machines which led to deprivation of the land of its nutrients and renders the land infertile for agricultural purposes. There is also incidence of pollution of varied kinds (that is, air, noise and water) to the environment. Water pollution and siltation has affected mainly water resources within the areas. However, given the problems associated with mining activities, there is no evidence that their operations have culminated into health problems. There is no prevalence of Malaria, Diarrhoea, skin diseases, and just a minimal occurrence of fever, and colds and mucus/phlegm. With the view to ensuring better conditions for residents within the mining area, some public sector mining industry support organizations are playing specific roles in diverse ways. Despite efforts by these organizations in ensuring that mining activities are carried out on sustainable basis without serious problems to the environment and the host communities, the public is yet to feel the impact of their activities. A critical assessment of their activities therefore shows that there is more to be achieved than what has been accomplished so far as far as environmental problems in the mining industry are concerned.

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