

The Current Scenario of the Mineral Resources in the Philippines

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ABSTRACT: This study was conducted to determine the status of mineral reserves in the Philippines. Particularly it explored the current economic, social and environmental state of the mineral industry. To substantiate the findings, a complex desk review was performed to uncover the legal and institutional frameworks that govern the mineral resources and identifies the policy gaps, problems and challenges of the mineral industry in the country. The findings of the study shed light on the different scenarios of the mineral industry which were used for policy recommendations.

KEYWORDS: *current scenario, mineral resources, Philippines*

I. INTRODUCTION

Earth's natural resources, including minerals, are anything obtained from the environment for human use or can be mined for profit. Due to rising global demand, continuously consuming mineral resources will deplete them. The mining sector, if carefully managed, presents enormous opportunities for advancing sustainable development particularly in low-income countries.

The Philippines is endowed with abundant mineral resources. This is due to its advantageous location along the "Pacific Rim of Fire," where copper, gold, nickel, chromite, and iron are abundant. As cited by Clemente et al. (2018), Dr. Carlo Arcilla of the National Institute of Geological Sciences attributes this to the abundance of copper-gold rich porphyry systems under the land surface and the nickel laterite crowding its tropical soils.

Humans and civilizations benefit and suffer from mining. Prospecting, exploring, building, operating, maintaining, expanding, abandoning, decommissioning, and repurposing a mine can affect social and environmental systems in direct and indirect ways (Haddaway et al., 2019). Health and living conditions are two negative effects. Mining in adjacent towns causes land use conflicts and other social repercussions like public health and human wellness. Mine exploration, construction, operation, and maintenance can cause deforestation, erosion, soil degradation, contamination of neighboring streams and wetlands, and increased noise, dust, and emissions. Abandonment, decommissioning, and repurposing can pollute soil and water.

Statement of the Problem

This paper aims to report the status of mineral resources of the Philippines as of March 2022. Specifically, the researcher wants to answer the following questions:

1. What are the total mineral reserves, particularly for nickel, gold, copper and chromite?
2. What is the current economic, social and environment state of the mineral industry?
3. What are the legal and institutional frameworks that govern the mineral resources?
4. What are the policy gaps, problems and challenges in the mineral industry?

II. METHODOLOGY

The researcher has employed Complete Desk Review (CDR) techniques for this study, which involves Secondary Data Gathering and Literature Review. In the conduct of Secondary Data Gathering, the researcher visited the website of the Department of Environment and Natural Resources (DENR), particularly of the Mines and Geo-sciences Bureau (MGB), wherein relevant data can be extracted. Another important material that the researcher has obtained is the Technical Report on Mineral Accounts titled "Mineral Accounts of the Philippines," published by the Philippine Statistics Authority (PSA) in 2020. The PSA presented this technical

report on the asset accounts for mineral resources, particularly for nickel, gold, copper, and chromite. Additionally, the researcher conducted an in-depth Literature Review (Baumeister & Leary, 1997; Tranfield, Denyer, & Smart, 2003), by researching, reading, analyzing, evaluating, and synthesizing. A successful and well-conducted review helps build knowledge and theory, which combines findings and perspectives from different empirical investigations (Webster & Watson, 2002).

III. RESULTS AND DISCUSSION

According to the Mines and Geosciences Bureau (2022), in March 2022, the Philippines has 9 Million hectares identified as having high mineral potential. As of January 2022, the Philippines' total land area covered by mining tenements is 2.55% or 764,357.32 hectares.

Mineral Accounts: Total Reserves in the Philippines

Total Nickel Reserves. The total nickel reserves in the Philippines have increased by 1.5% from 2.02 billion metric tons (MT) in 2013 to 2.05 billion MT in 2018. The stock of nickel showed a decrease in levels from 2013 to 2017 due to stable nickel production and reclassifications, while an increase was posted in 2018 due to upward reappraisals amounting to more than 119 million MT.

Total Gold Reserves. The total gold reserves in the Philippines have increased by 0.8% from 4.85 million kilograms of reserves in 2013 to 4.89 million kilograms in 2018. Gold reserves were dominated by Class C reserves or the non-commercial and other known deposits. In 2018, 13.3% of the total gold reserves were classified as Class A while 60.4% were classified as Class C.

Total Copper Reserves. From 2013 to 2018, total copper reserves in the country remained on the same level at around 1.14 billion metric tons. This is mainly attributed to the non-activity of copper reserves, with the following averages: Class C 83.8%, Class B 12%, and Class A 4.2%.

Total Chromite Reserves. The total chromite reserves in the Philippines increased by 11.21% from 40.33 million MT in 2013 to 44.86 million MT in 2018 due to an upward reappraisal. Among the three classes, Class C of chromite reserves had the biggest share with an average volume of 34.93 million MT from 2013 to 2018. It rose by 30.82% from 31.75 million MT in 2016 to 41.54 million MT in 2017. Meanwhile, Class A chromite reserves recorded its biggest decline by 60.26% from 8.52 million MT in 2015 to 3.39 million MT in 2016. In addition, Class B had the smallest share among the three classes.

The Current State of the Minerals Industry in the Philippines

Economic Scenario. With regards to Mineral Exports, Employment and Taxes Paid, as reported by the MGB in March 2022, the Philippines' mineral export is US\$ 6.14 Billion for metallic, non-metallic minerals and mineral products in 2021. Copper, gold and nickel are the country's top mineral exports. The major countries of destination are Japan, Australia, Canada and China. In 2021, there were 183,852 workers employed in the minerals industry. This number of workers employed has 0.43% contribution to total employment. While estimates vary, it is conservatively assumed that for every job in the industry, about four indirect jobs may be generated in the upstream and downstream sectors. As reported by the MGB (2022), the mineral industry has paid in an amount of PhP 30.65 Billion of national and local taxes, fees and royalties in 2020. MGB reported that the fees, charges and royalties collected by the bureau have amounted to PhP3.2 Million. In terms of Mineral Statistics and Primary Mineral Commodities, as reported by MGB (2022), the gross production value of metallic mining, gold sold to BSP, and large-scale metallic mining in the country is PhP160.90 Billion. This total estimated value for metallic minerals is up by 20.34% or PhP27.20 Billion vis-à-vis 2020's PhP133.71 Billion. The MGB added that in 2021, when mining at current prices, the Gross Value Added (GVA) is PhP120.4 Billion or 0.62% of mining contribution to the Gross Domestic Product (GDP); while, when mining at constant 2018 prices, the GVA is PhP 90.9 Billion or 0.49% of mining contribution to the GDP. According to MGB, the primary mineral commodities in 2021 are gold, nickel and nickel products, and copper. The estimated value of gold produced is PhP52.48 Billion, for nickel and nickel products is PhP89.48 Billion, and for copper is PhP17.29 Billion. While in terms of Mineral Resources Development Projects, as reported by the MGB (2022), there are fifty-five (55) operating metallic mines in the country in 2021. It was also reported that there are seven (7) processing plants in the country in 2021. There are four (4) gold processing plants, two (2) nickel processing plants, and one (1) copper smelter plant.

Social Scenario. In terms of Social Development and Management, pursuant to DENR Administrative Order No. 2000-99 or the Rules and Regulations on the Implementation (IRR) of the Social Development and

Management Programs (SDMP) for Mining Projects, a SDMP shall be, in consultation and in partnership with the host and neighboring communities, actively promoted and shall cover and include all plans, projects, and activities of the Contractor/Permit Holder/Lessee towards enhancing the development of the host and neighboring communities. As of December 2021, the MGB (2022) reported that mining companies have committed PhP26.08 Billion for the Development of the Host and Neighboring Communities (DHNC), Information, Education and Communication, and Development of Mining Technology and Geosciences as part of the SDMP. The amount of PhP19.56 Billion for the DHNC stands to benefit 1,022 barangays from various identified Programs, Projects, and Activities (PPAs).

Environment Scenario. In terms of Environmental Protection and Rehabilitation, the Philippine government ensures the environment's primary protection before, during, and after mining operations. As of December 2021, the MGB (2022) reported that mining companies have committed PhP384.70 Billion for the implementation of approved plans/programs/ projects/activities under Environmental Protection and Enhancement Program, and an amount of PhP5.51 Billion is allocated for Final Mine Rehabilitation and/or Decommissioning Plan. As of December 2021, there are 45.06 Million seedlings were planted in about 35,359.24 hectares of mined-out and other areas. Of these, 41 million trees have survived or a survival rate of 91%.

Legal and Institutional Frameworks:

Mineral Resources' Laws and Policies in the Philippines

First national mining policy concentrated on extraction and use of mineral resources, not environmental protection. The Philippine Bill of 1902, enacted by the U.S. Congress on July 1, 1902, clearly defined the provisions on conservation of natural resources for the Filipinos and dealt extensively with mining claims and rights, but it did not provide comprehensive regulations for sustainable mineral resources management. The Philippine Environmental Policy (PD 1151, Series of 1977) and the Philippine Environment Code (PD 1152, Series of 1977) create the foundation for using natural resources. Moreover, Article XII - National Economy and Patrimony, Section 2 of the 1987 Philippine Constitution strengthens the governance on the natural resources of the country. According to Fortun et al. (2022), the mining industry is also governed by administrative rules and regulations issued by the Philippine President and the DENR Secretary that are necessary to enforce the Mining Act, such as the IRR. The Supreme Court's jurisprudence interpreting the Constitution and the Mining Act also form part of the law of the land.

People's Small-Scale Mining Act of 1991 (RA 7076). RA 7076 is an act creating a people's small-scale mining program and for other purposes. Its policy is for the State to promote, develop, protect and rationalize viable small-scale mining activities in order to generate more employment opportunities and provide an equitable sharing of the nation's wealth and natural resources, giving due regard to existing rights.

Philippine Mining Act of 1995 (RA 7942). RA 7942 and its IRR, the DENR-Administrative Order (DAO) No. 2010-21 is the foremost mining legislation in the Philippines. It governs the exploration, development, and utilization of mineral resources. The law sets the framework for mineral resources management as the state acknowledges its responsibility "to promote rational exploration, development, utilization and conservation through the combined efforts of government and the private sector in order to enhance national growth in a way that effectively safeguards the environment and protect the rights of affected communities."

Executive Order (EO) No. 79, Series of 2012 and its IRR, the DAO 2012-07. Executive Order (EO) No. 79, s. 2012 – Institutionalizing and Implementing Reforms in the Philippine Mining Sector Providing Policies and Guidelines to Ensure Environmental Protection and Responsible Mining in the Utilization of Mineral Resources.

DENR Memorandum Order (DMO) No. 2016-01. DMO 2016-01 is entitled "Audit of all Operating Mines and Moratorium on Mining Projects" issued by then DENR Secretary Regina Paz L. Lopez in line with the pronouncement on responsible mining by President Rodrigo R. Duterte to give way for a comprehensive review of the mining claims of concessions given.

Department Administrative Order (DAO) No. 2017-10. DAO 2017-10 is entitled "Banning the Open Pit Method of Mining for Copper, Gold, Silver, and Complex Ores in the Country." Issued by then DENR Secretary Regina Paz L. Lopez, open pit method of mining has been regarded to have ended up to perpetual liabilities, causing adverse impacts to the environment, particularly due to the generation of acidic and/or heavy metal-laden water, erosion of mine waste dumps and/or vulnerability of tailings dams to geological hazards. Hence, this DAO has been issued.

Department Administrative Order (DAO) No. 2018-13.DAO 2018-13 is entitled “Lifting of the Moratorium on the Acceptance, Processing and/or Approval of Applications for Exploration Permit under DENR Memorandum Order No. 2016-01.” The DAO was issued in line with government’s Economic Agenda, particularly on increasing competitiveness and the ease of doing business to attract local and foreign direct investment to the country.

Executive Order (EO) 130, Series of 2021. Amending Section 4 of the EO No. 79, s.2012, Institutionalizing and Implementing Reforms in the Philippine Mining Sector Providing Policies and Guidelines to Ensure Environmental Protection and Responsible Mining in the Utilization of Mineral Resources. The Order lifted the moratorium on Mineral Agreements previously imposed by the EO No. 79. Consequently, the Philippine Government through the DENR may now enter into mineral agreements in the form of Mineral Agreement (MA), Mineral Production Sharing Agreement (MPSA), Financial or Technical Assistance Agreement (FTAA), Co-Production Agreements and Joint Venture Agreements. Explorations Permits (EPs), as the initial channel of entry for MAs, may continue to be granted by the DENR in preparation for the MAs under DENR Administrative Order 2018-13, “Lifting of the Moratorium on the Acceptance, Processing and/or Approval of Application for Exploration Permit under DENR Memorandum No. 2016-06.”

EO 130, s.2021 is expected to be a key driver in the country’s post-COVID recovery, by ushering in significant economic benefits through increased direct investments, creation of additional employment opportunities in rural areas, and support to government projects such as the “Build, Build, Build” Program.

Department Administrative Order (DAO) No. 2021-25.DAO 2021-25 is the IRR of EO No. 130, entitled: Amending Section 4 of the EO No. 79, s. 2012, Institutionalizing and Implementing Reforms in the Philippine Mining Sector Providing Policies and Guidelines to Ensure Environmental Protection and Responsible Mining in the Utilization of Mineral Resources. The administrative order highlights the grant of new mineral agreements and renegotiation of existing mining contracts and agreements.

Department Administrative Order (DAO) No. 2021-40.DAO 2021-40 is entitled “Lifting of the ban on the open pit method of mining for copper, gold, silver and complex ores in the country under the DENR Administrative Order No. 2017-10 and providing for additional enhanced parameters criteria for surface mining methods.”

Governance Mechanisms for the Use of Mineral Resources

According to De Leon-Bolinao and Jose (as cited in Pedrosa and Abaya, 2016), deforestation and damage to mountains, sea resources, rivers, and other natural resources have been brought about by mining activities. Hence, their potential and alleged adverse impacts in biodiversity and environmental quality are something that the government has to manage. The DENR regulates and administers the mining industry. Its line bureau, the Mines and Geosciences Bureau (MGB), ensures compliance with the Mining Act and administers and disposes of mineral lands and mineral resources through the grant of exploration permits (EPs) and/or Mineral Agreements (MAs) to duly qualified entities. Also under DENR’s mantle is the Environmental Management Bureau (EMB), which supervises the observance of the applicable environmental laws such as PD 1586, RA 9275, RA, 9275, RA 6969, RA 9003.

Governance Mechanisms in Reconnaissance, Exploration, Mining Operation. Reconnaissance or prospecting is considered exploration and requires an EP under the Mining Act. An EP offers the holder the right to explore for all minerals in a designated region for six years, extendable by two. Exploration should follow a Work Program. EP holders have first opportunity to produce and use minerals in the exploration area after the mining project feasibility declaration is approved. The Mining Act, its IRR, and EO No. 79 prohibit mining in certain locations. As long as the mining area isn't closed, mining may be allowed. The Local Government Code of the Philippines authorizes Local Government Units to categorize real properties as residential, agricultural, commercial, industrial, timberland, etc., but nothing required that a mining region be designated initially as mineral land before mining activity.

Governance Mechanisms in Cancellation, Abandonment and Relinquishment.The Mining Act allows EP holders to relinquish the whole or portion of the permit area. It also allows contractors of MAs and FTAAAs to withdraw from or abandon their rights thereto if, in their judgment, the mining project is no longer economically feasible, even after they have exerted reasonable diligence to remedy the cause or situation. The mining contractor must, however, continue to comply with and satisfy all of its financial, fiscal, environmental and legal obligations under the contracts.

Policy Analysis of Gaps, Problems and Challenges

According to DENR Secretary Roy A. Cimatu (DENR, 2018), during the 5th Meeting on the Mining Policy Direction to exchange insights on current issues with the mining industry, there is a need to come up with effective policy reforms and come up with ideas on how to improve the people's perception on mining through environmental rehabilitation work; to make people see the good in the industry; to make method of mining more transparent; and how the industry would help lower the poverty level in the country.

The intention of RA 7942 was to provide guidance for mining operations to ensure safety and security for the community and environmental protection and rehabilitation for the area. According to Clemente et al. (2018), there are overlapping functions in some laws and even the disconnection among the implementors of IRR of RA 7942, which need to be revisited.

Gaps on Policies. Different mining sites in the country have encountered unique issues. For instance, in the Caraga Region, Clemente et al. (2018) were able to identify critical issue, these include:

- Conflicts in policy where environmental protection and the moratorium on logging clash with the site development of mining companies;
- Surface mining for nickel ores and direct shipment have created policy gaps in mineral accounting and valuation;
- Reforestation policy was also lacking. No law prohibits harvesting planted trees to replace felled trees. DENR only monitors planted trees for three years, so the company can cut it down after this period and resume operations; and
- Standards of compliance were absent in the provisions for rehabilitation. Setbacks in rehabilitation and replanting include the stunting of endemic species, and too much use of more easily grown alien forest-plantation species.

Institutional Challenges. In most mining sites, indigenous groups and peoples aren't educated, protected, or supported. Since RA 7942 forbids mining in ancestral lands without a Certificate of Non-Overlap and the Free and Prior Informed Consent, the National Commission on Indigenous Peoples (NCIP) works as a liaison between the indigenous peoples (IP) and the firm. This obligation is muddled when the commission advocates for the mining corporation instead of its IP constituents.

Each mine has multipartite monitoring team (MMT). Monitoring is done at least once a year but can be quarterly depending on operation speed. DENR-EMB has designated these sites as critical, although no random sampling is done. The monitoring team's qualifications and competency are questioned. The team's functions are vital for the sector, although its efficacy in monitoring mining corporations is questioned. The corporation controls the monitoring schedule, while EMB and the other members appear to be observers with no power over MMT.

Environmental Concerns. Clemente et al. (2018) reported that environmental damage and tree-cutting permits are key mining issues. Even with the technical suspension, mining businesses can continue and ship stockpiles without significant legal impediment and community welfare duties. Technically suspending mining in different places resulted to unregulated operations and fewer payments from affected people. The EO 23 moratorium on logging disallows cutting trees without a permit, surpassing RA 7942, which requires a permit to cut trees upon receipt of an operating permit. The cutting moratorium persists despite gray areas, causing long permit procedures and leaks that lead to corruption. Enterprising operators also get salvage permits for damaged trees. In some circumstances, the stricter tree-cutting permit is avoided by using the easier tree-salvaging permit. DENR must defend its forest conservation mandate, resolving technical flaws and implementation deficiencies. This policy flaw increases disaster risk since stripped concessional lands are vulnerable to erosion and environmental degradation. Polluted water and mudslides endanger low-lying neighborhoods (Regis, E., 2012).

IV. CONCLUSION AND RECOMMENDATION

Conclusion

Some government agencies have overlapping mandates. For this reason, there is great value in coordination among various agencies in the implementation, formulation, evaluation, updating, and revision of IRRs.

The Philippine Mining Act of 1995 or RA 7921 is the foremost mining legislation that governs the exploration, development, and utilization of mineral resources. Several Executive Orders and Departments

Orders were also implemented which provide policies and guidelines in the mining sector. It was found out that there were policy conflicts and most gaps are in environmental protection, indigenous people's rights, and the moratorium in logging ban; and gaps were also observed in mineral accounting and valuation. Aside from water pollution and deforestation, disaster risk-related consequences such as erosion were also found to aggravate further environmental degradation.

Recommendations

In view of the foregoing policy gaps, institutional problems and environmental concerns, the following recommendations and actions were drawn in order to address certain issues:

1. To address water pollution issues, active treatment of mined-out and idle mining lands must be part of the operating firm's environmental compliance, especially to RA 9275 and its regulation on water quality and effluent standards pursuant to DAO 2016-08 and DAO 2021-19 or the updated Water Quality Guidelines and General Effluent Standards.
2. The money comes from the company's coffers, so independence cannot be guaranteed. A mechanism insulating the Multi-partite Monitoring Team (MMT) from the influence of the mining company, local politicians and other interest groups have to be instituted. The composition of the MMT has to be made consistent, both in terms of membership and the required technical competence, to ensure rigor, continuity and historical recall in monitoring operations.
3. Implementation of DAO 2015-02 should be strengthened and provide a more comprehensive monitoring of the state of the environment on a regular basis. It is highly recommended that strict and consistent submission and validation of the reporting documents to concerning regulatory agencies shall be enforced, and the efficient implementation of DAO 2015-02 to address the mine rehabilitation and other mine-related environmental concerns.

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