

TERRESTRIAL BIODIVERSITY ASSESSMENT IN SELECTED KEY AREAS IN MINDANAO AS POLICY MAINSTREAM FOR RESPONSIBLE MINING

- ❖ More than half of the estimated mineral wealth of the Philippines is found in Mindanao where almost 50% of gold and 65% nickel reserves of the country are located.
- ❖ Mining industry in the Philippines has contributed greatly in the development of the country but this can likely cause irreversible environmental destruction. Most of the potential and existing mining areas actually overlap with the identified Key Biodiversity Areas in the country.
- ❖ Mindanao can hardly fulfill sustainable development through responsible mining without any empirical data on the biodiversity status within the surrounding habitats of the key mine areas.
- ❖ The government must initiate policies and programs to strengthen institutional capacities to conduct outreach and training activities with artisanal and small-scale miners and improve environmental management technology, upgrade programs, and regional regulatory implementation.

WHAT'S THE ISSUE?

The study conducted by Sherryl Lipio-Paz, et.al., titled "The Assessment of Terrestrial Biodiversity In Selected Key Mining Areas of Mindanao funded by Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD) found out that based on the Red List of Threatened Species under the International Union for Conservation of Nature (IUCN), there are 111 flora and fauna species recorded in selected mine areas in Mindanao of which 11 are critically endangered flora, 13 endangered flora and fauna, 58 vulnerable flora and fauna and 29 near-threatened (Table #). Nematodes that are sensitive to disturbance were identified and there were few true forest species recorded while some species tolerant to varying degrees of disturbance were observed in the study. The threatened endemic birds were found to prefer mature forests which implies urgent need to conserve forested patches in mine areas of the island. Among the activities that are threatening the terrestrial biodiversity in selected key mining areas in Mindanao as well as its sustainable development are: Large scale mining, agricultural expansion to forested habitat, wild life hunting and human encroachment. There are also factors affecting biodiversity such as no alternative and more profitable source of income, lack of education and ecosystem services and biodiversity conservation among the locals, lack of coordination and intervention of local agencies and different sectors on biodiversity management, and lack of ecological research among others. Further forest degradation in the mining areas of Mindanao would threaten the forest dependent flora and fauna species. Fragmentation in the remaining forest patches in the mining areas may create forest edges, which will adversely affect the population of endemic and threatened forests species. The eastern parts of Mindanao which is predicted as primary High Conservation Value Areas for most of the flora and fauna may require further research and discussion with stakeholders to improve inclusions and governing laws and policies for its implementation.

Species distribution models revealed that areas with high habitat suitability which are considered primary high conservation value areas (HCVAs) for selected forest-dependent terrestrial flora and fauna are located mostly in eastern parts of Mindanao (Caraga, Compostela Valley, Davao Del Norte and Davao Oriental) where mining concessions are overlapping with mature forests.

Table #. Threatened species surveyed in selected key mining areas of Mindanao per 2015 IUCN Red List

Taxa	CR	EN	VU	NT	LC	NR	DD	EW
Flora								
Trees	10 (4%)	2 (0.8%)	22 (8.8%)	1 (0.4%)	16 (6.4%)	0	199 (79.6%)	0
Non-trees	1 (0.3%)	9 (2.5%)	8 (2.2%)	9 (2.5%)	17 (4.8%)	0	313(87.7%)	1 (0.3%)
Fauna								
Birds	0	1 (0.6%)	11 (6.5%)	10 (5.9%)	142 (86.9%)	3 (1.79%)	1 (0.6%)	0
Mammals								
Volant	0	0	2 (7.1%)	6 (21.4%)	18 (64.3%)	0	0	0
Non-volant	0	0	1(11.1%)	1 (11.1%)	6(66.7%)	0	1 (11.1%)	0
Amphibians	0	1 (2.5%)	11(27.5%)	1(2.5%)	23(57.5%)	4(10%)	0	0
Reptiles	0	0	3 (3.9%)	1(1.3%)	43 (55.8%)	0	30(38.9%)	0
TOTAL	11	13	58	29	202	7	619	

CR = Critically endangered; E = endangered; VU = Vulnerable; NT = Near-threatened;

LC = least concern; NR = No record; DD = data deficient; EW = Extinct in the Wild

Source: Assessment of Terrestrial Biodiversity in Selected Key Mining Areas of Mindanao

WHY IS IT IMPORTANT TO MINDANAO?

The second biggest island of the country, Mindanao is home to 21.5 million people in 2015, almost a quarter of the total population of the Philippines. Endowed with rich mineral resources, Mindanao contributed about 21 percent of the country's total mining output from 2006 to 2008. Its mineral deposits are valued at \$312 billion or about 40 percent of the country's total mineral reserves of \$840 billion (DENR-MGB, 2008). The CARAGA and Davao region contribute the most to the national output with more than eight percent each. Mindanao can hardly fulfill sustainable development through responsible mining without an empirical data on the biodiversity status within and the surrounding habitats of the key mine areas. The relationship between biodiversity - the variety and variability of living organisms - and ecosystem services is complex because biodiversity can contribute to delivering benefits to people in a number of ways. Effective and efficient policy on terrestrial biodiversity is needed to ensure that Mindanao can sustain inclusive growth over the longer-term.

Mindanao continues to make substantial contributions to the country's agriculture output, maintaining its strength as an agriculture-based economy despite natural calamities that pulled down production in some sectors. Large forest in the mining areas of Mindanao are cleared not just for mining but also for agriculture, road networks and urbanization leading to forest fragmentation and habitat loss of wildlife. Improving the management of protected areas is also crucial for Mindanao, especially since climate change will increase future uncertainty about the ecosystem. Human industrial and agricultural activities will most likely result in substantial loss of wildlife habitat if not regulated. Biodiversity loss is viewed largely as a function of human action. A significant proportion of threatened flora and fauna reflected in Table # implies urgent conservation action for such species and the remaining forest patches in the mining areas of the island.

WHAT SHOULD POLICY MAKERS DO?

- ❖ **Climate Change Mitigation and Adaptation measure must be integrated in any biodiversity conservation in Mindanao to be effective in the long-term.**
- ❖ **Harmonize related provisions of the mining laws and regulations and allocate resources/funds for monitoring and evaluating progress of the implementation.**
- ❖ **Formulate policies that encourage robust ecological researches, studies, and strengthen capabilities of researchers in the mining sector in order to recommend regulations anchored to scientific basis.**
- ❖ **Further involvement of the Local Government Units particularly in regulating small-scale mining operations, and in monitoring and addressing environmental degradation and conflicting land uses.**
- ❖ **Strengthen community-NGO-Government Agencies collaborations to ensure monitoring of biodiversity and ecosystem services, in order to report on trends and management effectiveness.**



References

- NEDA (2010), Mindanao Strategic Development Framework 2010-2020
- Forester D.,(1996), Modeling Human Factors That Affect the Loss of Biodiversity. Department of Forest Resources, University of Idaho, Moscow, ID 83844, U.S.A.
- Responsible Mining in Mindanao. <http://stprmm.carsu.edu.ph/>
- Lipio-Paz, S, et.al., (2016), Assessment of Terrestrial Biodiversity in Selected Key Mining Areas of Mindanao, Technical Report submitted to PCIEERD in collaboration with University of Southern Mindanao (USM), University of Science and Technology of Southern Philippines (USTP) and Caraga State University (CSU)
- Mindanao Development Authority. Retrieved Sept 27, 2017 from <http://minda.gov.ph/news/92-top-mindanao-agri-products-post-solid-growth>
- Conserving Biodiversity & Delivering Ecosystem Services at Important Bird Areas in Nepal. Retrieved Sept 27, 2017 from <http://www.conservation.cam.ac.uk/sites/default/files/file-attachments/NepalEcosystemsServicesLowRes.pdf>