

Implications of lifting the open-pit mining ban

ENGR. LUDWIG JOHN HIDALGO PASCUAL
Consultant

Background

✓ Policy movement

- RA 7942, Mining Act of 1995, ... does not prohibit the open pit mining method
- DENR AO No. 2017-10, Banning the Open Pit Method of Mining ..., signed on April 27, 2017
- DENR AO No. 2021-40, Lifting of the Ban on the Open Pit Method of Mining ..., signed on December 23, 2021.

✓ Industry situationer

- Ending 2021, production value of ₱ 224 B
- Exporting US46.2 B worth of minerals, equivalent to 8.3% of total Philippine exports
- Employs 184k, oor 0.47% to total employment
- Total government revenue from mining is ₱ 39.1 B
- 55 operating metallic mines, 30 of which are nickel laterite surface mines and 5 are open-pit mines

Rationale

- ✓ History of disasters by open-pit mines
 - Marcopper Mining (Marinduque)
 - Palawan Quicksilver Mines (Palawan)
 - Benguet Dizon (Zambales)
 - Bagacay Mines (Samar)
- ✓ Many are abandoned, leaving immense liabilities for government to address
- ✓ Former tailings storage facilities i.e. dams, ponds, may still hold toxic metal levels.
- ✓ TSF structural integrity poses great risk to nearby communities
- ✓ Impact to water resources and watersheds
- ✓ Social impact

Objectives

- Determine the rationale behind varying insights on open pit or surface mining operations.
- Evaluate the social and environmental welfare costs in allowing open mining projects affected by the ban to proceed to operations stage; and
- Provide ways forward on simultaneously optimizing open pit mining benefits and ensuring ecological integrity.

Open-pit mining definition

- “... characterized by the extraction of metallic ores from a surface excavation resembling roughly an inverted cone with benches along its walls.... mainly for the extraction and disposition of copper, gold, silver and complex ores.”
- Surface mining; benches;
- Methods applied by non-metallic mining (cement plant feed), nickel laterite mining (without basting); strip mining (coal);
- Common challenges with other surface mining methods and mineral processing: rehabilitation, surface run-off, tailings storage, worker/community safety, air pollution, displacement/resettlement, social exclusion,
- Common challenges with underground mining and mineral processing: tailings storage, water resource contamination, worker/community safety, displacement/resettlement, social exclusion,

Open-pit mining definition

Carmen Open Pit producing commercially
Carmen Copper pit, Cebu



Siana Gold Project, Surigao del Norte



Semirara Mining (coal), Semirara island



FCF Minerals, Nueva Vizcaya



Open-pit mining definition

- Nickel laterite mining operations exporting direct shipping ores



Policy review

✓ Mining policy landscape

Republic Act (RA) No. 7942	"Philippine Mining Act of 1995"	EO No. 533 s. 2006	"Adopting Integrated Coastal Management as a National Strategy"
DAO 2010-21	RIRR of RA 7942	EO No. 79 s. 2012	"Institutionalizing and Implementing Reforms in the Philippine Mining Sector to Ensure Environmental Protection and Responsible Mining, particularly on the Full Enforcement of Environmental Standards in Mining"
RA No. 7076	"People's Small-scale Mining Act of 1991"		
RA No. 9147	"Wildlife Resources Conservation and Protection Act"	EO 270 s. 2004	"National Policy Agenda on Revitalizing Mining in the Philippines"
RA No. 7586, as amended by RA No. 11038	"The National Integrated Protected Areas System Act of 1992"	EO No. 130 s. 2021	"Amending Section 4 of Executive Order No. 79 S. 2012"
RA No. 11038	"Expanded National Integrated Protected Areas System Act of 2018"	DENR DAO No. 2016-12	"Adopting the Philippine Biodiversity Strategy and Action Plan (PBSAP) 2015-2028"
RA No. 83716	"The Indigenous People's Rights Act of 1997"	DENR MC No. 2016-745	"Integration of Biodiversity in the Planning, Implementation and Monitoring of Development Projects and Tenurial Instruments Issued by the DENR"
RA No. 9072	"National Caves and Cave Resource Management and Protection Act"	24 Article 2, Section 16 of the 1987 Constitution of the Republic of the Philippines	It is the policy of the State to protect and advance the rights of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature
RA No. 9003	"Ecological solid Waste Management Act of 2000" '1		All laws under the oversight of the Professional Regulation Commission
RA No. 9275	"Philippine Clean Water Act of 2004"	DENR DAO 2017-15	Guidelines on Public Participation Under the Philippine Environmental Impact Statement (EIS) System
RA No. 8749	"Philippine Clean Air Act of 1999"	DENR DAO 2003-30	IRR for the PEIS
RA No. 6969	"Toxic Substances and Hazardous and Nuclear Waste Control Act"	DENR DAO 2017-10	Ban on open-pit mining method
RA No. 7160	"Local Government Code of 1991"	DENR DAO 2021-40	Lifting of the ban of the open-pit mining method...
RA No. 8550	"Philippine Fisheries Code of 1998"	DENR DAO 2022-04	Enhancing Biodiversity Conservation and
RA No. 10654	"An Act to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing, Amending Republic Act No. 8550"	DENR DAO 2018-19	Guidelines for Additional Environmental Measures for Operating Surface Metallic Mines.
Presidential Decree (PD) No. 1586	"Establishing an Environmental Impact Statement System including other Environmental Management Related Measures and for Other Purposes"	DENR MEMORANDUM ORDER NO. 99 - 32	Policy Guidelines and Standards for Mine Wastes and Mill Tailings Management
DENR DAO 2003-30	Implementing Rules and Regulations of PD 1586	PD 442 as amended	Labor Code of the Philippines
PD No. 705, as amended	"Revised Forestry Code of the Philippines".	RA 9710	Magna Carta of Women
Executive Order (EO) No. 578 s. 2006	"Establishing the National Policy on Biodiversity"	DENR DAO No. 2000-98	Mine Safety and Health Standards

Development and ecological integrity implications: Benefits

- Government's share and revenue sources from mining projects
- Social development commitments
- Programs, activities, projects (PAPs) (livelihood, re-greening/reforestation, envi rehab, education and health support)
- Direct and indirect investments (infrastructure - health, utilities, water supply)
- Contributions to local economy (employment, purchasing power, non-metallics incl. construction)
- Community organizing (cooperatives, IP processes & political structures, community representations, etc)
- Local and global supply chain/value chain augmentation/optimization

Development and ecological integrity implications: Benefits

✓ National Government/ LGU /Community share and revenue sources from mining projects

Item	Rate	Collecting agency
Royalty	5% for operations within mineral reservations	MGB
Excise taxes	4% of sales (output goods)	BIR
Income Tax	30% of taxable income	BIR
V AT	12% of goods bought	BIR
Mining Fees and Charges		MGB
Customs duties		BOC
Withholding taxes		BIR
Business tax	Maximum of 2% of sales	LGU
Real property tax		LGU
Registration Fee		LGU
Occupation Fee		LGU
Additional NG share (for FTAA)	0.5*(NMR) – BGS (paid only if BGS is less than 50% of NMR)	MGB
SDMP Fund (benefits)	1 % of mining and milling cost	Trust fund 30% to province and 70% to city or municipality)
EPEP Fund (benefits)		
MMT Fund (benefits)	PhP 50,000 replenishable	Trust Fund c/o MGB

NMR – Net mining revenue BGS – Basic government share VAT – Value added tax
Source: Ronald U. Mendoza and Tristan A. Canare, 2013 (updated)

Development and ecological integrity implications: Benefits

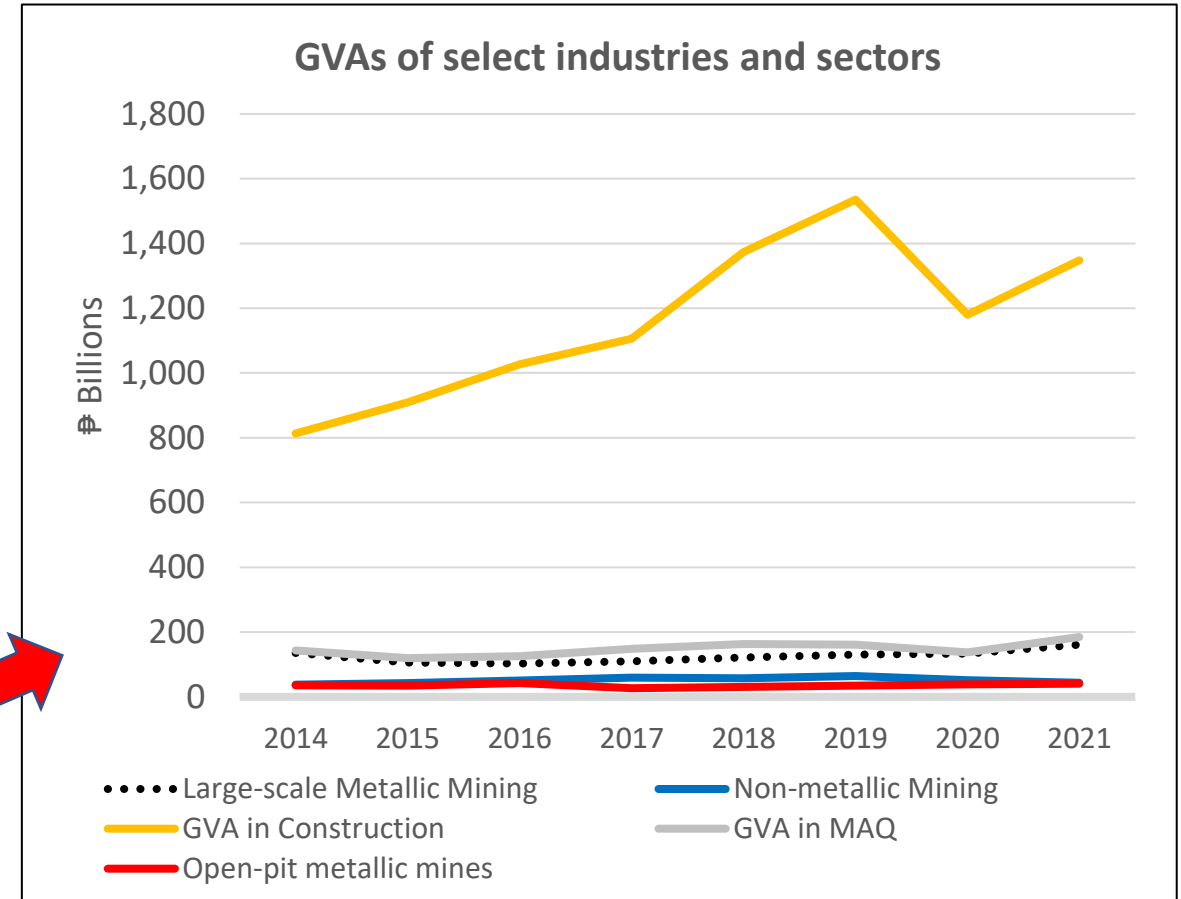
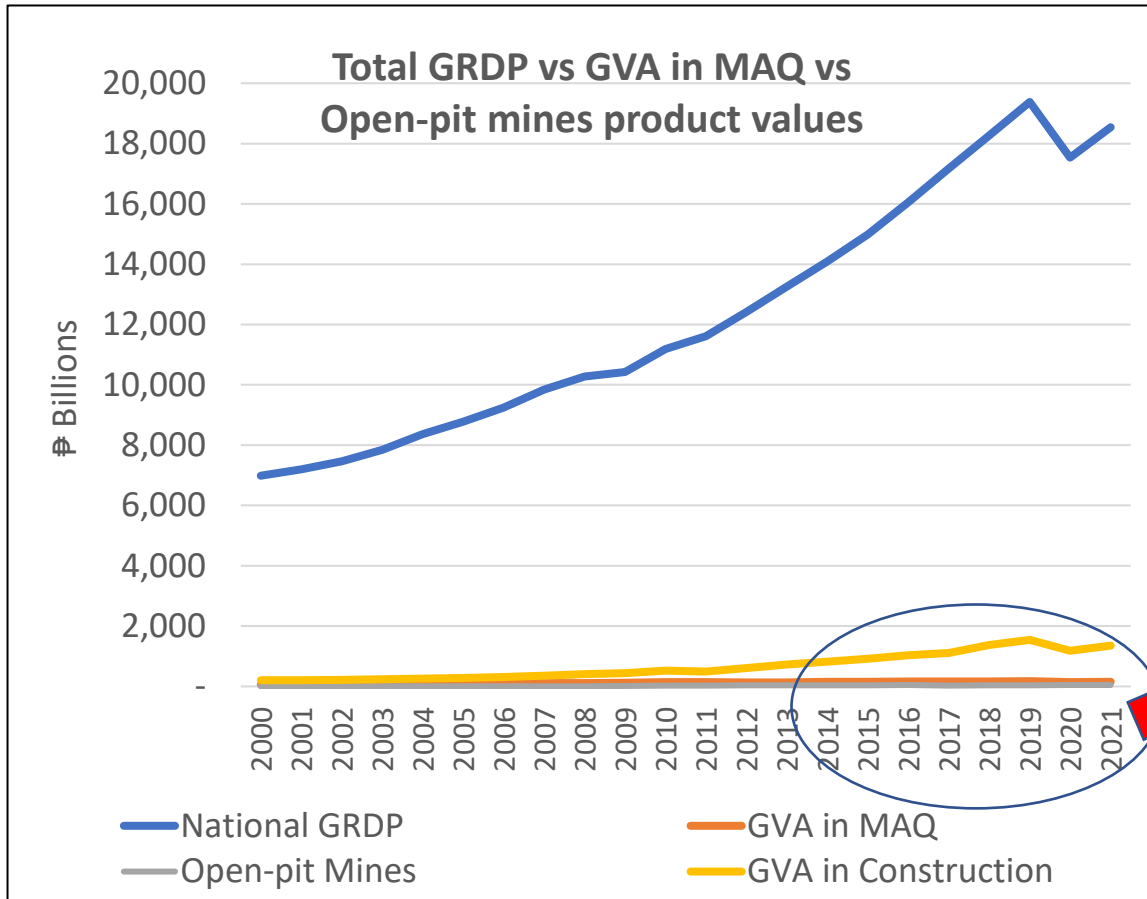
- ✓ National Government/ LGU /Community share and revenue sources from mining projects

Project	Investment	Est. 10-year Excise taxes	Est. 10-year LGU revenue
Operating			
OceanaGold	\$320 million	₱2.7 billion Based on 2016 payments	₱2.3 billion Based on 2016 payments
Carmen Copper	\$88 million (without mine development)	₱2.2 billion Based on 2016 payments	₱700 million Based on 2016 LGU payments
FCF Minerals	\$149 million	₱1.3 billion Based on 2018 payments	₱340 million Based on 2018 LGU payments
Eramen Minerals	₱113 million	₱350 million Based on 2018 payments	₱5 million Based on 2018 payments
Prospective			
Tampakan	\$5.9 billion	₱80 billion	
Kingking	\$2 billion	₱18 billion	
Silangan	\$1.7 billion	₱7.2 billion	

Source: EITI, MGB, author's computation

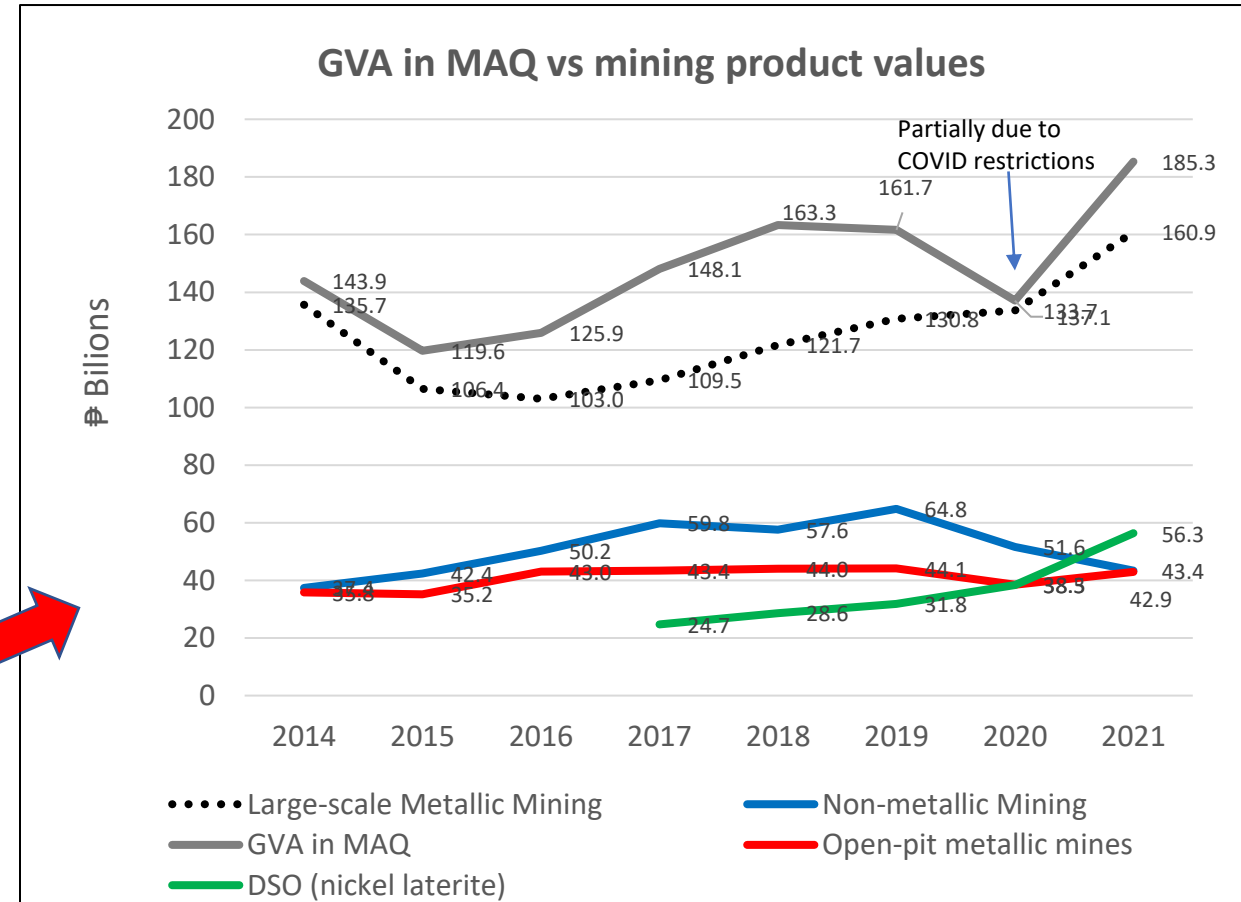
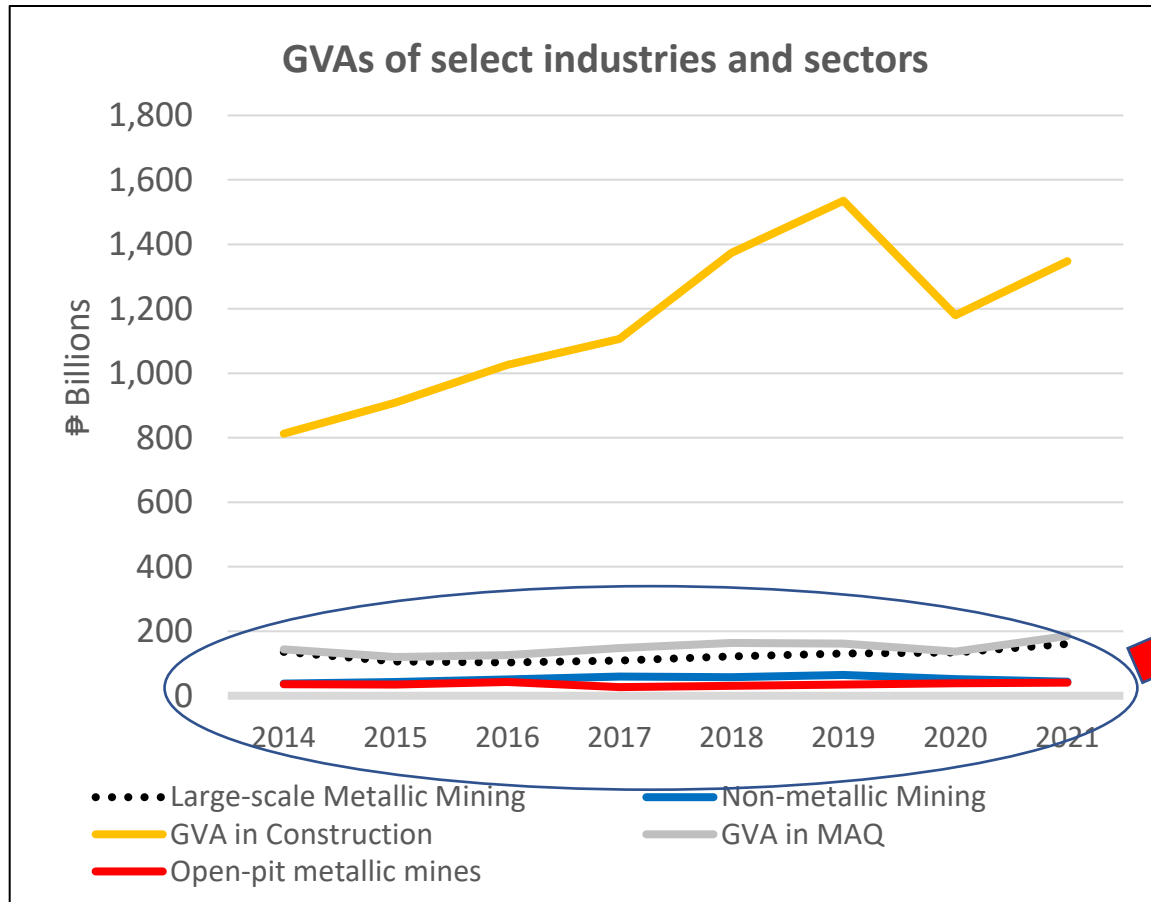
Development and ecological integrity implications: Benefits

✓ National Government/ LGU /Community share and revenue sources from mining projects



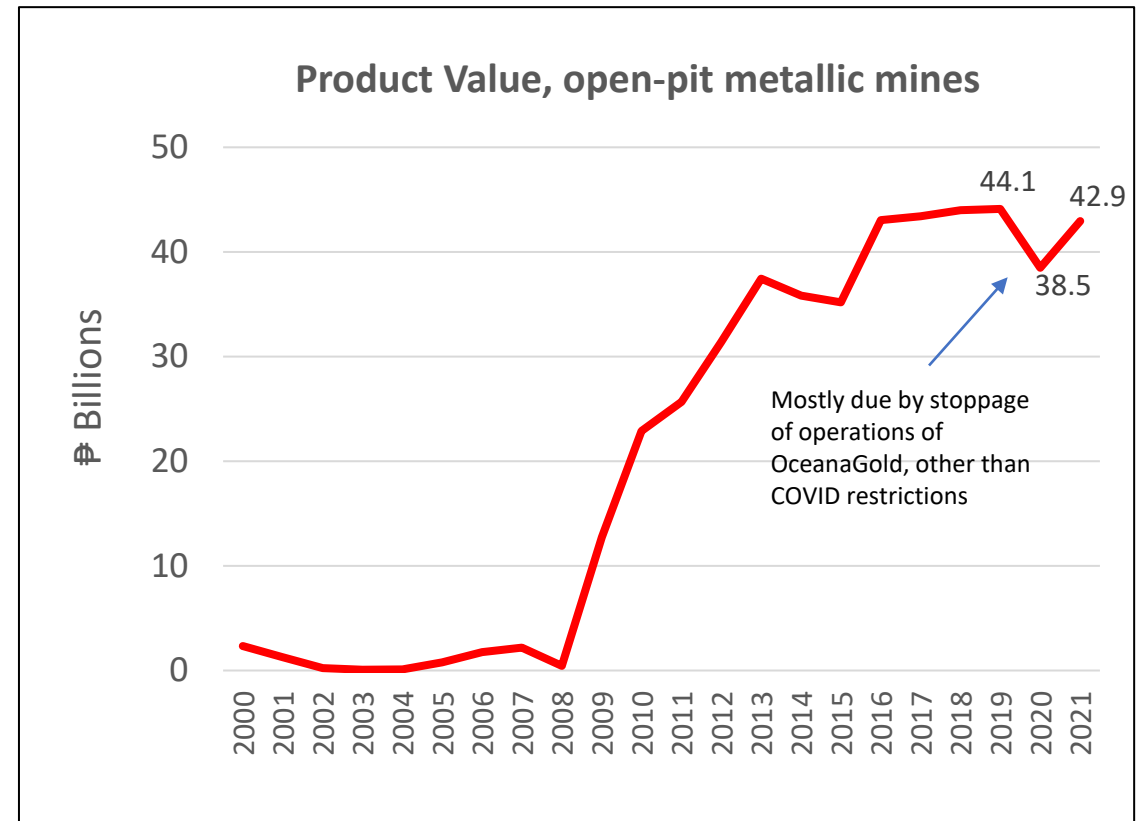
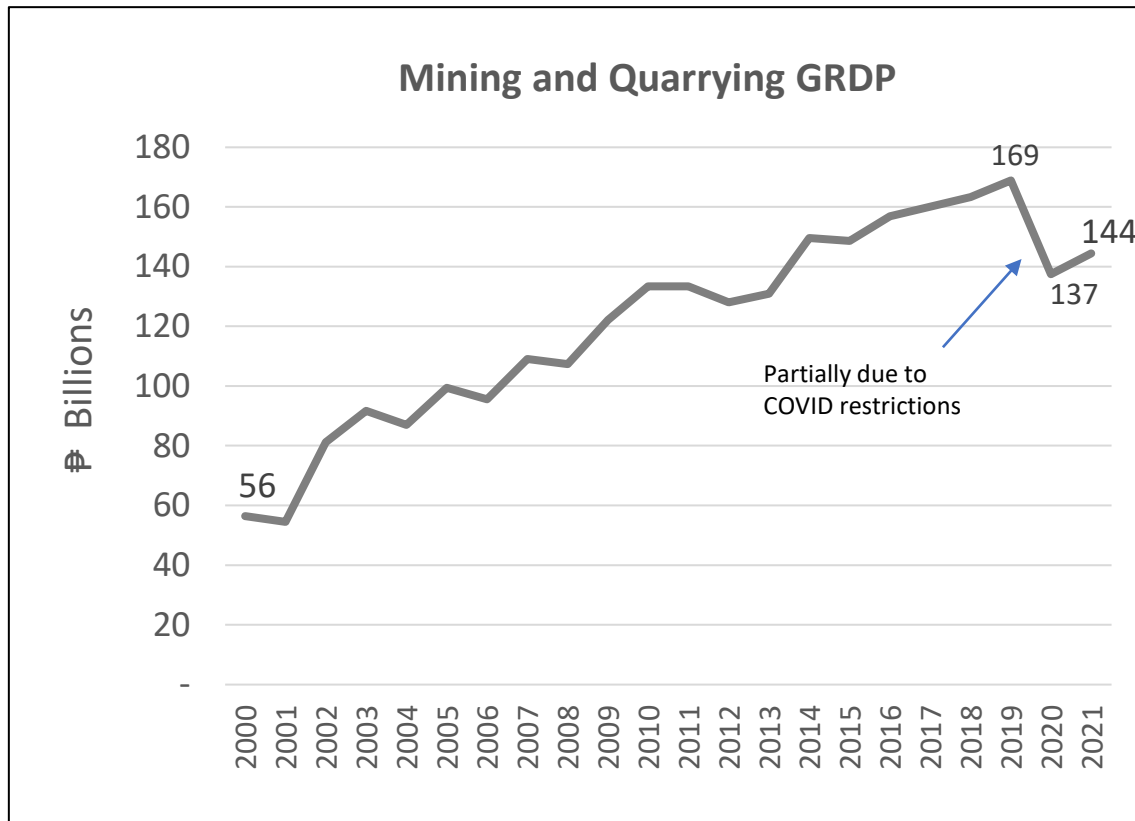
Development and ecological integrity implications: Benefits

✓ National Government/ LGU /Community share and revenue sources from mining projects



Development and ecological integrity implications: Benefits

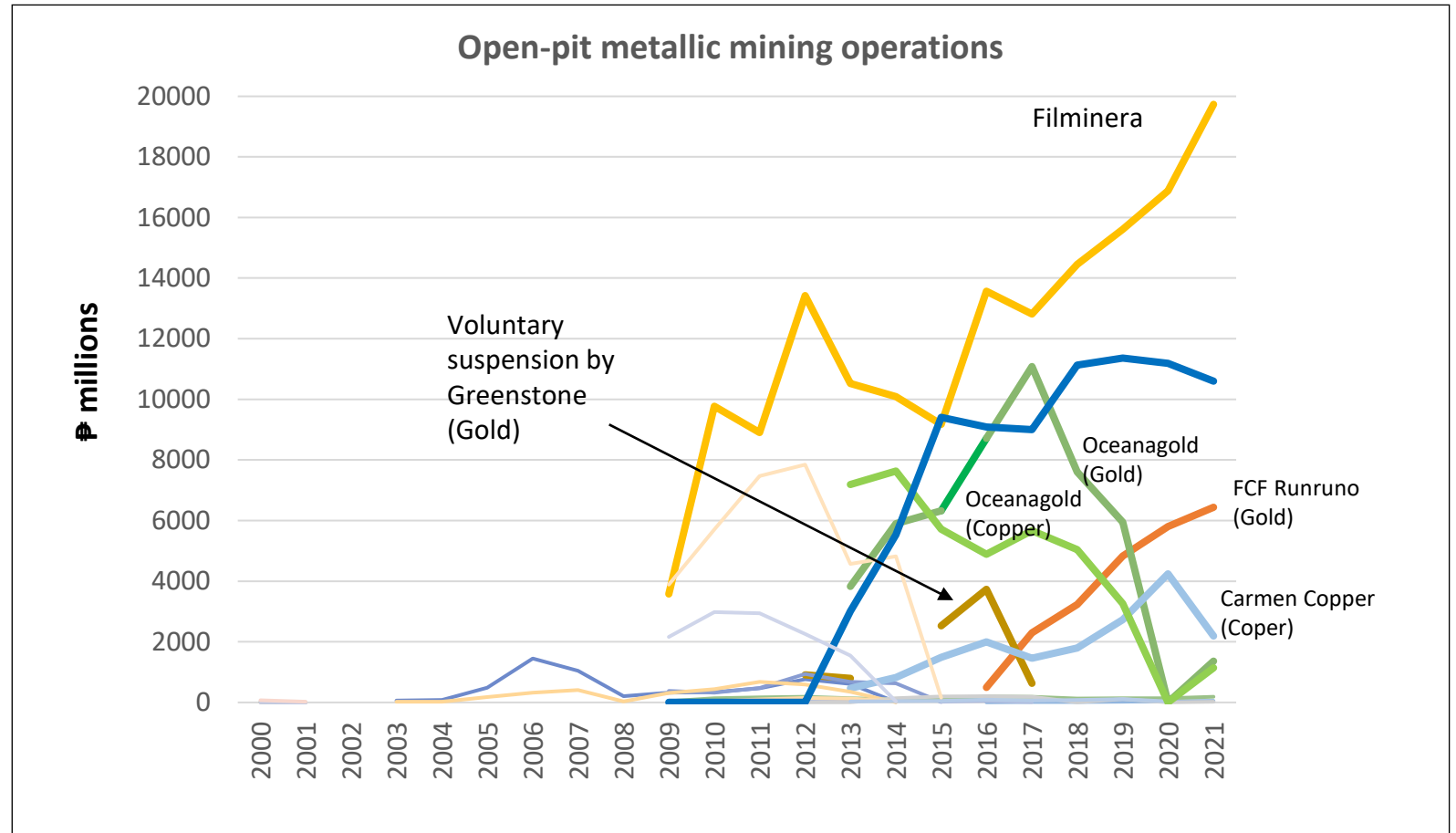
✓ National Government/ LGU /Community share and revenue sources from mining projects



Development and ecological integrity implications: Benefits

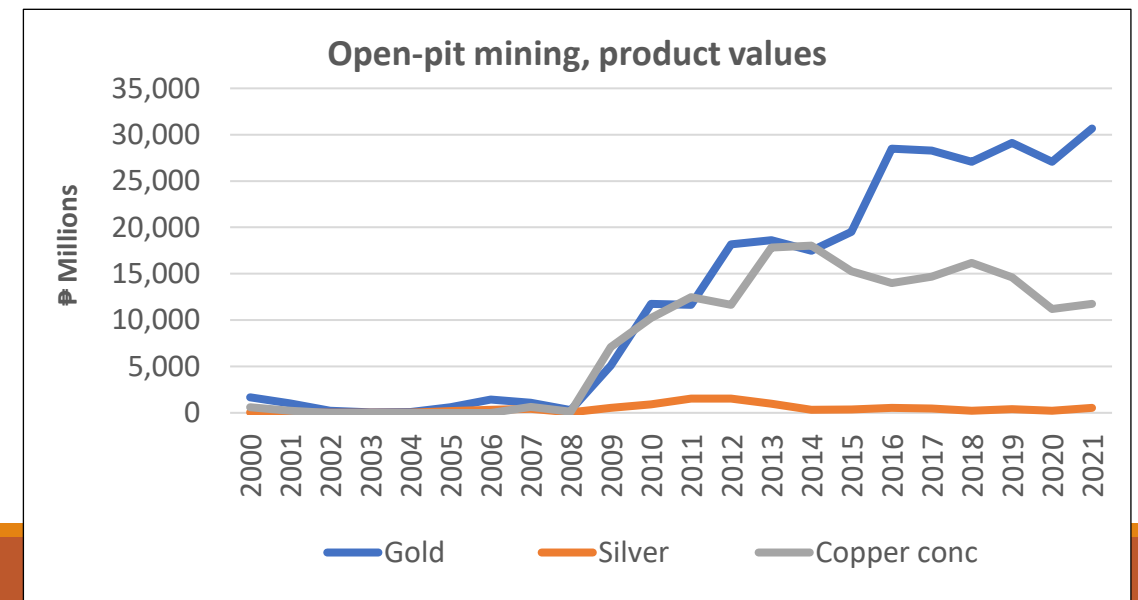
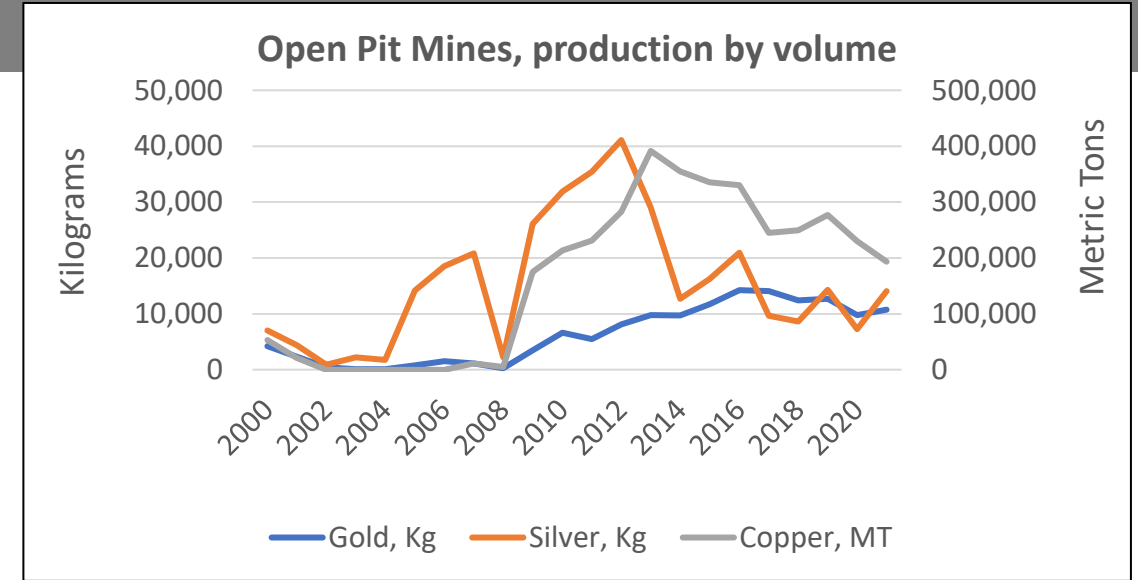
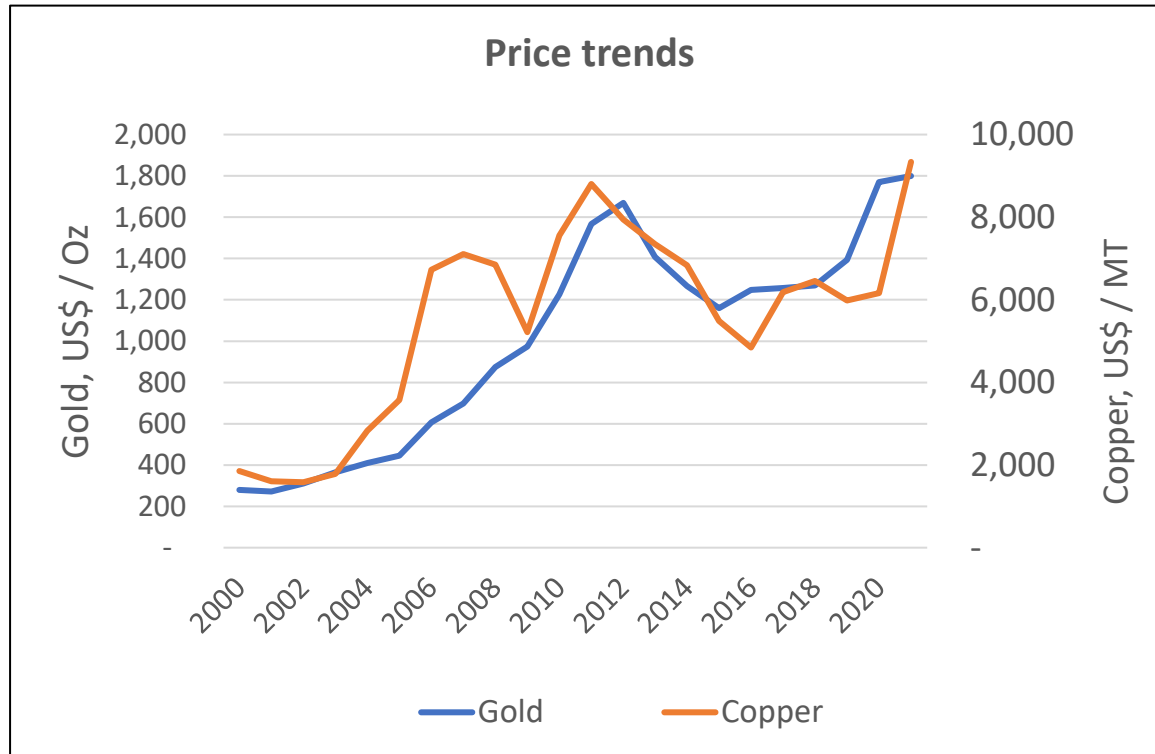
✓ Drop in values:

- Oceanagold dispute with LGU, barricades;
- Delayed FTAA renewal decision;
- Drop started in 2017; There were no production reported by OGPI for 2020
- Total production value loss of approximately ₱17 billion per year due to policy impact



Development and ecological integrity implications: Benefits

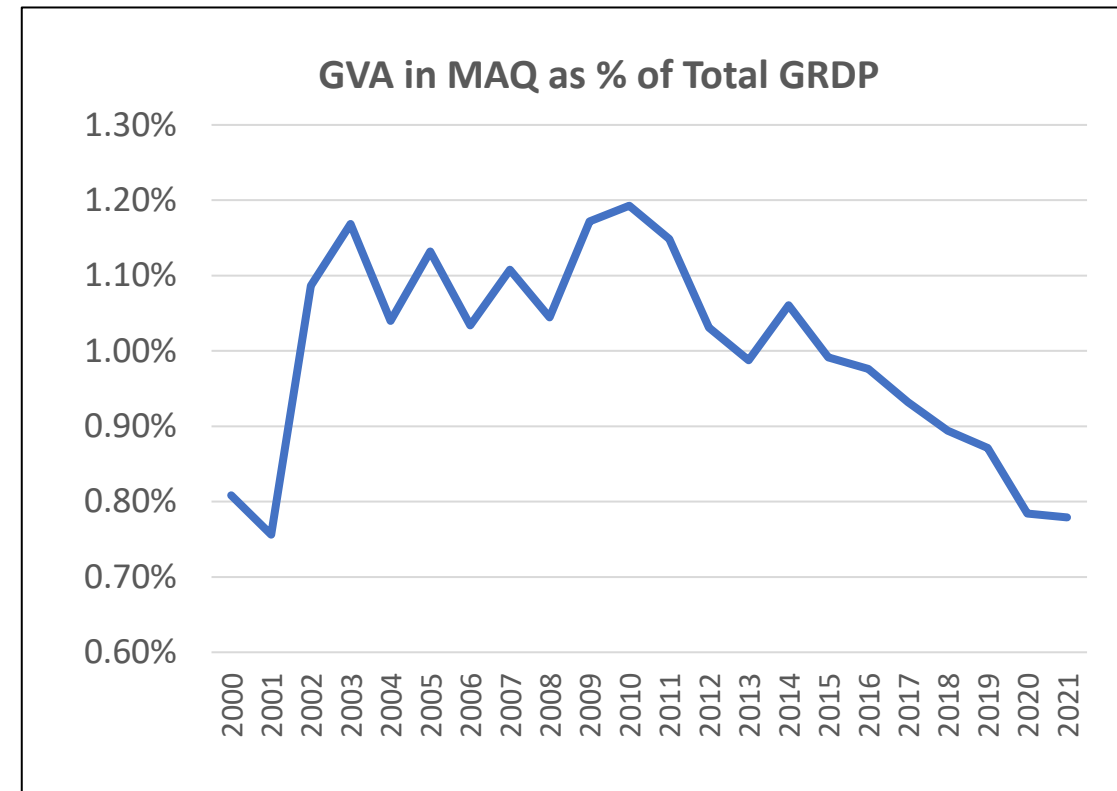
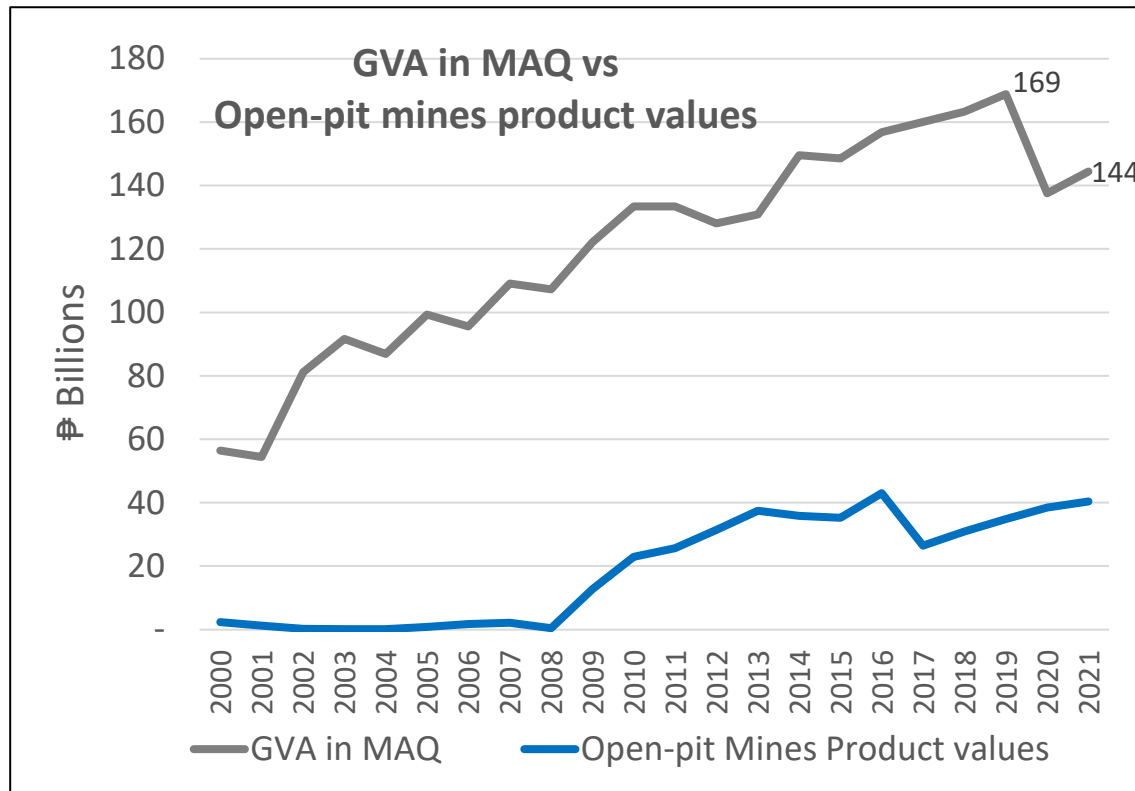
- ✓ National Government/ LGU /Community share and revenue sources from mining projects



Development and ecological integrity implications: Benefits

✓ Contribution to local economy:

- Less than 1.2% of total GDP since 2000
- Less than 1.0% since 2015
- 225,000 employment in Mining and Quarrying
- ₱3.5 Billion to LGUs in 2021



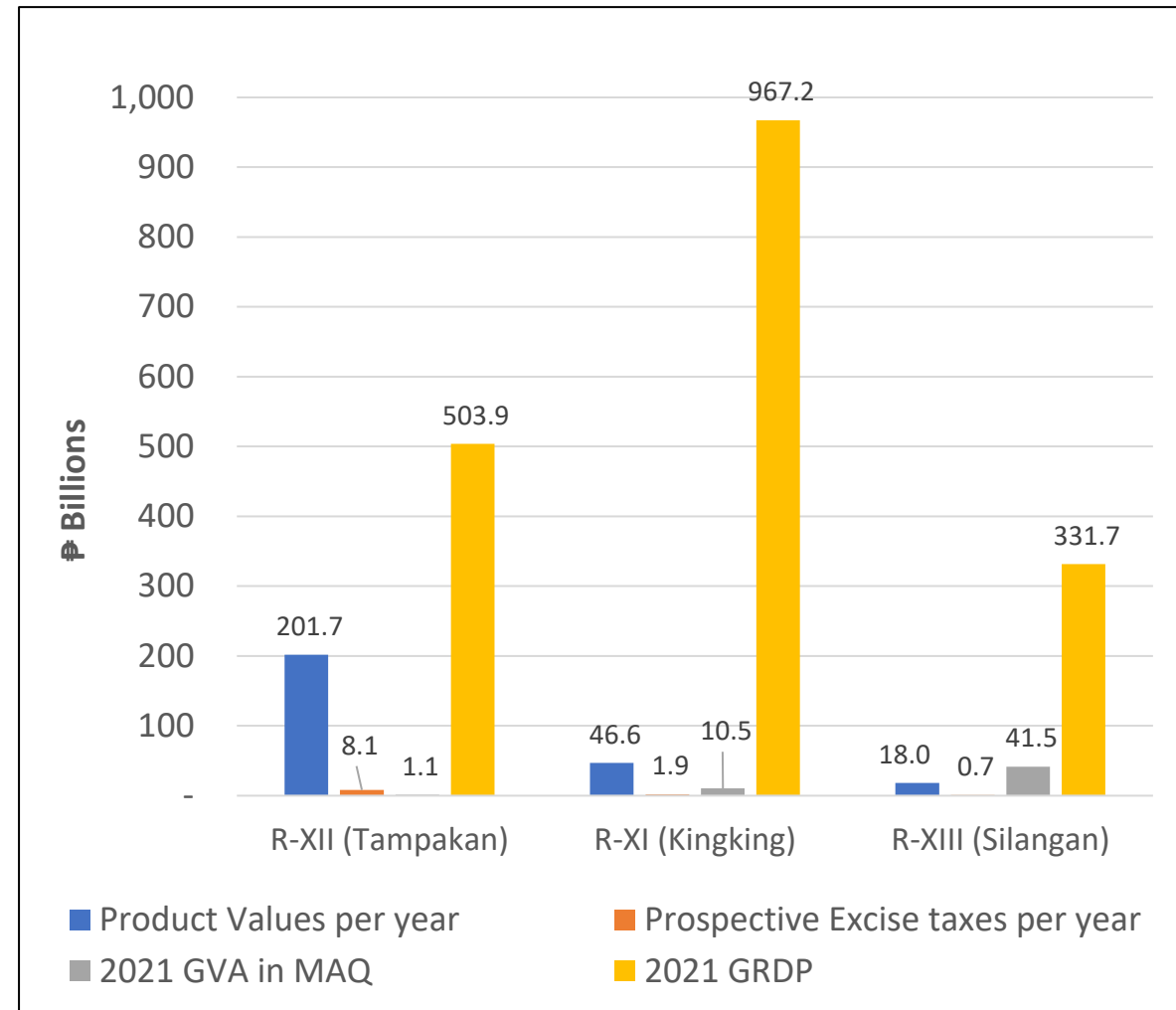
Development and ecological integrity implications: Benefits (prospective)

✓ Flagship projects vs 2021 GVA in MAQ and GRDPs for the region

In ₱ billions

Project	Product Values per year	Est. excise taxes per year	2021 GVA in MAQ for the region	2021 GRDP for the region
Tampakan (open-pit)	201.73	8.1	1.1 Region XII	503.9 Region XII
King-king (open-pit)	46.59	1.9	10.5 Region XI	967.2 Region XI
Silangan (UG)	18.02	0.7	41.5 Region XIII	331.7 Region XIII
	266.34			

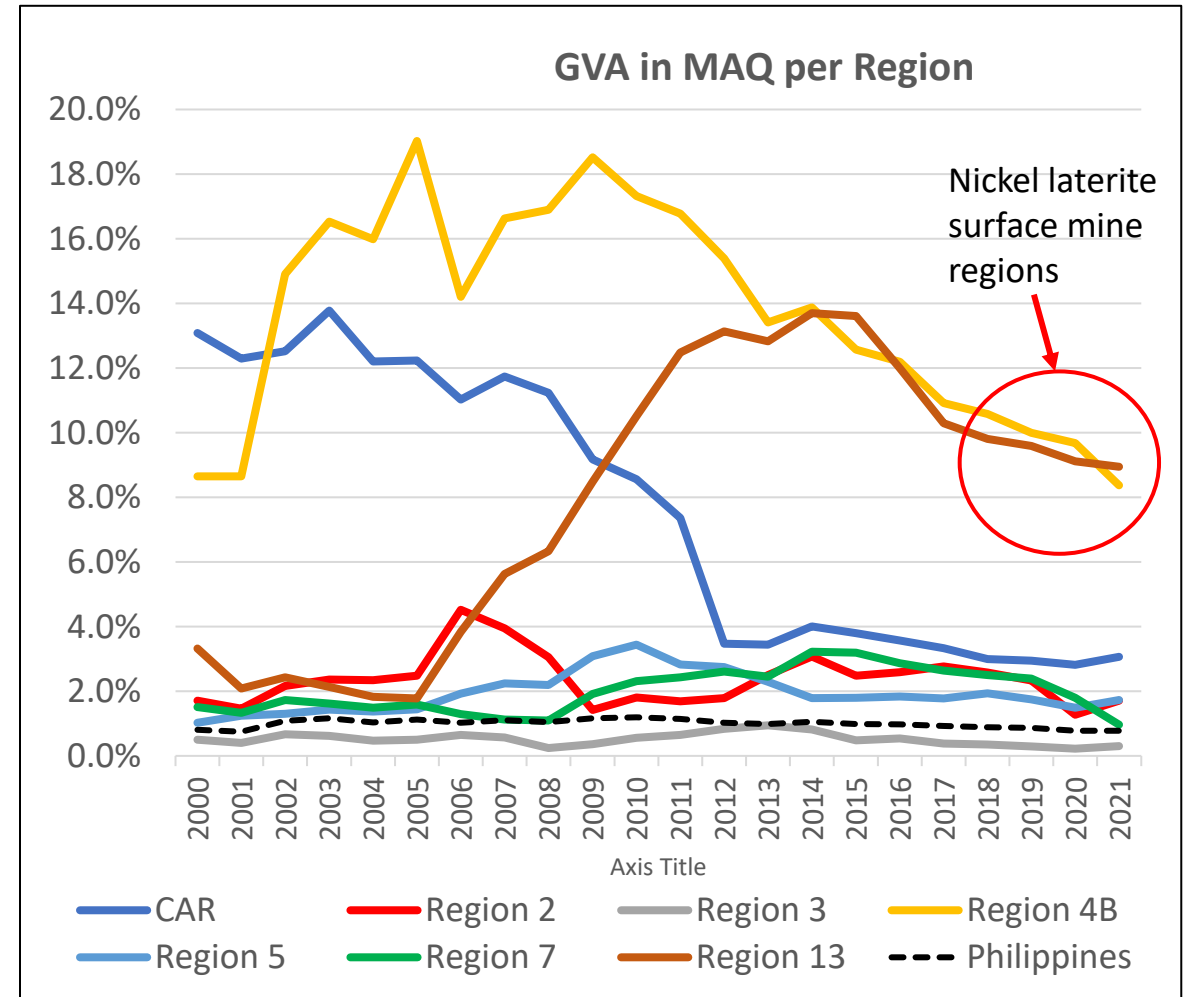
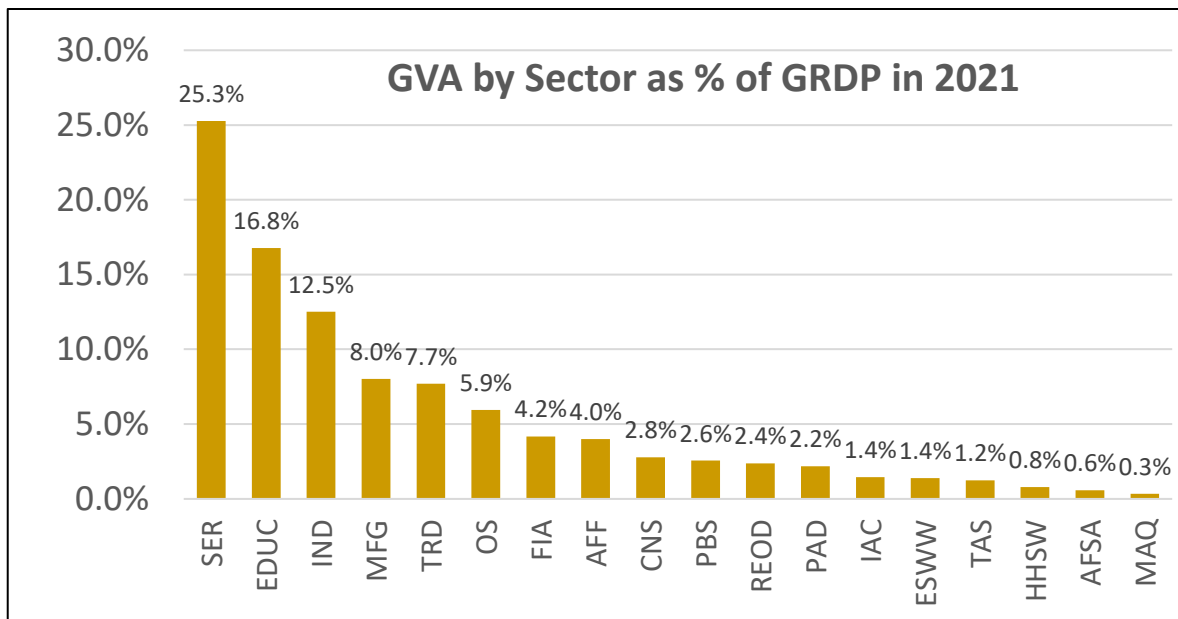
Source: PSA and author's computations



Development and ecological integrity implications: Benefits

✓ Contribution to local economy: 2021 GVA in Mining and Quarrying as % of Gross Regional Domestic Product

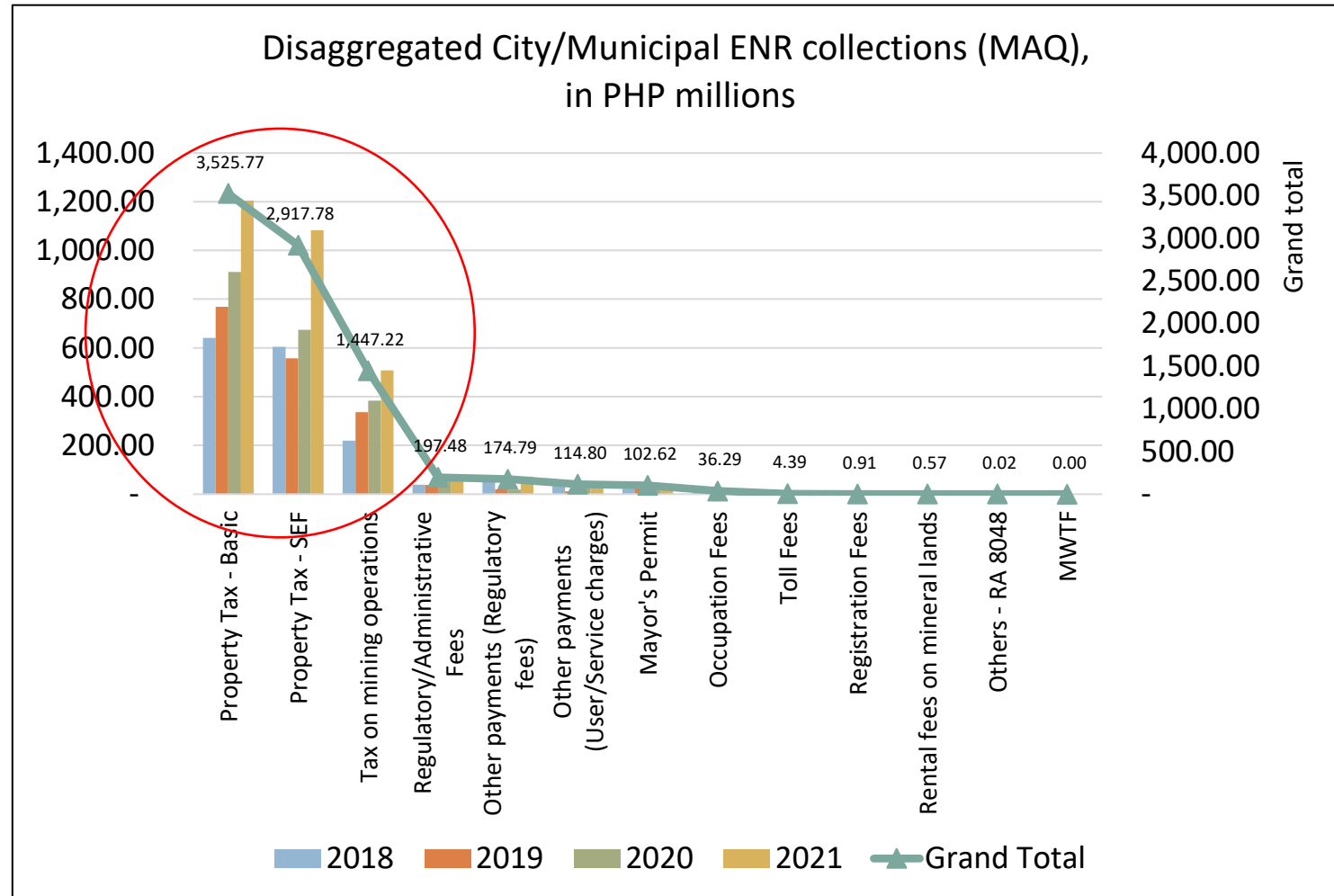
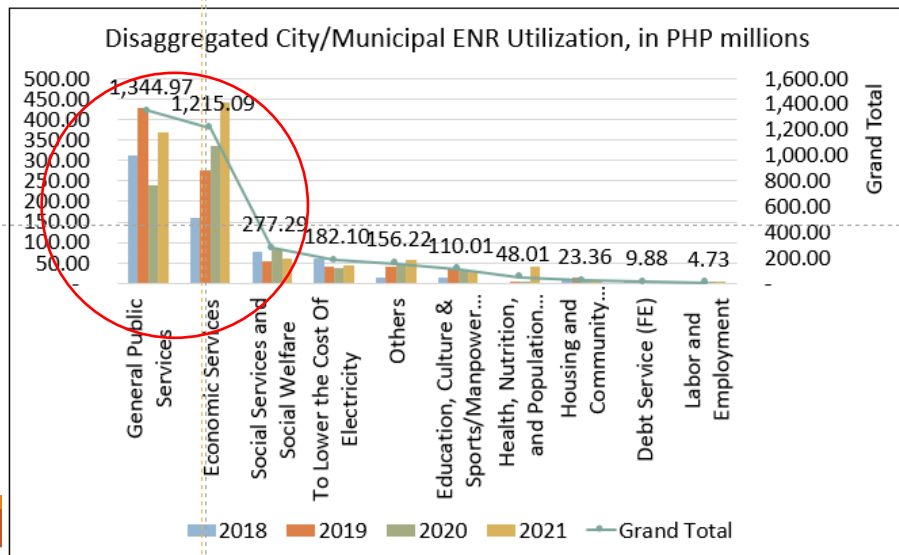
- 13% in Region XIII
- 8.4% in Region IV-B
- 3.1% in CAR



Development and ecological integrity implications: Benefits

✓ Contribution to local economy

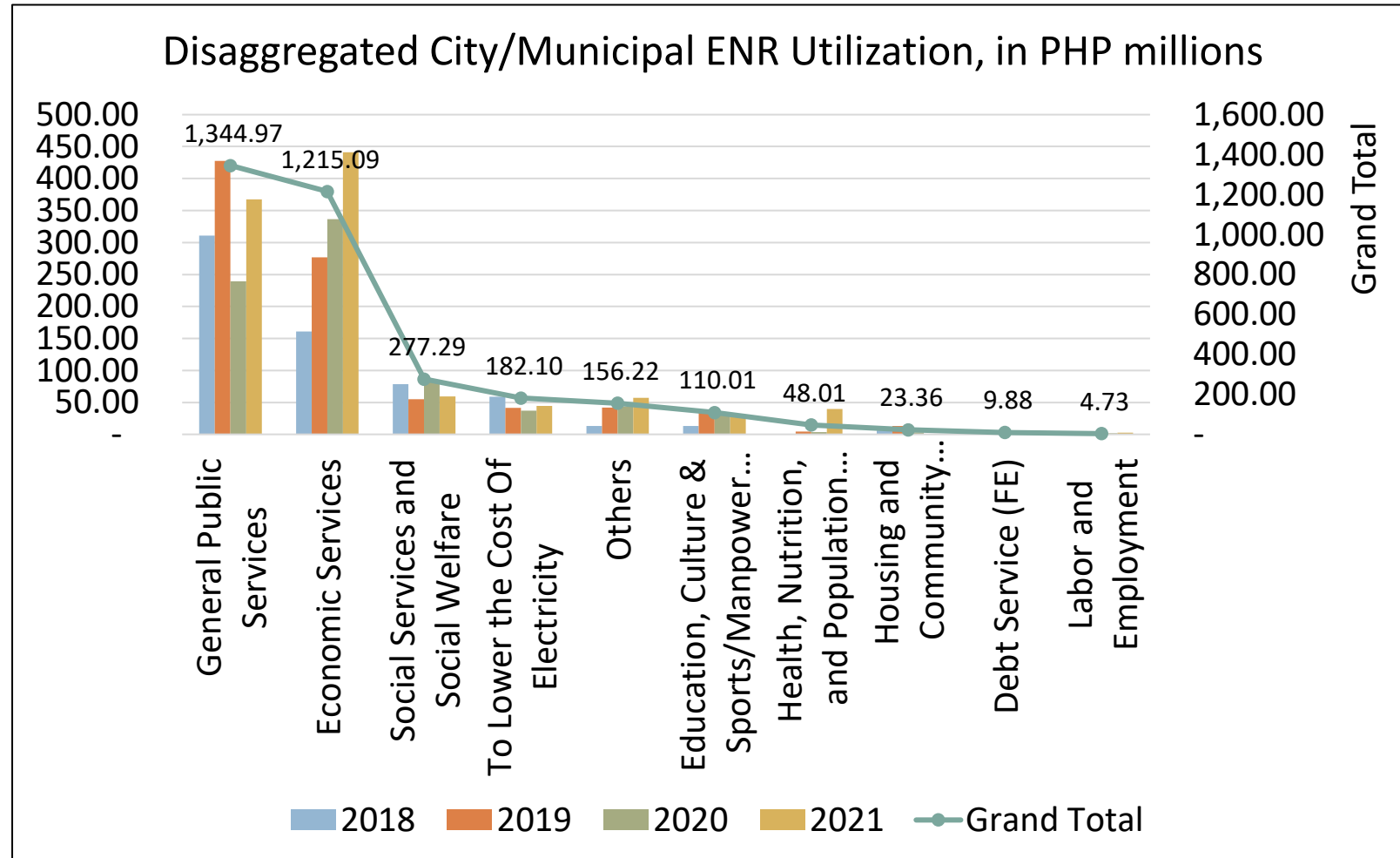
- Programs, activities and projects
- Calamity, health, education support
- Direct & indirect infrastructure investments
- Complementation in labor and employment



Development and ecological integrity implications: Benefits

✓ Contribution to local economy

- General public / economic services
- Complementation in labor and employment



Development and ecological integrity implications: Benefits

✓ Contribution to local economy

- Social development and management fund commitments
- Employment
- Royalties to Indigenous People
- Community engagement
- Incomplete reporting on IP royalties; lacks transparency and accountability



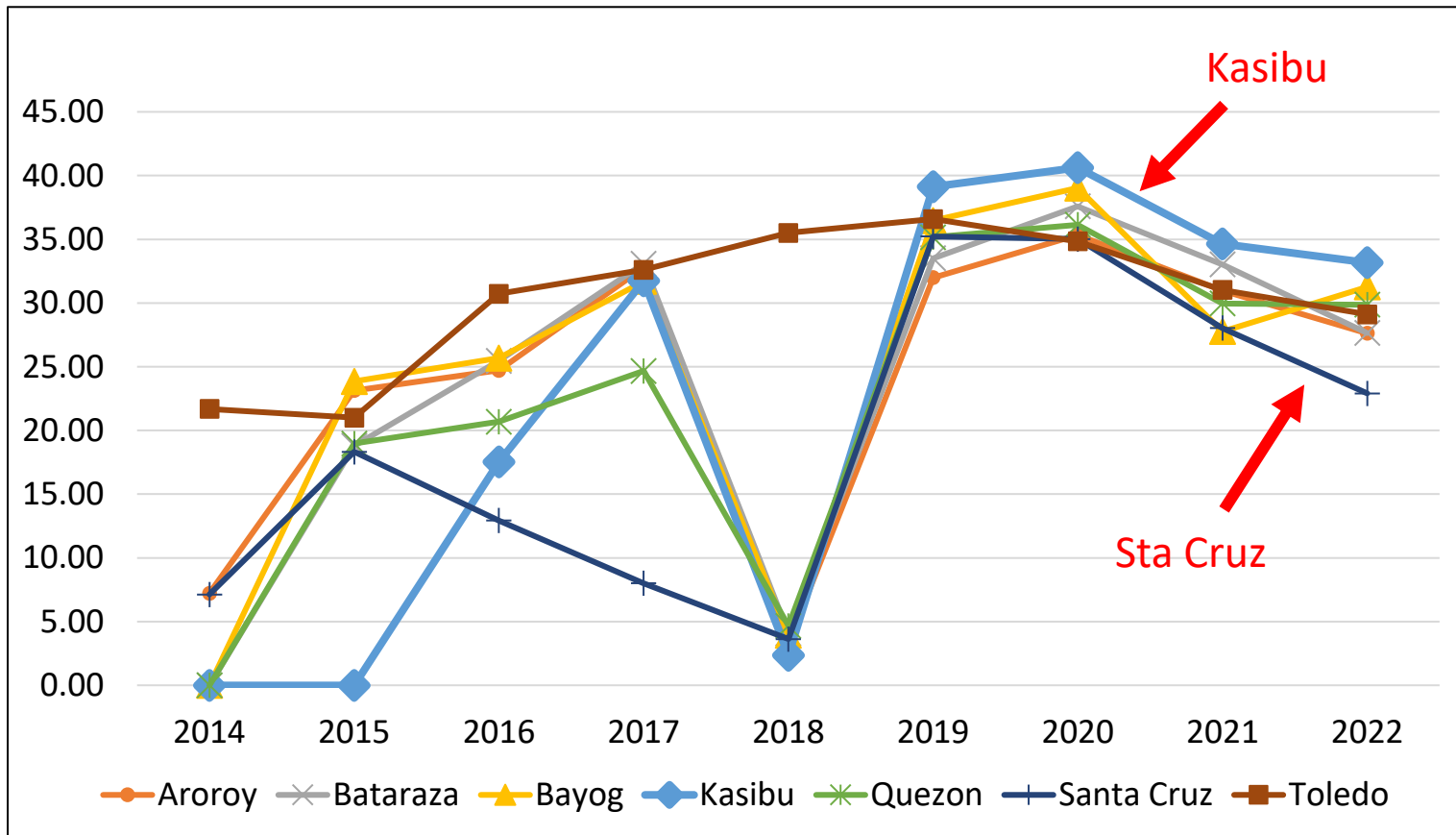
Project	10-year estimated SDMP
Operating	
OceanaGold	₱430 million Based on 2013-2014 SDMP annual average
Carmen Copper	₱370 million Based on 2013-2014 SDMP annual average
FCF Minerals	₱340 million Based on 2018 SDMP

Project	10-year estimated IP royalties
Operating	
OceanaGold	₱290 million Based on 2013 figure

Development and ecological integrity implications: Benefits

CONTRIBUTION TO LOCAL ECONOMY: EVIDENCE FROM DTI-CMCI INDEX

Summary of annual index



2021 to 2022 rankings

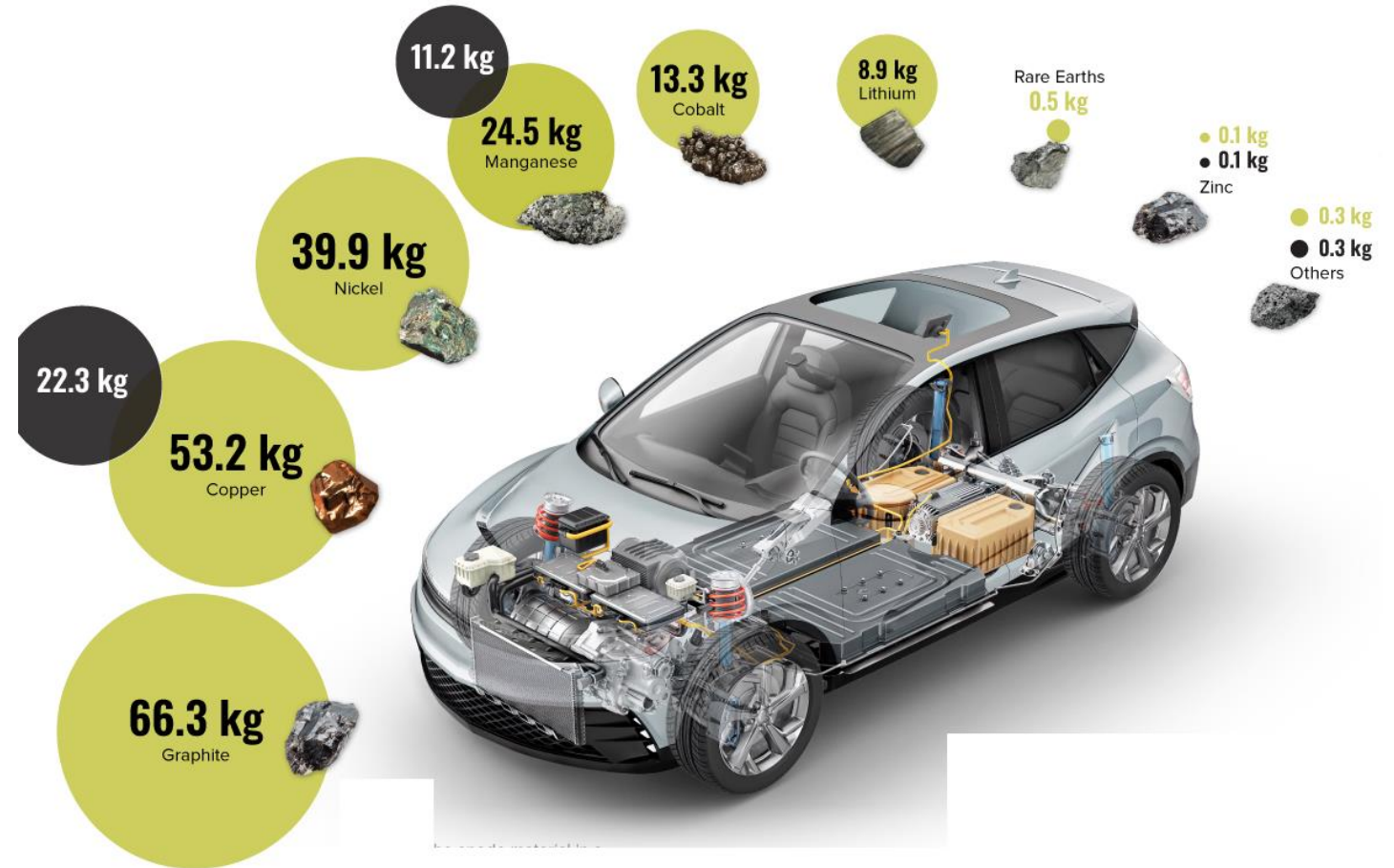
- Aroroy – 326 to 339 (1st class)
- Bataraza -176 to 337 (1st class)
- Bayog – 528 to 201 (3rd class)
- Kasibu -113 to 102 (3rd class)
- Quezon – 433 to 284 (4th class)
- Santa Cruz – 430 to 477 (1st class)
- Toledo – 101 to 104 (Component city)

Source: DTI-CMCI 2022

Development and ecological integrity implications: Benefits

✓ Global and local supply chain augmentation

- Non-metallics and industrial minerals for the construction industry
- Energy storage materials



Development and ecological integrity implications: Social and environmental welfare cost

✓ Ecological integrity concerns

- disaster risks
- natural resource depletion
- watershed degradation leading to shortage of water supply
- pollution & chemical toxicity
- illegal use of explosives
- contamination of water bodies
- displacement of families
- inequitable distribution of benefits, host vs adjacent and affected LGUs
- illegal activities – mining operations, logging, peace and order concerns, leakages, compromised adjudication processes, risk to environmental officers and enforcers
- safety and health, labor and work arrangements

Development and ecological integrity implications: Social and environmental welfare cost

✓ Ecological integrity concerns

- Dizon Copper Silver Mines, San Marcelino, Zambales, non-operating mine
- Tailings collapse, 27 August 2012
- Affected Mapanuepe Lake and eventually into the Sto. Tomas River.
- Around 250 families evacuated as low-lying villages were flooded with mine waste.



Source: K2fly, 2021

Development and ecological integrity implications: Social and environmental welfare cost

✓ Ecological integrity concerns

- Marcopper Mining Corp., Marinduque province
- Tailings dam breach, March 1996
- Est. 3 million tons tailings discharge into the Mogpog and Boac Rivers.



Source: ejatlas.org

Development and ecological integrity implications: Social and environmental welfare cost

DAMAGE ESTIMATES FROM MARCOPPER MINING DISASTER

1993 spill pumped an approximate total of 200M tons of toxic chemicals into Boac River for 16 years.

- ✓ Marcopper Mining Corp did not undertake comprehensive EIA for using previously mined pit as waste storage – led to collapse
- ✓ DENR still issued ECC to allow operations to continue
- ✓ Directly affected 15-20k residents
- ✓ Heavy metal poisoning

Source: Fatalla, JM. 2019. The 1996 Marcopper Mining Disaster in Marinduque: Five Decades of Social Injustice and Neglect



PHOTO COURTESY OF
MARINDUQUEGOV

Development and ecological integrity implications: Social and environmental welfare cost

DAMAGE ESTIMATES FROM MARCOPPER MINING DISASTER

In 1998, the present value of current and future foregone income in coastal and river fishing, crop farming, and farm trading:

PHP 179,563,980

Scenario A: With Short-Term Rehabilitation

PHP 162,134,115

Scenario B: With Long-Term Rehabilitation

Source: Bennagen, ME. 1998. Estimation of environmental damages from mining pollution: The Marinduque Mining Accident. EEPSEA Research Report Series.



PHOTO COURTESY OF
MARINDUQUEGOV

Development and ecological integrity implications: Social and environmental welfare cost

DAMAGE ESTIMATES FROM MARCOPPER MINING DISASTER

Just this **May 16, 2022**, the Regional trial court issued a ruling on the 1993 Marcopper mine spill case.

It granted **PHP 200,000 in temperate damages** and **PHP 100,000 in moral damages** to each of at least 30 plaintiffs. An additional **PHP 1 million for exemplary damages** was awarded.

Severely undercompensated when compared to valuation study.

Source: Jocson, LMJ. 2022, May 25. Court rules against Marcopper. *BusinessWorld*.



Development and ecological integrity implications: Social and environmental welfare cost

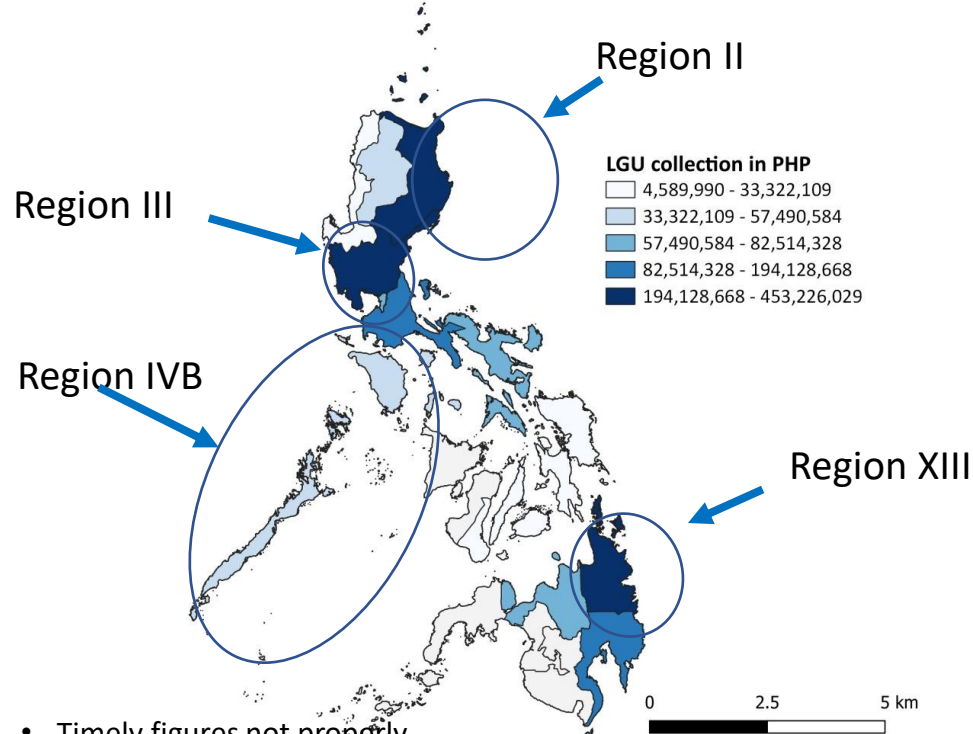
ENVIRONMENTAL VIOLATIONS: EVIDENCE FROM MINE AUDITS

- Non submission of revised EPEP/FMRDP as required by amended ECC
- Evidence of soil erosion and lack of slope stabilization measures
- Run off not captured, discharges to nearby water bodies, causing siltation
- Partial compliance on water quality (groundwater and spring water quality)
- No accredited pollution control officer
- Poorly designed and located siltation ponds may not capture silt-laden run off during heavy rains
- Cut and uprooted trees without tree cutting permit
- Improper delineation contributes to weak attribution for mine impacts

Development and ecological integrity implications: Social and environmental welfare cost

- ✓ Inequitable distribution of benefits, host vs adjacent and affected LGUs
 - ✓ Inconsistent monitoring and reporting of benefits from LGU level

AGGREGATED LGU COLLECTION BY REGION, 2018

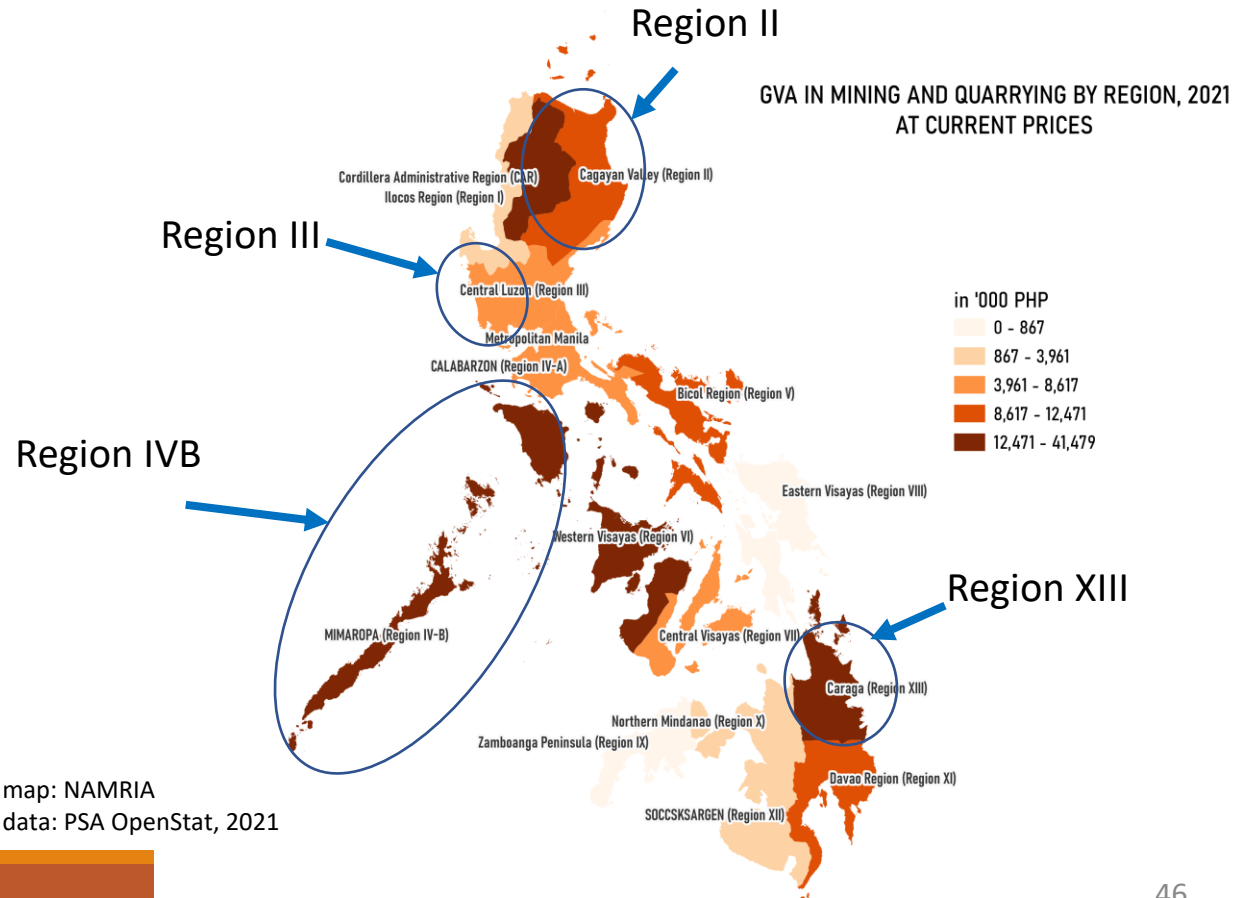


- Timely figures not properly reported by LGUs

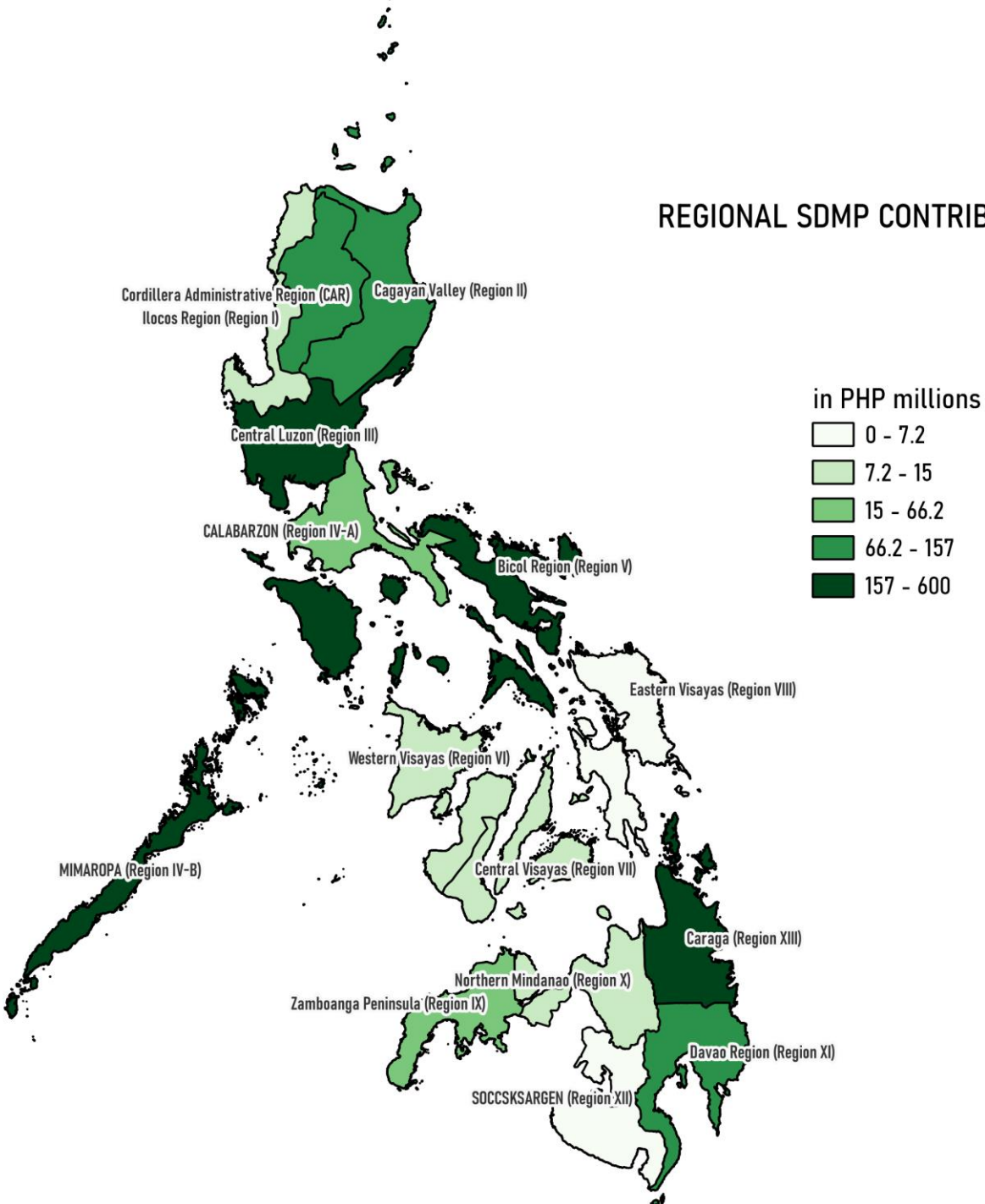
Source of basic map: NAMRIA
Source of basic data: PSA OpenStat, 2021

Region II

GVA IN MINING AND QUARRYING BY REGION, 2021
AT CURRENT PRICES

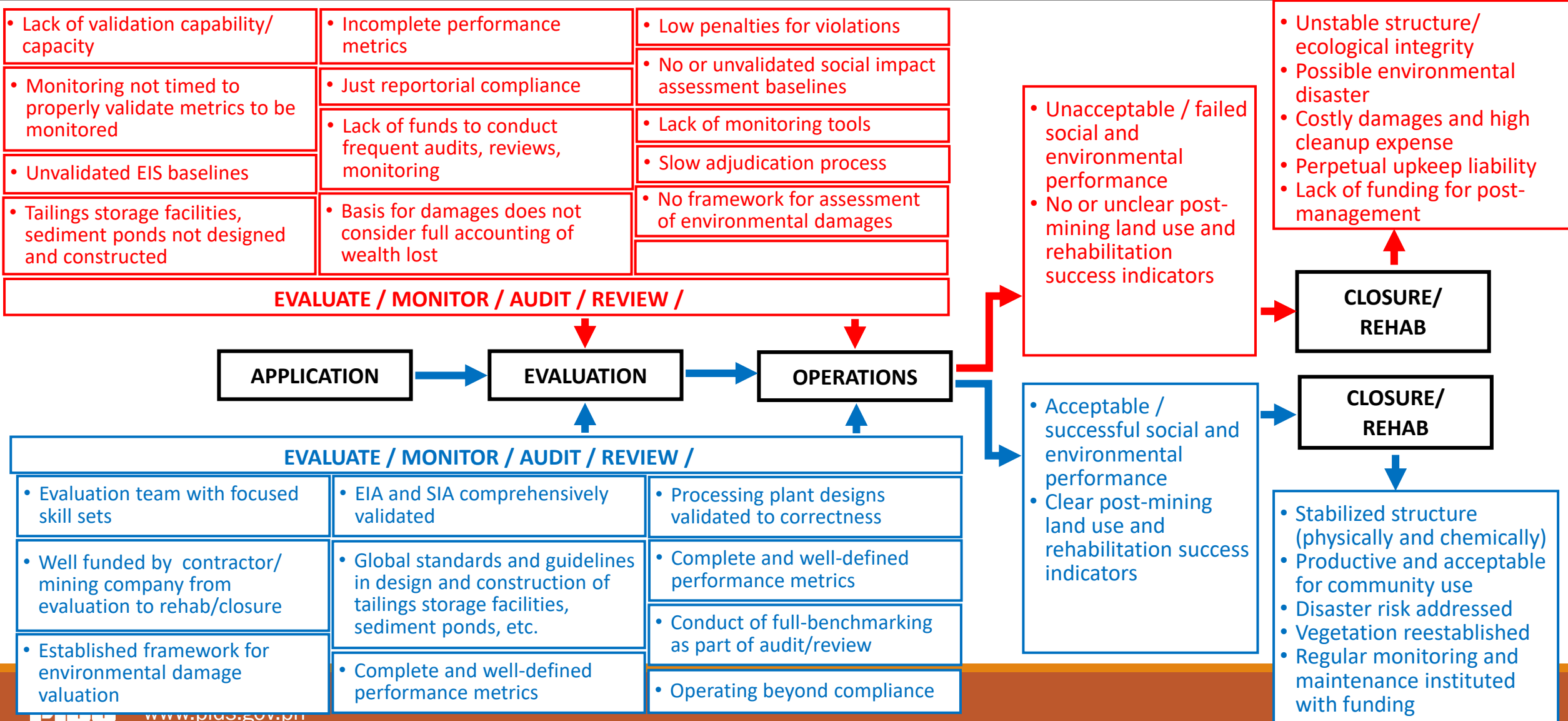


REGIONAL SDMP CONTRIBUTIONS IN 2021



Source of basic map: NAMRIA
Source of basic data: PSA OpenStat, 2021

Pathways



Pathways

✓ Semirara Mining and Power Corporation (Semirara island, Antique)

- Accelerated rehabilitation of its South Panian coal mine backfilling and reforestation of the 168-hectare open pit)
- 2021 ASEAN Energy Awards, Special Submission Category

BEFORE: South Panian Open Pit in 2016

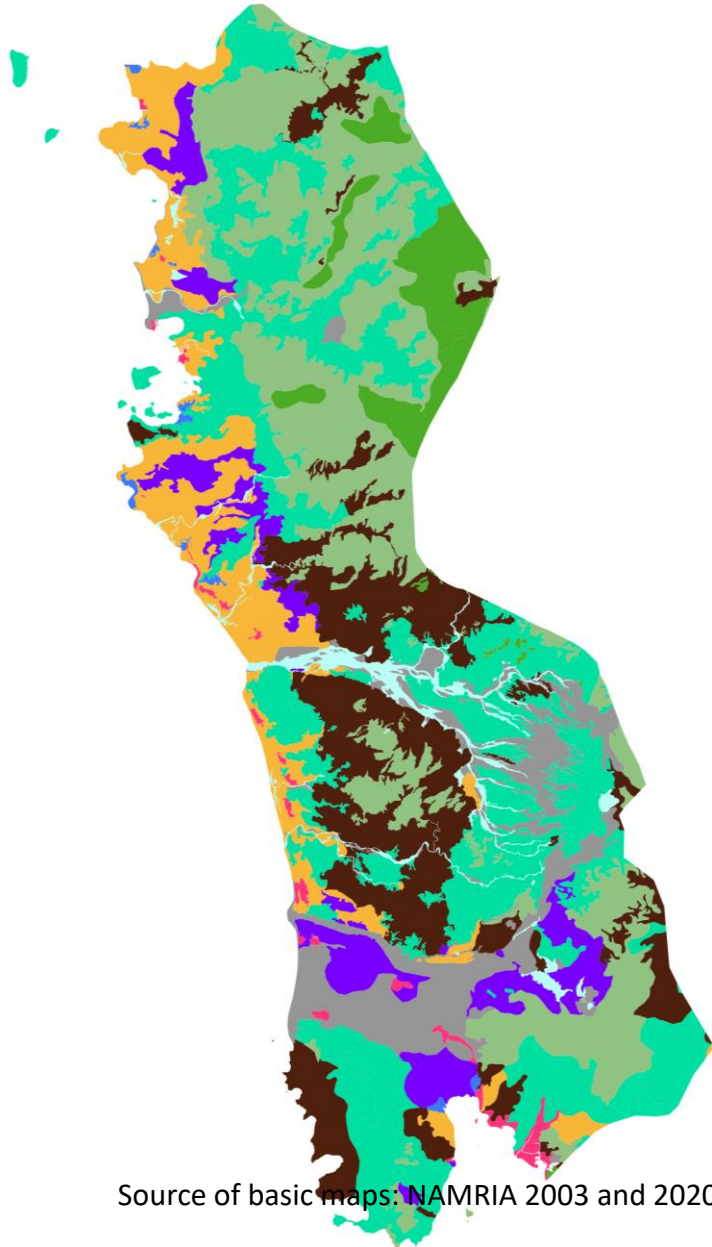


AFTER: South Panian Rehabilitated Pit in 2021



LAND COVER CHANGES 2003-2020: ZAMBALES

ZAMBALES
Land Classification, 2003



LAND CLASSIFICATION

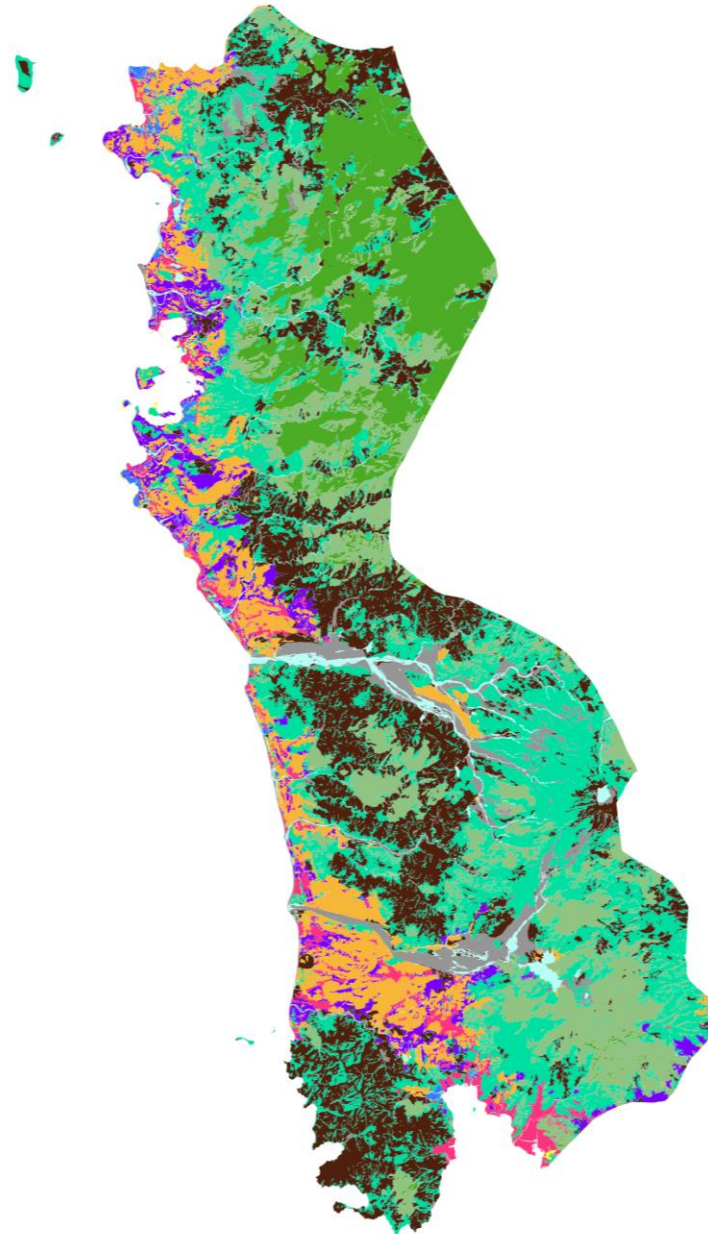
- Annual Crop
- Brush/Shrubs
- Built-up
- Closed Forest
- Fishpond
- Grassland
- Inland Water
- Marshland/Swamp
- Open Forest
- Open/Barren
- Perennial Crop

0 10 20 km



Source of basic maps: NAMRIA 2003 and 2020

ZAMBALES
Land Classification, 2020



LAND CLASSIFICATION

- Annual Crop
- Brush/Shrubs
- Built-up
- Closed Forest
- Fishpond
- Grassland
- Inland Water
- Mangrove Forest
- Open Forest
- Open/Barren
- Perennial Crop

0 10 20 km



LAND COVER CHANGES 2003-2020: ZAMBALES

Land Category	2003, ha	2020, ha	Difference, ha	Year 2003 % of Total	Year 2020 % of Total	% Difference Between 2003 and 2020
Annual Crop	35,094.64	33,115.06	(1,979.58)	7.24	6.79	(5.64)
Brush/Shrubs	102,668.03	105,556.82	2,888.79	21.19	21.63	2.81
Built-up	3,215.67	9,737.28	6,521.60	0.66	2.00	202.81
Closed Forest	16,259.68	42,419.44	26,159.76	3.36	8.69	160.89
Fishpond	1,200.84	1,759.00	558.16	0.25	0.36	46.48
Grassland	56,954.05	74,082.27	17,128.22	11.75	15.18	30.07
Inland Water	8,671.66	6,722.61	(1,949.05)	1.79	1.38	(22.48)
Mangrove Forest	-	593.06	593.06	0.00	0.12	0.00
Marshland/Swamp	46.46	-	(46.46)	0.01	0.00	(100.00)
Open Forest	85,994.77	58,019.54	(27,975.22)	17.75	11.89	(32.53)
Open/Barren	30,923.62	17,569.91	(13,353.71)	6.38	3.60	(43.18)
Perennial Crop	24,045.63	15,652.37	(8,393.26)	4.96	3.21	(34.91)

Source: Authors' calculations

Ways forward

- ✓ Establish sustainability indicators and monitoring and evaluation platforms
 - Ecological integrity indicators (watershed management, forest cover, water resource, water bodies, biodiversity, audits, mineral wealth, ...)
 - Public health and safety (disaster risk, heavy metal toxicity, worker safety, women and child laborers...)
 - Abandoned mines, post mining rehabilitation (covered by bonds, penalties, etc.) ; responsibility of government vs mining company
 - Post-mining rehabilitation performance metrics
 - Post-mining community level indicators (local economy competitiveness, resiliency, public health, etc)
 - Baseline and endline monitoring for in-course and post-mining impact assessments
 - Periodic monitoring and reporting and public disclosure of mining firm operations
 - Digital monitoring and evaluation platforms for the above
 - Augmented government oversight on non-metallics
 - Institution of perpetual rehab and maintenance fund for closed / foreclosed mines
 - Assure continuity and applicability of environmental laws even in declared autonomous regions

Ways forward

- ✓ Optimize benefits from open pit mines, while addressing ecological integrity concerns
 - Strengthen transparency platforms including monitoring and evaluation standards and metrics
 - Institute programmatic review of adjacent / clustered mining projects
 - Strengthen institutional capacity to validate project EIS (hydrogeologists, TSF engineers, socio-economists, etc.)
 - Augment mining fiscal regime for appropriate benefit sharing (fair share of State, LGUs, communities)
 - Improve cost accountability arrangement including expense coverage for proposal assessment or validation, monitoring and evaluation, and post-mining rehabilitation
 - Shorten adjudication process and increase penalties and community compensation for damages
 - Reinvestment and programming of mining revenues towards human capital and ecological integrity PAPs
 - Adapt more accurate policy definitions for open-pit mining, large/small-scale mining, covering both metallic and non-metallic mineral extraction
 - Continue or assure national oversight on government revenue matters in difficult to access provinces/regions

End of presentation

Thank you.