Compiling Environmental Accounts:
The Philippine Experience

Virginia M. Bathan
Chief Statistical Specialist
Environment and Natural Resources Accounts Division
Macroeconomic Accounts Service

Regional e-Training Programme on the Use of the SEEA for Evidence-based Policy
03 November 2021

Outline

- About the Philippine Statistics Authority (PSA)
  - Environment and Natural Resources Accounts Division
- Milestone of Philippine SEEA
- Coordination mechanism
- Development of Environmental Accounts
- Development of Subnational Environmental Accounts
- Challenges /Forward Directions

About the Philippine Statistics Authority

Established thru **Republic Act 10625**, also known as the **"Philippine Statistical Act of 2013"**

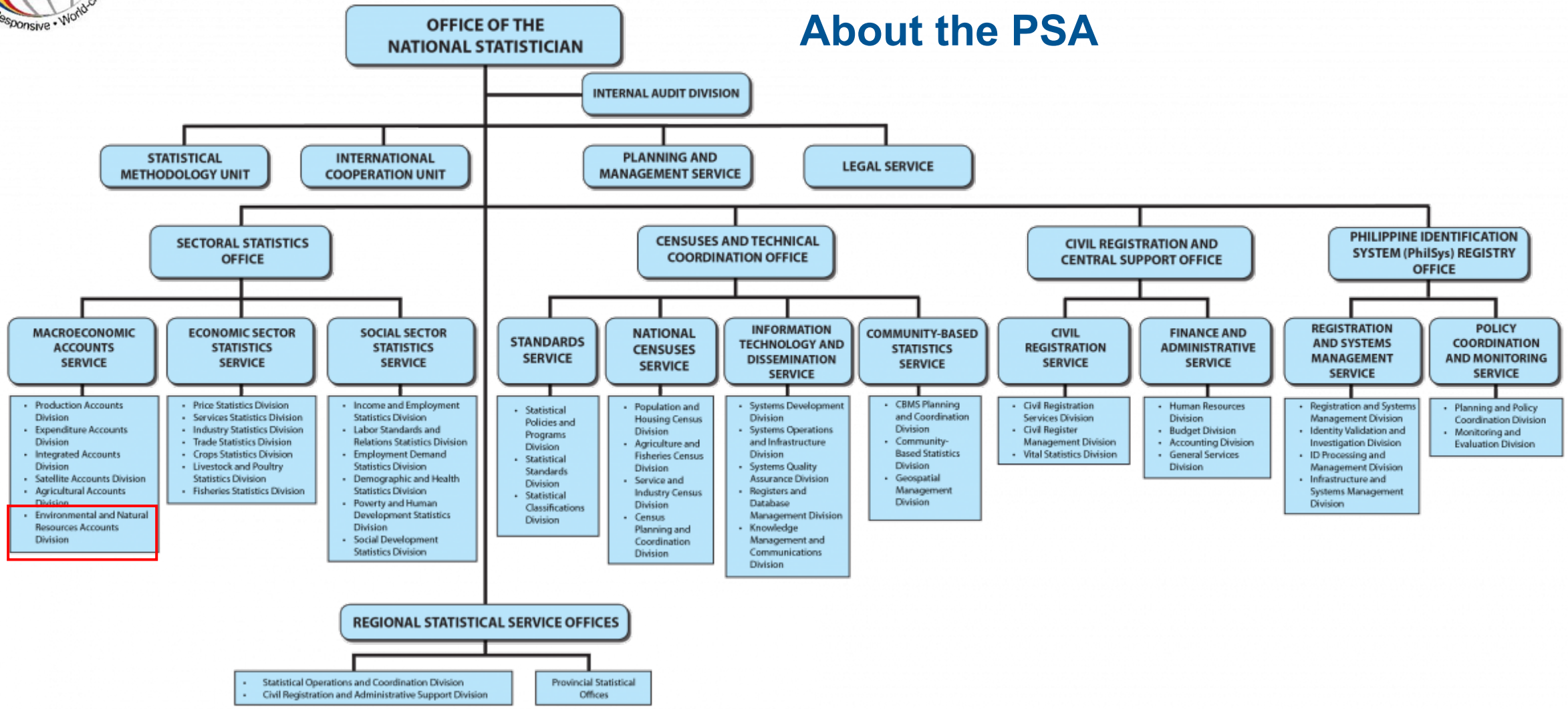
It is the central statistical authority on statistics, the coordinator of the Philippine Statistical System (PSS), administrator of civil registration functions, and administer Philippine National Identification System

Responsible for all national censuses and surveys, sectoral statistics, consolidation of selected administrative recording systems, and **compilation of national accounts.**

About ENRAD

- **Environmental accounts** *(minerals, water, energy, land, DRRE)*
- **Environment statistics and indicators** *(CPES, disaster-related and climate change-related statistics)*
- **Technical Coordination**

About the PSA



Milestone of Philippine SEEA

1 — 1991-2000
ENRAP Environment and Natural Resource Accounting Project

2 — 1995-1997
ENRA I
Integrated Environmental Management for Sustainable Development (IEMSDI)

3 — 1998-2001
ENRA II
Institutionalization of PEENRA

4 — 1999-2000
Benchmark Survey on Environmental Protection Expenditure (SEPE)

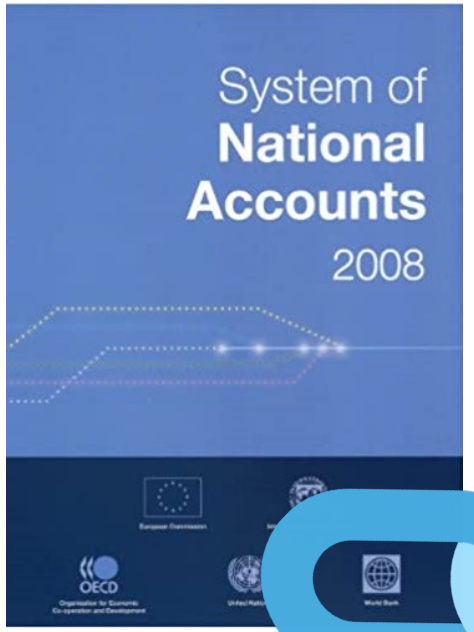
5 — 2000
International Workshop on Environment and Natural Resources Accounting

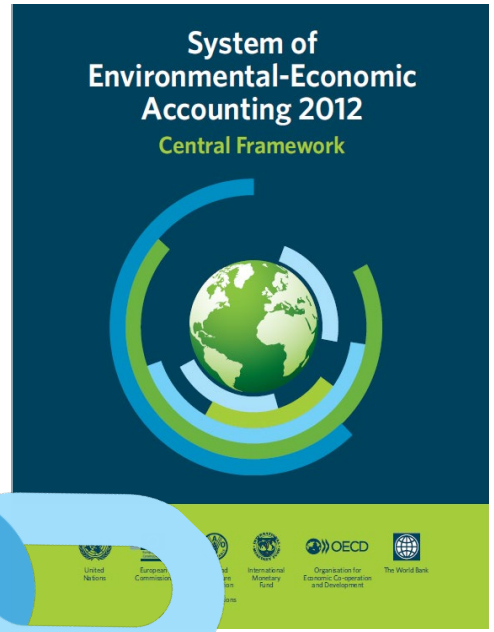
6 — 2014-Apr 2017
Wealth Accounting and Valuation of Ecosystem Services (WAVES) Project

7 — 2017-2020
Philippine Economic-Environmental and Natural Resource Accounting (PEENRA) Project

The Philippine environment and natural resources accounting provides mechanisms to support the goals in the Philippine Development Plan: Ensuring ecological integrity and a clean and healthy environment (PDP 2017-2022)

The Philippine environment and natural resources accounting follows the SEEA Central Framework





Coordination Mechanism

Interagency Committee on Environment and Natural Resources Statistics (IACENRS)

The IACENRS serves as **venue for discussion and resolution of issues, review current techniques and methodologies, and recommend policies and workable schemes** towards the improvement of environment and natural resources and other related statistics.

It is currently composed of Department of Environment and Natural Resources (DENR), National Economic and Development Authority (NEDA), Philippine Statistic Authority (PSA), Climate Change Commission (CCC), Department of Science and Technology- Philippine Atmospheric Geophysical and Astronomical Services Administration (DOST-PAGASA), National Disaster Risk Reduction Management Council (NDRRMC), and Department of Interior and Local Government (DILG).

1. Five Technical Working Groups (TWG) under the IACENRS:

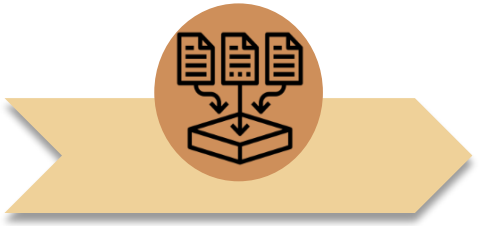
1. TWG on Mineral Resources
2. TWG on Energy Resources
3. TWG on Water Resources
4. TWG on Land and Soil Resources
5. TWG on Disaster Statistics
6. TF on Natural Capital Accounting

2. Bilateral meetings

3. National Convention on Statistics / National Statistics Month

Development of Environmental Accounts/Ecosystem

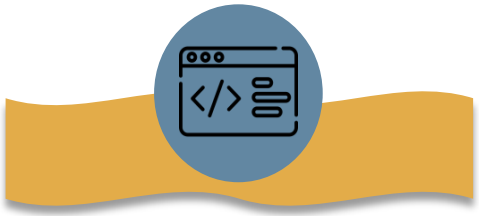
- Preparatory Research
- Review of Related Literature
- Capacity building



Data collection and assessment

Preparation of preliminary estimates

Consultation with data source agencies and TWG



Web release, Dissemination and Publication

- Finalization of results
- Preparation of Materials for Web Posting
- Writing of Technical Report

Presentations to:
- IACENRS and TWGs
- PSA Management

Revisions based on discussions

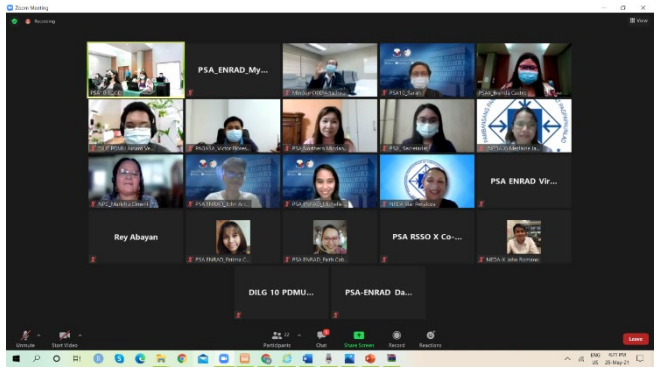
Source: 2020 ENRAD Operations Manual

Training on SEEA-Mineral Accounts and Adjusted Macroeconomic Indicators

Study Visit to BPS-Indonesia for SEEA Energy and Water Accounts

Writeshop for the Technical Reports on Environmental Accounts

Consultation Workshops with Stakeholders

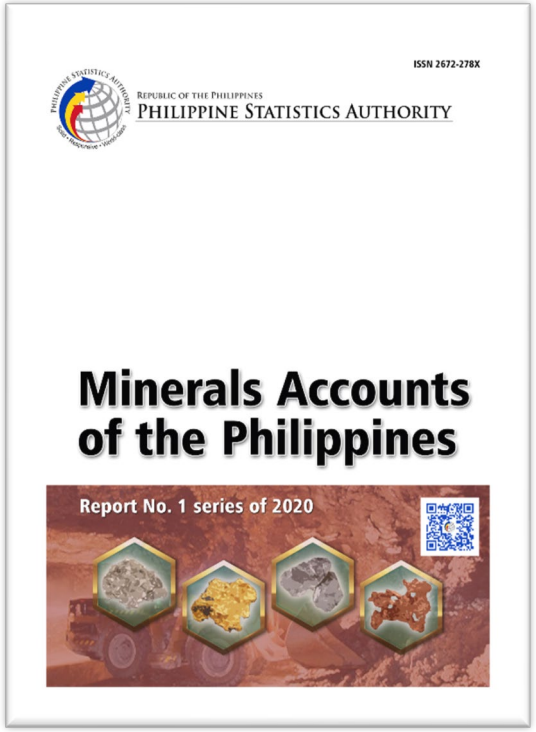


Technical Session with the Region

Appreciation Training on SEEA

Mineral Asset Accounts

The **Mineral Accounts of the Philippines** aims to provide information on the stocks and changes in stocks of four metallic mineral resources in the country, namely: **nickel, copper, chromite**, and **gold**.



Data sources

- Metallic Resource/Reserve Inventory of the Philippines (MRI)
- Philippine Mineral Production
- List of Mineral Production Sharing Agreements (MPSA) by contractor

- Metallic Mineral Production Data used in the National Accounts of the Philippines
- Gross Value Added in Mining and Quarrying (2013-2020)
- 2020 Supply and Use Table
- Total revenue, book value of fixed assets, and interest expense of establishments engaged in Mining and Quarrying

- Treasury bill rates (2013-2020)

- Social discount rate

USES OF MINERAL ACCOUNTS

Produce indicators of sustainability: level of resources, extraction rate, expected life index of assets

Development of macroeconomic indicators: adjusted net national income and adjusted net national savings in support of sectoral development planning and policymaking

Provide key information for policies on the appropriate fiscal regime for mining

Scope, Aggregations and Units

- Covers 2013 to 2020 (Physical and Monetary Asset Accounts)
- Four metallic minerals: Nickel, Chromite, Gold, and Copper
- Presented in national aggregates for confidentiality
- Measured in physical terms (metric tons, kilograms) and Monetary (Philippine Peso)

Republic of the Philippines
Philippine Statistics Authority

PRESS RELEASE

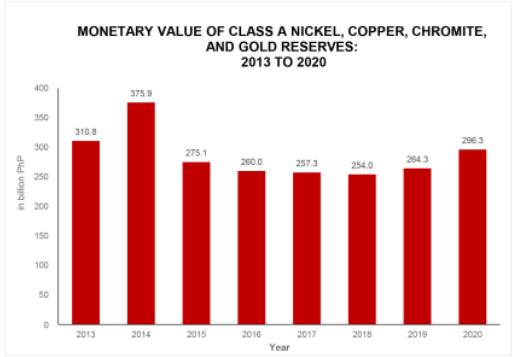
Philippines' Class A Nickel, Copper, Chromite and Gold Resources Valued at PhP 296.28 Billion in 2020

Date of Release: 29 July 2021
Reference No. 2021-300

The Mineral Accounts of the Philippines aims to provide information on the stocks and changes in stocks of four metallic mineral resources in the country, namely: nickel, copper, chromite, and gold. These accounts allow for the monitoring of the sustainability of the extraction of these valuable yet depletable natural assets. The compilation adheres the System of Environmental-Economic Accounting 2012 Central Framework (SEEA-CF).

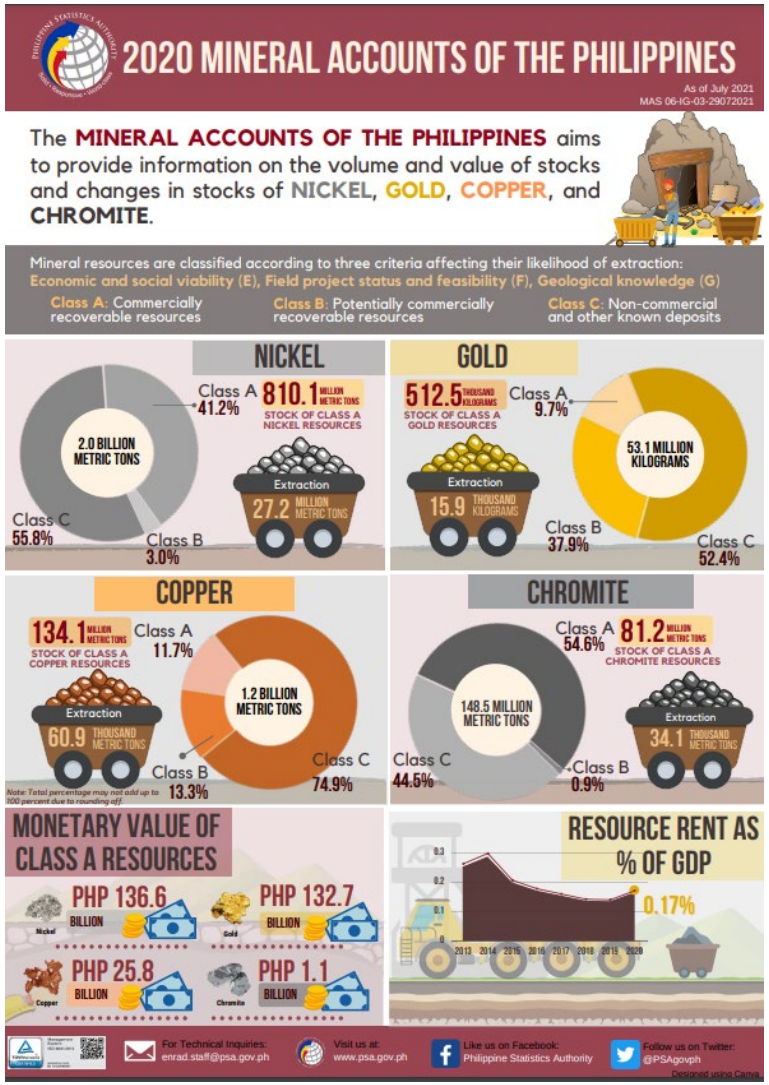
Monetary Asset Accounts

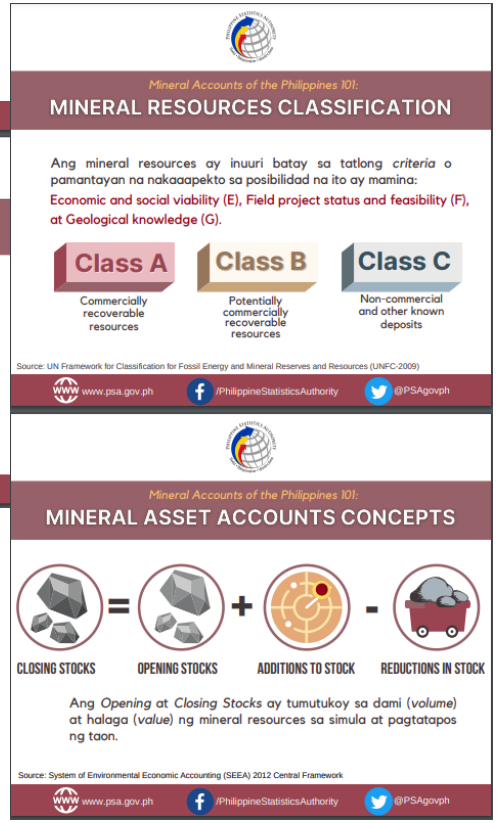
The valuation of the mineral assets of the Philippines uses the Net Present Value Approach as recommended by SEEA-CF using a 10 percent discount rate.[1]



[1] Recommended by National Economic and Development Authority. https://www.neda.gov.ph/wp-content/uploads/2017/01/Revisions-on-ICC-Guidelines-and-Procedures-Updated-Social-Discount-Rate-for-the-Philippines.pdf

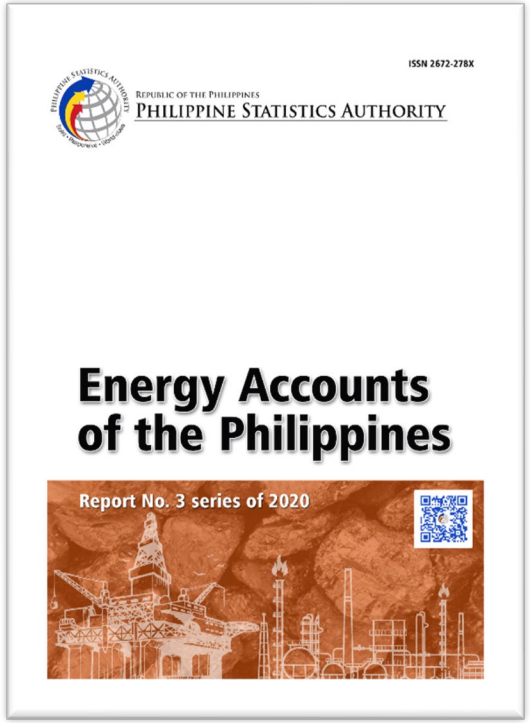
PSA Complex, East Avenue, Diliman, Quezon City, Philippines 1101
Telephone: (632) 8938-5267
www.psa.gov.ph





Energy Asset Accounts

The **Energy Accounts of the Philippines** aims to provide information on the stocks and changes in stocks of non-renewable energy resources in the country, namely: **coal, oil, natural gas,** and **condensate**.



Data sources:

- Reserves and Extractions Data on Coal, Oil, Natural Gas, and Condensate
- National Accounts of the Philippines,
- Establishment-based Data (ASPBI and CPBI)
- Treasury bill rates (2013-2020)
- Social discount rate

USES OF ENERGY ACCOUNTS

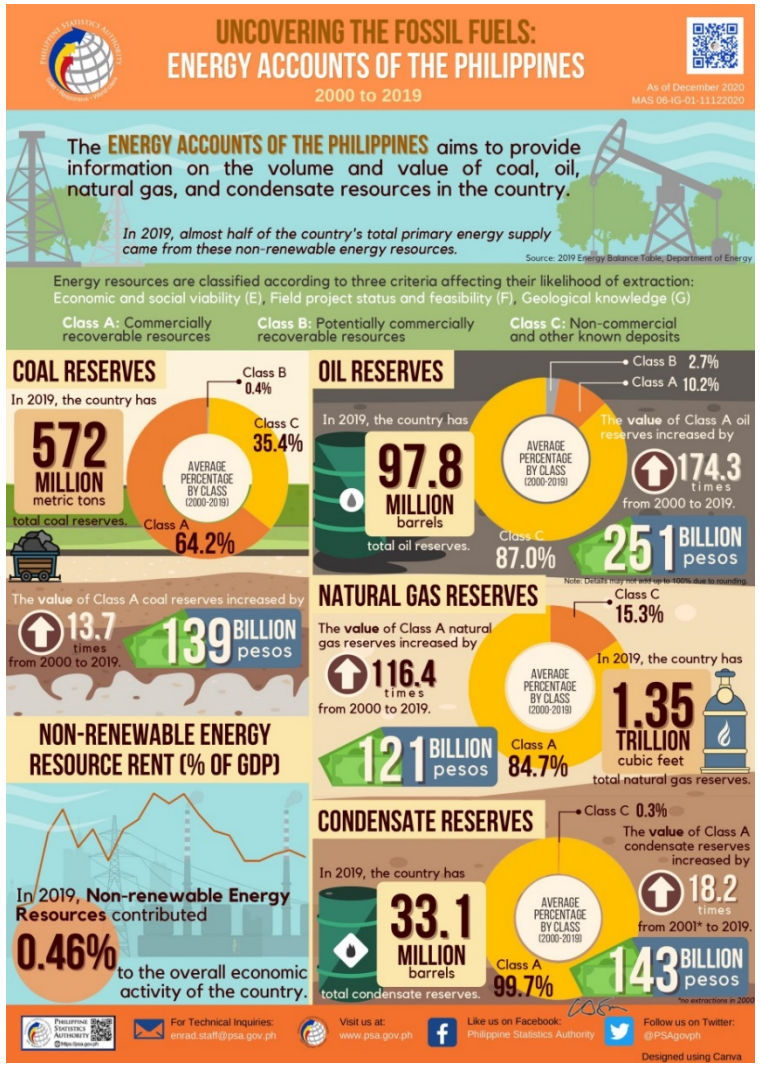
Produce indicators of sustainability: level of resources, extraction rate, expected life index of assets

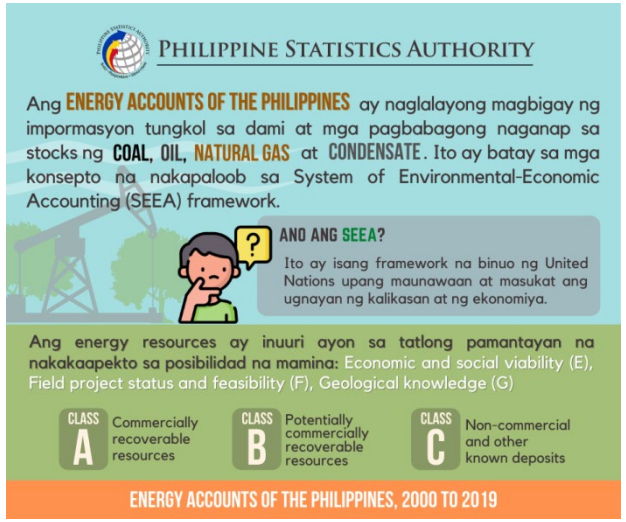
Development of macroeconomic indicators: adjusted net national income and adjusted net national savings in support of sectoral development planning and policymaking

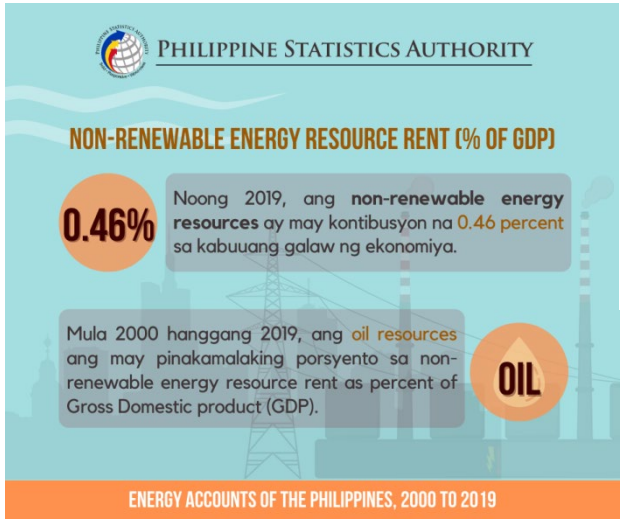
Provide key information for policies on the appropriate fiscal regime for mining

Scope, Aggregations and Units

- Covers 2000 to 2019
- Presented in national aggregates for confidentiality
- Physical (metric tons, barrels, cubic feet) and Monetary (Philippine Peso)







Home » Statistics » Economic » Macroeconomic Accounts » Environmental Accounts

Contribution of coal, oil, natural gas, and condensate resources to the Gross Domestic Product (GDP) increased from 2000 to 2019

Reference Number: 2020-435
Release Date: 05 January 2021

Derived Indicator from the Energy Accounts

Non-Renewable Energy Resource Rent (% of GDP). The non-renewable energy resource rent is the value of extractions of coal, oil, natural gas, and condensate resources less all extraction costs. The contribution of these non-renewable energy resources to the overall economic activity of the country increased 11.4 times, from 0.04 percent in 2000 to 0.46 percent in 2019 (Figure 1).

On the average, oil resource has the largest share of 0.19 percent in the non-renewable energy

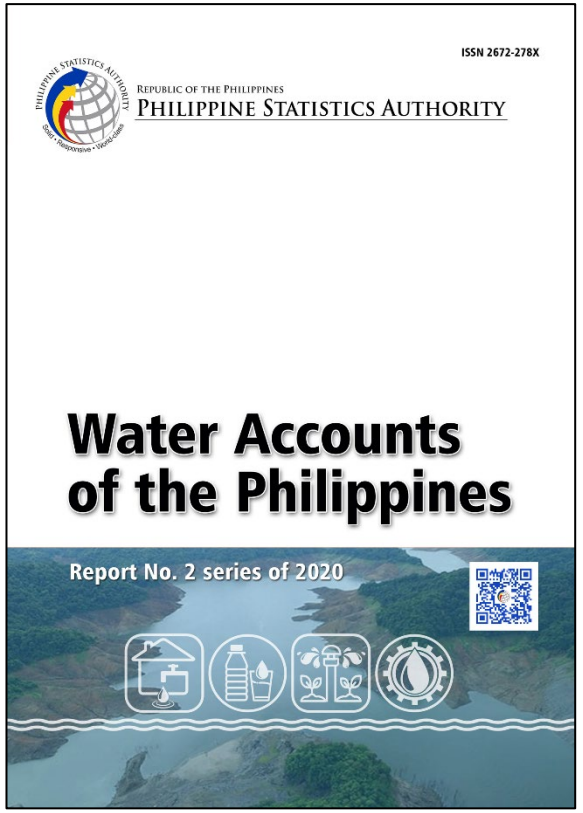
Water Flow Accounts

The **Water Accounts of the Philippines** aims to provide information on the flows of water between the environment and the economy- from its **initial abstraction** as input to various economic activities to its **return to the environment**.

Applications of the Water Accounts



- Identify the economic units responsible for the abstraction and discharge of water into the environment
- Assess and monitor the pressure on water quantities that is exerted by the economy
- Evaluate alternative options for reducing the pressure on water



Main Data Sources

Summary of Water Permit Grants (Water allocated), by source and by use

National Accounts of the Philippines
2018 Supply and Use Table
Livestock and Poultry Inventory

Water Production, Billed Volume and Losses
Water Prices

Parameters on livestock and poultry daily water requirements, by species

Parameters on water needed for irrigation, Volume per hectare irrigated

Scope, Aggregations and Units

- Covers 2010 to 2020
- Abstraction from Freshwater Resources
  - Surface Water (lakes, rivers and streams, artificial reservoirs)
  - Groundwater (water from aquifers)
- National Level Data
- Flow Accounts in physical terms (cubic meters), monetary terms (Philippine Peso), level of water stress (percentage), water use efficiency (cubic meters/PhP of gross value added)

Republic of the Philippines
Philippine Statistics Authority

PRESS RELEASE

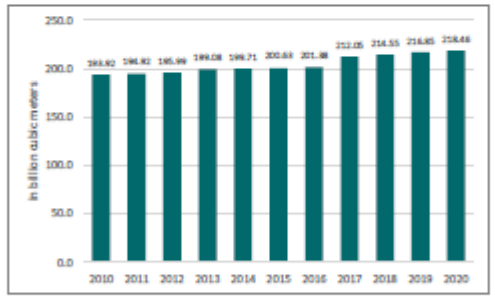
Country's Overall Water Use Efficiency Decreased while Water Stress remains at Low Level

Date of Release: 07 October 2021
Reference No. 2021-420

Water Accounts of the Philippines

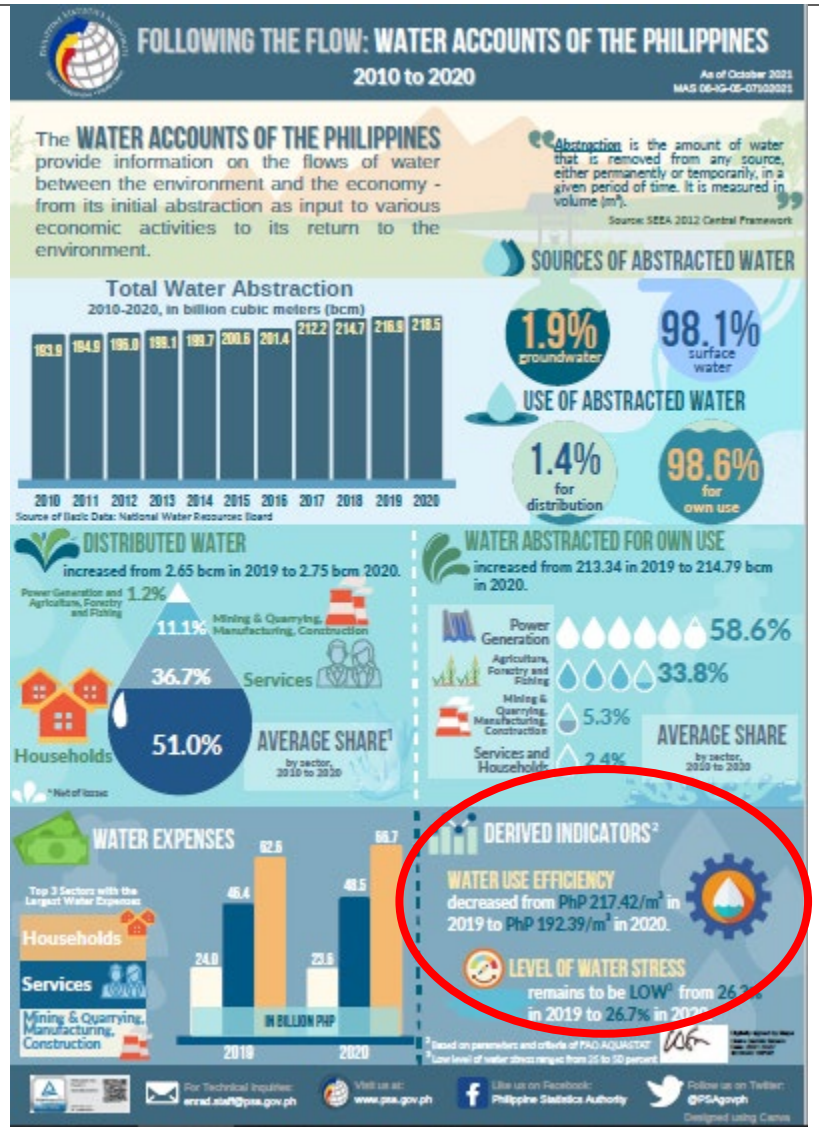
The country's total water abstraction, or the amount of water that was removed from its source either permanently or temporarily, increased by 0.8 percent, from 216.85 billion cubic meters (bcm) in 2019 to 218.46 bcm in 2020. From 2010 to 2020, on the average, 98.1 percent of the total abstraction was from surface water such as lakes, artificial reservoirs, rivers and streams, and the remaining 1.9 percent came from groundwater reservoirs. On the average, 98.6 percent of the abstracted water was for own use while the remaining 1.4 percent was intended for distribution to other economic units. (Figure 1, and Tables 1.1 to 1.11)

Figure 1. Total Water Abstraction, 2010 to 2020



Water abstracted for own use also increased from 213.34 bcm in 2019 to 214.79 bcm in 2020. From 2010 to 2020, the largest amount of self-abstracted water was for the power sector (58.6%). This was followed by the agriculture, forestry and fishing sector (33.8%), mining and quarrying, manufacturing, and construction (5.3%), and the services sector and households (2.4%). It should be noted that the power sector, specifically hydropower, uses water in a non-consumptive manner. That is, water remains in or is immediately returned to the location from which it was extracted. (Figure 2, and Tables 1.1 to 1.11)

PSA Complex, East Avenue, Diliman, Quezon City, Philippines 1101
Telephone: (632) 8938-5267
www.psa.gov.ph



Water Accounts of the Philippines 101:

KAHALAGAHAN NG TUBIG SA EKONOMIYA

Isa sa napakahalagang resource ng ating bansa ay ang **TUBIG**. Ang likas na yamang ito ay ginagamit ng humigit-kumulang 110 milyong populasyon at ng lahat ng mga industriya sa buong bansa.

www.psa.gov.ph

Water Accounts of the Philippines 101:

BAKIT MAHALAGANG MAG-ACCOUNT NG WATER FLOWS?

Ang **WATER FLOW ACCOUNTS** ay nagbibigay ng impormasyon na makatutulong sa pagpaplano at paggawa ng mga polisiya sa sektor ng tubig. Naglalayon itong sagutin ang mga tanong tulad ng:

- Saan nanggagaling ang tubig na ating ginagamit?
- Gaano karaming tubig ang ginagamit ng iba-ibang sektor ng ekonomiya?
- Ilang porsyento ang para sa sariling paggamit at ilan naman ang para sa distribusyon sa iba pang sektor?

www.psa.gov.ph /PhilippineStatisticsAuthority @PSAgovph

Environmental Accounts being Developed

1. **Disaster Risk Reduction Expenditure Accounts** – monitors the resources allocated to the four thematic areas of DRR, namely: Disaster Preparedness, Disaster Response, Disaster Rehabilitation and Recovery, and Disaster Prevention and Mitigation
2. **Material Flow Accounts** - compiles entry of raw materials *such as biomass, fossil fuels and minerals* from environment to the economy and the returns to the environment in the form of *solid wastes, wastewater, and air emissions.*
3. **Ecosystem Accounts** - organizes data about habitats and landscapes, measuring the ecosystem services, tracking changes in ecosystem assets, and linking this information to economic and other human activity.
4. **Timber Accounts** - The physical asset account for timber resources records the volume of timber resources at the beginning and end of an accounting period and the change in stock over the accounting period.

PSA – UNSD Project

Implementation of the PSA-UNSD Project titled "Environmental-Economic Accounting for Evidence-Based Policy in the Philippines"

The Project aims to address the technical and institutional barriers to the establishment of routinely produced environmental-economic accounts.

Land Accounts and **Ecosystem Extent Accounts** at the national level using the **Artificial Intelligence for Environment and Sustainability (ARIES) Tool.**

What is ARIES for SEEA?

- Tool that uses ARIES technology to compile ecosystem accounts that are consistent with the SEEA Ecosystem Accounting
- Includes land cover accounts consistent with the SEEA Central Framework
- Uses same definitions, classifications, accounting rules as the SEEA
- Can help automate production of maps and tables
- Provides infrastructure for the SEEA community to share and reuse interoperable data and models
- Utilizes freely available global remote-sensing derived data and models
- Can generate accounts for any user-specified terrestrial area in the world
- Rapidly computes these accounts online, using a web browser
- Generates a comprehensive report, fully documenting the data, models, coefficients and methods used

Subnational Environmental Accounts

Cordillera Administrative Region - minerals, land, timber, water and tourism

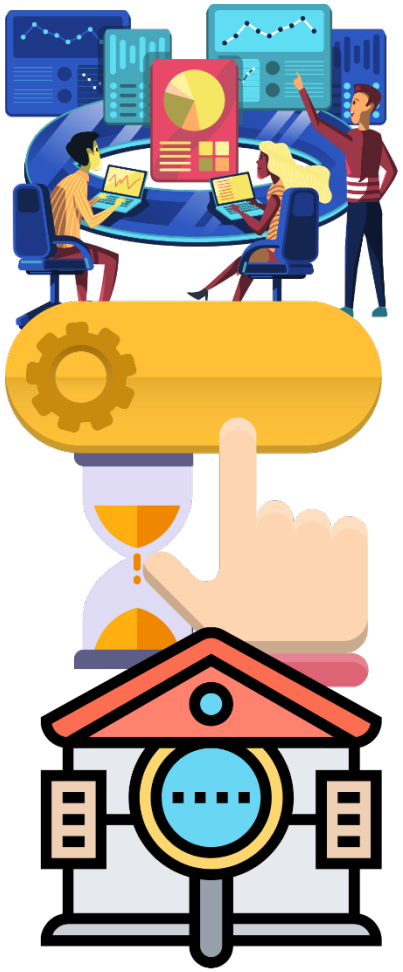
Central Luzon Region – land and timber

Caraga Region – minerals, land and timber

Northern Mindanao Region – water

Challenges and Way Forward

Challenges



On Data:

1. Availability of data required to populate the account tables
2. Timeliness, configuration (units, classifications, etc.) of some data items
3. Multiple data sources

Other challenges:

1. Limited manpower
2. Rescheduled activities due to pandemic

Future Directions

Strengthening of data sharing mechanisms through the IAC on Environment and Natural Resources Statistics and technical working groups

Extension of the scope of the accounts

- Mineral Asset Accounts – include non-metallic minerals
- Energy Accounts – development of Energy Flow Accounts
- Water Accounts – development of Water Asset Accounts

Development of accounts for other resources and environment-related themes

Development of regional environmental accounts

Increasing stakeholder appreciation and participation through advocacy activities (trainings, dissemination and consultation fora)

Thank you!

http://www.psa.gov.ph

http://openstat.psa.gov.ph

https://twitter.com/PSAgovph

https://www.facebook.com/PhilippineStatisticsAuthority