TECHNICAL NOTES

A. Conceptual Framework

Compendium of Philippine Environment Statistics (CPES)

The compendium covers a core set of environment statistics which is grouped into six components namely: 1) environmental conditions and quality; 2) environmental resources and their use; 3) residuals; 4) extreme events and disasters; 5) human settlements and environmental health; and 6) environment protection, management and engagement.

As described in Framework for the Development of Environment Statistics (FDES), Basic Set of Environment Statistics has been set up following a progression of three tiers, based on the level of relevance, availability and methodological development of the statistics. Tier 1 is the core set of environment statistics that serve as an agreed and limited set of environment statistics that are of high priority and relevance to most countries. Tier 2 includes environment statistics which are of priority and relevance to most countries but require greater investment of time, resources or methodological development. It is recommended that countries consider producing them in the medium-term. Tier 3 includes environment statistics which are either of lower priority or require significant methodological development. It is recommended that countries consider producing them in the long-term.

Component 2: Environmental Resources and Their Use

Environmental resources and their use is a compilation of statistics on environmental resources, defined by the System of Environmental Economic Accounting (SEEA) 2012 Central Framework as “the naturally living and nonliving components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity”. This component has six subcomponents: mineral resources, energy resources, land, soil resources, biological resources and water resources. Statistics under this component focuses on measuring the availability, consumption and use of environmental resources.

Subcomponent 2.1: Mineral Resources

Mineral resources are the elements or compounds composed of a concentration of naturally occurring solid, liquid, or gaseous materials in or on the earth’s crust (FDES, 2013). Minerals may be metallic or non-metallic in nature. Moreover, these resources are non-renewable and do not regenerate in any human timescale. There are two topics under this subcomponent: 1) stocks and changes of mineral resources; and 2) production and trade of minerals. The former, statistics on their stocks, is required to

assist in the sustainable management of these resources. Meanwhile, the latter, statistics on the amounts of extraction, and their imports and exports, is important to measure the pressure on these resources.

Subcomponent 2.2: Energy Resources

Energy can be produced from non-renewable and renewable sources. As with mineral resources, non-renewable energy resources such as coal and petroleum cannot be renewed in any human timescale. Once extracted and used, the resource is considered depleted. Meanwhile, renewable energy is captured from sources that replenish themselves. These include solar, hydroelectric, geothermal, and biomass. There are two topics under this subcomponent. The first topic is stocks and changes in stocks of non-renewable energy resources, which can provide insights on the sustainable management of these resources. The second topic is on the production, trade and consumption of energy, which highlights the production from non-renewable and renewable sources as well as the energy consumers.

Subcomponent 2.3: Land

Land is a unique environmental resource that delineates the space in which economic activities and environmental processes take place and within which environmental resources and economic assets are located (FDES, 2013). There are two topics under this subcomponent. These are 1) land use; and 2) use of forest land. Statistics on land use cover both land in use and land not in use. On one hand, not all forest land is used primarily to produce wood, thus, statistics on forest land should be broken down according to its primary designated function. The primary designated functions of forests are production, protection of soil and water, conservation of biodiversity, social services, multiple use and other (FDES, 2013).

Subcomponent 2.4: Soil Resources

Soil resources comprise the top layers (horizons) of soil that form a biological system (FDES, 2013). The changing volume of soil must be measured to assess the extent of soil erosion and the impact of natural disasters, and to assess soil depletion due to economic activities. Although conceptually included in the FDES, development of the necessary statistics for soil resources is subject to further research.

Subcomponent 2.5: Biological Resources

Biological resources are renewable resources capable of regeneration through natural (non-managed or managed) processes. These resources include timber and aquatic resources and a range of other animal and plant resources (such as livestock, orchards, crops and wild animals), fungi and bacteria. Biological resources may be natural (non-cultivated) or cultivated. Statistics on this component support formation of programs that aim to promote sustained economic growth, ensure sustainable consumption and production patterns, sustainable use of oceans, seas and marine resources, and lastly, protect and restore terrestrial ecosystems. There are five topics under this subcomponent. The first topic is timber resources, which are defined by the volume of trees, living and dead, which can still be used for timber or fuel. Second is the aquatic resources. This includes fish, crustaceans, mollusks, shellfish, aquatic mammals and other aquatic organisms that are considered to live within the boundaries of the EEZ of a country throughout their life cycles, including both coastal and inland fisheries. Third, crops refer to plants or agricultural produce grown for food or other economic purposes, such as clothes or livestock fodder. Fourth is the livestock. This covers animal species raised by humans for commercial purposes, consumption or labour. Lastly, other non-cultivated biological resources refer to a range of naturally occurring biological resources that provide inputs to the economy and form an important part of biodiversity.

Subcomponent 2.6: Water Resources

Water resources comprise freshwater and brackish water. Policymakers need statistics on water resources, their abstraction, use and returns for many reasons, including to estimate the amount of available water resources; monitor abstraction from key water bodies to prevent overutilization; ensure equitable usage of abstracted water; and track the volume of water returned to the environment. Statistics on this subcomponent are consequential in the compilation of the water asset and flow accounts. There are two topics under this subcomponent. These are 1) water resources; and 2) abstraction, use and returns of water. The former is measured in terms of flows to and out of the inland water resources during a period of time. The latter, on the contrary, are the flows of water between the environment and the human subsystem and within the human subsystem.

B. Glossary of Terms

Terms	Definition
Aquaculture	Farming of aquatic organisms, including fish, mollusks, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. *
Aquatic resources	Comprise fish, crustaceans, mollusks, shellfish, aquatic mammals and other aquatic organisms that are considered to live within the boundaries of the Exclusive Economic Zone (EEZ) of a country throughout their life cycles, including both coastal and inland fisheries. Migrating and straddling fish stocks are considered to belong to a given country during the period when those stocks inhabit its EEZ. *
Biological resources	Renewable resources that are capable of regeneration through natural (non-managed or managed) processes. Biological resources include timber and aquatic resources and a range of other animal and plant resources (such as livestock, orchards, crops and wild animals), fungi and bacteria. *
Crops	Plants or agricultural produce grown for food or other economic purposes, such as clothes or livestock fodder. *
Cultivated biological resources	Cover animal resources yielding repeat products and tree, crop and plant resources yielding repeat products whose natural growth and regeneration are under the direct control, responsibility and management of an institutional unit. *
Environmental resources (assets)	Naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity. Environmental resources include natural resources (such as sub-soil resources (mineral and energy), soil resources, biological resources and water resources) and land. They may be naturally

Terms	Definition
	renewable (e.g., fish, timber or water) or non-renewable (e.g., minerals). *
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 per cent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use. *
Land	Provides space for natural ecosystems, human habitats and human activities. As this space is finite, the expansion of human activities can reduce the space occupied by natural ecosystems, thus reducing ecosystems' capacity to yield ecosystem goods and services for all living beings. From the resource perspective, land is a unique environmental resource that delineates the space in which economic activities and environmental processes take place and within which environmental resources and economic assets are located. *
Land cover	The observed (bio) physical cover on the earth's surface. *
Land use	Reflects both the activities undertaken and the institutional arrangements put in place for a given area for the purposes of economic production, or the maintenance and restoration of environmental functions. Land being "used" means the existence of some kind of human activity or management. Consequently, there are areas of land that are "not in use" by human activities. *
Livestock	Animal species that are raised by humans for commercial purposes, consumption or labour (ISIC Rev. 4, Section A, Division 01). *
Natural biological resources	Consist of animals, birds, fish and plants that yield both once only and repeat products for which natural growth and/or regeneration is not under the direct control, responsibility and management of institutional units. *
Other non-cultivated biological resources	These resources may include wild berries, fungi, bacteria, fruits, sap and other plant resources that are harvested (ISIC Rev. 4, Section A, class 0230), as

Terms	Definition
	well as wild animals that are trapped or killed for production, consumption and trade (ISIC Rev. 4, Section A, class 0170). *
Renewable energy	Captured from sources that replenish themselves. It includes solar (photovoltaic and thermal), hydroelectric, geothermal, tidal action, wave action, marine (non-tidal currents, temperature differences and salinity gradients), wind and biomass energy, all of which are naturally replenished, although their flow may be limited. *
Soil resources	Comprise the top layers (horizons) of soil that form a biological system. *
Stocks of non-renewable energy resources	Amount of known deposits of mineral energy resources
Stocks of mineral resources	Amount of known deposits of non-metallic and metallic mineral resources.
Timber resources	Defined by the volume of trees, living and dead, which can still be used for timber or fuel. *
Water abstraction	Amount of water that is removed from any source, either permanently or temporarily, in a given period of time. Water is abstracted from surface water and groundwater resources by economic activities and households. Water can be abstracted for own use or for distribution to other users. *
Water resources	Consist of freshwater and brackish water, regardless of their quality, in inland water bodies, including surface water, groundwater and soil water. *

**FDES, 2013 Glossary*

C. Compilation Methodology and Data Sources

Following the structure and statistics listed in the FDES, data available within the national statistical system were identified and requested from data source agencies or gathered from statistical publications. The collected data are checked for consistency and formatted into statistical tables. The data for Component 2 of the CPES were obtained from the following:

Data Item	Source
Mineral Resources	
• Metallic Minerals Resource, Reserve Inventory of the Philippines • Non-Metallic Minerals Resource, Reserve Inventory of the Philippines • Mineral Production • Mineral Accounts of the Philippines	Mines and Geosciences Bureau Environment and Natural Resources Accounts Division (ENRAD), PSA
Energy Resources	
• Energy Balance Tables • Energy Accounts of the Philippines	Department of Energy ENRAD, PSA
Land	
• Area Under Irrigation	National Irrigation Administration
Biological Resources	
• Roundwood Forest Production • Production of Processed Wood • Production of Non-Timber Forest Products • Imports and Exports Log and Processed Forest Products • Exports of Non-Timber Forest Products	Forest Management Bureau
• Fertilizer Production, Sales, Importation and Exports	Fertilizer and Pesticide Authority
• Volume of Production (Commercial, Inland Municipal, Marine Municipal, and Aquaculture)	Fisheries Statistics Division, PSA
• Area Planted and Area Harvested: Palay, Corn, and Other Crops • Volume of Production: Palay, Corn, and Other Crops • Volume and Value of Agricultural Exports and Imports	Crops Statistics Division, PSA
• Livestock, Chicken and Duck Inventory • Animals Slaughtered in Slaughter Houses • Chickens Dressed in Dressing Plants	Livestock and Poultry Statistics Division, PSA
• Number of CITES Imports, Exports and Re-Export Permits Issued	Biodiversity Management Bureau
Water Resources	

Data Item	Source
• Number of Water Permits Issued and Volume of Water Allocated • Summary of Water Permit Grants by Water Source Type, Use and Region • Water Accounts of the Philippines	National Water Resources Board ENRAD, PSA

D. Statistical Tables

Table 2.1.1	Metallic Minerals Resource, Reserve Inventory of the Philippines, as of 2019
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Table 2.2	Mineral Production by Mineral, 2010 to 2019
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Table 2.4	Physical Asset Accounts for Energy Resources, 2010 to 2017
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Table 2.10.3	Aquaculture Brackish water Fish Cage Volume of Production by Species and by Geolocation, 2010 to 2019
Table 2.10.4	Aquaculture Freshwater Fish Pond Volume of Production by Species and Geolocation, 2010 to 2019
Table 2.10.5	Aquaculture Freshwater Fish Pen Volume of Production by Species and Geolocation, 2010 to 2019

Table 2.10.6	Aquaculture Freshwater Fish Cage Volume of Production by Species and Geolocation, 2010 to 2019
Table 2.10.7	Aquaculture Marine Pen Volume of Production by Species and Geolocation, 2010 to 2019
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Table 2.18	Physical Flow Accounts of Water, 2010 to 2019
Table 2.19	Number of Water Permits Issued and Volume of Water Allocated by Water Use, 2010 to 2019
Table 2.20	Summary of Water Permit Grants by Water Source Type, Use, and Region, as of 2019

References:

United Nations. (2017). *Framework for the Development of Environment Statistics 2013*. New York.

United Nations. (2014). *System of Environmental-Economic Accounting 2012 Central Framework*. New York.