



DAY 02: **SESSION 04**

Asset Accounts: Structure and Principles

Regional Training Workshop on the System of Environmental-Economic Accounting

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Shanghai, China
16 November 2015



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Learning Outcomes

On completion of this unit, you will be able to:

- explain the general purpose of asset accounting
- explain the links between balance sheets and asset accounts
- describe the assets that make up asset accounts
- understand the difference between physical and monetary accounts



Unit Outline

- what are assets in the SEEA-CF?
- asset classification
- **group activity**
- valuation of environmental assets



Acronyms

SEEA	=	System of Environmental-Economic Accounting
SEEA-CF	=	SEEA Central Framework
SNA	=	System of National Accounts
1993 SNA	=	SNA Manual (1993 Edition)
2008 SNA	=	SNA Manual (2008 Edition)
ASNA	=	Australian System of National Accounts
CBRs	=	Cultivated Biological Resources
COFC	=	Consumption of Fixed Capital
NPV	=	Net Present Value
SUTs	=	Supply and Use Tables

Asset Account: Structure and Principles

This session is based on Chapter 05 *Classification of environment assets in the Central Framework* in the *System of Environmental-Economic Accounting 2012 - Central Framework*.



What Are Assets in SNA?

SNA records economic assets:

- an "asset life" of one year or more
- ownership rights enforceable by institutional units
- institutional units are entitled to claim the benefits associated with the use of the asset in question
- values expressed in monetary terms only, including current and constant prices or chain volume measures
- divided between produced and non-produced assets



What Are Assets in SNA?

Environmental resources (or assets) are included in the balance sheets if these criteria are met:

Resources such as the atmosphere or high seas, over which no ownership rights can be exercised, or mineral or fuel deposits that have not been discovered or that are unworkable, are not included as they are not capable of bringing any benefits to their owners, given the technology and relative prices existing at the time (SNA, 2008, *para.* 1.46).



What Are Assets in SEEA-CF?

SEEA-CF has a similar scope to SNA with a focus on the individual components that make up the environment:

- **resources available for use in economic activity**
- **harvesting, extraction or direct use in economic production, consumption and accumulation**

This scope includes land and inland waters that provide space for undertaking economic activity.

See Section 5.2 Scope of environmental assets in UN (2013) *System of Environmental-Economic Accounting 2012 - Central Framework*, pp.134-139.





What Are Assets in SEEA-CF?

SEEA-CF records environmental assets which are also economic assets under SNA criteria:

- an "asset life" of one year or more
- ownership rights enforceable by institutional units
- institutional units are entitled to claim the benefits associated with the use of the asset in question
- values expressed in physical and monetary terms
- monetary values in current prices only to date
- divided between land, natural assets and CBRs

What Are Assets in SEEA-CF?

- 1 **Mineral and energy resources**
 - 1.1 Oil resources
 - 1.2 Natural gas resources
 - 1.3 Coal and peat resources
 - 1.4 Non-metallic mineral resources
(excluding coal and peat resources)
 - 1.5 Metallic mineral resources
- 2 **Land**
- 3 **Soil resources**
- 4 **Timber resources**
 - 4.1 Cultivated timber resources
 - 4.2 Natural timber resources
- 5 **Aquatic resources**
 - 5.1 Cultivated aquatic resources
 - 5.2 Natural aquatic resources
- 6 **Other biological resources**
(excluding timber and aquatic resources)
- 7 **Water resources**
 - 7.1 Surface water
 - 7.2 Groundwater
 - 7.3 Soil water

SOURCE: adapted from Table 5.2.1 Classification of environmental assets in the SEEA Central Framework, in UN (2013) *System of Environmental-Economic Accounting 2012 - Central Framework*, p.125.



GROUP ACTIVITY





Valuation of Environmental Assets

Asset accounts are used to determine the wealth held in environmental assets in physical and monetary terms. In principle, all benefits delivered by environmental assets can be valued in monetary terms:

- physical measures were the usual method pre-SEEA
- countries like Australia produced experimental monetary estimates of some assets in SNA balance sheets
- the focus of SEEA is to monetarise the value of environmental assets and their benefits

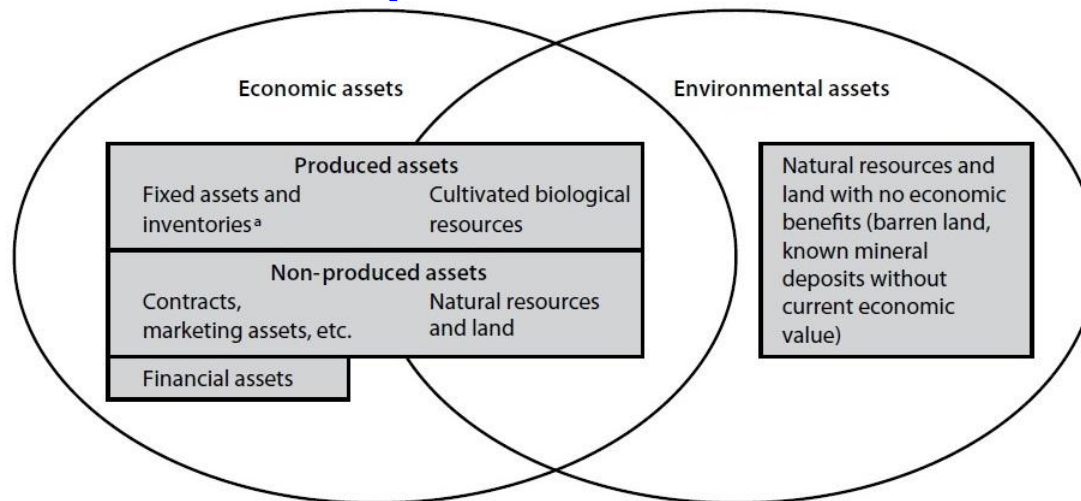


Valuation of Environmental Assets

- how much is spent on maintaining and improving environmental assets?
- asset accounts are required to support measures of resource depletion in physical and monetary terms
- compare value of depletion with various measures
- cannot manage what we do not measure
- wealth per person or *per capita*
- how much income is generated from environmental assets?

Valuation of Environmental Assets

In the Central Framework, consistent with the SNA, the scope of valuation is limited to the benefits that accrue to economic owners of economic assets (including many environmental assets):



SOURCE: Figure 5.1 Relationship between environmental and economic assets, in UN (2014) *System of Environmental-Economic Accounting 2012 - Central Framework*, p.139.



Valuation of Environmental Assets

In physical terms, the scope of environmental assets measured in the Central Framework may be greater than the scope of environmental assets measured in monetary terms following the SNA definition of economic assets.

This is because there is no requirement in physical terms that environmental assets must deliver economic benefits to an economic owner.





Valuation of Environmental Assets

There may be environmental assets that are recorded in the Central Framework in physical terms which have no measured monetary value, and are therefore excluded from environmental assets measured in monetary terms.

Where such assets are recorded in physical terms, the quantities should be recorded separately from quantities of environmental assets that do deliver economic benefits to economic owners.





Valuation of Environmental Assets

Physical asset accounts are usually compiled for specific types of assets:

- different units are used for different assets meaning aggregation is not generally possible
- physical units lack a common unit of measurement
- currency provides a common unit of measurement for monetary values (comparability)



Valuation of Environmental Assets

Asset accounts (like balance sheets) record:

- stock levels (opening and closing)
- additions to (and reductions in) stock

There are special types of asset accounts:

- land accounts
- water accounts

Asset Account: Structure and Principles



Table 5.2
General structure of the physical asset account for environmental assets (*physical units*)

	Mineral and energy resources	Land (including forest land)	Soil resources	Timber resources		Aquatic resources		Water resources
				Cultivated	Natural	Cultivated	Natural	
Opening stock of resources	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additions to stock of resources								
Growth in stock	na	Yes*	Soil formation Soil deposition	Growth	Natural growth	Growth	Natural growth	Precipitation Return flows
Discoveries of new stock	Yes	na	na	na	na	na	Yes*	Yes*
Upward reappraisals	Yes	Yes	Yes*	Yes*	Yes*	Yes*	Yes	Yes*
Reclassifications	Yes	Yes	Yes	Yes	Yes	Yes	Yes	na
<i>Total additions to stock</i>								
Reductions in stock of resources								
Extractions	Extractions	na	Soil extraction	Removals	Removals	Harvest	Gross catch	Abstraction
Normal reductions in stock	na	na	Erosion	Natural losses	Natural losses	Normal losses	Normal losses	Evaporation Evapotranspiration
Catastrophic losses	Yes*	Yes*	Yes*	Yes	Yes	Yes	Yes	Yes*
Downward reappraisals	Yes	Yes	Yes*	Yes*	Yes*	Yes*	Yes	Yes*
Reclassifications	Yes	Yes	Yes	Yes	Yes	Yes	Yes	na
<i>Total reductions in stock</i>								
Closing stock of resources	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: "na" means not applicable.

* An asterisk indicates that this entry is usually not significant for the resource or is typically not separately identified in the source data. In practice, not all cells that reflect the possibility of an entry here should be shown separately in published accounts for each type of resource.

SOURCE: Table 5.2 in UN (2014) *System of Environmental-Economic Accounting 2012 - Central Framework*, p.142.





Valuation of Environmental Assets

There are five types of reductions in the stock of an environmental asset:

- extraction
- normal reductions in stock
- catastrophic losses
- downward reappraisals
- reclassifications





Valuation of Environmental Assets

Entries related to changes in land cover and land use—for example, within an asset account for forest and other wooded land—are generally in the nature of reclassifications.

Thus, for the analysis of changes in land cover and land use, it is often useful to record entries relating to different types of reclassifications.



Valuation of Environmental Assets

The compilation of asset accounts by *institutional sector* may be desirable for particular types of environmental assets where the ownership of resources is of policy or analytical interest, including the attribution of mineral and energy resources between government units and extracting units, and the assessment of the ownership of land.



Valuation of Environmental Assets

Additional entries are required if asset accounts are to be created for institutional sectors:

- acquisitions and disposals of environmental assets
- uncompensated seizures
- possible impact on national-level accounts
e.g. a unit of one country seizes assets of another



Table 5.3

Conceptual form of the monetary asset account (*currency units*)

Opening stock of resources
Additions to stock of resources
Growth in stock
Discoveries of new stock
Upward reappraisals
Reclassifications
<i>Total additions to stock</i>
Reductions in stock of resources
Extractions
Normal loss of stock
Catastrophic losses
Downward reappraisals
Reclassifications
<i>Total reductions in stock</i>
Revaluation of the stock of resources
Closing stock of resources

SOURCE: Table 5.3 in UN (2014) *System of Environmental-Economic Accounting 2012 - Central Framework*, p.144.





Valuation of Environmental Assets

For most environmental assets, it will be the case that measurement requires the estimation of the physical flows followed by estimation of the monetary flows.





Valuation of Environmental Assets

The monetary account reflects a valuation of physical flows as recorded in the physical asset account. The measurement scope is broader in physical terms for some environmental assets. For example:

- timber resources not used for wood supply are included in physical terms but excluded in monetary terms
- mineral and energy resources not deemed to be sub-economic are treated in the same way



Valuation of Environmental Assets

The only additional entry recorded in the monetary asset account compared with the physical asset account concerns revaluations:

- revaluations relate to changes in the value of assets due solely to price changes and reflecting nominal holding gains and losses on environmental assets
- the nominal holding gain for environmental assets is calculated as the increase in value accruing to the owner of the asset as a result of a change in its price over an accounting period.



Valuation of Environmental Assets

Both the SNA and SEEA recommend asset valuation based on market prices. A range of techniques are used to approximate market values where prices are unavailable or unfit for purpose:

- ***net present value***: resource rent derived using residual value method and discounted value of future benefits
- ***rights-based valuation***: using tradeable rights to own or use an environmental asset (e.g. fishing rights)
- ***appropriation method***: sum of revenue (taxes, levies, royalties) collected by government



Valuation of Environmental Assets

Measurement issues will be discussed in the next section.





Key Concepts

**SEEA and SNA measure the same assets in monetary terms.
SEEA uses asset accounts; SNA uses balance sheets:**

- **SEEA values expressed in physical and monetary terms**
- **the monetary account reflects a valuation of physical flows as recorded in the physical asset account**
- **measurement scope is broader in physical terms for some environmental assets**