

**SEEA: THE INTERNATIONAL
STANDARD FOR ENVIRONMENTAL-
ECONOMIC ACCOUNTING**

**ACCOUNTING FOR ENVIRONMENTAL
ASSETS**

SIAP Training Course on SEEA
23-27 September, 2013
Kuala Lumpur, Malaysia

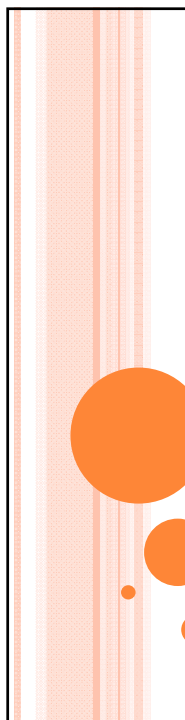
OBJECTIVES OF THE DAY

- The definition and scope of environmental assets
- The link between environmental assets and economic assets
- The structure of asset accounts
- The definition of depletion of individual resources
- The approaches to the valuation of individual resources
- The possible applications of information from asset accounts



DISCUSSION:

WHAT QUESTIONS OR ISSUES DO YOU HAVE ABOUT ACCOUNTING FOR ENVIRONMENTAL ASSETS?



I: DEFINING ENVIRONMENTAL ASSETS




DISCUSSION:

**WHAT “THINGS” MIGHT BE
CONSIDERED ENVIRONMENTAL
ASSETS?**

DEFINITION OF ENVIRONMENTAL ASSETS

“Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the bio-physical environment, which may provide benefits to humanity”

2012 SEEA Central Framework 2.17



ONE ENVIRONMENT : TWO PERSPECTIVES

Individual
environmental
assets /
resources

Timber
Water
Soil
Fish



Ecosystems

Forests
Lakes
Agricultural
areas

SCOPE OF INDIVIDUAL RESOURCES

- 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 resources and aquatic resources)**
- 7 Water resources**
 - 7.1 Surface water
 - 7.2 Groundwater
 - 7.3 Soil water

PHYSICAL AND MONETARY SCOPE

- In principle, when accounting for environmental assets in physical terms include all environmental assets whether or not they have a monetary value
 - All land in a country is included in physical land accounts
 - Also timber resources, other biological resources, soil, inland water resources
- Mineral and energy resources scope is known deposits
- Aquatic resources scope is all resources within EEZ plus rights on high seas
 - In practice limit to commercial stocks and subsistence

KEY POINTS AND BOUNDARY ISSUES

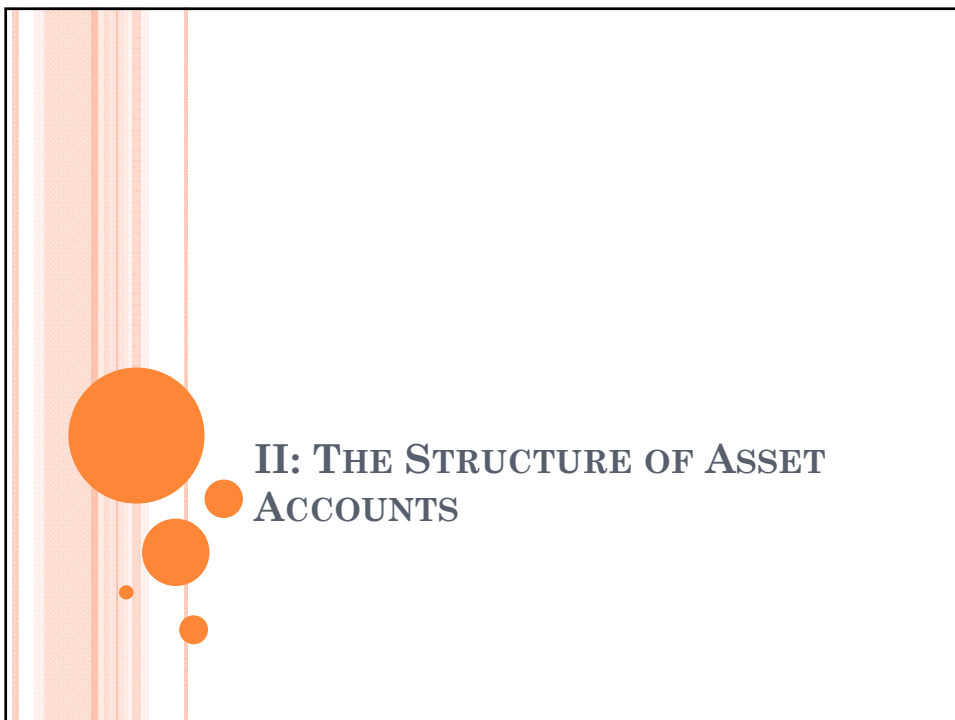
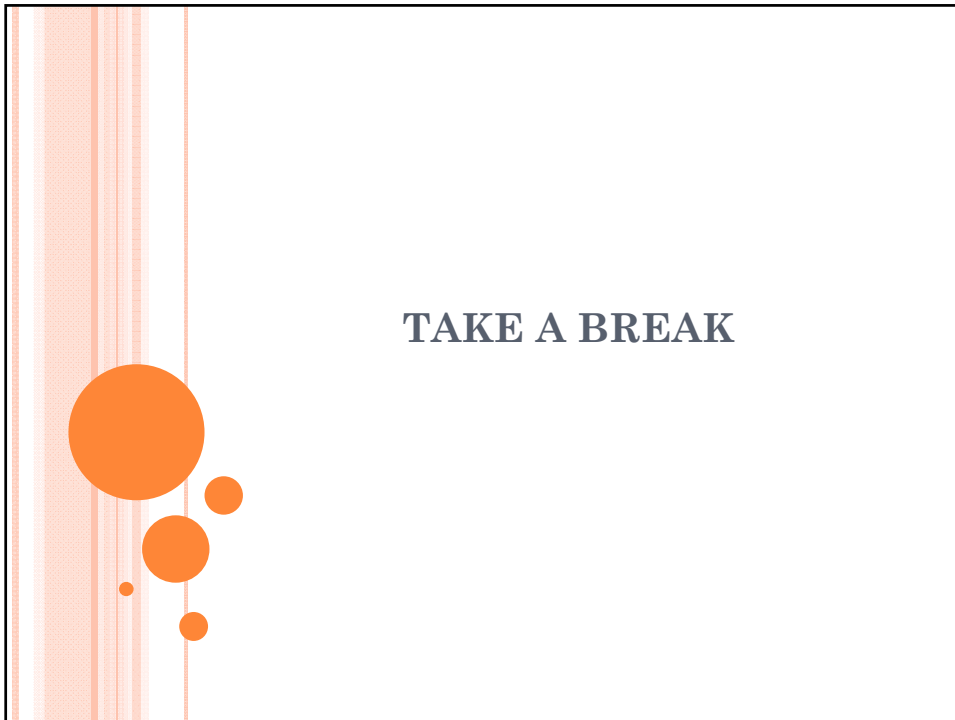
- Distinct treatment of land
 - Account for its provision of space / area not the resources that are within it
- Include natural and cultivated biological resources
- Oceans and atmosphere excluded
- Stocks of potential energy from renewable sources excluded
 - E.g. solar, wind, tidal power
 - Slight exception for hydropower

ECOSYSTEM ASSETS

- Areas comprising combinations of individual resources (timber, soil, water, etc) but also having ecological processes and characteristics
- Aim to assess
 - Condition of the ecosystem within an area (i.e. how is it functioning, quality of processes)
 - Flow of ecosystem services to economic and human activity
- Ecosystem asset accounting measures environmental impact rather than environmental pressures

KEY MESSAGES

- Environmental assets can be seen from two perspectives: individual resources & ecosystems
- Both natural and cultivated resources are included in scope
- Scope is generally broader in physical terms than in monetary terms
- Land is accounted for in terms of area/space



BASIC ASSET ACCOUNT STRUCTURE

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

REAPPRAISALS AND RECLASSIFICATIONS

- Reappraisals: changes due to use of updated information to reassess physical size of the stock
 - Changes in quality
 - Changes in technology to permit additional extraction
 - May imply revisions
- Reclassifications: where an environmental asset is use for a different purpose – particularly permanent changes in land use
 - Decrease in one category leads to increase in another



DISCUSSION:
**WHAT ENTRIES ARE NEEDED
FOR OTHER BIOLOGICAL
RESOURCES?**



**III: DEPLETION OF
ENVIRONMENTAL ASSETS**

DEFINITION OF DEPLETION

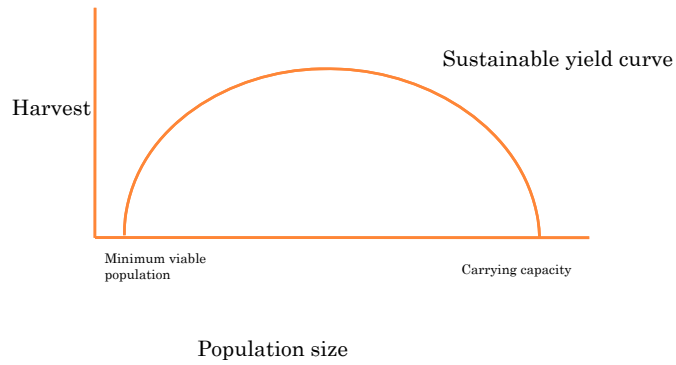
“Depletion, in physical terms, is the decrease in the quantity of the stock of a natural resource over an accounting period that is due to the extraction of the natural resource by economic units occurring at a level greater than that of regeneration”

2012 SEEA Central Framework 5.76

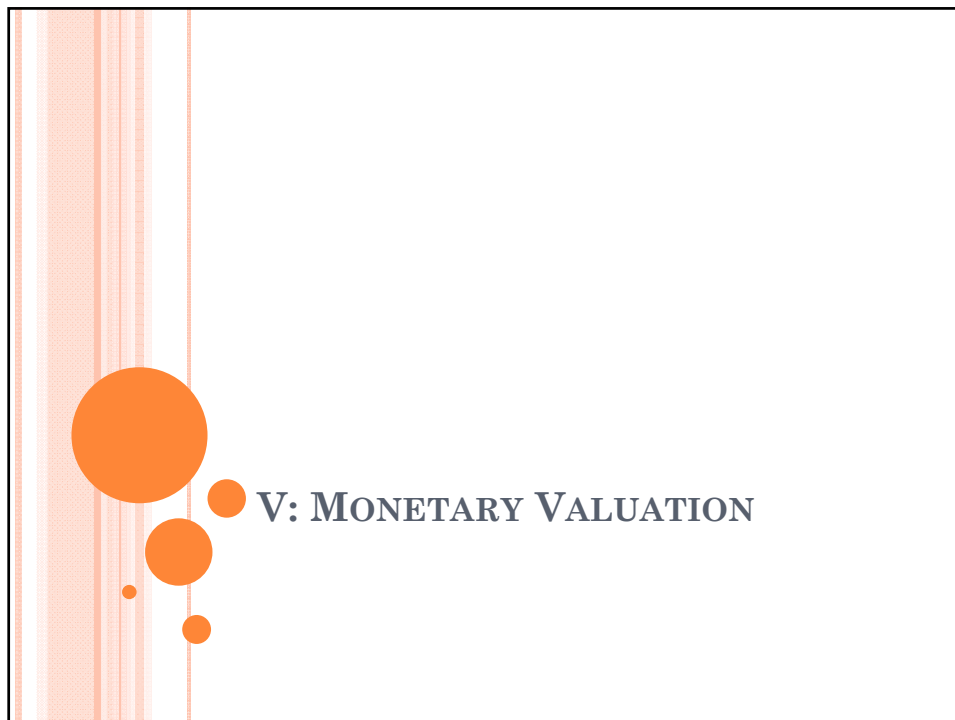
KEY POINTS

- Depletion must be a physical flow before valuation takes place
 - Monetary estimates equal physical flow * average price of resource before extraction
- Only for natural resources not cultivated resources
- Only extraction by economic units – not all reductions in stock
- Discoveries of non-renewable resources are not considered regeneration
- Depletion will generally not equal change in the value of the stock
- Depletion is distinct from degradation which reflects reductions in the functioning of ecosystems

DEPLETION AND SUSTAINABLE YIELD



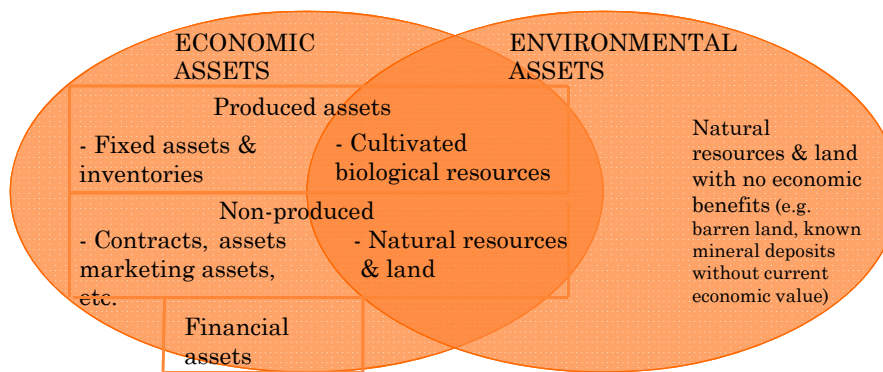
IV: EXERCISE ON FOREST LAND AND TIMBER RESOURCES



DEFINING ECONOMIC ASSETS

- Economic owner:
 - The institutional unit entitled to claim the benefits associated with the use of an asset in an economic activity
- Economic benefits
 - Include operating surplus from sale of extracted resources, rent earned by allowing use of resources, receipts from sale of assets
- Economic asset
 - Store of value representing the benefit or series of benefits accruing to the owner by holding or using the asset over time

ECONOMIC AND ENVIRONMENTAL ASSETS



VALUATION PRINCIPLES & METHODS

- Value at balance sheet date (e.g. end of financial year)
- Value using market prices
 - Market prices are amounts of money that willing buyers pay to willing sellers
 - Exchange prices/value or transaction prices – generally observable
- If prices not observable need to determine a price that would be applicable if a market had existed

METHODS FOR ESTIMATING MARKET PRICES

- Market price equivalents
 - Prices for similar products or assets
- Written down replacement costs
 - Used for buildings and machines equal to the original purchase price adjusted for depreciation and the current replacement cost
- Net present value (NPV)
 - Assess the value of the future flow of benefits (income) from using or owning the asset



LOGIC OF NPV

1. Estimate past Resource Rent (RR) from sale of resources
2. Estimate the physical stock and remaining asset life assuming a rate of extraction
3. Estimate future annual flows of RR over the asset life
4. Discount each future annual estimate of RR
5. Sum the discounted estimates => NPV



MEASURES OF RESOURCE RENT

- Residual value method
 - Generally obtained from national accounts and related data - see Table 5.4.1
- Appropriation method
 - Based on payments made by extractors of resources to owners of resources – e.g. royalties paid to government for mining
- Access price method
 - Based on payments made by extractors for access rights and licences – e.g. quotas in fishing
- In theory all provide the same estimate but in practice all can be quite different

RESIDUAL VALUE METHOD

Output (sales of extracted environmental assets at basic prices, includes all subsidies on products, excludes taxes on products)

Less Operating costs

Intermediate consumption (input costs of goods and services at purchasers' prices, including taxes on products)

Compensation of employees (input costs for labour)

Other taxes on production plus Other subsidies on production

Equals Gross Operating Surplus - SNA basis (a)

Less Specific subsidies on extraction

Plus Specific taxes on extraction


Equals Gross Operating Surplus - for the derivation of resource rent

Less User costs of produced assets


Consumption of fixed capital (depreciation) + Return to produced assets

Equals Resource rent

Depletion + Net return to environmental assets (b)



EXERCISE:
VALUATION OF A COAL DEPOSIT



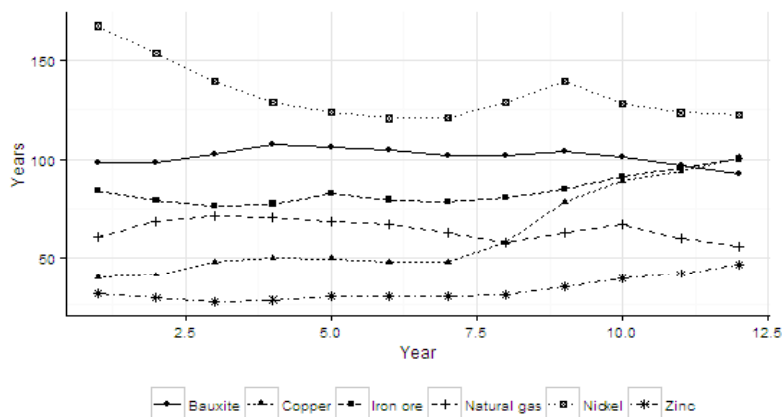
**VI: USE OF ASSET ACCOUNTING
INFORMATION**

POSSIBLE INDICATORS IN PHYSICAL TERMS

- Changes in land use and land cover
 - E.g. rates of conversion of agricultural and forest land
- Shares of resources that are cultivated or natural biological resources
- Ratio of extraction to natural growth for natural biological resources
- Intensity of water use: abstraction / stocks
- Availability of resources per capita
- Asset lives: expected extraction rates / stocks



EXPECTED ASSET LIVES OF MINERAL RESOURCES



POSSIBLE INDICATORS IN MONETARY TERMS

- Total wealth including environmental assets
 - Shares of wealth attributed to individual assets
 - Rates of return to different assets
- Estimate future government revenues – royalties, taxes, rent, quotas, licences
- Depletion
 - Adjusted GDP
 - Productivity measures adjusting for cost of natural capital in addition to cost of fixed capital



CONGRATULATIONS
&
THANK YOU

