

System of  
Environmental  
Economic  
Accounting

# Estimating ecosystem wealth, degradation and enhancement in SEEA EEA

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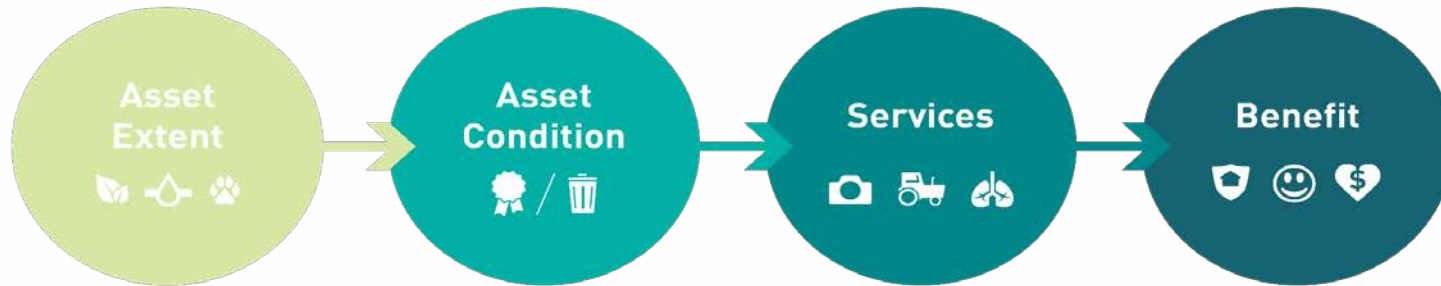


United Nations



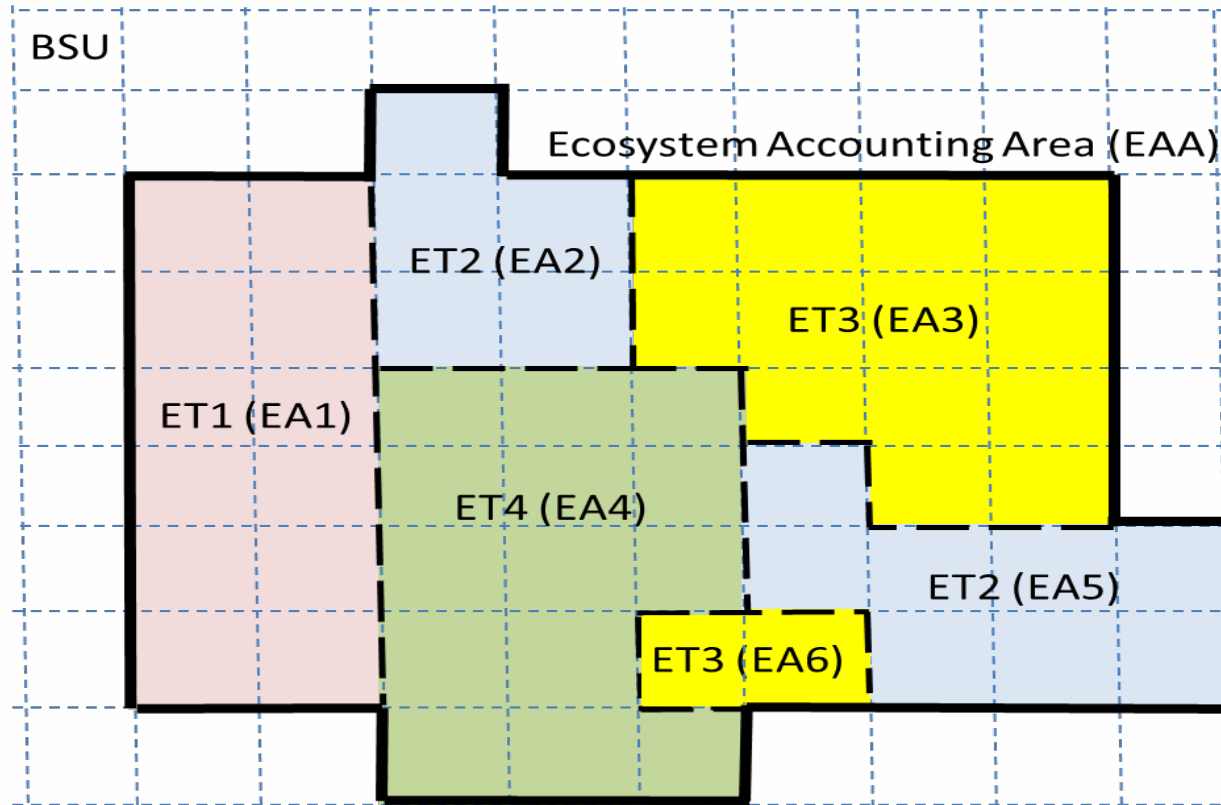
# Recapping the SEEA & ecosystem accounting

# Core ecosystem accounting model



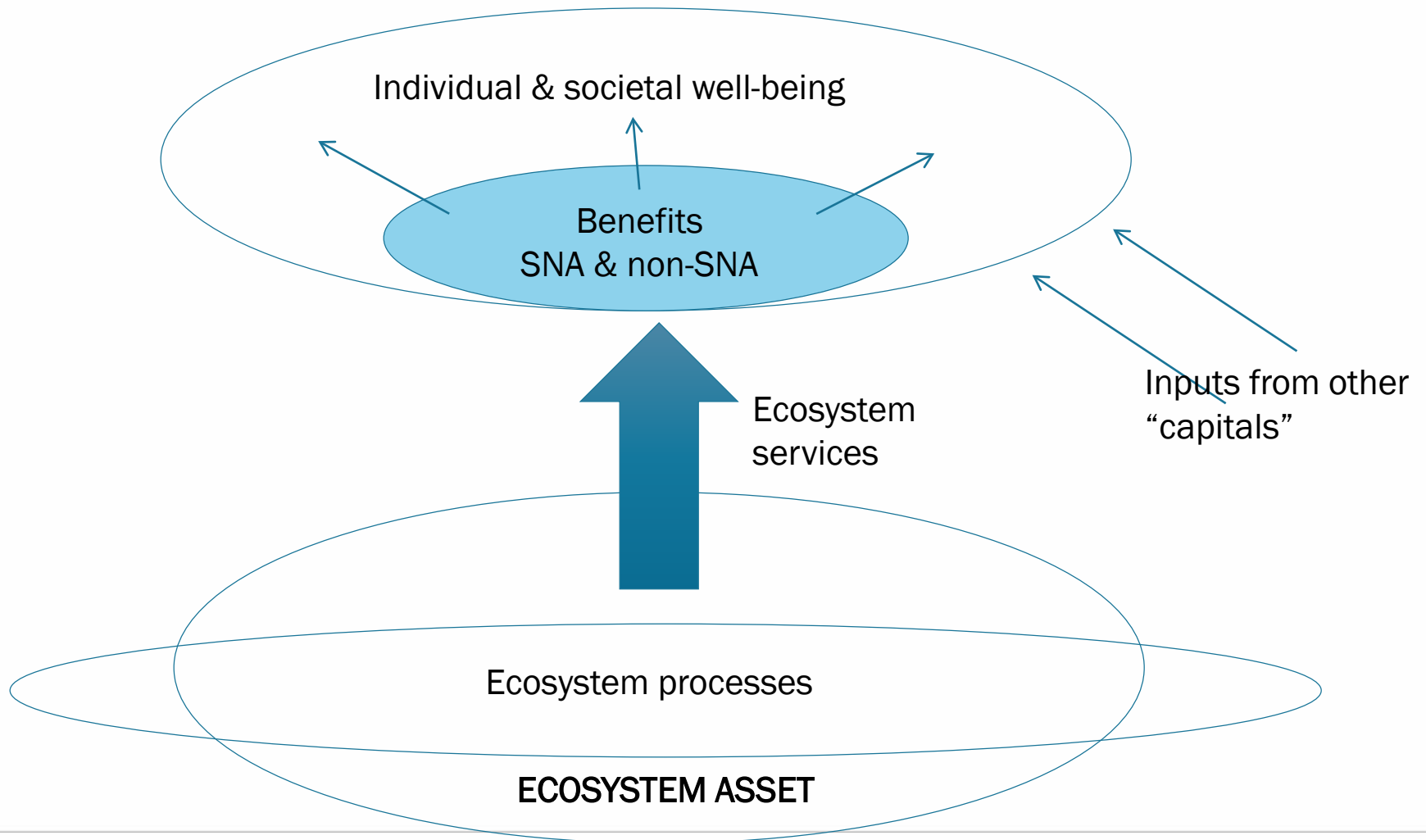
- Single asset framework applied to different landscapes and ecosystem types
- Assess impact of human activity on asset extent and condition
- Asset condition influences the production of ecosystem services
- Ecosystem services provide economic and social-wellbeing benefits

# Delineating spatial units



Stylised presentation of six separate Ecosystem Assets (EA) of four different Ecosystem Types (ET)

# Stocks & flows in ecosystem accounting



# Valuation context

# Context for a SEEA valuation approach

Main aim in asset valuation is integration with national accounting values of assets to provide more comprehensive picture of wealth and links to degradation, capital costs and shares

For integration, need to apply a valuation concept that is consistent – i.e. exchange values or transaction prices

Recognise difference from wealth accounting in terms of private and social valuations

Focus on capital is fundamental in understanding sustainability, resilience, etc. – valuing ecosystem services, as for GDP, is necessary but not sufficient

# Accounting concepts



# Key concepts in valuing produced assets

Accounting has a focus on recording transactions between units

With respect to produced assets, asset valuation usually starts by recording level of investment

- Assumption that price paid/invested is an estimate of future returns/benefits
- Consider valuation of public infrastructure

Valuing the stock of produced assets requires assumptions on

- Asset lives
- Depreciation rates/profiles
- Replacement costs / asset prices

# Valuing assets that are not transacted

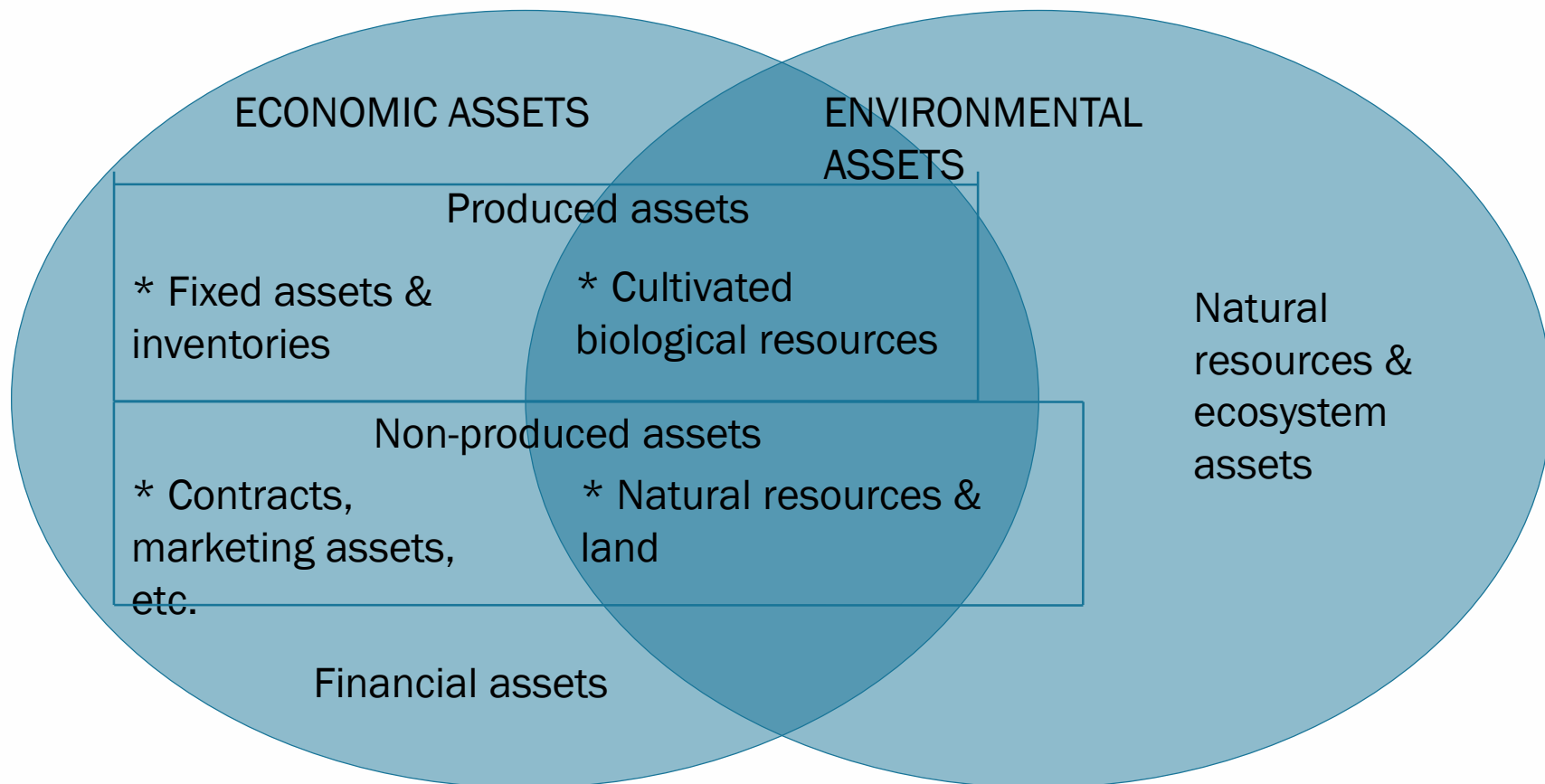
SNA proposes to use Net Present Value – discounted stream of future benefits

- Asset lives
- Scope and definition of benefits
- Profile of future flows (level and timing)
- Prices for benefits
- Discount rate

In ecosystem accounting follow the same NPV logic

- Benefits defined in terms of ecosystem services – broader than set of SNA benefits
- Prices and discount rates – depends on purpose
- Asset lives – renewable and non-renewable distinctions
- Profile of future flows – simplistic versus ecological

# Linking economic and environmental assets



# Accounting treatments

Ecosystem asset values as the sum of NPV of individual services

- Links to SNA balance sheet
- Links to wealth accounting

Degradation

- Align to the concept of consumption of fixed capital in SNA
- Must reflect a decline in condition (not price only) due to economic and human activity
- Doesn't equal change in NPV

Enhancement

- Must reflect an increase in condition (not price only) due to economic and human activity

Other changes in volume / Revaluations

- Account for changes in NPV not due to economic and human activity – e.g. catastrophic losses, discoveries, asset price changes

# Structure of an asset account

	Proxy ecosystem type (based on land cover)															
	Artificial surfaces	Herbaceous crops	Woody crops	Multiple or layered crops	Grassland	Tree-covered areas	Mangroves	Shrub-covered areas	Regularly flooded areas	Sparse natural vegetated areas	Terrestrial barren land	Permanent snow and glaciers	Inland water bodies	Coastal water and inter-tidal areas	Sea and marine areas	TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<b>Opening stock of ecosystem assets</b>																
<b>Additions to stock</b>																
<b>Reductions in stock</b>																
<b>Revaluations</b>																
<b>Closing stock of ecosystem assets</b>																

# Key Issues in the Valuation of Ecosystem Services

# Estimating future flows

Patterns of future flows of ecosystem services may vary significantly

- Ecological processes and dynamics, including connections between ecosystem assets
- Trade-offs between ecosystem services
- Demand factors (e.g. population and income growth)
- Consider critical natural capital, ecological thresholds and limits

Focus on expectations

- SEEA EEA : Expected ecosystem service flows
- Different from optimal or sustainable flows
- BAU vs scenarios

Future flows for ecosystem assets with no final ecosystem services

- Do they have a zero-value?

# Defining degradation

## Developing the concept of ecosystem capacity

- Idea of matching supply of ES with likely demand for a given ecosystem condition
- Need to clarify distinction from potential supply and capability
- Degradation as the decline in ecosystem capacity

## Allocation of degradation

- Attribution of ecosystem service flows to individual ecosystem assets
- Allocation to economic units – to either units causing the decline in capacity or to the units suffering the loss of future benefits



# Valuation questions: Restoration costs

## Restoration cost possibilities

- Estimate of asset values based on "purchase" cost as per produced assets
- Estimate of a cumulative debt reflecting a liability to society
- Estimate of degradation in terms of change in restoration cost over an accounting period

## Restoration cost challenges

- Problem of linking "purchase" price to future flows of benefits
- As debt, challenge of aligning change in asset with change in liability in measuring net wealth
- As degradation, need to reflect cost of replacing at current condition
- Overall, challenge of determining baseline condition and societal preferences

# Other valuation issues

Estimating and valuing ecosystem enhancement

Selection of discount rates

- Question of alignment with SNA – generally imply use of private market based rates but discussion needed

Links to wealth accounting concepts of shadow / “accounting” prices

Links to existing/observed market values of land

- Extent to which land values align to economists’ expectations wrt future benefit flows
- Notion of highest and best use approach
- Notions in accounting of fair and market value

Valuation of biodiversity

- Biodiversity as a characteristic that underpins future flows and can degrade and be enhanced



**THANK YOU**

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