System of Environmental Economic Accounting

# SEEA Experimental Ecosystem Accounting; Applications of the SEEA

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# Objectives of the Session

- Overview of the SEEA Experimental Ecosystem Accounting
- Linking SEEA with SDGs
- Indicators

# SEEA Experimental Ecosystem Accounting

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# One Environment: Two Perspectives

**SEEA**
**Central Framework:**
Individual Environmental Assets/Resources

- Timber
- Water
- Soil
- Fish


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**Experimental Ecosystem Accounts:**
Ecosystem Assets (spatially based)

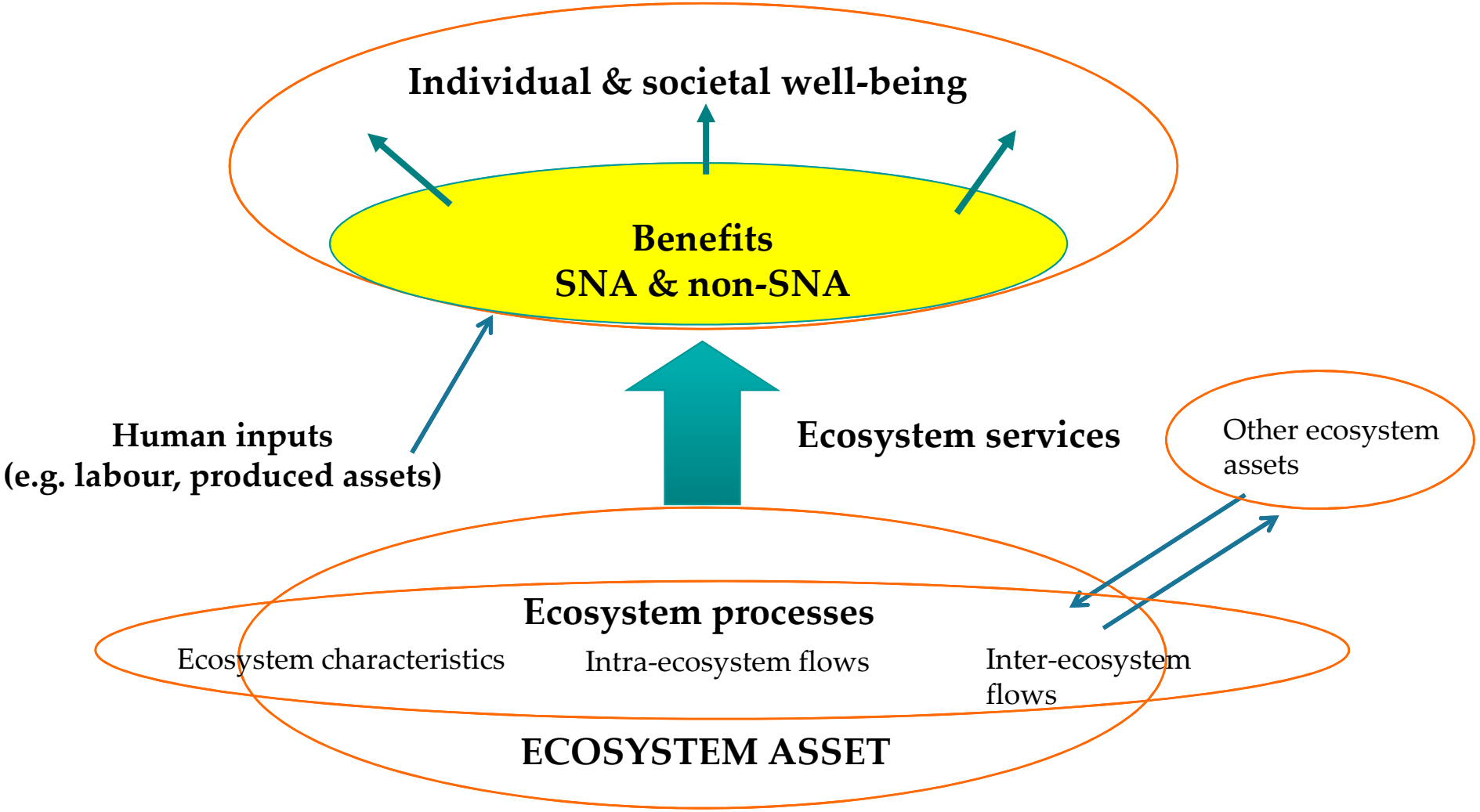
- Forests
- Lakes
- Agricultural areas

***Ecosystem Assets are environmental assets viewed from a systems perspective***

# SEEA Experimental Ecosystem Accounting (SEEA EEA)

- An integrated accounting framework for ecosystem stocks (assets) and flows (services)
  - Measures the contributions of ecosystem to economic and other human activity
  - Takes a detailed spatial approach (geography and statistics)
- A synthesis of current knowledge on ecosystem services, ecosystem condition and related concepts
  - "Experimental" because significant measurement challenges remain and further testing of concepts is needed

# Ecosystem Accounting model

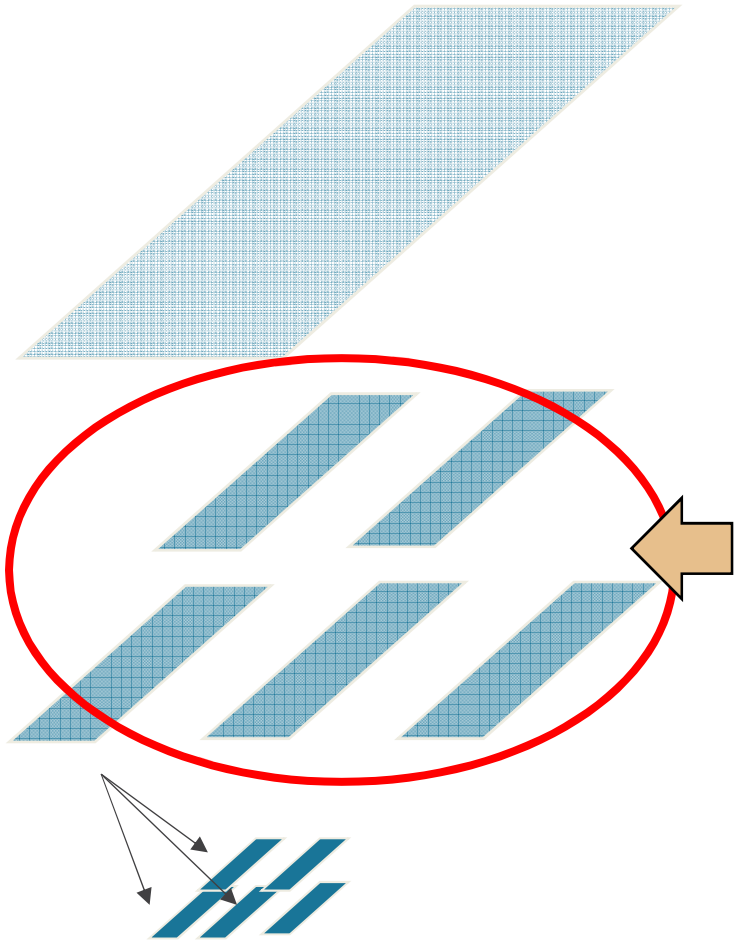


# Statistical units

Geographical aggregation

Ecosystem Unit (EU)

Basic Spatial Unit (BSU)

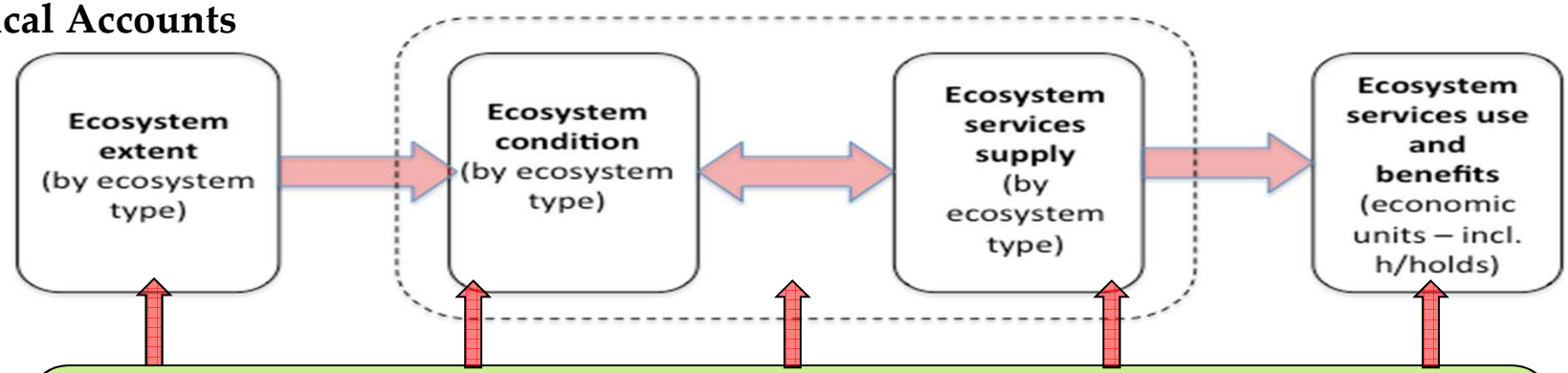


## Ecosystem units

- Spatial areas that form the conceptual base for accounting and the integration of relevant statistics.
- Delineation is based on ecological characteristics
- Where various ecological data are not available, a land cover based delineation can be used as a starting point

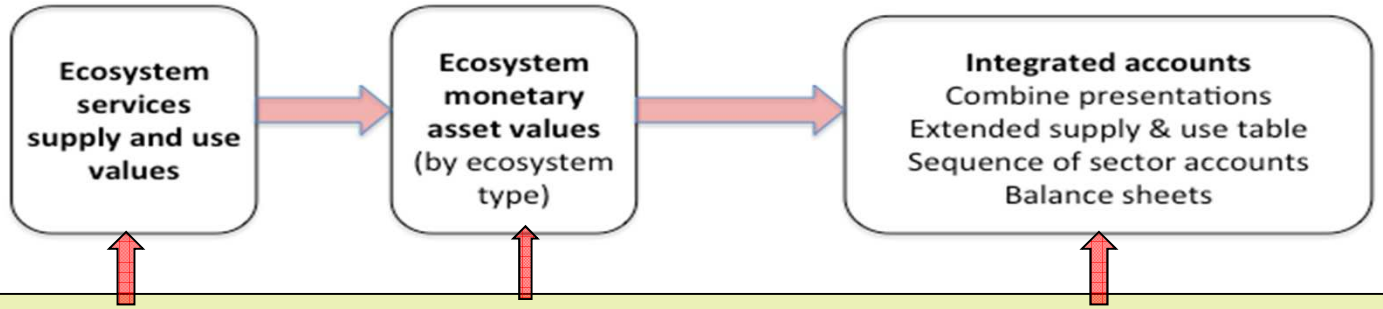
# Broad steps in ecosystem accounting

## a. Physical Accounts




**Ecosystem thematic accounts:** Land, Carbon, Water, Biodiversity
**Supporting information:** Socio-economic conditions and activities, ecological production functions
**Tools:** classifications, spatial units, scaling, aggregation, biophysical modelling
**Source:** Official statistics, spatial data, remote sensing data

## b. Monetary Accounts




**Supporting information:** SNA accounts, I-O tables
**Tools:** Valuation techniques

# Ecosystem condition

**Table 4.4 Changes in ecosystem condition for an LCEU**

| | | Characteristics of ecosystem condition | | | | |
|---|---|---|---|---|---|---|
| | | Vegetation | Biodiversity | Soil | Water | Carbon |
| | | Indicators (e.g. Leaf area index, biomass, mean annual increment) | Indicators (e.g. species richness, relative abundance) | Indicators (e.g. soil organic matter content, soil carbon, groundwater table) | Indicators (e.g. river flow, water quality, fish species) | Indicators (e.g. net carbon balance, primary productivity) |
| **Opening condition** | | | | | | |
| | | | | | | |
| **Improvements in condition** | | | | | | |
| | Improvements due to natural regeneration (net of normal natural losses | | | | | |
| | Improvements due to human activity | | | | | |
| | | | | | | |
| **Reductions in condition** | | | | | | |
| | Reductions due to extraction and harvest of resources | | | | | |
| | Reductions due to ongoing human activity | | | | | |
| | Catastrophic losses due to human activity | | | | | |
| | Catastrophic losses due to natural events | | | | | |
| | | | | | | |
| **Closing condition** | | | | | | |

Using basic measures, can derive table of changes in condition.

Could also be done by referencing each indicator to a reference condition.

# Ecosystem extent account

| | Type of Ecosystem Unit | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | |
| **Opening extent** | | | | | | | | | | | | | | | | |
| Additions to extent | | | | | | | | | | | | | | | | |
| Managed expansion | | | | | | | | | | | | | | | | |
| Natural expansion | | | | | | | | | | | | | | | | |
| Upward reappraisals | | | | | | | | | | | | | | | | |
| Reductions in extent | | | | | | | | | | | | | | | | |
| Managed regression | | | | | | | | | | | | | | | | |
| Natural regression | | | | | | | | | | | | | | | | |
| Downward reappraisals | | | | | | | | | | | | | | | | |
| Net change in extent | | | | | | | | | | | | | | | | |
| **Closing extent** | | | | | | | | | | | | | | | | |

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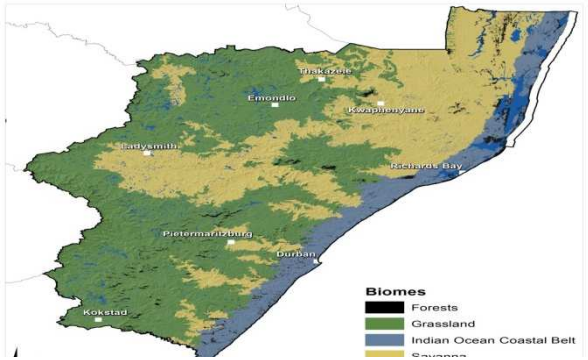
# Example: South African pilot study - Ecosystem extent accounts (by biome) for KZN




| Hectares | Grassland | Savanna | Indian Ocean Coastal Belt | Wetland | Forest |
|---|---|---|---|---|---|
| **Opening balance 1840** | 4 581 933 | 3 259 059 | 893 967 | 393 718 | 202 822 |
| Total reductions in stock | 1 651 736 | 840 380 | 528 754 | 107 567 | 18 208 |
| Total reductions as a % of 1840 | 36 | 26 | 59 | 27 | 9 |
| **Opening balance 2005** | 2 930 197 | 2 418 679 | 365 213 | 286 151 | 184 614 |
| Total reductions in stock | 277 108 | 208 607 | 59 723 | 18 276 | 9 792 |
| Total reductions as a % of 1840 | 6 | 6 | 7 | 5 | 5 |
| **Opening balance 2008** | 2 653 090 | 2 210 072 | 305 490 | 267 875 | 174 822 |
| Total reductions in stock | 68 092 | 34 757 | 11 782 | 9 082 | 3 128 |
| Total reductions as a % of 1840 | 1 | 1 | 1 | 2 | 2 |
| **Opening balance 2011** | 2 584 998 | 2 175 315 | 293 708 | 258 793 | 171 694 |

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*Source:*

Driver, A., Nel, J.L., Smith, J., Daniels, F., Poole, C.J., Jewitt, D. & Escott, B.J. 2015. Land and ecosystem accounting in KwaZulu-Natal, South Africa. Discussion document for Advancing SEEA Experimental Ecosystem Accounting Project, October 2015. South African National Biodiversity Institute, Pretoria.

# Ecosystem condition account

## (End of accounting period)

| Type of Ecosystem Unit | Ecosystem characteristics | | | | | | |
|---|---|---|---|---|---|---|---|
| | Vegetation | Water resources | Soil | Carbon | Biodiversity | Air | ... |
| 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 | | | | | | | |

# Example: An Experimental Ecosystem Account for the Great Barrier Reef Region 2015 by ABS

**TABLE 3.5: VEGETATION CONDITION, BY NRM TERRESTRIAL REGION, GREAT BARRIER REEF REGION,** 2000-01 to 2011-12, Index (2000-01 = 100)

| NRM Region | 2000-01 g C/m$^2$/day | 2000-01 points | 2001-02 points | 2002-03 points | 2003-04 points | 2004-05 points | 2005-06 points | 2006-07 points | 2007-08 points | 2008-09 points | 2009-10 points | 2010-11 points | 2011-12 points |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Burdekin | 1.70 | 100 | 68 | 53 | 63 | 50 | 72 | 73 | 106 | 106 | 95 | 131 | 100 |
| Burnett Mary | 1.90 | 100 | 87 | 105 | 116 | 93 | 101 | 72 | 117 | 114 | 110 | 148 | 125 |
| Cape York | 2.12 | 100 | 99 | 82 | 88 | 91 | 90 | 103 | 99 | 104 | 88 | 111 | 99 |
| Fitzroy | 1.84 | 100 | 71 | 80 | 82 | 69 | 81 | 64 | 119 | 107 | 108 | 151 | 112 |
| Mackay Whitsunday | 3.59 | 100 | 89 | 74 | 84 | 75 | 83 | 87 | 99 | 90 | 88 | 93 | 97 |
| Wet Tropics | 3.11 | 100 | 102 | 91 | 91 | 95 | 93 | 102 | 104 | 106 | 96 | 100 | 98 |
| **Total GBR Region** | **2.38** | **100** | **88** | **81** | **88** | **80** | **87** | **86** | **106** | **103** | **96** | **117** | **103** |

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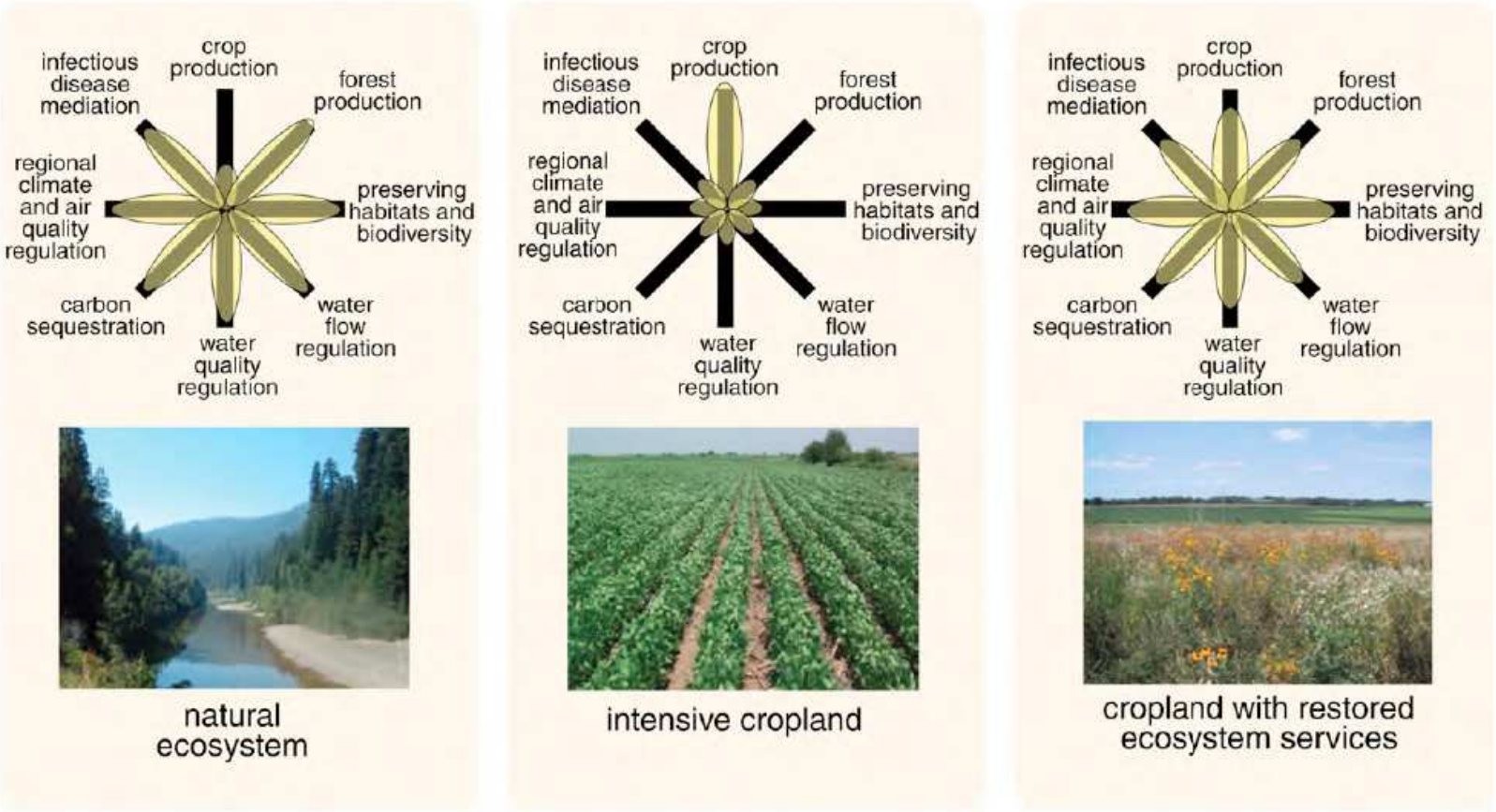
Source: *Information Paper: An Experimental Ecosystem Account for the Great Barrier Reef Region 2015*
http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/4680.0.55.001Main%20Features12015?opendocument&tabname=Summary&prodno=4680.0.55.001&issue=2015&num=&view=

# Expected bundle of ecosystem services




(Foley et al. 2005 Science)

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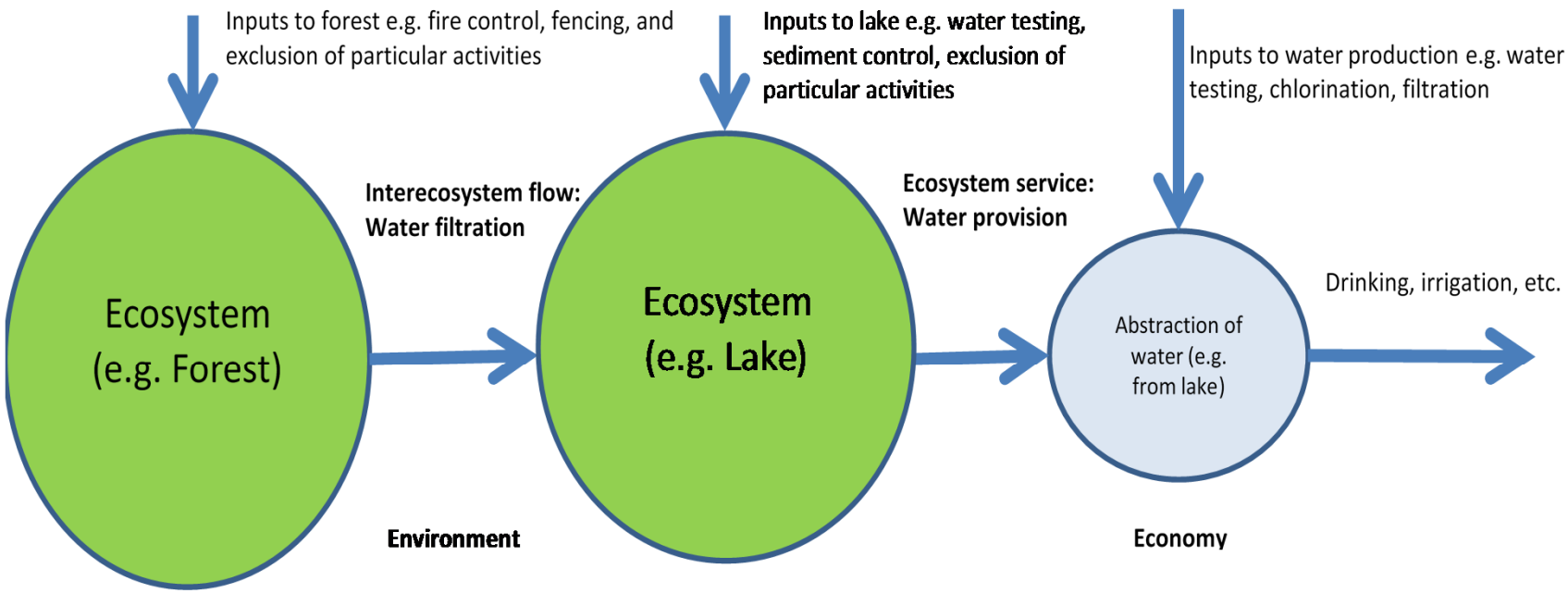
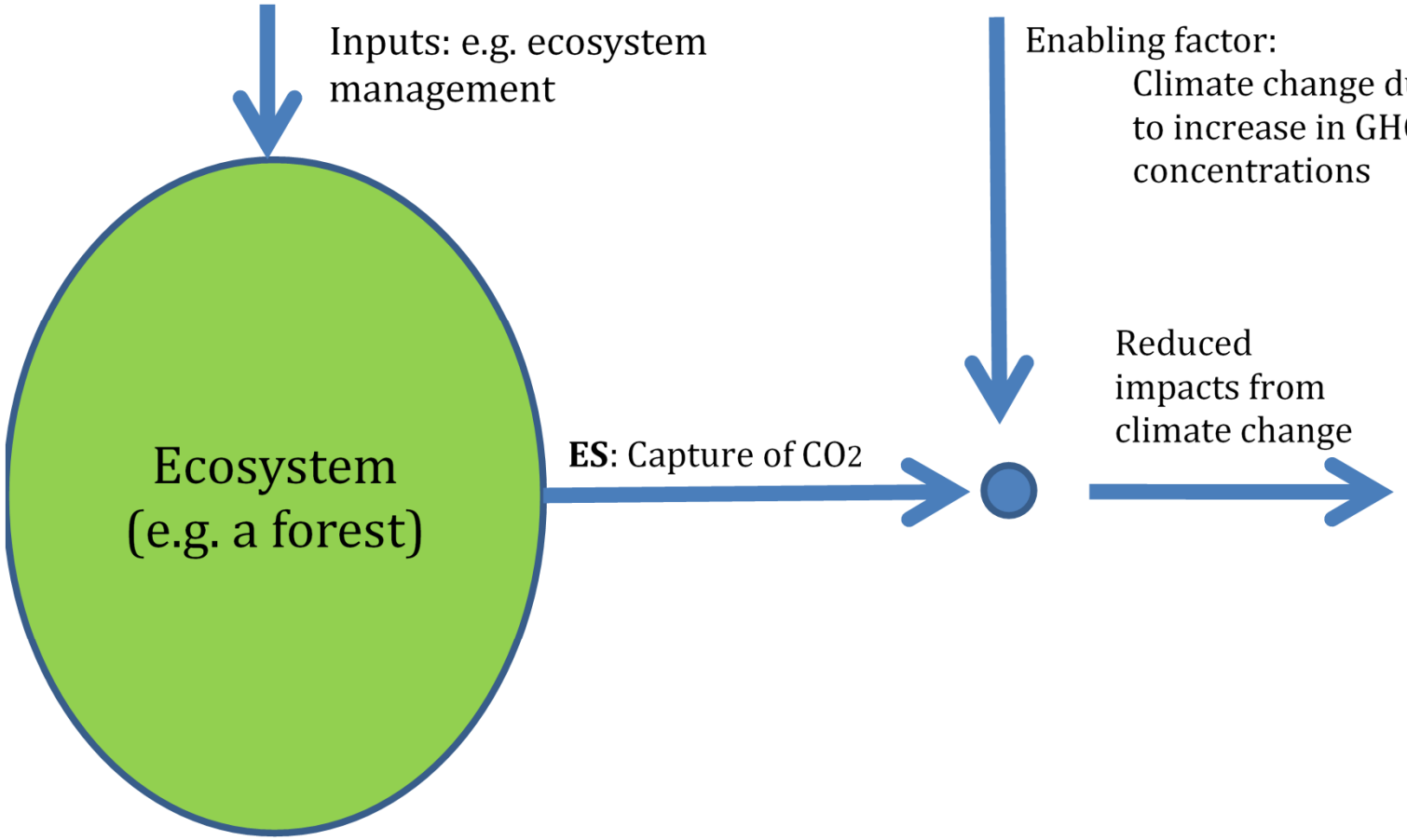
# Ecosystem services: Water Provisioning




- SEEA only accounts for the final ecosystem service of water provisioning

# Ecosystem services: carbon sequestration




Source: SEEA-EEA, Fig. A3.4, p. 71

# Ecosystem services supply and use table

**ECOSYSTEM SERVICES SUPPLY TABLE**

| | UNITS | Type of economic unit | | | | | | | Type of Ecosystem Unit | | | | | | | | | | | | | | TOTAL SUPPLY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Agriculture, forestry and fisheries | Electricity, gas supply | Water collection, treatment and supply | Other industries | Households | Accumulation | Rest of the world - Imports | 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 | |
| | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| **Ecosystem services**<br>Provisioning services<br>Regulating services<br>Cultural services | | A | | | | | | | B | | | | | | | | | | | | | | |
| **Products** | | C | | | | | | | D | | | | | | | | | | | | | | |

**ECOSYSTEM SERVICES USE TABLE**

| | UNITS | Type of economic unit | | | | | | | Type of Ecosystem Unit | | | | | | | | | | | | | | TOTAL USE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Agriculture, forestry and fisheries | Electricity, gas supply | Water collection, treatment and supply | Other industries | Households | Accumulation | Rest of the world - Exports | 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 | |
| | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| **Ecosystem services**<br>Provisioning services<br>Regulating services<br>Cultural services | | E | | | | | | | F | | | | | | | | | | | | | | |
| **Products** | | G | | | | | | | H | | | | | | | | | | | | | | |

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# Thematic accounts

- Standalone accounts on topics of interest in their own right
- Direct relevance in the measurement of ecosystems and in assessing policy responses.
- Thematic accounts include accounts for land, carbon, water and biodiversity.

Example: Carbon Accounting in Australia

| Primary reservoir | Geocarbon (Mt C) | Hectares (million) | Biomass carbon (Mt C) | Soil organic carbon (Mt C) | Total biocarbon (Mt C) |
|---|---|---|---|---|---|
| **Biocarbon** | | | | | |
| Natural ecosystems | | | | | |
| *Rangelands* | | 596.3 | 6,374 | 6,603 | 12,977 |
| *Non rangelands:* | | | | | |
| *Eucalypt native forests* | | 16.7 | 4,671 | 3,753 | 8,424 |
| *Shrub lands & woodlands* | | 14.7 | 500 | 636 | 1,137 |
| *Grass, shrub & heath lands* | | 1.6 | 37 | 51 | 87 |
| *Rainforests* | | 2.3 | 1,225 | 252 | 1,477 |
| *Other* | | 0.7 | 15 | 16 | 32 |
| *Marine ecosystems* | | 1.8 | 114 | 1,084 | 1,198 |
| *Fresh water ecosystems* | | 9.9 | 4 | 7 | 11 |
| **Total Natural ecosystems** | | **644.0** | **12,941** | **12,402** | **25,343** |
| Semi-natural ecosystems | | | | | |
| *Highly modified rangelands* | | 50.0 | 750 | 1,500 | 2,250 |
| *Grazing in modified pastures outside rangelands* | | 32.9 | 132 | 1,315 | 1,447 |
| **Total Semi-natural ecosystems** | | **82.9** | **882** | **2,815** | **3,697** |
| Agricultural ecosystems | | | | | |
| *Cropping* | | 25.5 | 102 | 1,022 | 1,124 |
| *Irrigated agriculture* | | 2.6 | 12 | 105 | 117 |
| *Plantation wood* | | 2.4 | 177 | 120 | 296 |
| *Reservoir/dam* | | 0.6 | 1 | 6 | 7 |
| *Other* | | 6.3 | 120 | 244 | 363 |
| **Total Agriculture ecosystems** | | **37.4** | **412** | **1,497** | **1,907** |
| Settlements | | 2.6 | 30 | 79 | 108 |
| Other | | 0.5 | 7 | 19 | 26 |
| **Total Settlements and Other** | | **3.1** | **37** | **98** | **134** |
| **Total biocarbon**[d] | | **767.4** | **14,270** | **16,811** | **31,081** |

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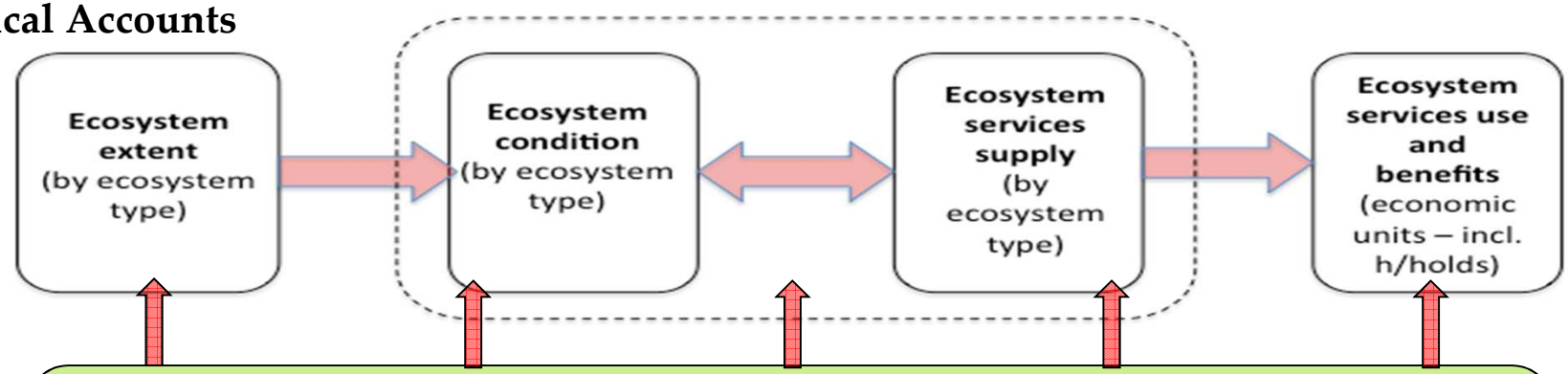
*Source:*
https://coombs-forum.crawford.anu.edu.au/publication/hc-coombs-policy-forum/4708/carbon-accounting-australia

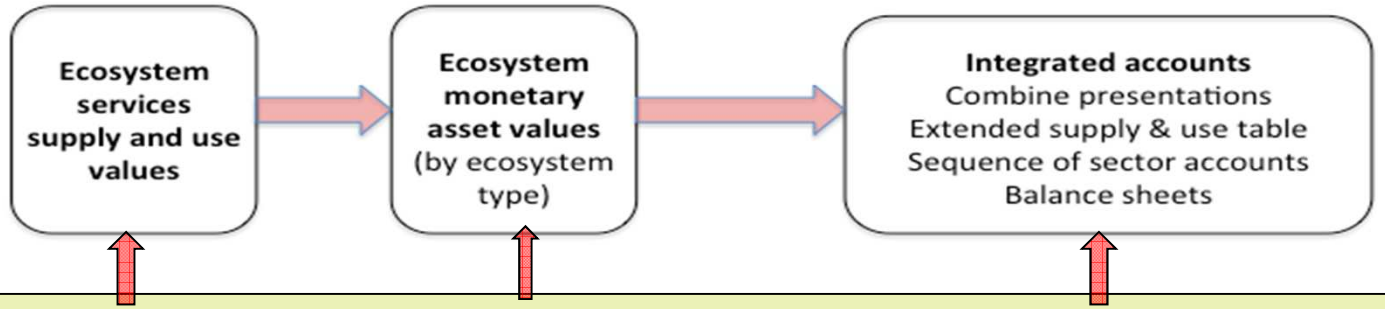
# Broad steps in ecosystem accounting

**a. Physical Accounts**




**Ecosystem thematic accounts:** Land, Carbon, Water, Biodiversity
**Supporting information:** Socio-economic conditions and activities, ecological production functions
**Tools:** classifications, spatial units, scaling, aggregation, biophysical modelling
**Source:** Official statistics, spatial data, remote sensing data

**b. Monetary Accounts**




**Supporting information:** SNA accounts, I-O tables
**Tools:** Valuation techniques

# Linking SEEA with SDGs

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# Methodological Consistency for SDGs: An Integrated Architecture

- Integration of the SDG indicator framework requires methodological consistency across themes and levels of monitoring.
- This methodological consistency should be supported by statistical frameworks such as the SNA and SEEA.
- Indicators based on statistical frameworks benefit from:
- Aligned definitions and classifications
- Coherence when combining environmental and economic statistics
- A common and comprehensive approach to disaggregation
- Including for all component statistics of an indicator
- International comparability

# Scope of alignment

- 41 of the indicators currently under discussion by the IAEG-SDGs can be defined according to the SNA and SEEA

| Sustainable Development Goals | # indicators informed by SNA & SEEA | | Sustainable Development Goals | # indicators informed by SNA & SEEA | |
|---|---|---|---|---|---|
| 2) Zero Hunger | 2 | (/10) | 11) Sustainable Cities and Communities | 3 | (/11) |
| 6) Clean Water & Sanitation | 5 | (/9) | 12) Responsible Consumption & Production | 3 | (/11) |
| 7) Affordable & Clean Energy | 4 | (/6) | 14) Life below Water | 6 | (/10) |
| 8) Decent Work & Economic Growth | 4 | (/15) | 15) Life on Land | 9 | (/13) |
| 9) Industry, Innovation & Infrastructure | 3 | (/10) | 17) Partnerships | 1 | (/20) |
| 10) Reduced Inequalities | 1 | (/12) | 1, 3, 4, 5, 13, 16 | None | (/71) |

# Methodological Consistency for SDGs

| | Material Flows & Solid Waste | Energy & Carbon Emissions | Water & Wastewater | Agriculture, Forestry & Fishery | Ecosystems | Land Use & Management |
|---|---|---|---|---|---|---|
| Efficiency/ Productivity in the use of Natural Resources | 1. How do we define efficiency? How do we define productivity?<br>2. How do we measure efficiency/productivity in the use of natural resources?<br>3. How do we disaggregate and compare across sectors?<br>4. How do we juxtapose environmental and economic information to derive these indicators? | | | | | |
| Waste Minimization and Treatment | 5. When is something considered waste? How is this defined?<br>6. How do we define reuse and recycling? How do we define 'regular collection', 'safe treatment' and 'good waste management'?<br>7. How do we disaggregate and compare this across sectors? | | | | | |
| Sustainability and Management of Resources | 8. How do we define and compare economic uses of natural resources to their availability?<br>9. How do we classify and monitor management of those resources?<br>10. How do we use tools such as GIS and land accounting to inform this? | | | | | |
| Monetary Indicators | 11. How do we measure and classify expenditure, taxes and subsidies on the management for different environmental issues? | | | | | |

- The answers to these questions should be consistent across indicators.
- **Aligning indicators to the SEEA and SNA helps build this consistency**

# Alignment of Energy Indicators: Example

- Target 7.3: By 2030, double the global rate of improvement in energy efficiency
- Current Proposal: Rate of improvement in energy intensity (%) measured in terms of primary energy and GDP
- Why use the SEEA and SEEA-Energy?
  - Application of common accounting concepts and principals in the SEEA Energy and SNA allowing for coherence when combining physical and monetary information
  - A common and comprehensive basis for disaggregation of both the numerator (SEEA-Energy Accounts) and denominator (SNA) based on ISIC

**SEEA Aligned Indicator:** $\dfrac{\textbf{Energy End Use by Industries}}{\textbf{Gross Value Added by Industries (Constant Prices)}}$

**Energy end use:** The use of energy products in producing goods and services (intermediate consumption of energy by industry). (*Derived from the SEEA Supply and Use Tables for Energy.)*

**Gross value added:** The difference between output and intermediate consumption in constant prices.

# Alignment of Water Indicators: Example

- Target 6.4. By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity
- Current Proposal: Percentage change in water use efficiency over time
- Why use the SEEA and SEEA-Water?
  - A consistent definition of water use to be applied across sectors, and coherence in the way in which "value" is defined and measured across sectors
  - A common and comprehensive basis for disaggregation of both the numerator (from the SEEA PSUT for water) and denominator (SNA) based on ISIC

| **SEEA Aligned Indicator:** $\frac{\text{Total Water Use}}{\text{Gross Domestic Product}}$ |
|---|
| **NOTE: This Indicator for the whole economy can be disaggregated by Economic Activity based ISIC when using the SEEA-Water accounting structure.** |
| **Total Water Use:** Water intake of an economic unit. Water use is the sum of water use within the economy (i.e. one economic unit intaking water received through distribution from another economic unit.) and water directly abstracted from the environment. |
| **Gross value added:** The difference between output and intermediate consumption in constant prices. |

# Alignment of Sustainable Growth Indicators: Example

- Target 8.4: Improve progressively. through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead
- Current Proposal: Resources productivity

**SEEA Aligned Indicator:** $\frac{\text{Domestic Material Consumption}}{\text{Gross Domestic Product}}$

**Domestic Material Consumption (DMC):** is derived from economy-wide material flow accounts (EW-MFA) a physical flow account included in the SEEA-CF. DMC is defined as the domestic extraction of materials (excluding bulk flows of water and air) plus physical imports minus physical exports. DMC measures the total amount of materials (excl. bulk flows of water and air) that are directly/actually used in a national economy, i.e. by resident units

# Alignment of Ecosystem Indicators: Example

- Target 15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
- Current proposal: Forest area as a percentage of total land area

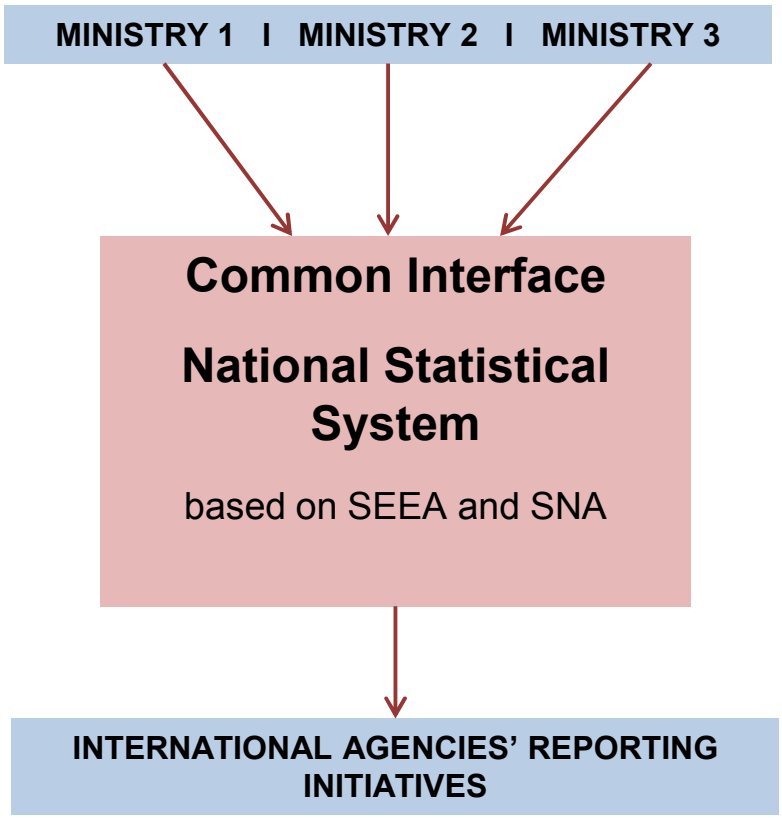
**SEEA Aligned Indicator:** $\frac{\text{Forest areas}}{\text{Total land area}}$

**Forest areas:** The area of forest land can be defined following two different perspective and the two should not be confounded. 1) Land cover ; 2) Land use perspective:

- The FAO Land Cover Classification System (LCCS) in the SEEA Central Framework provides a basis for defining and classifying any piece of land with rigorous syntax and clear classification criteria for land cover that can be supplemented with information on properties and characteristics of the basic objects.
- The Classification of Land Use provided in the SEEA Central Framework for detailed explanation of each forest land covered land used for forestry, natural conservation, water provision, etc.

**Total country area** is defined as the area enclosed by all inland borders and if applicable, the normal baselines (low-water mark) and straight baselines on the seaward side. In the SEEA Central Framework, land accounts encompass areas covered by terrestrial land and inland water resources such as river and lakes. In certain applications, the land accounts may be extended to include areas of coastal water and a country's exclusive economic zone.

# SEEA: Streamlined Reporting for SDGs




**Methodological Consistency** resulting from implementation of the SEEA **reduces reporting burden** of national ministries/agencies:

- Single Data System to Inform Indicators
- Data Compiled Once for Many Purposes
- Reduced need for countries to make arduous data adjustments for international reporting

Facilitates **streamlined reporting process for global SDG Indicators**

- Consistent definitions, classifications and spatial units at national and international level allows for **direct transmission of information**

# Indicators

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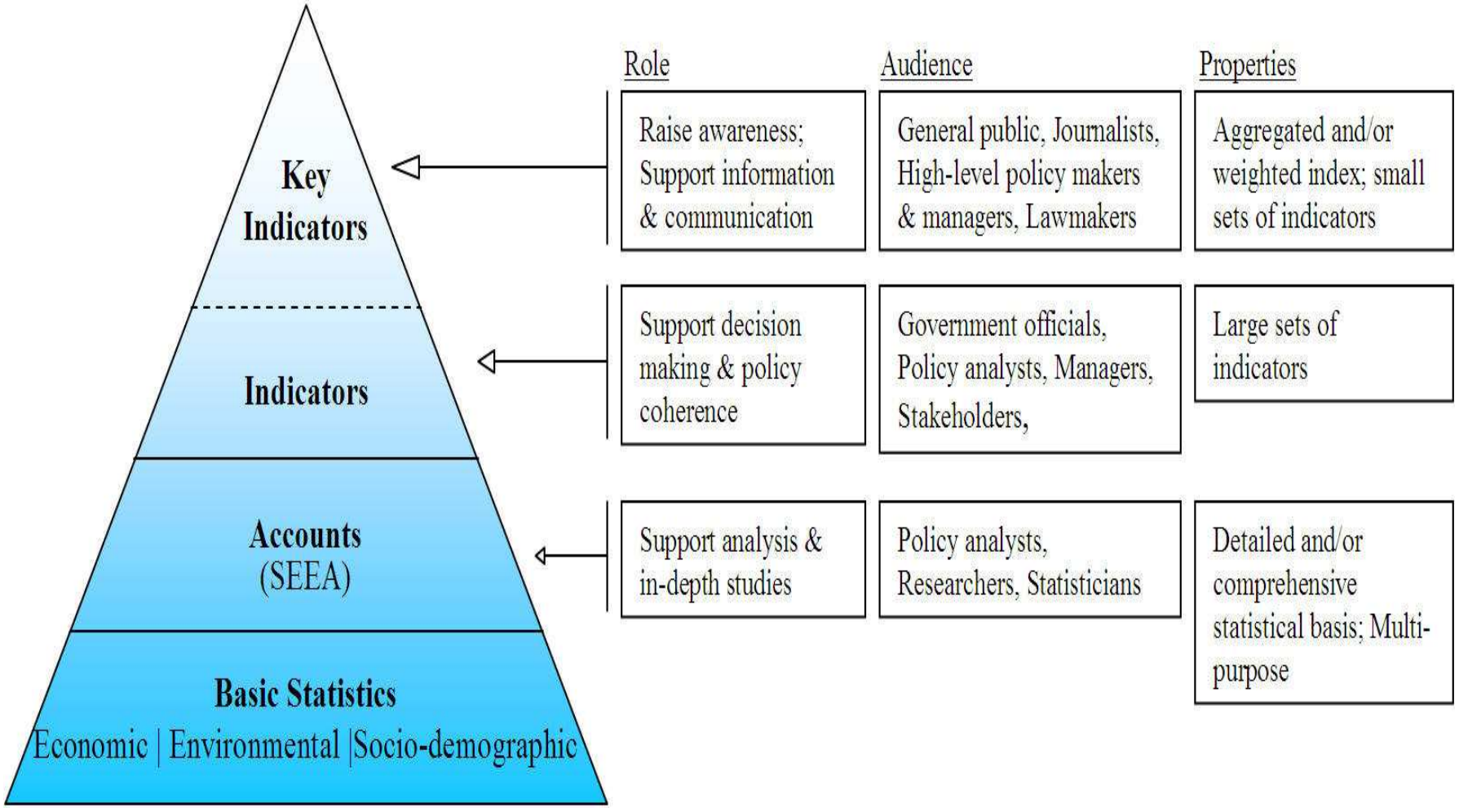
# Indicators


Role
Audience
Properties
Key Indicators
Raise awareness; Support information & communication
General public, Journalists, High-level policy makers & managers, Lawmakers
Aggregated and/or weighted index; small sets of indicators
Indicators
Support decision making & policy coherence
Government officials, Policy analysts, Managers, Stakeholders,
Large sets of indicators
Accounts (SEEA)
Support analysis & in-depth studies
Policy analysts, Researchers, Statisticians
Detailed and/or comprehensive statistical basis; Multi-purpose
Basic Statistics
Economic | Environmental |Socio-demographic

## Resource use and environmental efficiency

- Efficiency indicators compare trends in economic activity
  - such as value-added, income or consumption with trends in specific environmental flows such as emissions, energy and water use, and flows of waste
- Intensity indicators -- ratio of the environmental flow to the measure of economic activity
- Productivity indicators -- inverse of intensity.

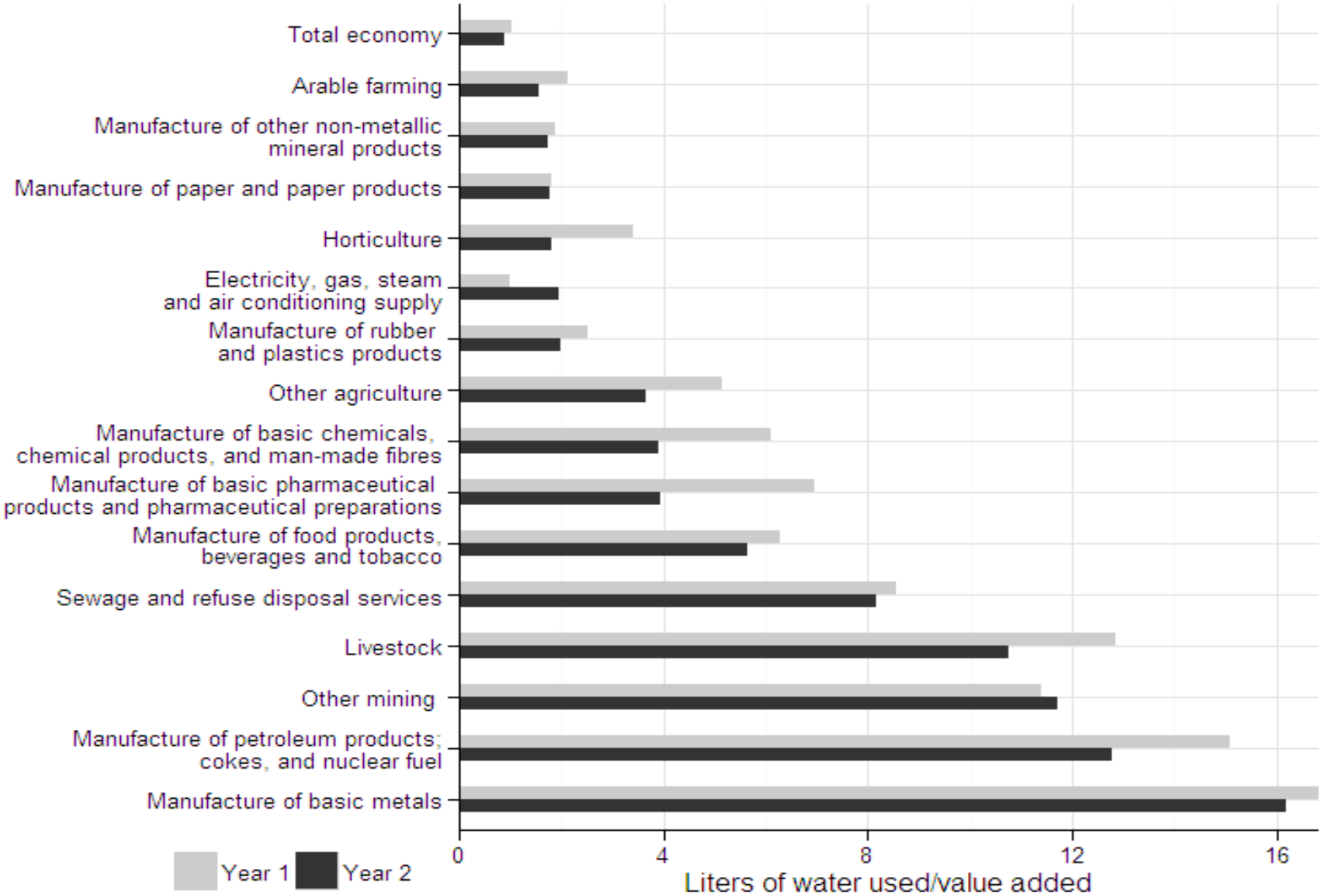
# Resource use and environmental efficiency

- Efficiency indicators—two broad categories
- Environmental efficiency indicators
  - characterise the environmental and economic efficiency with which **pollutants and other residuals** generated in production and consumption are mitigated, controlled and prevented.
  - They are usually expressed as intensity or productivity ratios.
- Resource efficiency indicators
  - characterise the efficiency with which **natural resources**, including water, energy and other materials are used in production and consumption.
  - usually expressed as intensity or productivity ratios.
  - relate environmental variables such as the extraction, supply or consumption of natural resources and materials to economic variables such as output, income and value added.

# Resource use and environmental efficiency

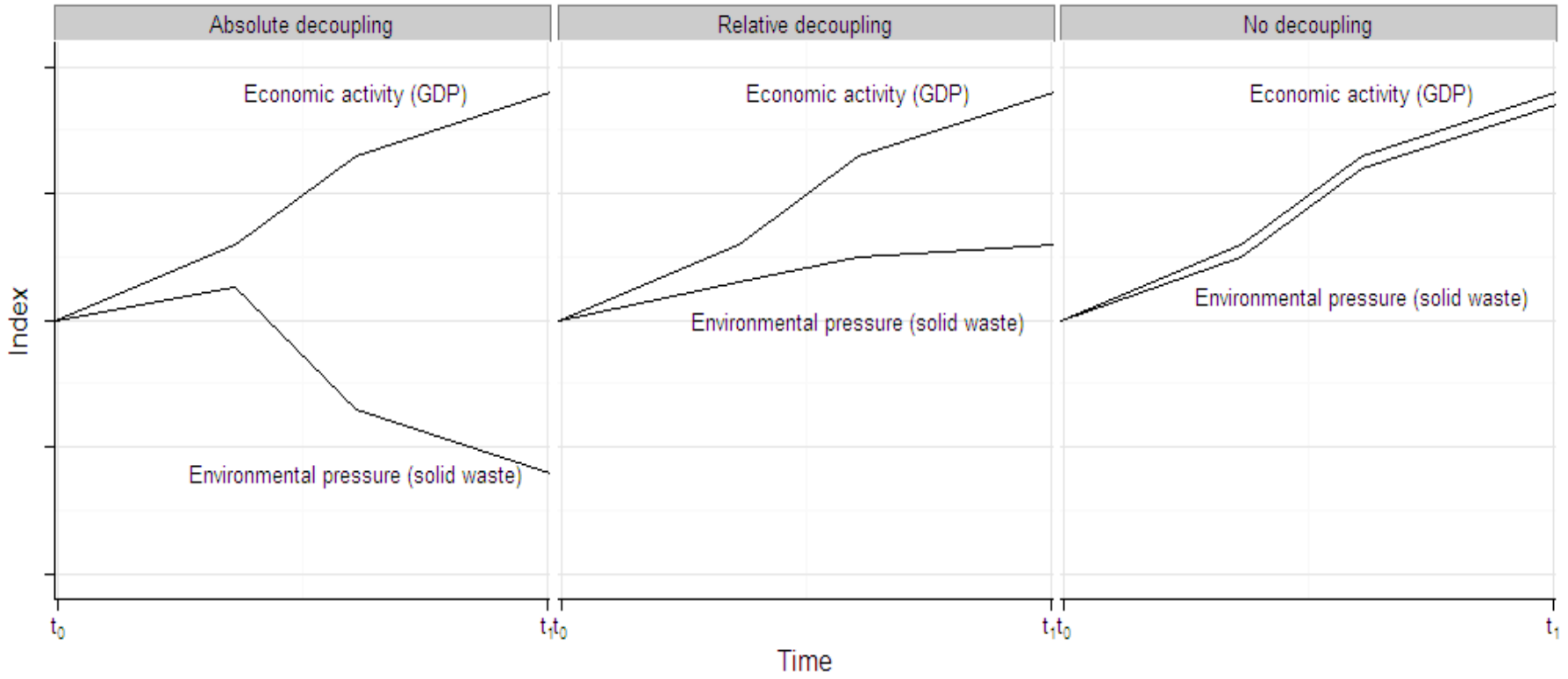
- Environmental efficiency indicators
  - Greenhouse Gas (GHG) or CO2 productivity
  - Air pollutant emission intensities
  - Water pollution intensities
- Resource efficiency indicators
  - Material productivity or intensity indicators
  - Energy productivity or intensity indicators
  - Water use productivity or intensity indicators

# Example - Industry level water use intensity indicators

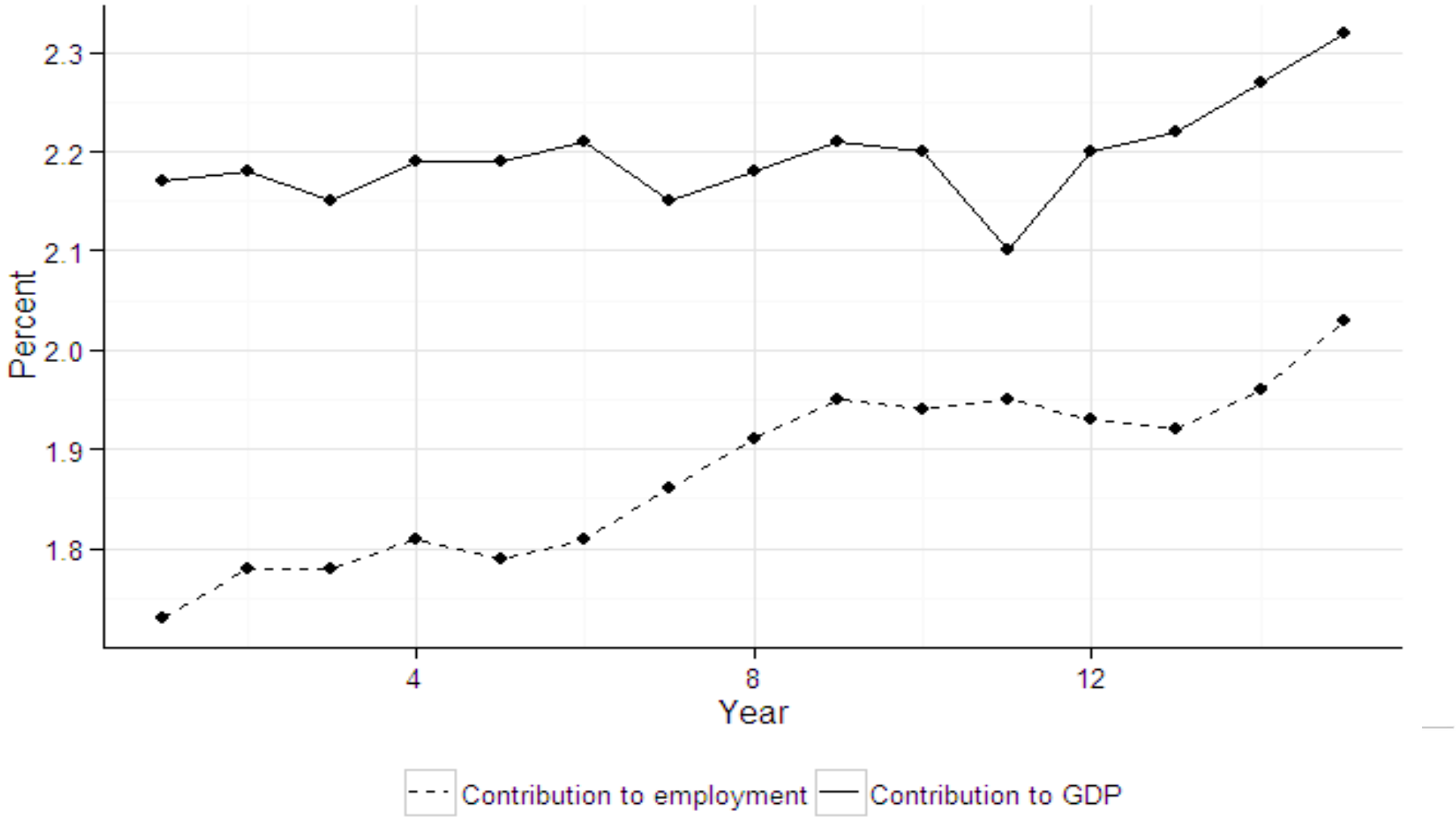


# Resource use and environmental efficiency-decoupling

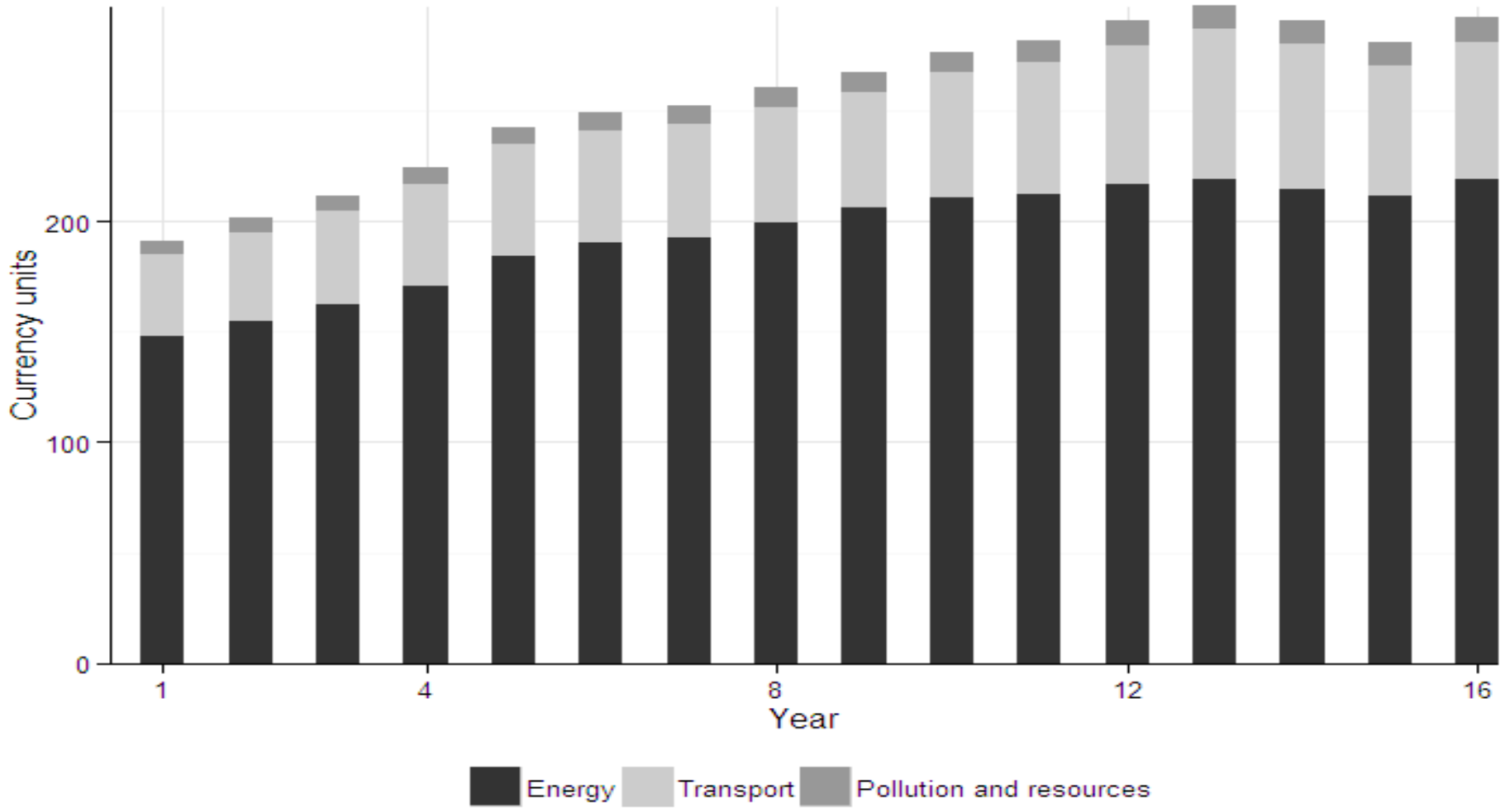
- Absolute: growth in the environmentally relevant variable is flat or decreasing while economic activity increasing
- Relative: growth rate of the environmentally relevant variable is positive but less than the growth rate of the economic variable



# Example – EGSS contributions to GDP and employment



# Taxes example: Environmental tax revenue by type

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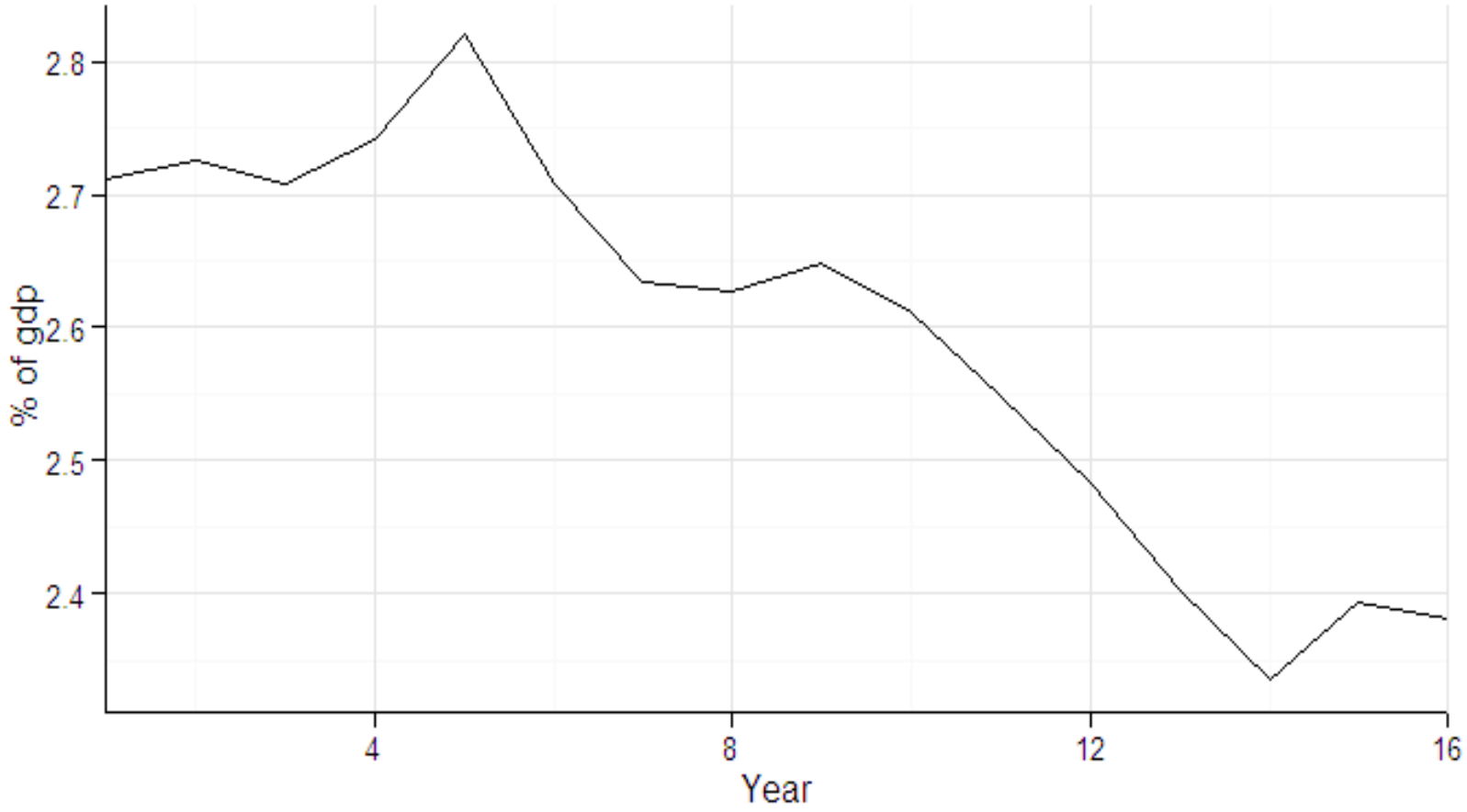
# Taxes example: Environmental tax revenue as % of GDP



# Example of indicators drawn from SEEA Energy and the national accounts

| Measurement issue | Indicator | Data sources for the indicator | |
|---|---|---|---|
| | | SEEA Energy | National accounts |
| Decoupling: Can economic growth happen without a similar increase in energy use? | Energy use per GDP | Physical supply-use tables for energy | Production account |
| Are expenditures on energy becoming relatively more or less burdensome for households? | Share of household income spent on fuel and electricity | Monetary supply-use tables for energy | Account for secondary distribution of income |
| How many years of energy extraction is left if extraction continues as now? | Resources-to-production ratio | Physical asset accounts for energy | |
| Is the economy weak sustainable? | Total national wealth | Monetary asset accounts for energy | Balance sheets |

# THANK YOU

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