SEEA and the Green Economy

Anthony Dvarskas
United Nations Statistics Division
July 3, 2013

Presentation Overview

- Review of the SEEA
- SEEA and Green Economy
- Example tables and indicators

The Suite of SEEAs

- **1993** Handbook – interim publication
- **2003** Updated SEEA handbook – manual of best practices
- **2006** UNSC decided to elevate SEEA to an international standard

- **2012 SEEA – The Central Framework (internationally agreed standard)**

Chapter 1 – Introduction to SEEA Central Framework
Chapter 2 – Accounting structure
Chapter 3 – Physical supply and use
Chapter 4 – Environmental activity accounts and flows
Chapter 5 – Asset accounts
Chapter 6 – Integrating and presenting the accounts

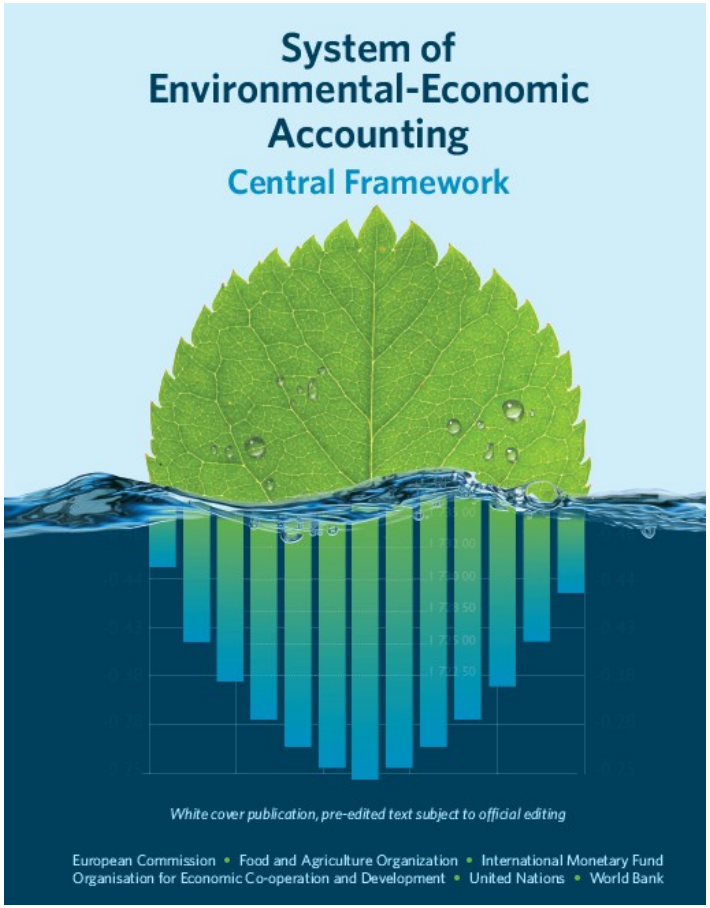
- **2013 SEEA – Experimental Ecosystem Accounts**
- **2013 SEEA – Applications and Extensions**

Subsystems:

- SEEA-Water, SEEA-Energy

Recent advances - SEEA

- Internationally agreed statistical framework to measure environment and its interactions with economy
- Adopted as international statistical standard by UN Statistical Commission in 2012
- Developed through inter-governmental process
- Published by UN, EU, FAO, IMF, OECD, WB

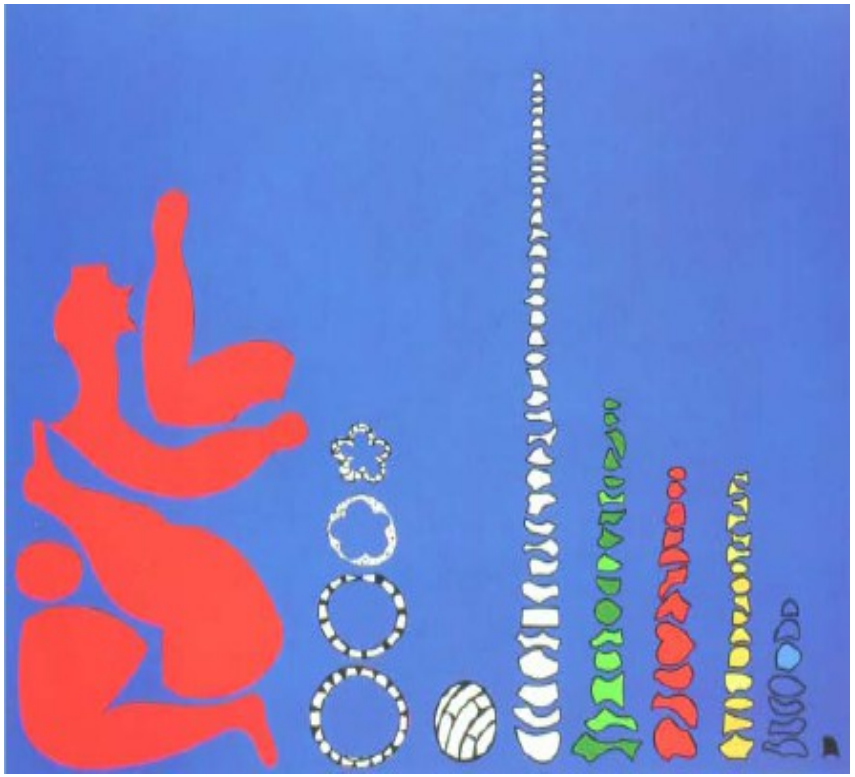


SEEA: A Statistical Standard

- Countries are “encouraged to implement the standard”
- International organizations have obligations to assist countries in implementation
- Implementation strategy adopted by Statistical Commission in March 2013
- Data reporting mechanism will be established

Problem: Information silos

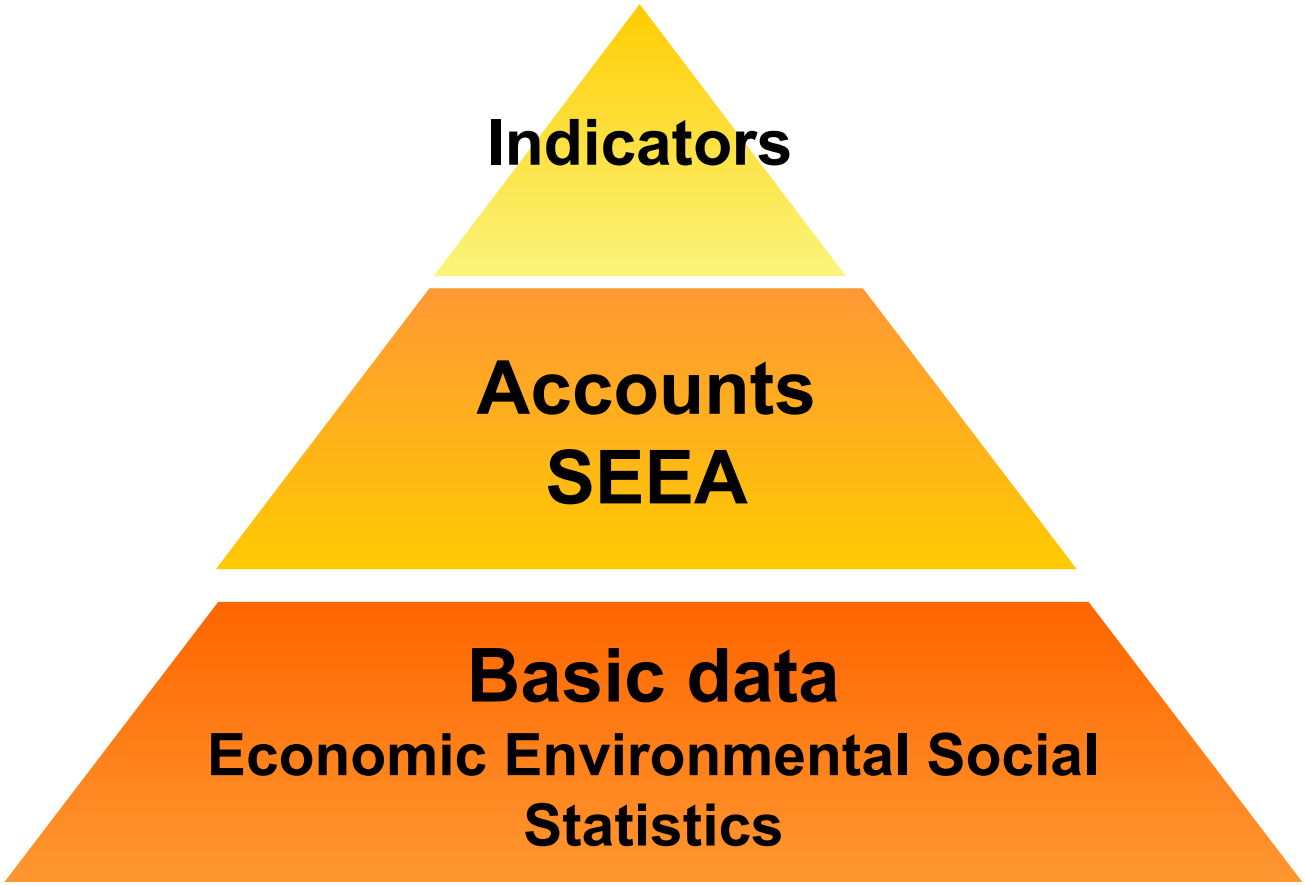
- Data developed to answer one particular question or problem
- Difficult to figure out if all information is included
- Not always easy to see the whole picture, or how it relates to other things



Solution: Integrated information

- Holistic picture
- Consistency of information and identification of data gaps
- Interconnections between economy, environment and society

The information pyramid



The SEEA Central Framework Accounts

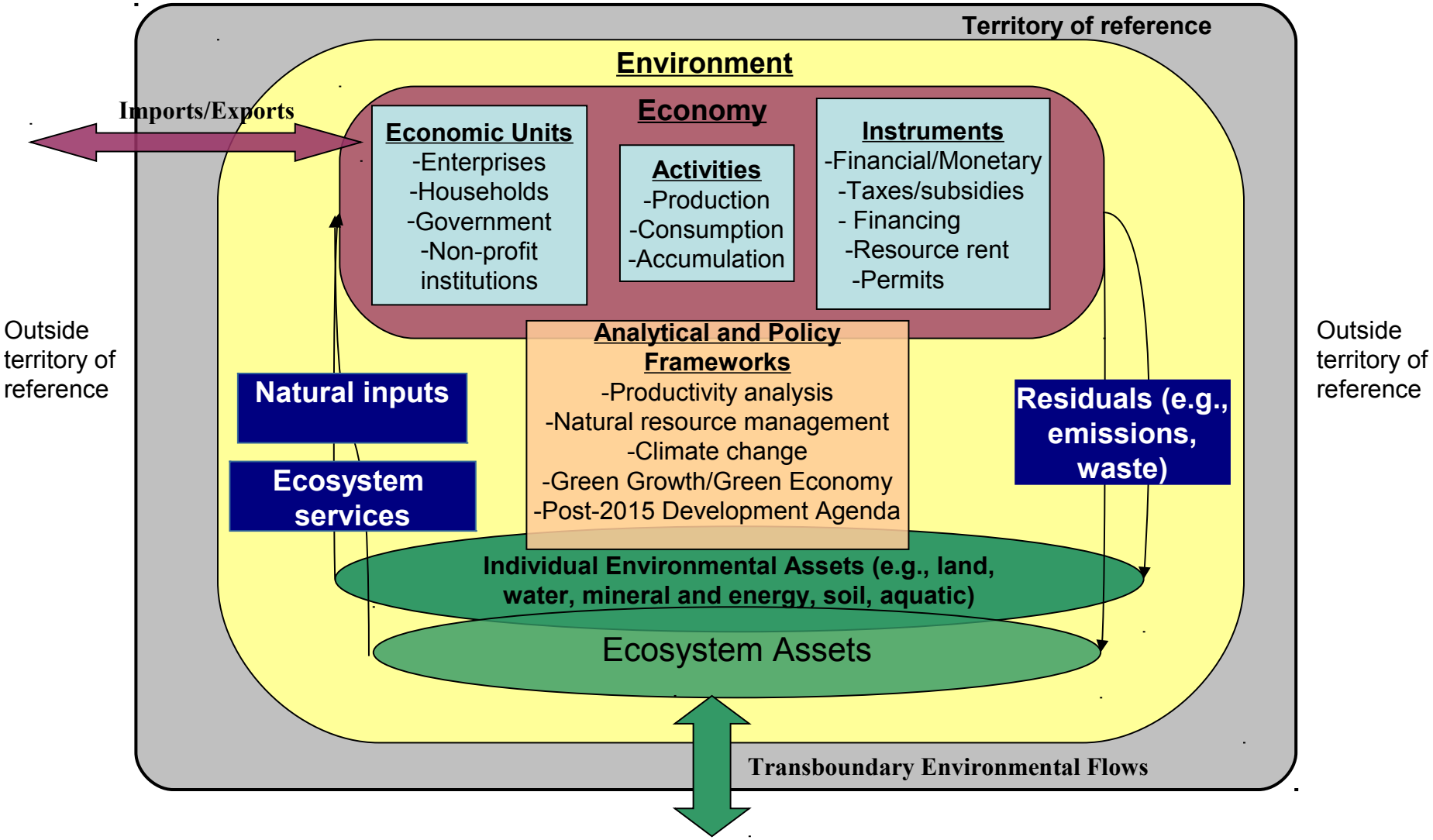
1. **Flow accounts**: supply and use tables for products, natural inputs and residuals (e.g. waste, wastewater) generated by economic activities.
   - physical (e.g. m^2 of water) and/or monetary values (e.g. permits to access water, cost of wastewater treatment, etc.)

2. **Stock accounts** for environmental assets: natural resources and land
   - physical (e.g. fish stocks and changes in stocks) and/or monetary values (e.g. value of natural capital, depletion)

3. **Activity / purpose accounts** that explicitly identify environmental transactions already existing in the SNA.
   - e.g. Environmental Protection Expenditure (EPE) accounts, environmental taxes and subsidies

4. **Combined physical and monetary accounts** that bring together physical and monetary information for derivation indicators, including depletion adjusted aggregates

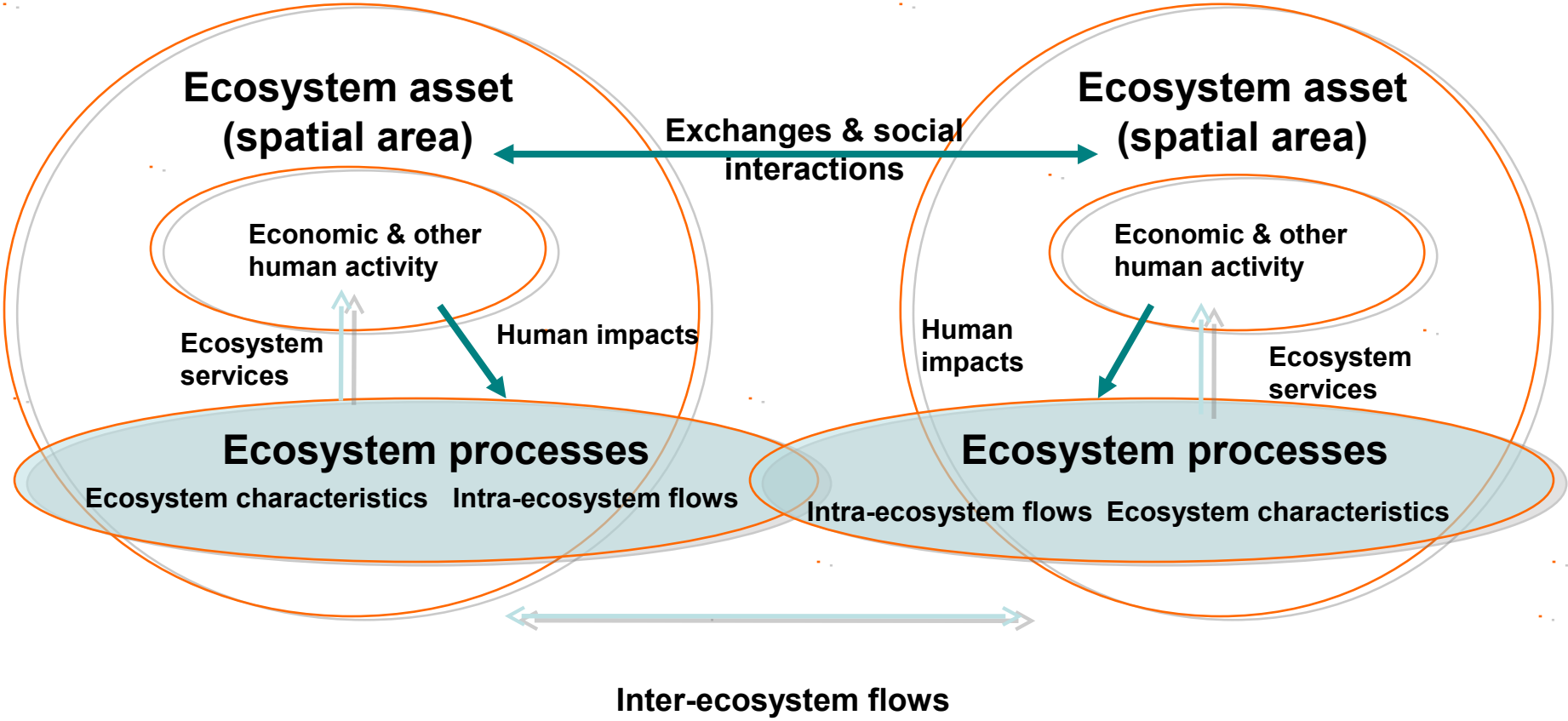
SEEA Conceptual Framework



SEEA Experimental Ecosystem Accounting

- Complements SEEA Central Framework
- Integrated statistical framework for accounting for ecosystem assets and associated services
- Important first step in development of statistical framework for ecosystem accounting

Basic accounting model



Ecosystem services

Ecosystem services are services that benefit humanity, and can be of direct or indirect use. Broad examples include:

- Provisioning services (nutrition, medicine, fur, uncultivated food)
- Regulating services (climate regulation, flood control, water filtration, air filtration, de-pollution)
- Cultural services (science, spiritual, ceremonial, recreation, aesthetic)

OECD Green Growth Strategy and SEEA

- Underlying conceptual frameworks very similar: combining economy and environment
- SEEA is powerful tool for green growth analysis (including input-output type of analysis)
- Main links between OECD GGS and SEEA:
  - Indicators that monitor the environmental and resource efficiency of the economy
  - Indicators that monitor environmental assets and their role in the economy
  - Indicators that monitor environmentally-related activities and instruments, and their role in the economy
- OECD plans to develop core set of SEEA tables to develop selected GGS indicators

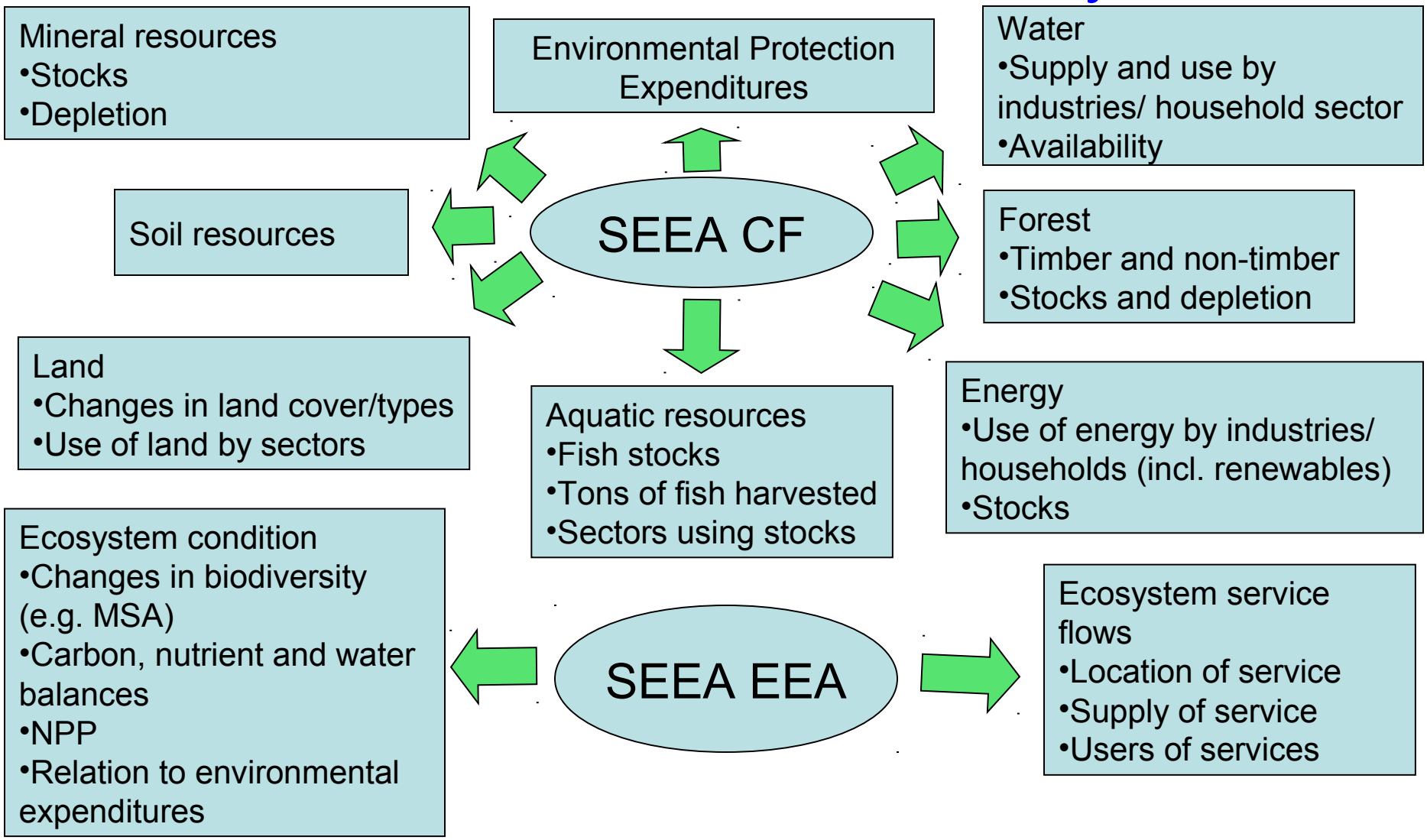
Source: OECD

Green Economy Indicators

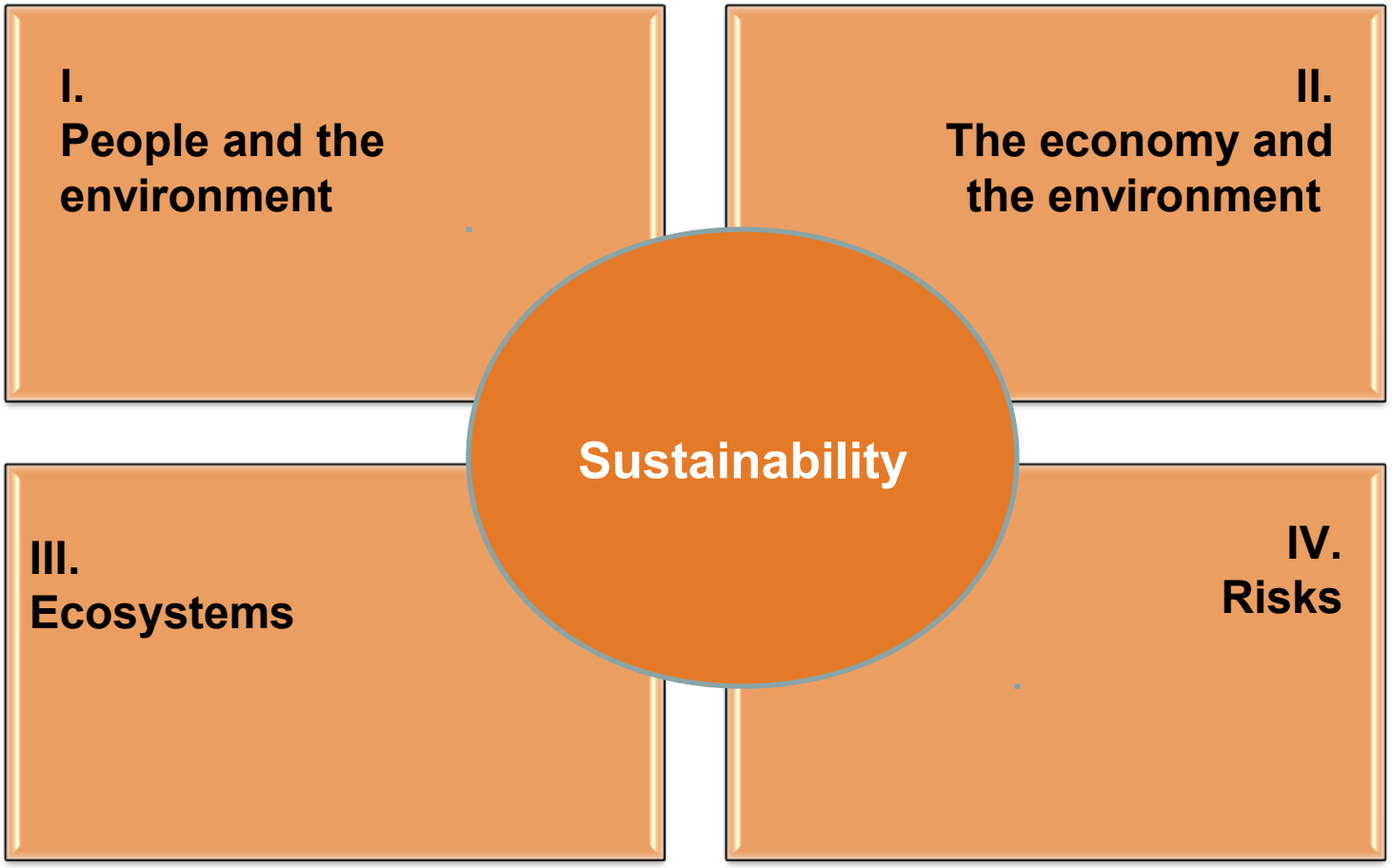
- Tracking state of the environment over time
  - Natural resource stocks
  - Flows impacting stocks
- Tracking pressures
  - Consumption and production patterns
  - Emissions
- Tracking environmental impact
  - Changes in ecosystem condition and services

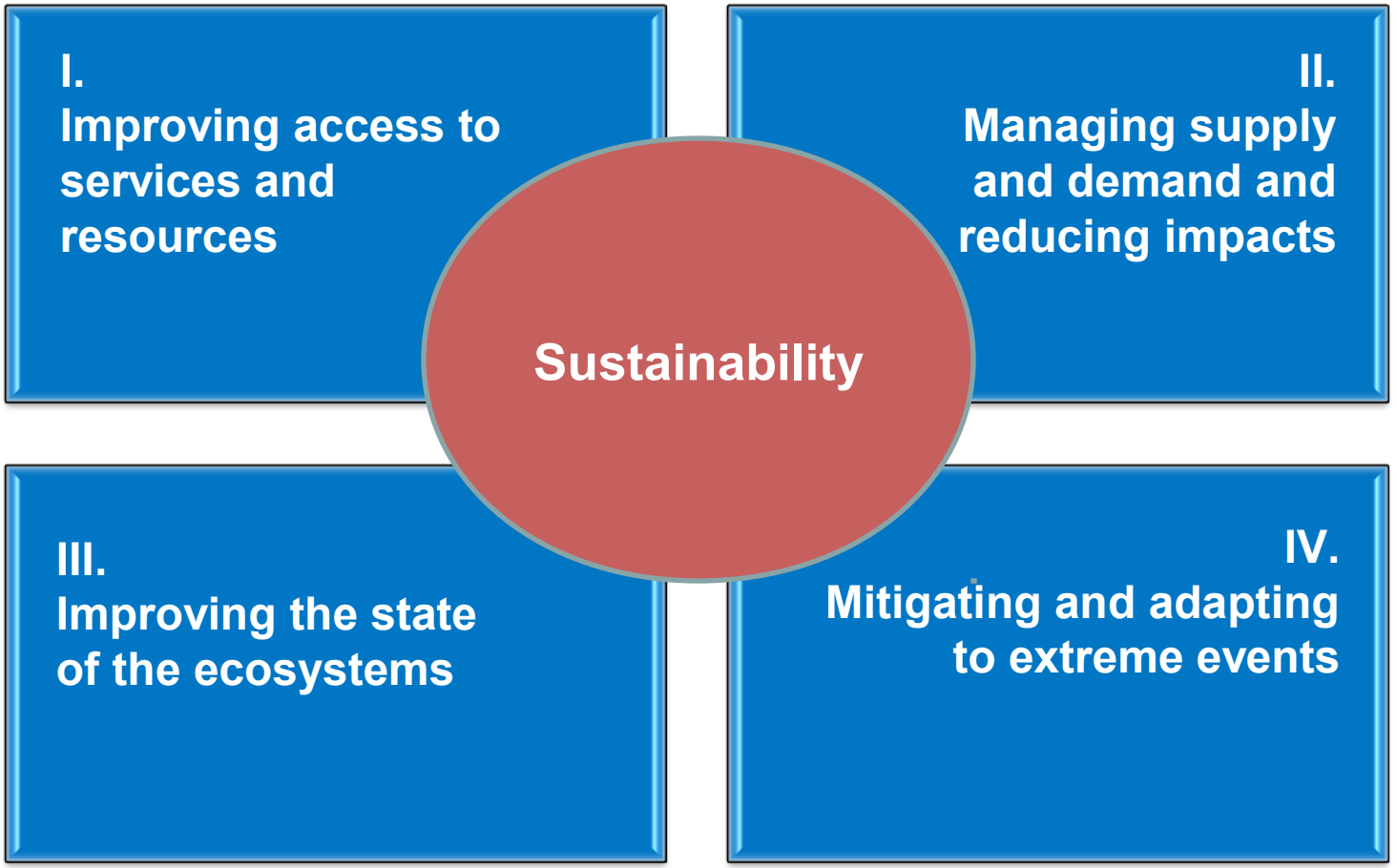
=> SEEA is natural framework for measurement of green economy

SEEA and Green Economy



The SEEA Policy Quadrants




I.
Improving access to services and resources
II.
Managing supply and demand and reducing impacts
Sustainability
III.
Improving the state of the ecosystems
IV.
Mitigating and adapting to extreme events

Quadrant I: Improving access

I. Improving access to services and resources

Key information in this quadrant (household sector related):

- Costs associated with the provision of services to households
- Investments in network infrastructure
- Employment and compensation in household production units
- Household consumption and disposable income
- Poverty and inequality

Quadrant II: The economy and the environment

II. Managing supply and demand

- ·Environmental goods and services sector (EGSS)
- ·Employment in EGSS
- ·Natural resource stocks

Key information in this quadrant:

- Efficiency of production
  - Decoupling
  - Multifactor productivity
- Efficiency of consumption
  - Embedded emissions
  - Footprint indicators
- Costs of production and payments by users (e.g. fees, taxes, rents, permits, etc.)
- Employment and compensation
- Financing (who pays for investments and current costs)
- Depletion
- Solid waste and emissions
- Environmental protection and resource management expenditures

Quadrant III: Water Quality and Water Health

III. Improving the state of the ecosystems

Key information in this quadrant:

- Ecosystem extent
- Ecosystem conditions
  - Water cycle
  - Carbon cycle
  - Nutrient cycle
  - Primary productivity
- Biodiversity
- Regulatory services provided by ecosystems

Quadrant IV: Extreme Events

IV. Mitigating and adapting to extreme events

Key information in this quadrant:

- Natural disasters
- Investments for mitigation
- Investments for adaptation

SEEA Example

- Water use and supply in Mauritius

ISIC	Concept	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	Households	69.2	62.0	65.3	67.1	67.6	70.3	70.6	73.1	73.2	73.0	72.1	75.2	76.6	73.7
10-33	Manufacturing	4.7	4.4	4.6	4.7	4.7	5.0	4.8	4.8	4.7	4.8	4.0	4.1	4.3	4.3
34-99 except 35, 36, 37, 55	Services	10.2	7.9	8.3	8.8	9.2	9.8	9.9	10.4	10.6	11.4	11.9	12.5	12.9	11.9
55	Accommodation services	2.9	3.1	3.3	3.6	3.5	3.6	3.7	4.1	4.3	4.4	4.6	4.7	5.1	5.2
01-03	Agriculture & livestock (potable)	0.8	1.0	0.9	0.9	1.0	1.1	1.1	1.3	1.4	1.4	1.4	1.5	1.5	1.5
	TOTAL POTABLE WATER SUPPLIED	87.8	78.3	82.4	85.1	86.1	89.8	90.2	93.7	94.3	95.2	94.0	97.8	100.3	96.5

Source: Central Water Authority

SEEA CF Example Asset Table

	Type of mineral and energy resource (Class A: Commercially recoverable resources)				
	Oil resources ('000 barrels)	Natural gas resources (m3)	Coal & peat resources ('000 tonnes)	Non-metallic minerals (tonnes)	Metallic minerals ('000 tonnes)
Opening stock of mineral and energy resources	800	1 200	600	150	60
Additions to stock					
Discoveries					20
Upwards reappraisals		200		40	
Reclassifications					
Total additions to stock		200		40	20
Reductions in stock					
Extractions	40	50	60	10	4
Catastrophic losses					
Downwards reappraisals			60		
Reclassifications					
Total reductions in stock	40	50	120	10	4
Closing stock of mineral and energy resources	760	1 350	480	180	76

* Different physical units (e.g. tonnes, cubic metres, barrels) will be used for different types of resources.

SEEA CF Example Physical Flow Table

	Supply table for air emissions								Use table for air emissions		
	Generation of emissions							Accumulation	Total supply of emissions	Flows to the Environment	Total use of emissions
	Industries					Households					
	Agriculture	Mining	Manufacturing	Transport	Other	Transport	Heating	Other	Emissions from landfill		Emissions released to the environment	
Type of substance												
Carbon dioxide	10 610.3	2 602.2	41 434.4	27 957.0	82 402.4	18 920.5	17 542.2	1 949.1	701.6	204 119.6	204 119.6	204 119.6
Methane	492.0	34.1	15.8	0.8	21.9	2.4	15.5	1.7	222.0	806.3	806.3	806.3
Dinitrogen oxide	23.7		3.5	0.8	2.6	1.0	0.2	0.1	0.1	32.0	32.0	32.0
Nitrous oxides	69.4	6.0	37.9	259.5	89.0	38.0	12.1	1.3	0.3	513.6	513.6	513.6
Hydroflourocarbons			0.3		0.4					0.7	0.7	0.7
Perflourocarbons												
Sulphur hexaflouride												
Carbon monoxide	41.0	2.5	123.8	46.2	66.2	329.1	51.2	5.7	1.1	666.9	666.9	666.9
Non-methane volatile organic compounds	5.2	6.5	40.0	16.4	27.2	34.5	29.4	3.2	0.9	163.3	163.3	163.3
Sulphur dioxide	2.7	0.4	28.0	62.4	8.1	0.4	0.4	0.1	0.0	102.5	102.5	102.5
Ammonia	107.9		1.7	0.2	0.9	2.3	11.4	1.2	0.2	125.9	125.9	125.9
Heavy metals												
Persistent organic pollutants												
Particulates (incl PM10, dust)	7.0	0.1	8.5	9.3	4.4	6.0	2.8	0.5	0.0	38.5	38.5	38.5

SEEA EEA Table Example

- Ecosystem condition and extent in Victoria

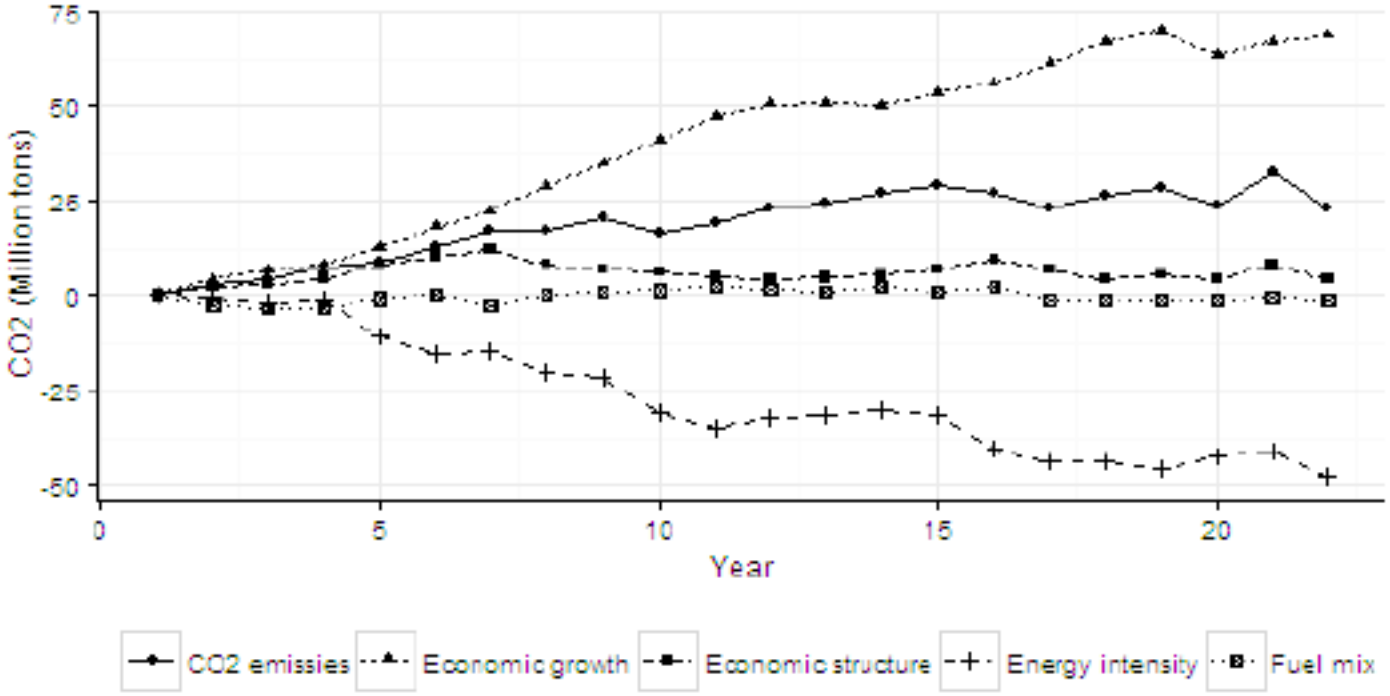
Table 7. Victorian wetland extent and condition classified by wetland system and origin: 1750, 1994, 2012

	1750		1994		2012	
Wetland system type and origin (2012)	Extent (Ha)	Average condition	Extent (Ha)	Average condition	Extent (Ha)	Average condition
Origin - Naturally occuring wetlands						
Estuarine	41,001	1	31,455	unknown	35,467	0.71
Lacustrine	152,437	1	138,998	unknown	169,083	0.65
Marine	3,216	1	3,160	unknown	3,302	unknown
Palustrine	218,763	1	187,497	unknown	289,405	0.78
Palustrine or Lacustrine (unknown specifics)	3,745	1	1,005	unknown	6,919	0.40
Unclassified	250,418	1	-	unknown	-	NA
Total natural wetlands	**669,580**	**1**	**362,115**	**unknown**	**504,176**	**0.70**
Origin - Non-naturally occuring wetlands						
Estuarine	-	NA	25,331	unknown	26,860	0.71
Lacustrine	-	NA	84,606	unknown	98,399	0.57
Marine	-	NA	41	unknown	633	unknown
Palustrine	-	NA	11,535	unknown	26,169	0.72
Palustrine or Lacustrine (unknown specifics)	-	NA	47	unknown	2,015	unknown
Unclassified	-	NA	46,499	unknown	-	NA
Total non-natural wetlands	-	NA	**168,059**	**unknown**	**154,076**	**0.64**
Total wetlands	**669,580**	**1**	**530,174**	**unknown**	**658,252**	**0.69**
Land not classified as wetland	*22,029,767*	*NA*	*22,169,173*	*NA*	*22,041,095*	*NA*

Source: Victorian Experimental Ecosystem Accounts

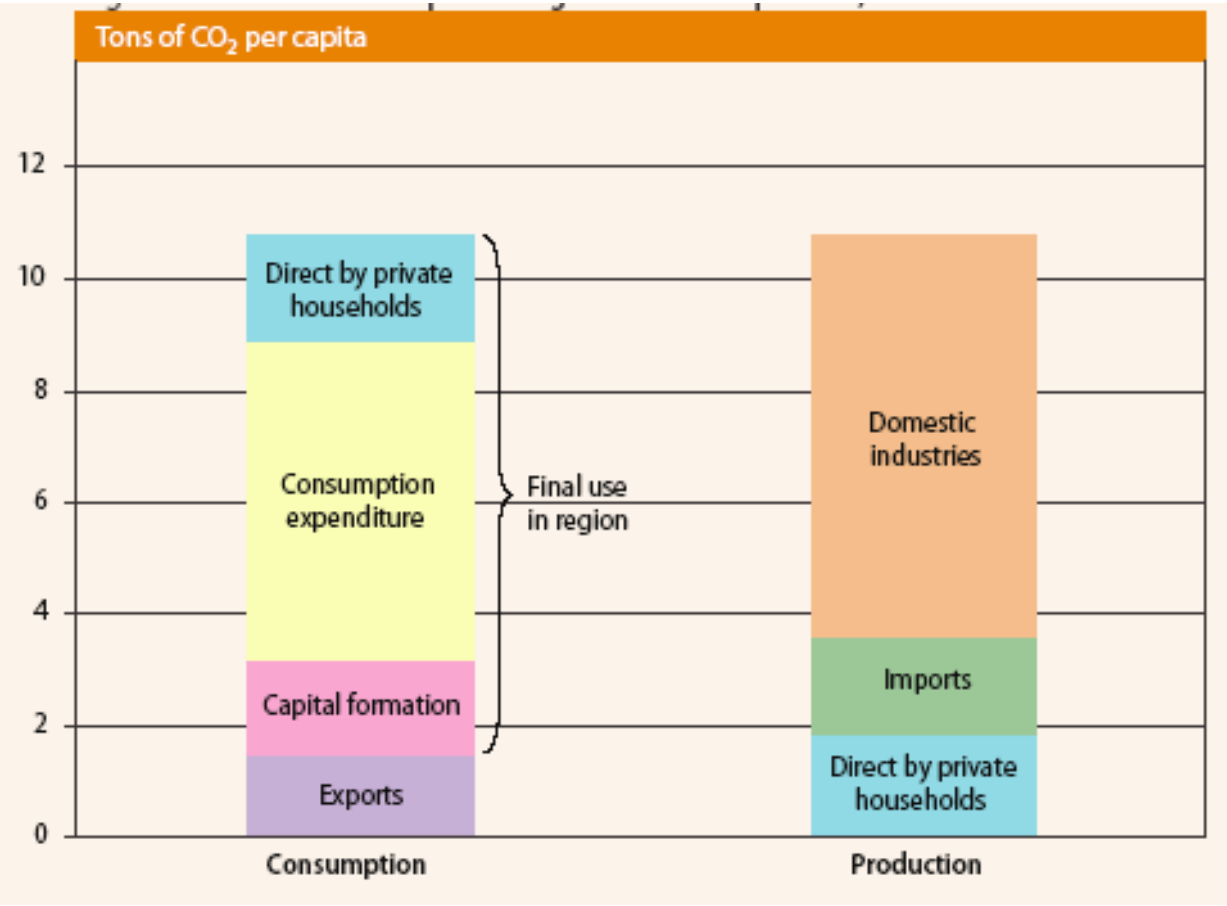
SEEA Examples

- Decomposition analysis



SEEA Examples

- Consumption and Production



Reference Material

Briefing notes:

Briefing note on SEEA Central Framework:
http://unstats.un.org/unsd/envaccounting/Brochure.pdf

Briefing note on SEEA Experimental Ecosystem Accounting:
http://unstats.un.org/unsd/envaccounting/workshops/int_seminar/note.pdf

Briefing note on SEEA Water and International Recommendations for Water Statistics (IRWS)
http://unstats.un.org/unsd/envaccounting/WWAP_UNSD_WaterMF.pdf

Methodological publications:

SEEA Central Framework:
http://unstats.un.org/unsd/envaccounting/White_cover.pdf

SEEA Experimental Ecosystem Accounting:
http://unstats.un.org/unsd/statcom/doc13/BG-SEEA-Ecosystem.pdf

SEEA Applications and Extensions:
http://unstats.un.org/unsd/statcom/doc13/BG-SEEA-AE.pdf

Library – searchable library of publications (e.g. country case studies, methodological publications, etc.)
http://unstats.un.org/unsd/envaccounting/ceea/archive/

Research agenda accompanying SEEA-Experimental Ecosystem Accounting
http://unstats.un.org/unsd/statcom/doc13/BG-SEEA-ResearchAgenda.pdf

Contact E-mail: dvarskas@un.org; seea@un.org