Introduction to SEEA 2012

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Learning outcomes

On completion of this unit, you will understand:

- The defining characteristics of Environmental Accounts and how these differ from environmental statistics
- The Statistical frameworks described by the SEEA-2012 and their relationship to the SNA.

The Environment in National Accounts

... a country could exhaust its mineral resources, cut down its forests, erode its soil, pollute its aquifers, and hunt its wildlife to extinction, but measured income would not be affected as these assets disappeared **(Repetto *et al*, 1989).**

Setting the Scene

Discuss the following questions in groups:

1. What do you think environmental statistics are

2. What do you think environmental accounts are?

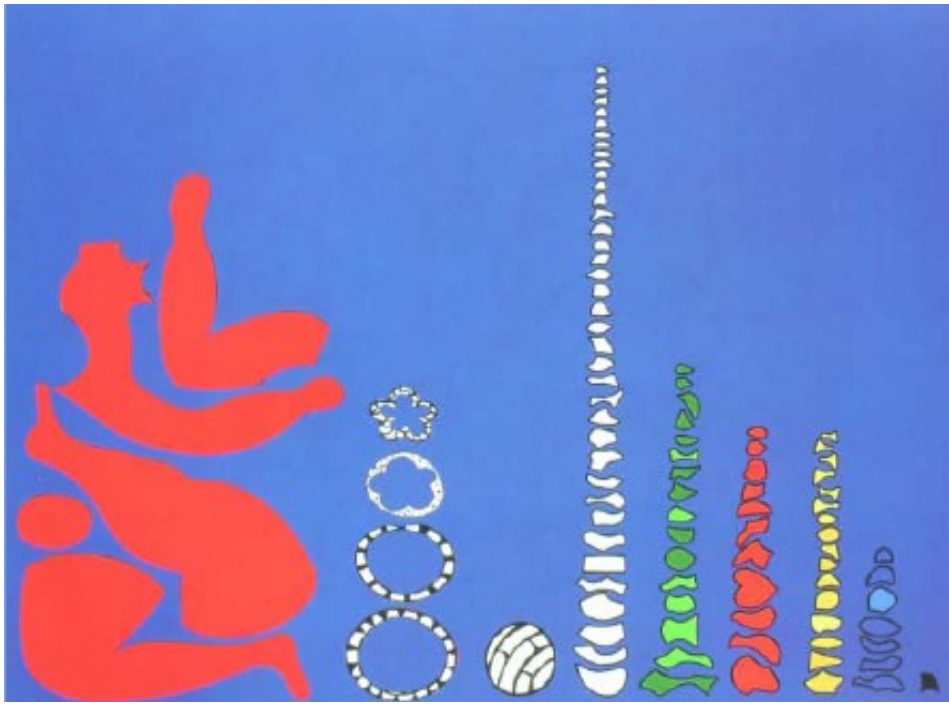
What are environmental statistics?

Statistics - the process of *collecting, organising and interpreting* numerical data about observable phenomena

- are commonly compiled with a particular regulatory or administrative purpose in mind
- use a variety of concepts, methods and classifications
- are often not well integrated with other datasets
- Environmental statistics may assist in the formulation and evaluation of socio-economic and environmental policies

Limitations of environmental statistics

- 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



Source: Julie Hass, Statistics Norway

Examples of Environmental Statistics produced by the ABS:

ABS Cat.No.4602.0 ***Environment Issues – People's Views and Practices. March 2007***

ABS Cat.No.4602.0.00.002 ***Community Engagement with Nature Conservation, Australia, 2011-12***

ABS Cat.No.4615.0 ***Salinity on Australian Farms, 2002.***

ABS Cat.No.4626.0.55.001 ***Environmental views and behaviour, 2011-12***

ABS Cat.No.4656.5 ***Household Choices Related to Water and Energy, WA, October 2009***

ABS Cat. no. 5204.0 ***Australian system of National Accounts, 2012-13***

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Why do we need environmental-economic information?

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- The quality of the environment impact human welfare an important policy issue
- concern about impact of economic activity on the environment
- continuing economic growth and human welfare depend on the environment
- are environmental endowments being used responsibly and **sustainably?**

What is sustainable development?

This concept is difficult to define. Here is the UN definition:

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Reference

UN (1987) *Our Common Future: Report of the World Commission on Environment and Development*. Transmitted to the General Assembly as an Annex to document A/42/427 — Development and International Co-operation: Environment. Oxford: Oxford University Press.

Integration of issues

There has been a shift in policy focus away from considering the economy, society and the environment as separate issues, to a more integrated approach aimed at sustainable development.

Accounting frameworks have the potential to link economic, social and environmental data, proving useful to structure economic statistics, and derive economic indicators.

Role of Environmental Accounts

Environmental (or *environmental-economic*) accounts are a tool to measure sustainability of economic behaviour.

These accounts provide an integrated framework for consistent analysis of the contribution of the environment to the economy, and the impact of the economy on the environment.

Why an accounting approach?

- encourages the adoption of standards
- generates consistency
- implicitly defines ownership (and hence responsibility) for environmental impacts
- encourages the development of comprehensive datasets
- facilitates international comparisons

Environmental Accounts

- Help make sense of the larger picture
- Helps to identify pieces that are missing
- Can make connections to other statistics – especially economic statistics

Source: Julie Hass, Statistics Norway

History of SEEA

Integration of these concerns required development of a statistical framework that combined the System of National Accounts — an economic tool — with appropriate environmental and social indicators:

- Rio Conference (1992)
- Agenda 21 proposed 'a program to develop national systems of integrated environmental and economic accounting in all countries'.

SEEA: A Framework for Environmental Accounts

In 1993, the United Nations endorsed the link between GDP and the environment:

- 1993
  - Publication of Interim version (SEEA-1993)
  - Established the London Group
  - 1993 SNA included a chapter on **satellite accounts**

- 2003
  - Publication of SEEA-2003
  - Established the London Group

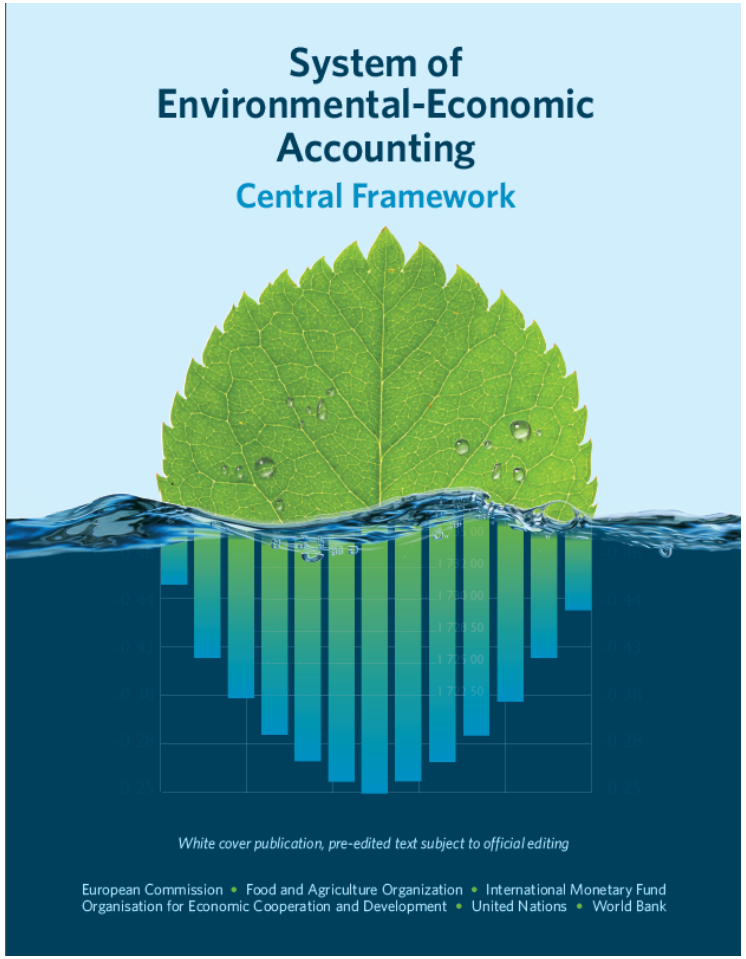
- UNSC at its 2006 session established the mechanisms to elevate SEEA to status of an international statistical standard:

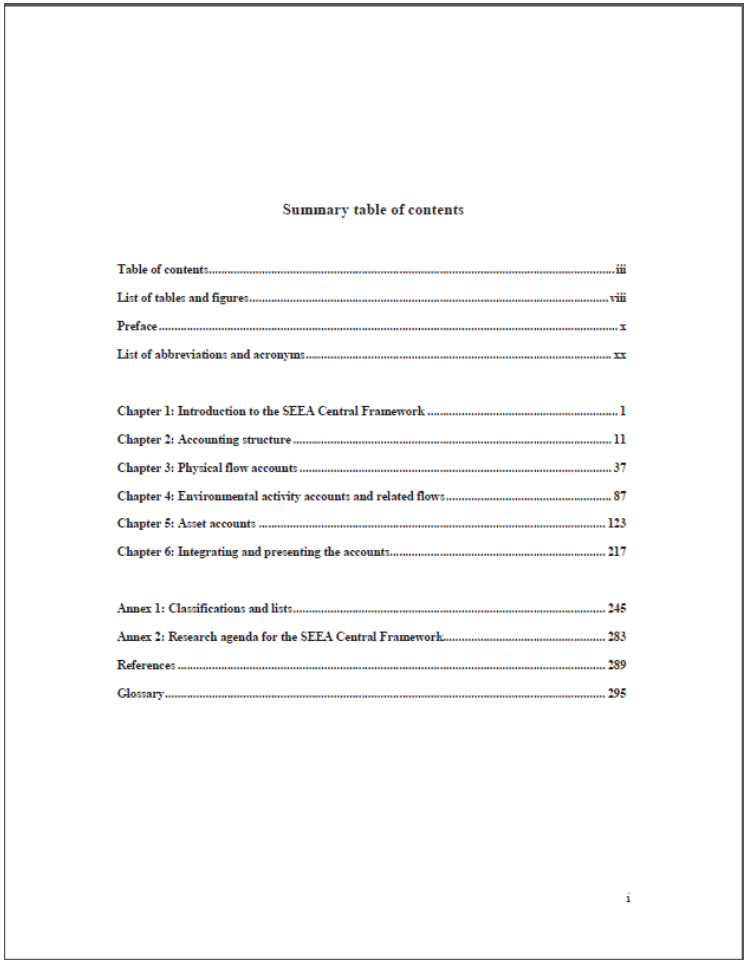
SEEA: A Framework for Environmental Accounts

- *System of Environmental-Economic Accounting – Central Framework* (SEEA-2012) adopted as an international standard at the United Nations Statistical Commission (UNSC) in 2012

- environmental concerns to be integrated into mainstream economic reporting by member countries

System of Environmental-Economic Accounting – Central Framework





Summary table of contents

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SEEA main building blocks

1. Physical Supply-Use tables & hybrid Accounts
2. Physical Asset Accounts
3. Accounts for Economic Activities related to the environment
4. Valuing environmental assets

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1. Physical Supply-Use (S-U) tables & hybrid Accounts

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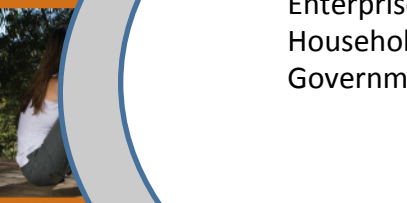
- Measures physical characteristics on production/consumption processes
- Main (S-U) flows are: natural resources; products; residuals
- Use the same economic classifications (ISIC/CPC) as the SNA
- Hybrid/Combined tables to produce indicators

Environmental accounts, what do they cover?



Economy

Enterprises
Households
Government

Natural inputs (e.g. minerals, energy, timber, fish and water)

Products

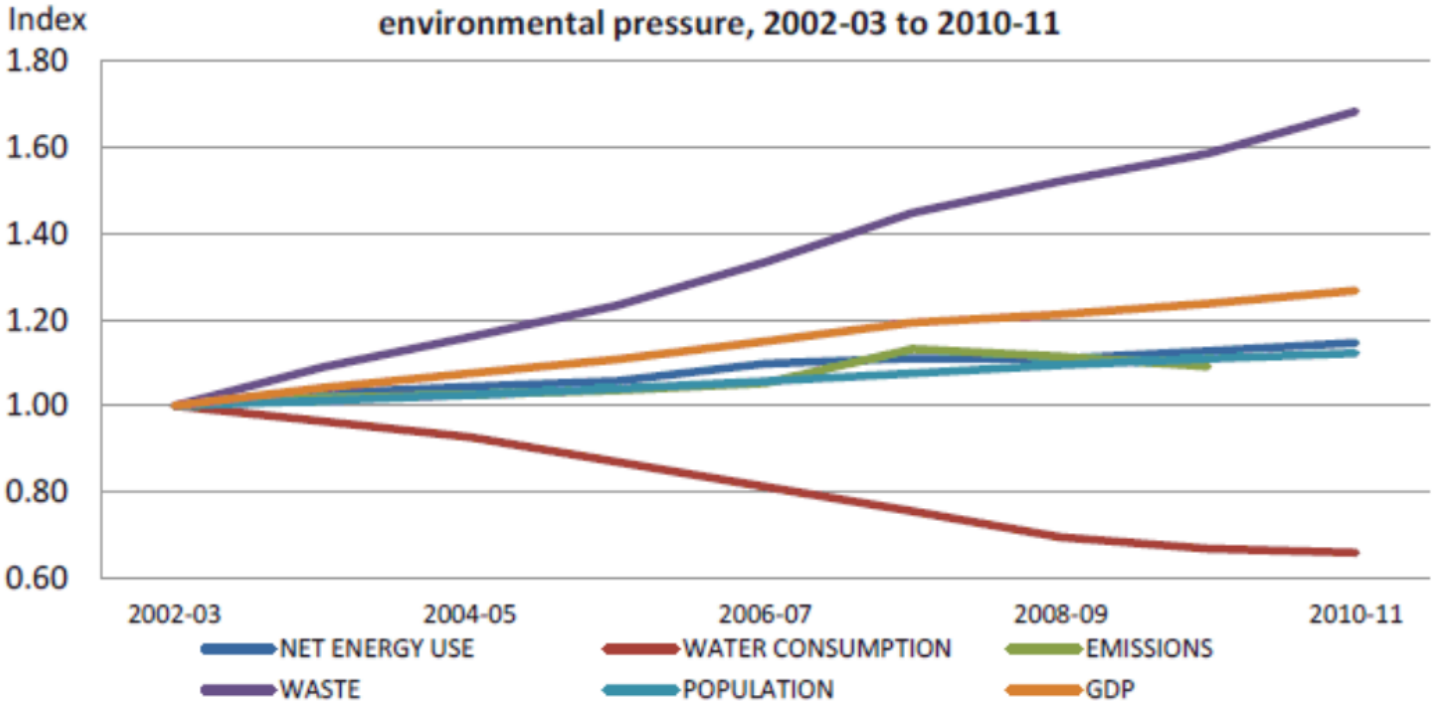
Residuals (e.g. air emissions, solid waste, return flows of water)

Environment

Mineral and energy resources
Timber resources
Fish resources
Water resources
Soil resources
Land

1. Physical Supply-Use (S-U) tables & hybrid Accounts *cont…*

Figure 1.3 GDP, population and selected physical indicators of environmental pressure, 2002-03 to 2010-11

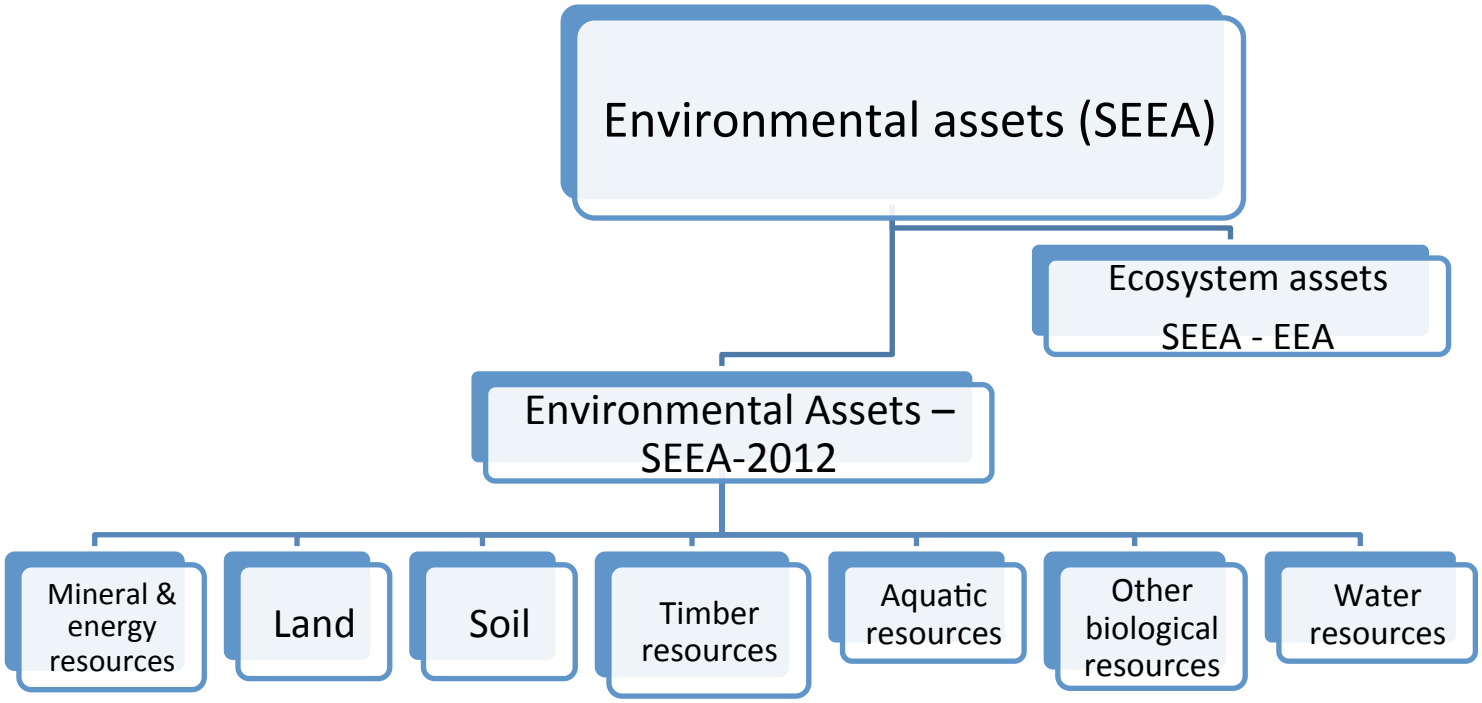


Note: Index: 2002-03 = 1

Sources: ABS; Department of Climate Change and Energy Efficiency; Department of Sustainability, Environment, Water, Population and Communities.

2. Asset Accounts

SEEA Asset Classification



2. Asset Accounts *cont…*

- Measures wealth of environmental capital in $$$ and physical terms
  - Inc. gains and losses

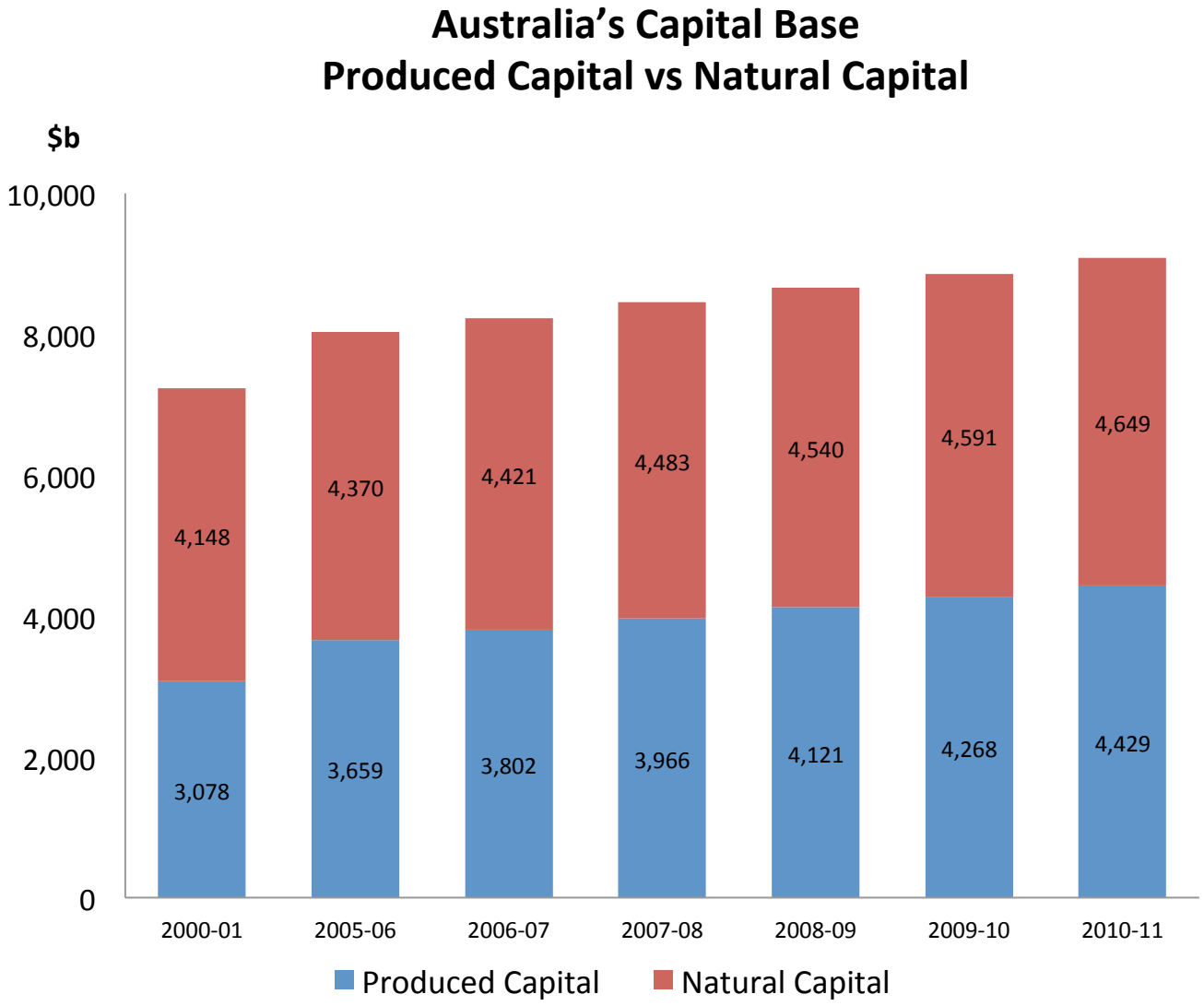
- Economic (SNA) environmental assets include
  - Land
  - Subsoil assets
  - Timber (plantation/native standing)
  - Fish stocks in open seas (some)
  - Water (possible)

2. Asset Accounts *cont…*

Environmental assets not included in ASNA:

- land with no 'economic' function
- sub-economic subsoil assets unavailable for economic exploitation
- water
- fish stocks in territorial waters
- native standing timber unavailable for economic exploitation
- other biological resources (e.g. native fauna)
- Biodiversity
- Amenity (Land)

2. Asset Accounts *cont…*



3. Valuing Environmental Assets

Market prices are preferred for the valuation of environmental assets.

In the absence of market prices both the SNA and SEEA (Central Framework) recommend the net present value (NPV) method.

This method is used to value some natural resource assets in the National Balance Sheet e.g. subsoil assets.

3. Valuing Environmental Assets: Subsoil

Various minerals are recorded on Australia's balance sheet, including coal, oil and natural gas reserves.

Subsoil assets in scope of the ASNA balance sheet meet the following criteria:

- Economically demonstrated reserves (EDRs)
- extraction is expected to be profitable at prevailing prices with existing techniques, and
- they are owned by an economic entity (typically the government).

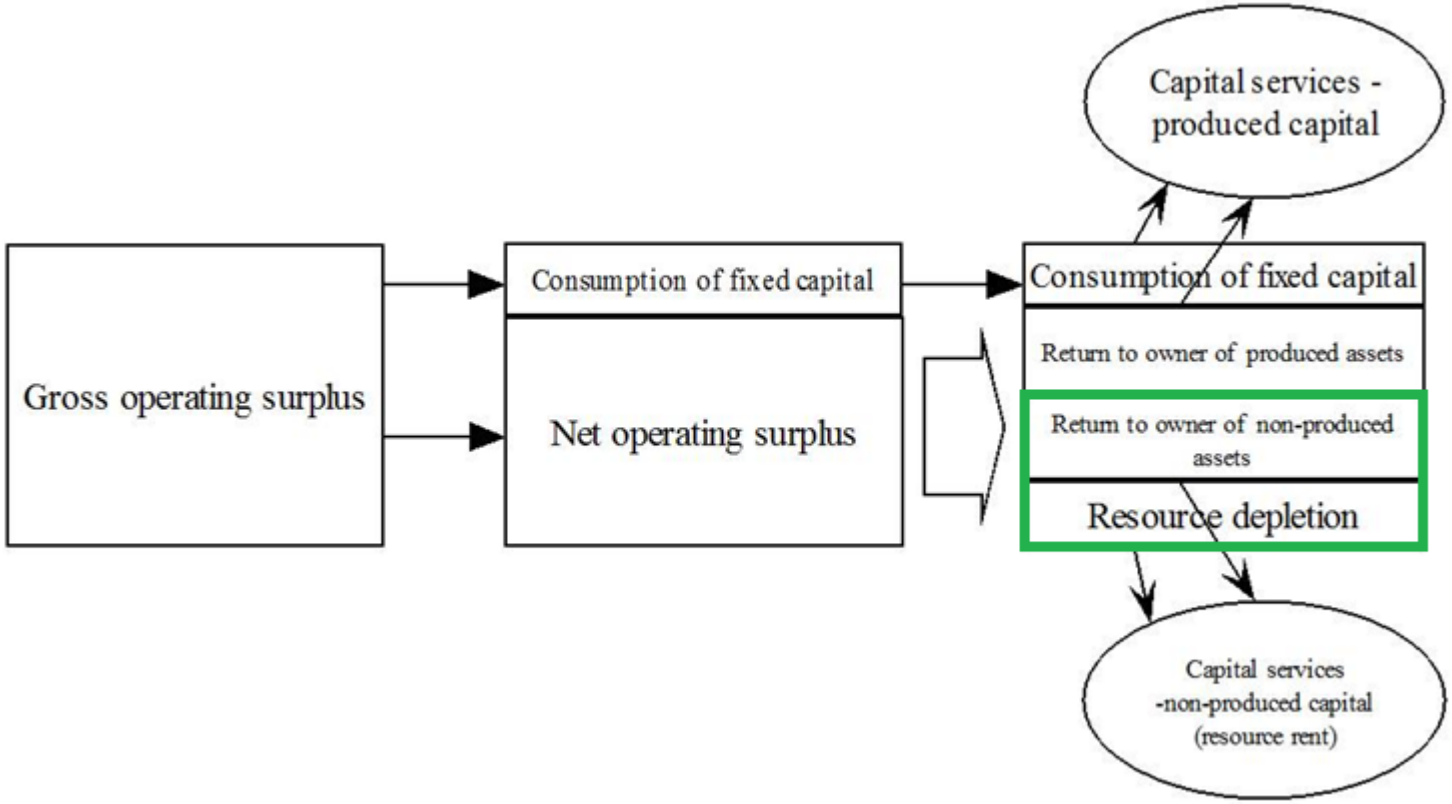
3. Valuing Environmental Assets cont…

What precisely is the economic benefit attributable specifically to owning and using mineral and energy resources?

- *Gross output - less* the cost of intermediate goods and services (to give gross value added), and *less* compensation of employees = GOS
- Not all of the firm's operating surplus can be attributed to the mineral and energy resource…
- Concept of resource rent

3. Valuing Environmental Assets: Subsoil *cont…*

Gross Operating Surplus: Resource rent



3. Valuing Environmental Assets: Subsoil *cont…*

ASNA uses the NPV method to value subsoil assets:

$$V_t = \sum_{t=1}^{n} \frac{RR_t}{(1+r)^n}$$

where

V	= net present value
RR	= resource rent
r	= discount rate
n	= asset life

Asset life equals EDR at the end of the year divided by the five-year moving average of production.

The discount rate used is the "large business borrowing rate", as published by the Reserve Bank of Australia. This rate represents the opportunity cost to mining companies for funds invested in extraction.

3. Valuing Environmental Assets: Depletion

Depletion — monetary (not physical) — arises when the value of a resource stock falls due to its use in productive activity. This use reduces the asset's ability to produce an income stream into the future.

Depletion in any one year is the change in the value of the asset between the beginning and end of the year, arising purely from its physical extraction.

3. Valuing Environmental Assets: Degradation

- Land degradation represents the real decline in land value resulting from declining quality of land.
- Land values are affected by multiple influences:
  - technological advances
  - water availability,
  - land use changes,
  - 'lifestyle' considerations, and
  - proximity to urban populations

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3. Environmentally—adjusted macroeconomic indicators

How do we calculate a measure of GDP that accounts for demands on the environment? No consensus on how "green GDP" is to be calculated. SEEA discusses adjustment of GDP for depletion of natural resources

Environmentally-adjusted Net Domestic Product (eaNDP) is the most commonly quoted indicator:

- focusses attention on depletion and degradation of natural capital

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Case Study: Nauru

What do you think Nauru's national accounts might show in 1975 and 2005?

e.g. production (GDP), income *etc.*

Do you think accounting for the environment could have helped Nauru?

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Nauru National Accounts 1975 & 2005 (theoretical excerpt)

1. Production account

	1975	2005		1975	2005
Uses	$m	$m	Resources	$m	$m
Intermediate consumption	370	55	Output	665	120
Gross domestic product	*295*	*65*			
Consumption of fixed capital	10	2			
Net domestic product	*285*	*63*			

2. Generation of Income account

	1975	2005		1975	2005
Uses	$m	$m	Resources	$m	$m
Compensation of employees	205	45	*Net domestic product*	*285*	*63*
Net operating surplus	*80*	*18*			

3. Allocation/distribution of income account

	1975	2005		1975	2005
Uses	$m	$m	Resources	$m	$m
Interest paid to overseas	5	40	*Net operating surplus*	*80*	*18*
			Compensation of employees	*205*	*45*
			Interest received from overseas	75	10
			Current international cooperation	2	35
Net disposable income	*357*	*68*			

4. Use of income account

	1975	2005		1975	2005
Uses	$m	$m	Resources	$m	$m
Final consumption expenditure	305	110	*Net disposable income*	*357*	*68*
Saving	*52*	*-42*			

5. Capital account

	1975	2005		1975	2005
Changes in assets	$m	$m	Changes in liabilities and net worth	$m	$m
Gross fixed capital formation	35	5	*Saving*	*52*	*-42*
Net lending (+)/Net borrowing (-)	17	-47			

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Nauru National Accounts 1975 & 2005, adjusted for depletion (theoretical excerpt)

1. Production account

	1975	2005		1975	2005
Uses	$m	$m	Resources	$m	$m
Intermediate consumption	370	55	Output	665	120
Gross domestic product	*295*	*65*			
Consumption of fixed capital	10	2			
Consumption of natural capital	**200**	**40**			
Adjusted net domestic product	*85*	*23*			

2. Generation of Income account

	1975	2005		1975	2005
Uses	$m	$m	Resources	$m	$m
Compensation of employees	205	45	*Adjusted net domestic product*	*85*	*23*
Adjusted net operating surplus	*-120*	*-22*			

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			Compensation of employees	*205*	*45*
			Interest received from overseas	75	10
			Current international cooperation	2	35
Adjusted net disposable income	*157*	*28*			

4. Use of income account

	1975	2005		1975	2005
Uses	$m	$m	Resources	$m	$m
Final consumption expenditure	305	110	*Adjusted net disposable income*	*157*	*28*
Adjusted saving	*-148*	*-82*			

4. Accounts for economic activities related to the environment

- Measures the financial aspect of economic response to environmental issues

- Environmental Protection Expenditure
- Environmental Goods and Services
- Environmental tax & subsidies

EPE Quiz

1. Scrubber for removing sulphur from coal
2. Collection and transport of waste by municipal authorities
3. Safety features installed on a nuclear power plant
4. Compost (i.e. result of composting activity)
5. In-roof insulation installed in private homes adjacent to Sydney airport
6. Construction of screens / hedges to reduce sound impact of motorways
7. Building and maintaining forest fire roads
8. Shotgun used strictly for feral cats

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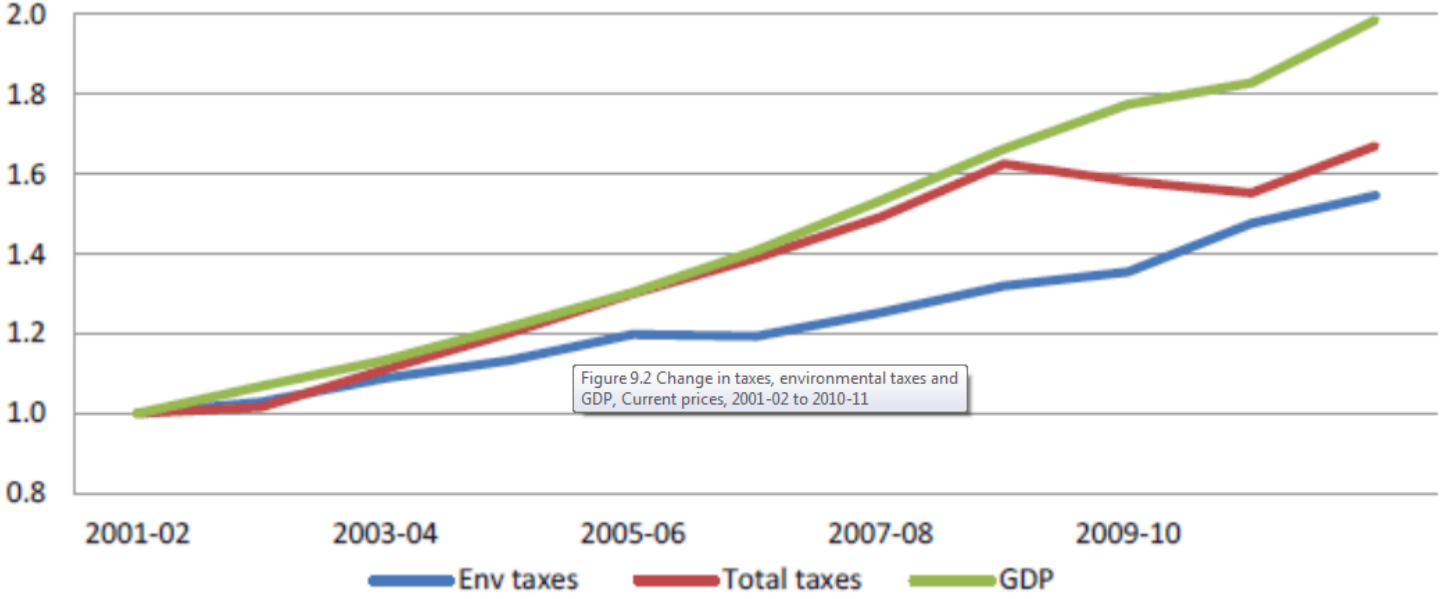
4. Accounts for economic activities related to the environment *cont…*

Figure 9.2 The change in taxes, environmental taxes and GDP, current prices, 2001-02 to 2010-11



Note: Index: 2000-01 = 1

Source: Australian System of National Accounts 2011-12 (ABS cat. No. 5204.0); *Taxation revenue, Australia, 2010-11* (ABS cat. no. 5506.0)

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