Policy application of SEEAW (and indicators)

Technical Workshop on the
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Jeremy Webb
United Nations Statistics Division

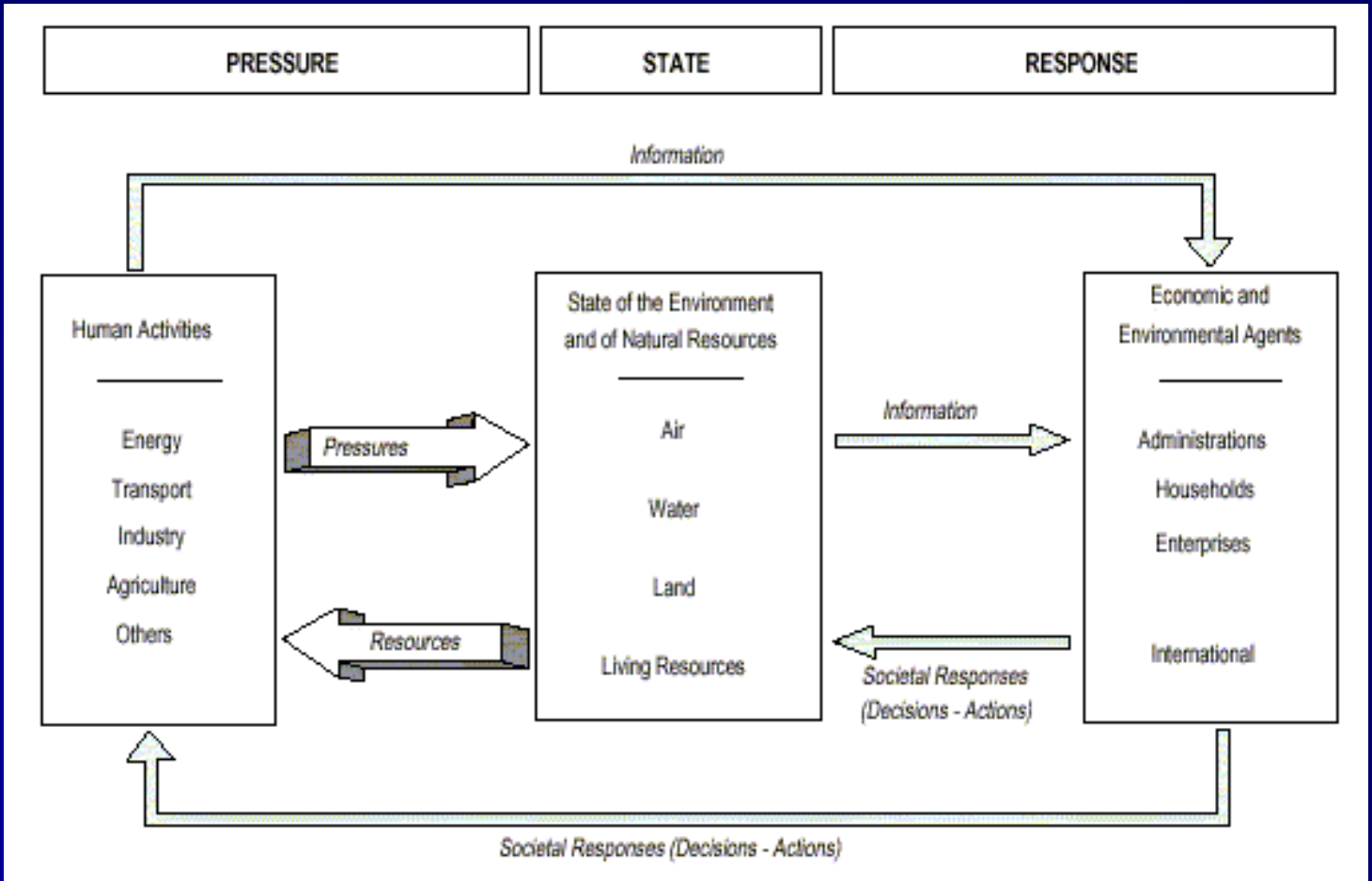
Outline

- Relationship between the environment and economy
- Data users for indicators and accounts
- The SEEAW and Indicators
- National examples
- Summary

The environment and the economy

- The relationship between the environment and the economy is complex – so is water data
- We need to find a way to communicate complex information, e.g.
  - The environment provides:
    - Economic resources to production process (e.g. water and energy)
    - Non-economic resources to production process as well as other uses for mankind
  - Environment receives wastes from the economy

A model of the relationships between the environment and economy: Pressure – State – Response



Indicators

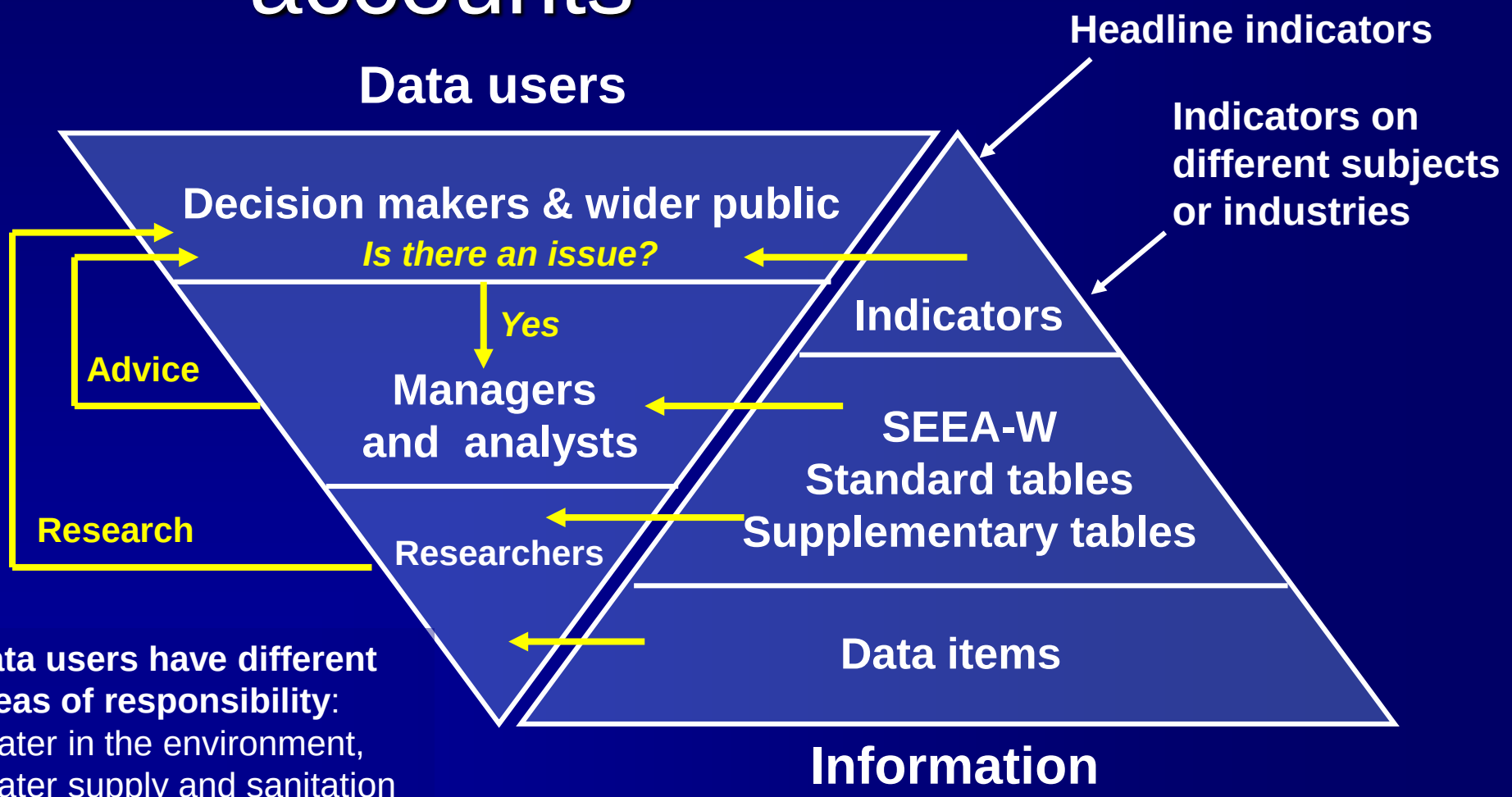
- Indicators can be used to monitor:
  - Government goals, targets or benchmarks
  - Pressure, state, response
  - Driving forces, pressure, state, impact, response
  - Outputs and outcomes
  - Inputs, outputs, outcomes, impacts
  - etc…

Characteristics of indicators

- Focus on outcomes
- Have an unambiguous 'good' direction
- Be supported by timely data of good quality
- Be available as a time series
- Be sensitive to changes
- Be summary in nature
- Be capable of disaggregation
- Be interpreted easily by the general reader

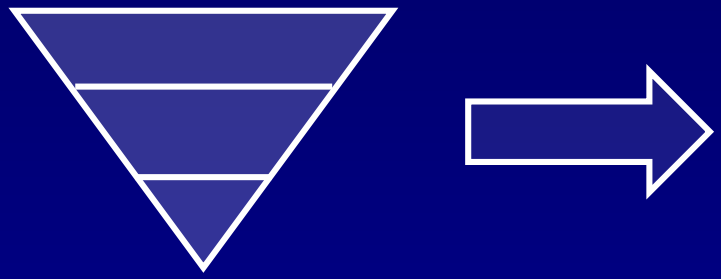
Adapted from Measures of Australia's Progress 2002, and Indicator Guidelines (Statistics NZ)
http://www.abs.gov.au/AUSSTATS/abs@.nsf/94713ad445ff1425ca25682000192af2/aa16f6e99c3078bfca256bdc001223f6!OpenDocument
http://www.stats.govt.nz/products-and-services/user-guides/indicator-guidelines/default.htm

Data users, indicators and accounts



Data users have different areas of responsibility:
- water in the environment,
- water supply and sanitation
- agriculture, electricity gen.
- manufacturing, tourism

Data users, indicators and accounts

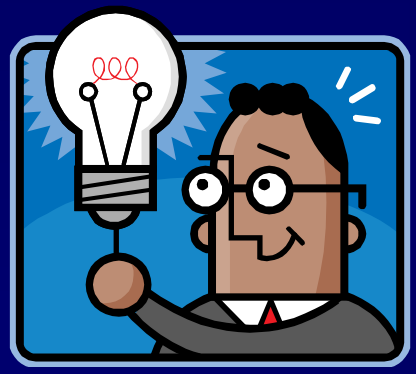
	Water in the environment e.g. Environment agency	Water supply and sanitation e.g. Utilities or health agencies	Industry specific water information e.g. Farmers or electricity generators
Top level decision makers and the wider public Summary information	e.g. National water indicators	e.g. MDG WSS indicators	e.g. Efficiency indicators by industry
Decisions makers, managers and analysts Summary information along with supporting tables, graphs and maps that allow further analysis	e.g. SEEA-W asset accounts	e.g. SEEA-W Hydrid accounts	e.g. PSUT and hybrid accounts
Researchers Detailed tables and in some cases levels of access to microdata (taking into consideration confidentiality)	e.g. Standard tables and in some cases microdata		

Application of indicators and accounts

- We have identified data users
- We have identified areas of responsibility

- How to match data to users?
- What will data be used for?

Application of indicators and accounts



- A lot of the information needed to address policy questions can be found in the SEEAW standard tables
- Some questions require additional information
  - In some cases the standard tables can be expanded to include:
    - more detailed industry breakdowns
    - a lower level of geographic reference (e.g. province instead of state)
  - Some of additional data can be drawn from supplementary tables

The SEEAW and Indicators
(pages 169-183)

SEEAW provides an annex on indicators:

- Water availability
- Water intensity and productivity
- Opportunities to increase water supply
- Cost and price of water supply and wastewater treatment services

Indicators of water availability

- Per capita renewable resources
  - Ratio between Total renewable water resources and population size. (WWDR 2003, Margat 1996)
- Annual Withdrawals of Ground and Surface Water as a Percent of Total Renewable Water/Exploitation index
  - The total annual volume of ground and surface water abstracted for water uses as a percentage of the total annually renewable volume of freshwater. (UN, 2001)
- Consumption Index
  - Ratio between Water Consumption and Total Renewable Resources. (Margat, 1996)

Per capita renewable resources from SEEAW

$$\frac{\text{Total renewable water resources}}{\text{Population}} = \frac{\text{2. Returns + 3. Precipitation + 4. Inflows – 6. Evaporation – 7. Outflows}}{\text{Population}}$$

SEEAW
Asset account

Annual Withdrawals of Ground and Surface Water as a Percent of Total Renewable from SEEAW

Withdrawals of ground and surface water

Total renewable water resources

=

SEEAW
Physical Use Table

1.i.1 Abstraction from surface water +
1.i.2 Abstraction from ground water

SEEAW
Asset account

2. Returns + 3. Precipitation + 4. Inflows – 6. Evaporation – 7. Outflows

Consumption Index from SEEAW

Water consumption

Total renewable water resources

=

SEEAW
Physical Supply Table

7. Consumption

SEEAW
Asset account

2. Returns + 3. Precipitation + 4. Inflows – 6. Evaporation – 7. Outflows

Indicators for water intensity and productivity from SEEAW

1. Water use and pollution intensity (physical units)		
	m^3 water/unit of physical output	**Water use or tons of pollution emitted per unit of output, such as**
	Tons of pollution/unit of physical output	**--population,** **--number of households, or** **--tons of wheat, steel, etc. produced**
2. Water and pollution intensity (monetary units)		
	m^3 water/value of output	**Water use or tons of pollution emitted per unit of output measured in currency units**
	Tons of pollution/value of output	
3. Water productivity ratios		
	GDP/ m^3 water	
	Value-added by sector/m^3 water	
4. Water 'pollutivity' ratios		
	Sector share of pollution/sector share of GDP	

Indicators for opportunities to increase water supply from SEEA

1. Return flows	
Quantity of return flows by source	May distinguish return flows from treated return flows (from municipal and industrial users) from untreated return flows such as agriculture
2. Water reuse	
Reuse water as share of total industry water use	May distinguish reuse of water within a plant from water recycled by municipal water utility
Recycled water as share of total water use by sector	
3. Losses	
Losses in abstraction and treatment as share of total water production	Both the amount and the reason for these losses are usually known by the water utility
Unaccounted for losses as share of total water use	These losses occur for a variety of causes and it is usually not certain how much each cause contributes

Indicators for cost and price of water supply and wastewater treatment

1. Supply cost and price of water	
Implicit water price	Volume of water purchased divided by supply cost
Average water price per m^3 by industry	Volume of water purchased divided by actual payments by that industry
Average water supply cost per m^3 by industry	Volume of water purchased divided by cost of supply to that industry
Subsidy per m^3 by industry	Average water price minus average water supply cost
2. Supply cost and price of wastewater treatment services	
Implicit wastewater treatment price	Volume of water treated divided by supply cost
Average wastewater treatment cost per m3 by industry	Volume of wastewater divided by treatment cost for that industry
Average wastewater treatment price per m3 by industry	Volume of wastewater divided by actual payments for treatment by that industry
Subsidy per m3 by industry	Average wastewater price minus average wastewater supply cost

Indicators of access to and affordability of water and sanitation services

1. Access to water and sanitation services
Average daily water consumption by households, differentiating rural and urban households
Percent of urban households with access to safe drinking water
Percent of rural households with access to safe drinking water
Percent of urban households with access to sanitation services
Percent of rural households with access to sanitation services
2. Affordability of water
Household expenditures for water as % of total expenditures, differentiating rural and urban
Average price of water to households, differentiating rural and urban
Average price of water for subsistence agriculture (irrigation and livestock watering)

Links between the World Water Development Report Indicators and SEEAW

- World Water Assessment Programme 2006
- 21 of 38 Indicators can be directly derived from the water accounts
- An 5 indicators can be partially derived
- 12 cannot be derived but can be included as supplementary information. Of these
  - 4 are social indicators (e.g. urban and rural population)
  - 3 are related to land areas and could be derived from land accounts
  - 3 are related to energy and could be derived from energy accounts
  - Remaining 2 relate to ISO 14001 certification

National examples of the application of water accounts

- China
- Australia
- Botswana
- Netherlands

Development of Water Accounting in China

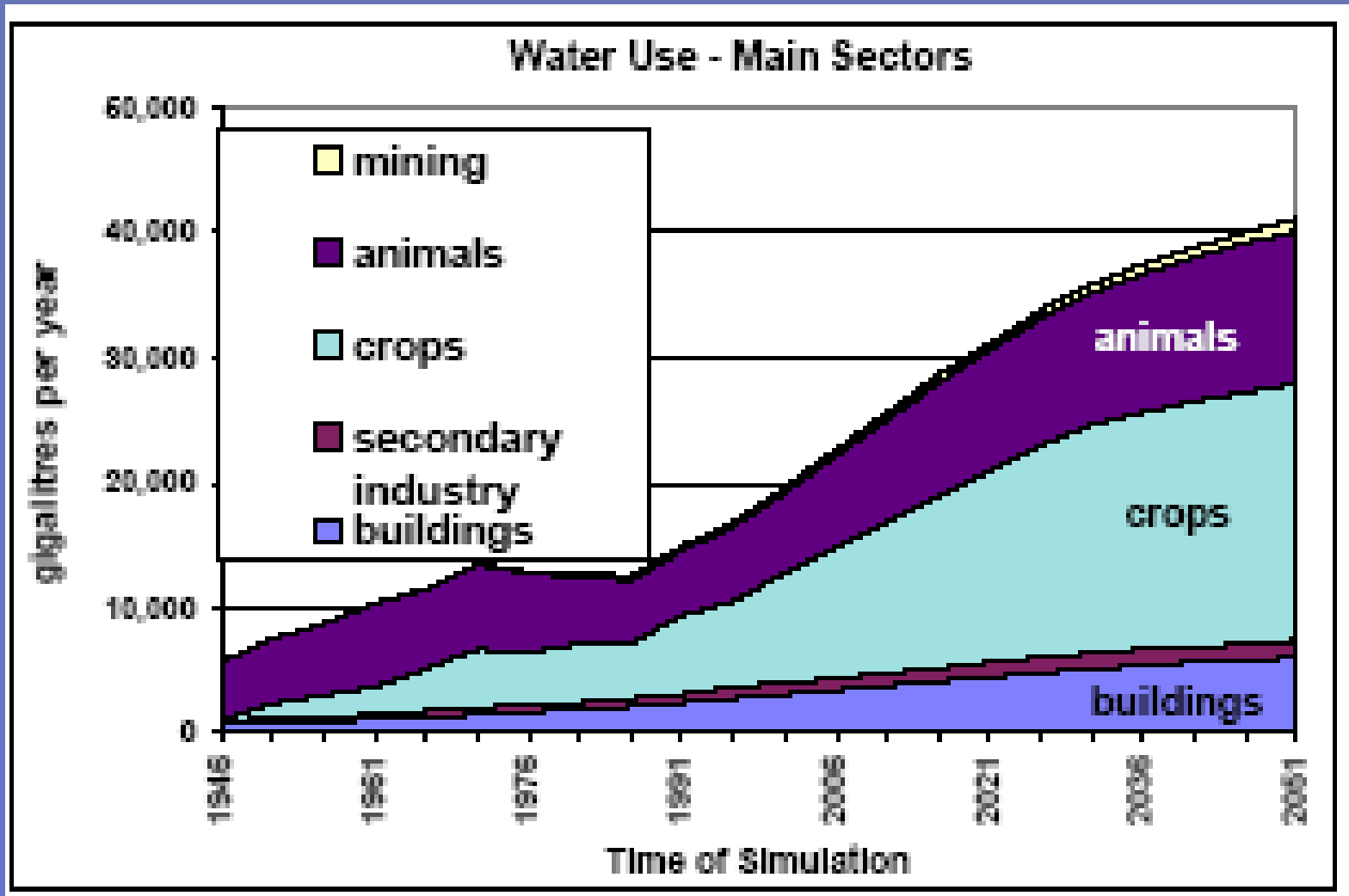
- Nov 2006 – Chinese delegation from the National Bureau of Statistics (NBS) and the Ministry of Water Resources (MWR) visit UN in New York for training on SEEAW
- Jan-Mar 2007 Project committee formed – UNSD, NBS and MWR
- Apr-July 2007 Pilot tables for physical supply use and emissions completed
- Aug 2007 UN Mission to China to review pilot work
- Sep-De 2007 Pilot tables for hybrid supply use and assets accounts completed.
- Jan 2008 – Chinese delegation visit UN in New York for training on SEEAW

In 14 months a great deal was achieved with existing data

Asset accounts for 10 regions

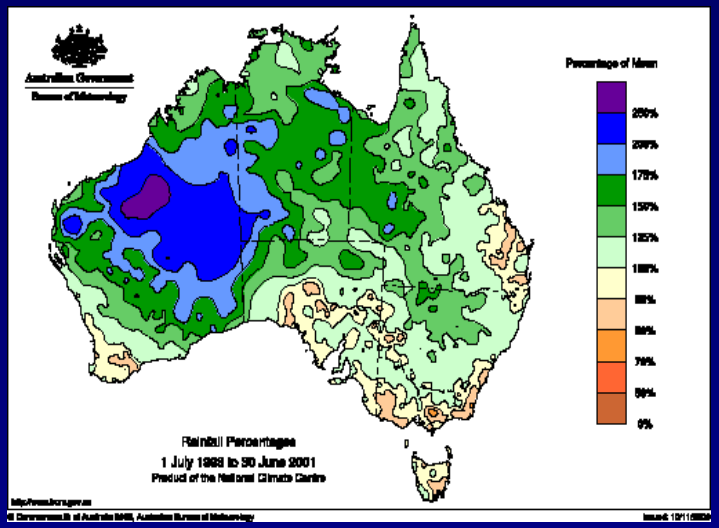
Water resources regions in China at the first class

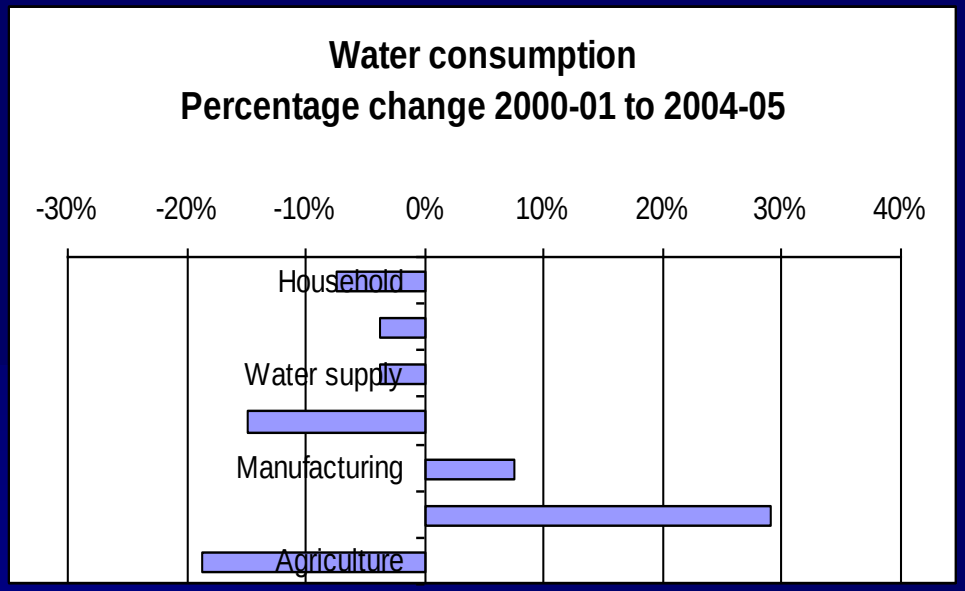
Projecting future water demands Australia 2050

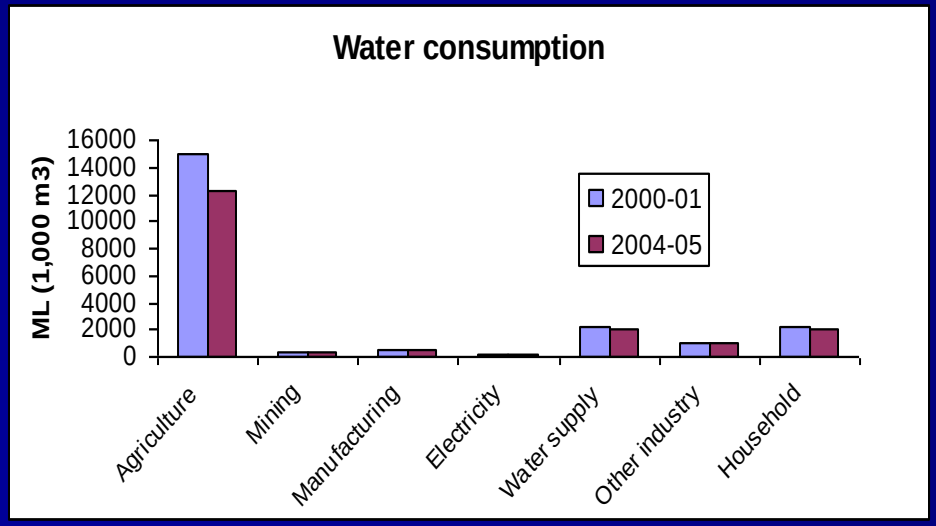


Australia

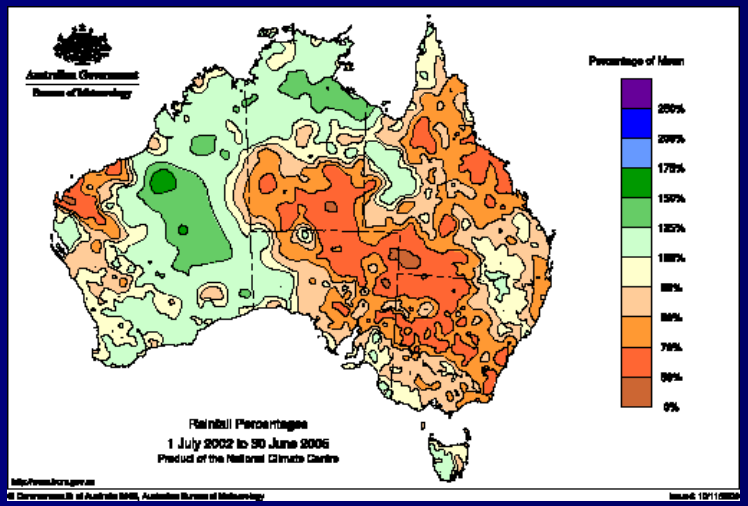
Percentage of mean annual rainfall 1998-99 to -2000-01



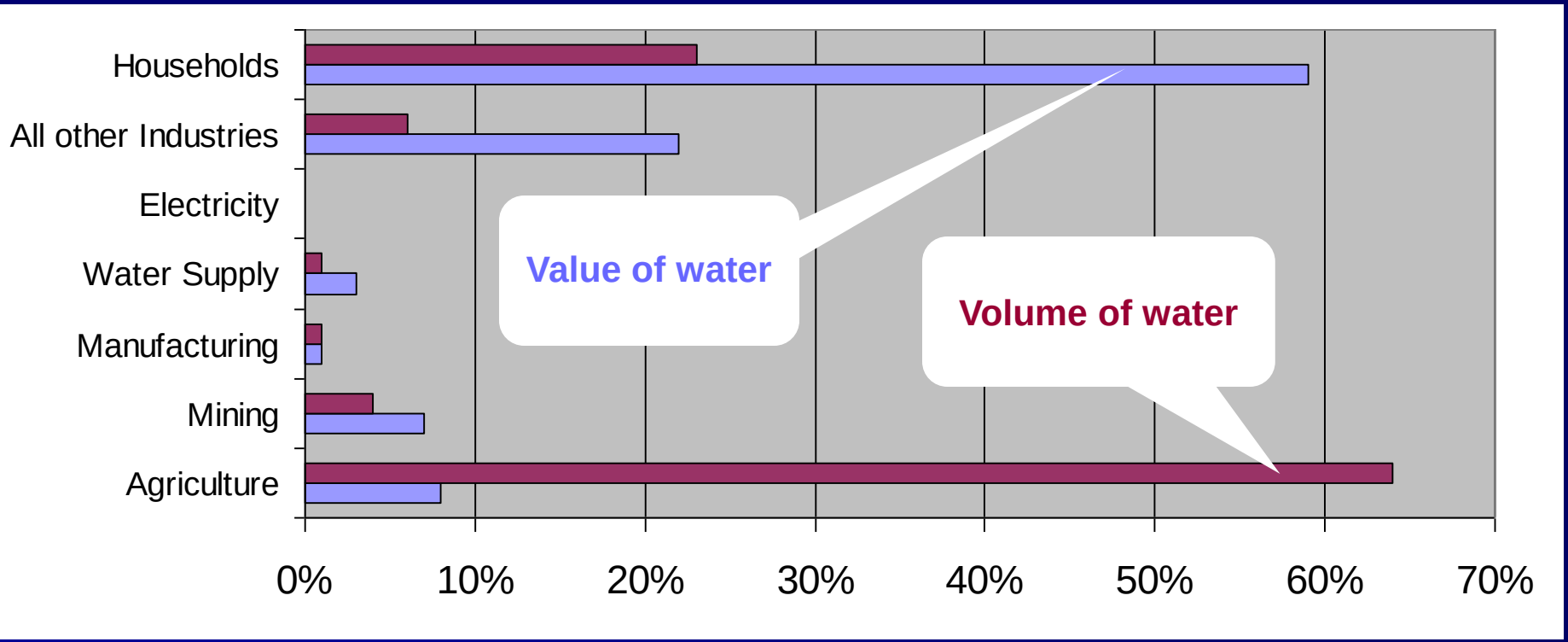




Percentage of mean annual rainfall 2002-03 to -2004-05

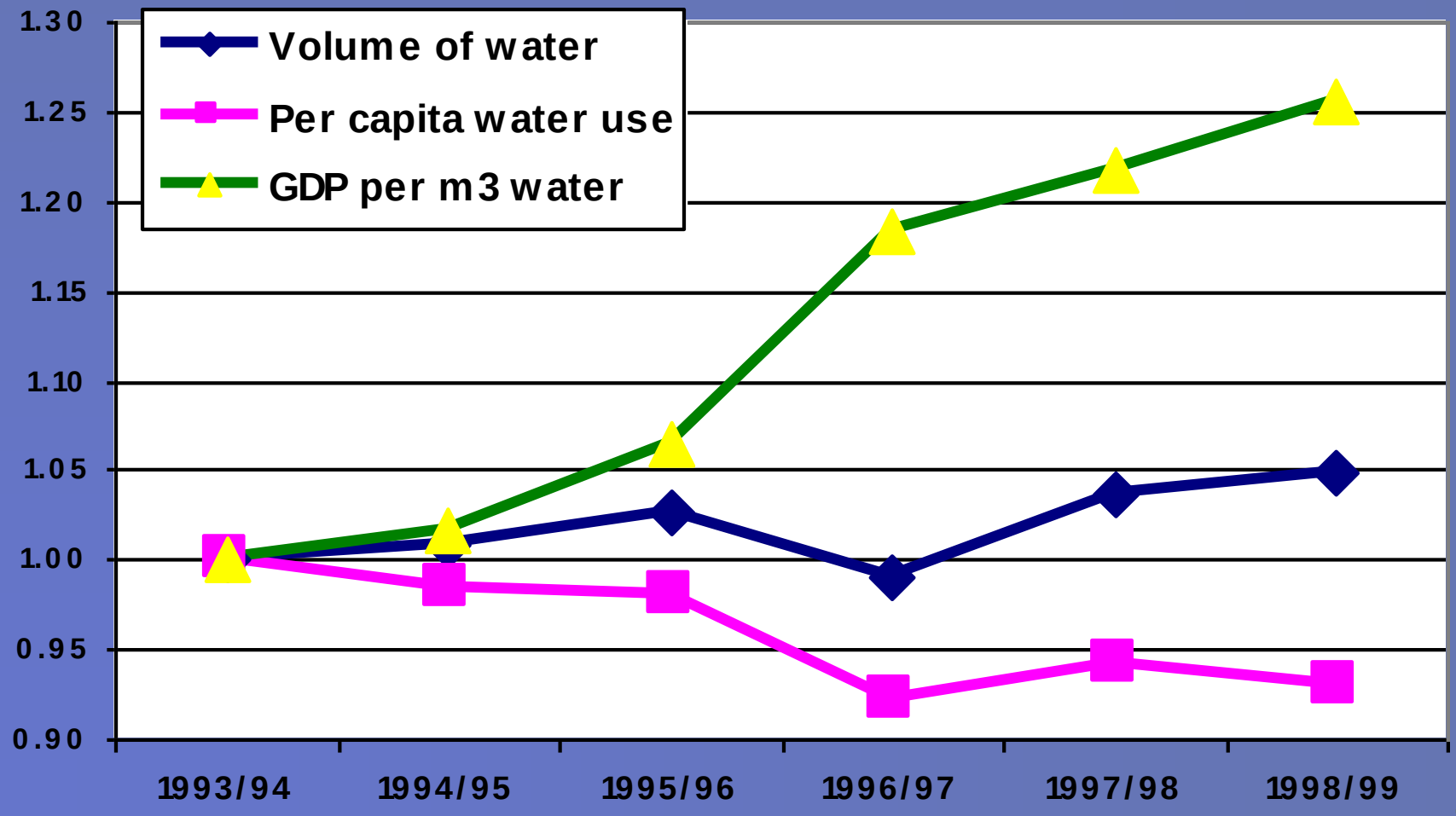


Australia 2004-05: monetary vs. physical use of distributed water (% of total use)

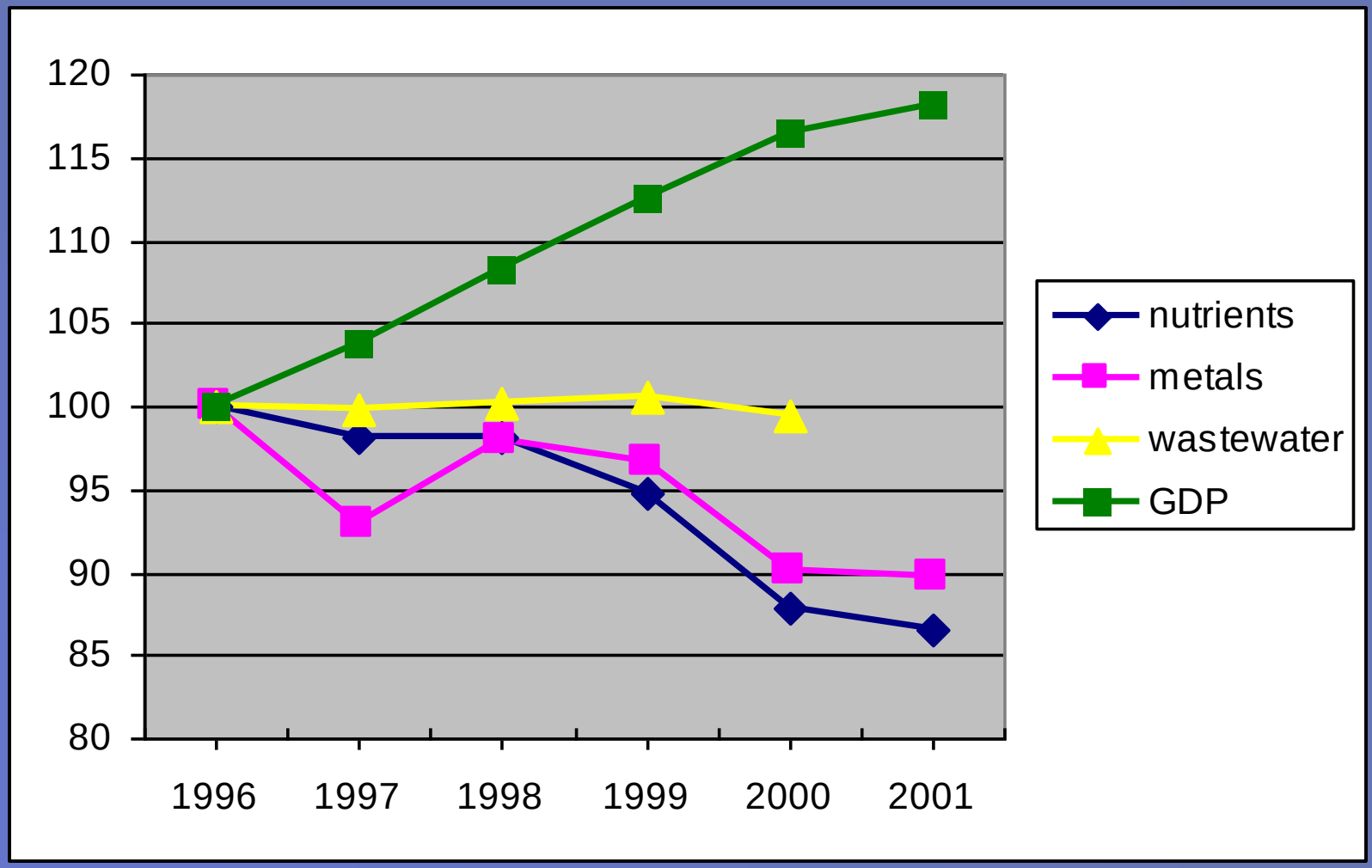


Source: ABS 2007. An Experimental Monetary Water Account for Australia 2004-05: http://www.abs.gov.au/ausstats/abs@.nsf/mf/4610.0.55.005

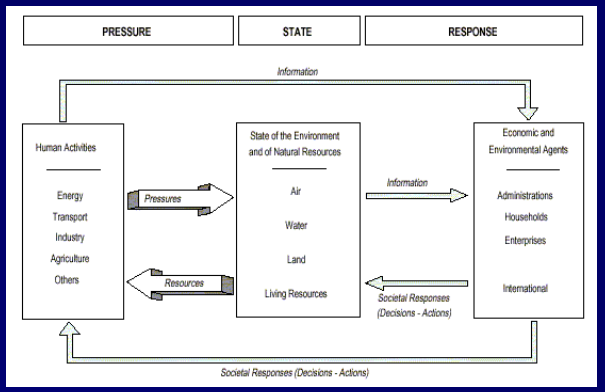
Botswana: water use and economic growth 1993-1998



Netherlands: water pollution and economic growth, 1999-2001

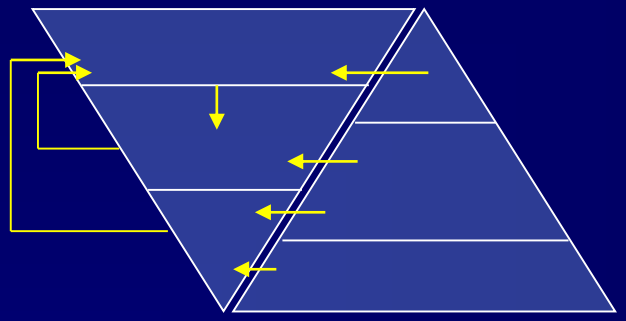


Summary



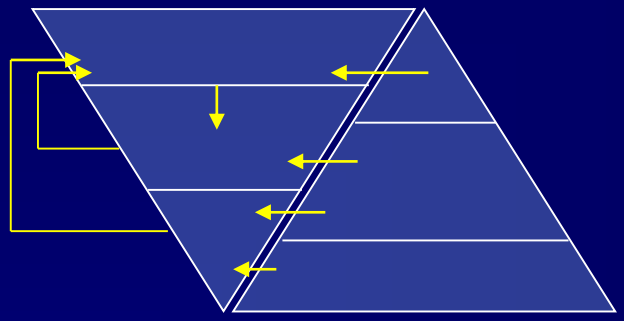
- Indicators and accounts communicate complex information
- Indicators and accounts can be presented in many ways, e.g.
  - Graphs
  - Maps
  - Tables

Summary



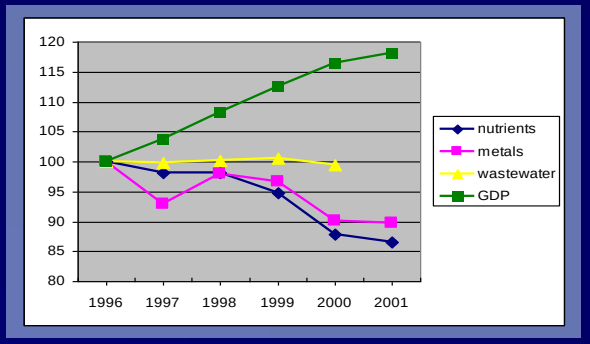
- Indicators are important communication tools
  - they summarise complex information
- Indicators are only as good as the data and accounts that underpin them
  - indicators need to be built on a solid foundation of data
- Indicators flag possible issues but other information is required to analyse issues
  - indicators need to be interpreted and analysed in the context of other data

Summary



- All of levels of information are needed to have a complete information system
- Because policy makers are not yet familiar with environment accounts, you may find it useful to conduct your own analysis of the accounts or to encourage others to do an analysis
- Indicators and accounts cover a range of subjects/industries

Summary



- Water indicators and the SEEAW can provide information on:
  - Macro trends (and decoupling) in:
    - total water use,
    - emissions,
    - water use by source and purpose, etc.
  - Industry-level trends
    - indicators used for environmental-economic profiles
  - Technology and driving forces
    - water intensity/productivity
    - total (domestic) water requirements to meet final demand
  - International transport of water and pollution

Contact details

Jeremy Webb
Statistician (Environment Statistics)
United Nations Statistics Division
New York 10017, USA
Room DC2 1410
Phone: +1 212 963 8564
Fax: +1 212 963 0623
Email: webbj@un.org

Michael Vardon
Adviser on Environmental-Economic Accounting
United Nations Statistics Division
New York 10017, USA
Room DC2 1532
Phone: +1 917 367 5391
Fax: +1 212 963 1374
Email: vardon@un.org