The System of Environmental-Economic Accounting for Water (SEEAW)

International Seminar on Environmental Accounting

United Nations Statistics Division

Rio de Janeiro

September 2009

Outline

- The need for SEEAW
- Background, process of development and implementation
- Main concepts and standard tables
- Common problems in compilation
- Indicator and uses
- Key lessons from implementation and the way forward

The need for SEEAW

- Supporting Integrated Water Resource Management (IWRM)
- Understanding the links between the economy and the environment
- Maximising/optimising the social, economic and environmental benefits of water use in the economy
- Managing water scarcity and competing demands for water, especially in the context of climate change
- Water as an economic good (e.g. water pricing, full cost recover, water rights)
- Identifying water intensive and water polluting industries for policy response (e.g. application of users pays and polluter pays principles)
- Bring together dispersed data into a multi purpose analytical framework

SEEAW – an interim international statistical standard

- SEEAW was adopted by the United Nations Statistical Commission in March 2007 as an interim statistical standard
- SEEAW has been recognized as useful by the users of information, including the 5th World Water Forum (Istanbul, March 2009)

  "SEEAW provides the much-needed conceptual framework for monitoring and assessment"

  Roberto Lenton, Global Water Partnership

- UNSD has developed an implementation plan and there has been rapid adoption by countries

44 Countries have, or are planning, water accounts*

- Andorra
- Australia
- Austria
- Bahamas
- Botswana
- Canada
- China
- Colombia
- Denmark
- Dominican Republic
- Egypt
- France
- Germany
- Guatemala
- Hungary
- Iraq
- Israel
- Italy
- Jordan
- Mexico
- Namibia
- Netherlands
- New Zealand
- Peru
- Philippines
- Portugal
- Singapore
- South Africa
- Spain
- Sweden
- Switzerland
- Trinidad and Tobago
- Ukraine
- Armenia
- Estonia
- Greece
- Lebanon
- Mauritius
- Norway
- Occupied Palestinian Territory
- Romania
- Tunisia
- Turkey
- United Kingdom

Plus 4 (Data not from GAWSWA)

- Bahrain, Brazil, Oman, Panama

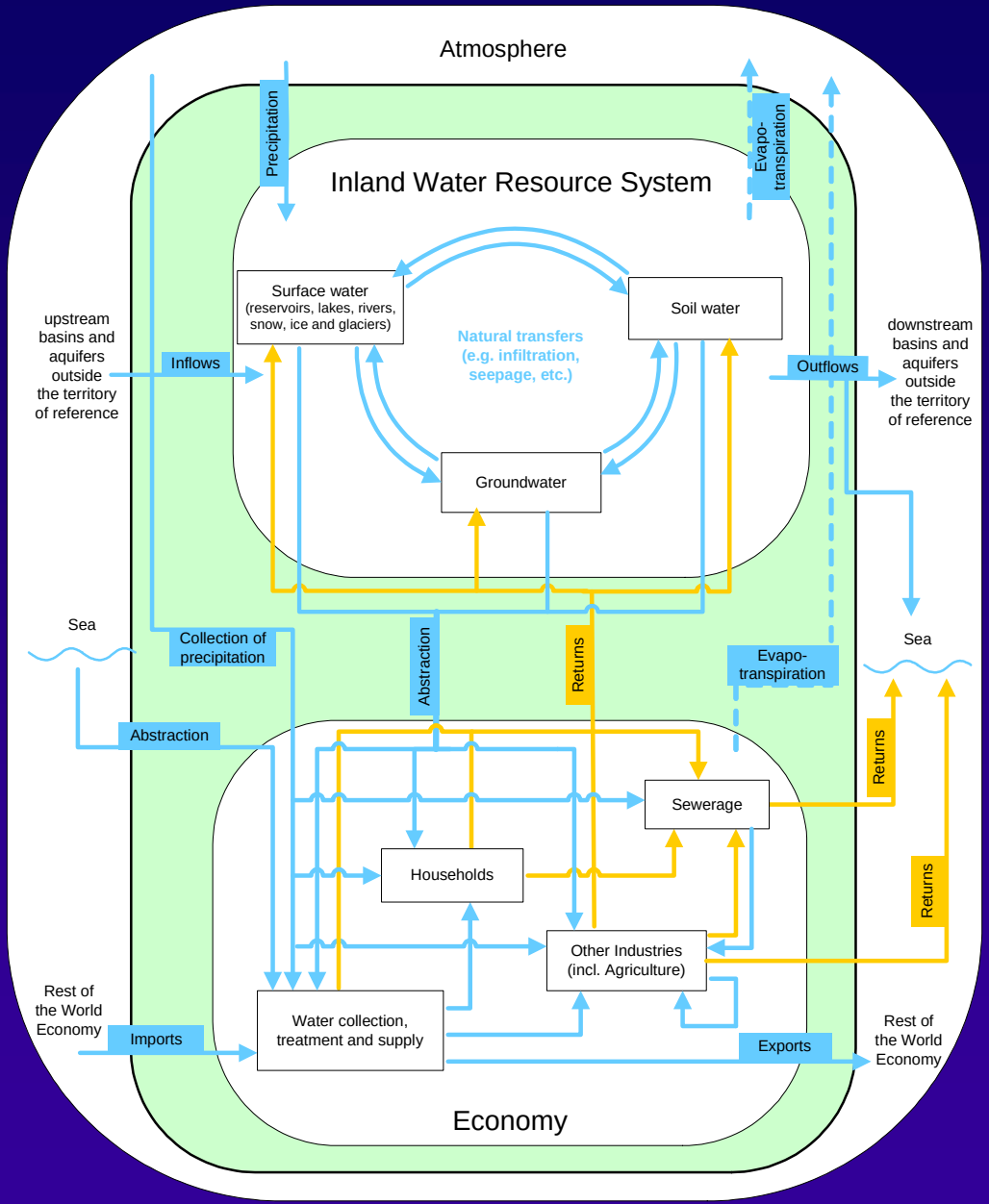
*Data from the Global Assessment of Water Statistics and Water Accounts

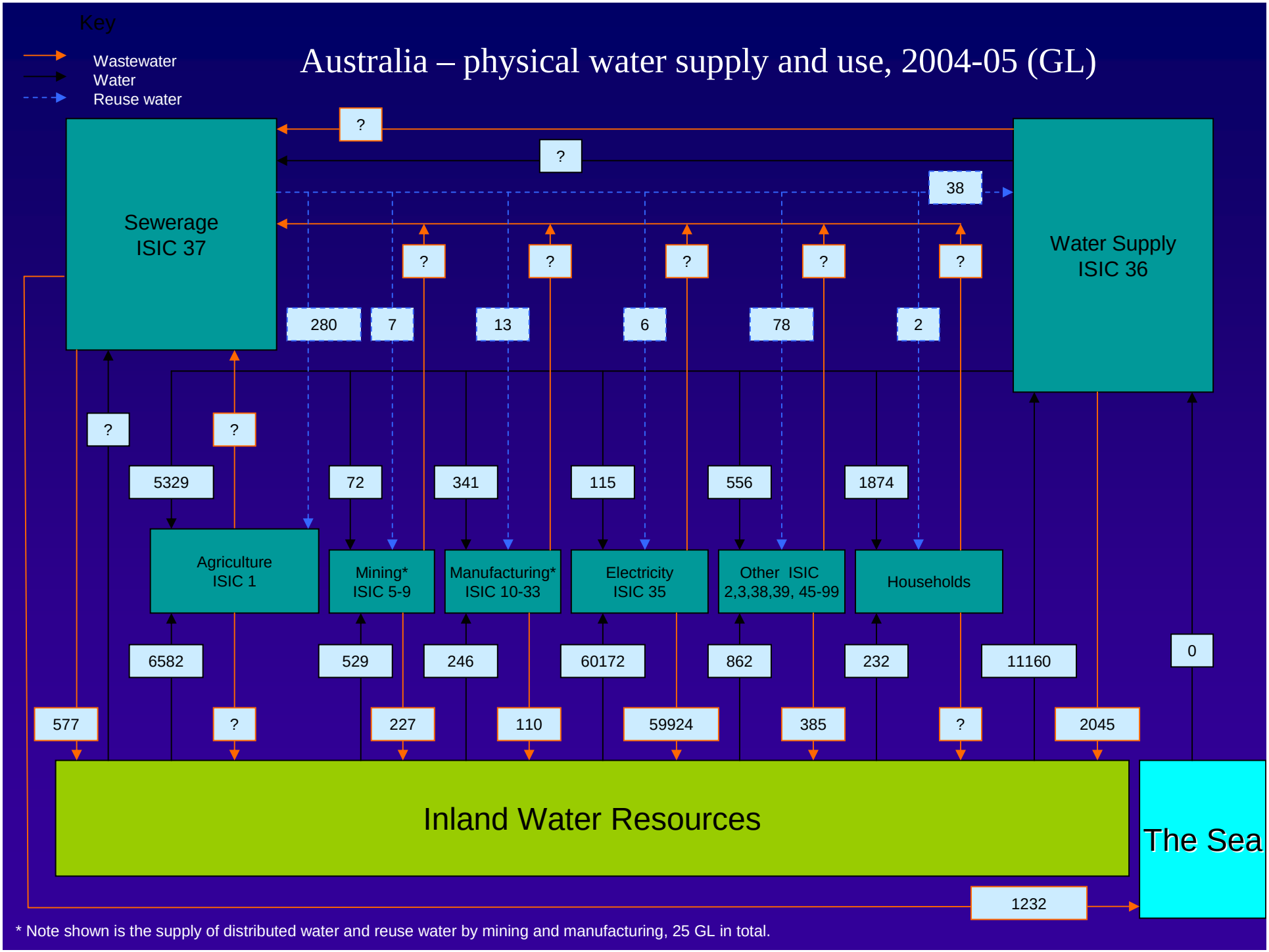
http://unstats.un.org/unsd/statcom/doc09/BG-WaterAccounts.pdf

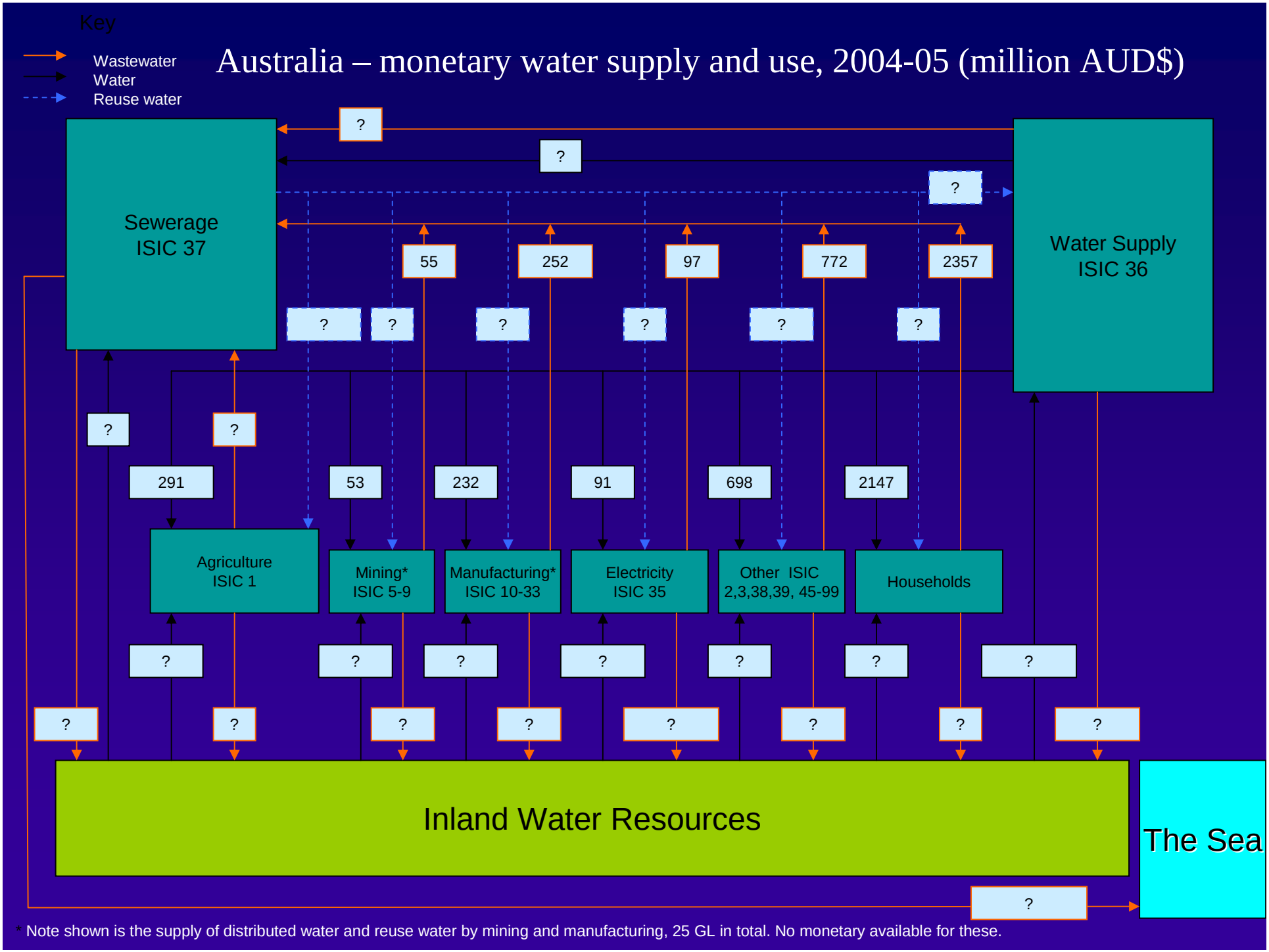
SEEAW

Overview

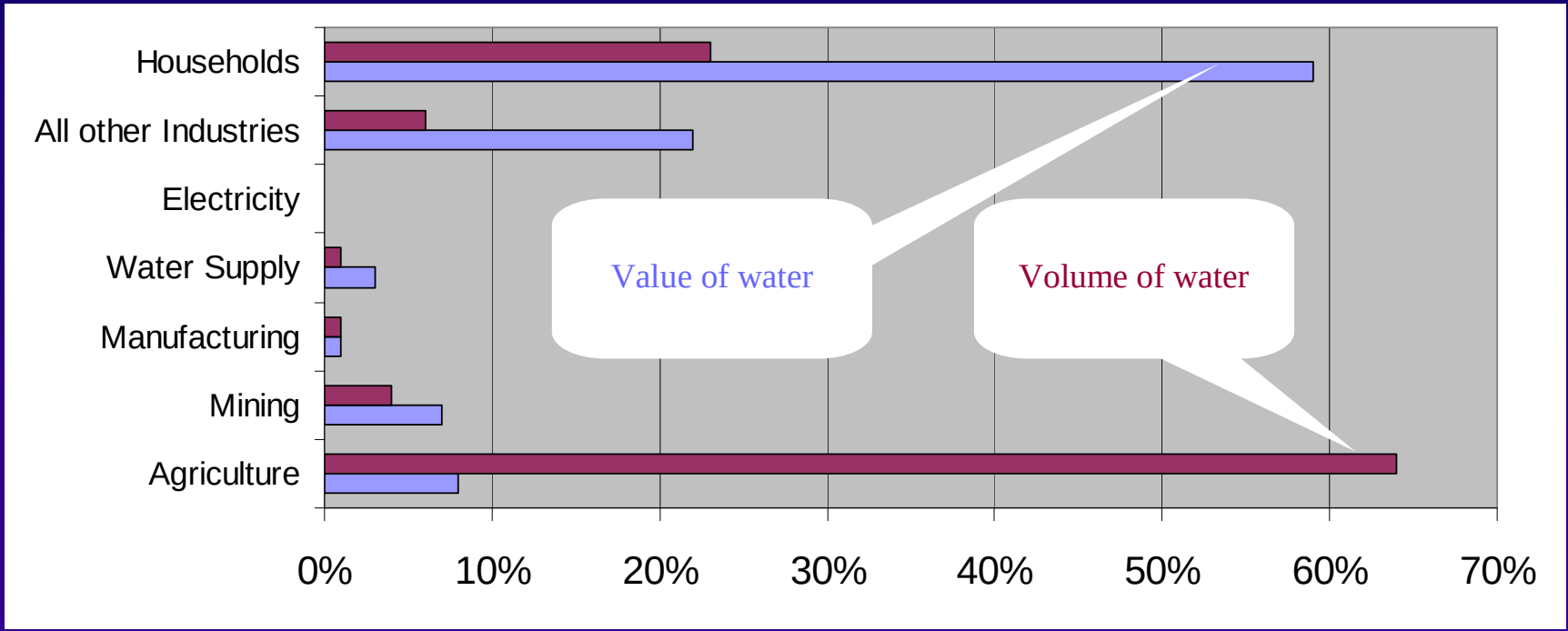
- Stocks and flows
- Economy and environment
- Monetary and physical



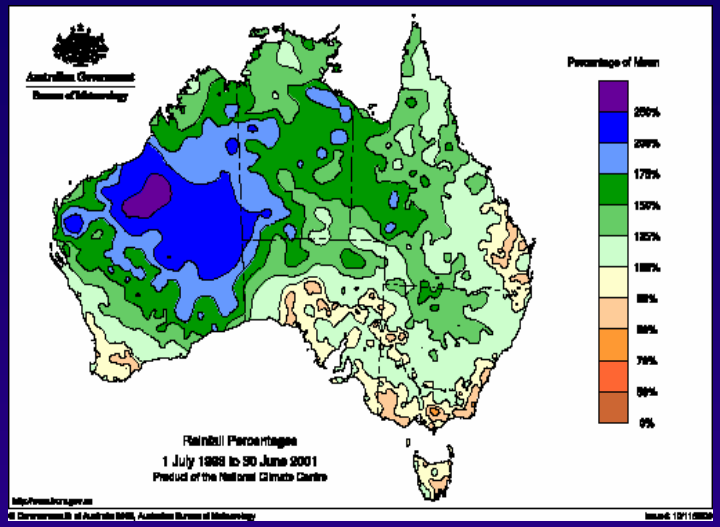

Key
Wastewater
Water
Reuse water
Australia – physical water supply and use, 2004-05 (GL)
Sewerage ISIC 37
Water Supply ISIC 36
?
?
38
?
?
?
?
?
280
7
13
6
78
2
?
?
5329
72
341
115
556
1874
Agriculture ISIC 1
Mining* ISIC 5-9
Manufacturing* ISIC 10-33
Electricity ISIC 35
Other ISIC 2,3,38,39, 45-99
Households
6582
529
246
60172
862
232
11160
0
577
?
227
110
59924
385
?
2045
Inland Water Resources
The Sea
1232
* Note shown is the supply of distributed water and reuse water by mining and manufacturing, 25 GL in total.

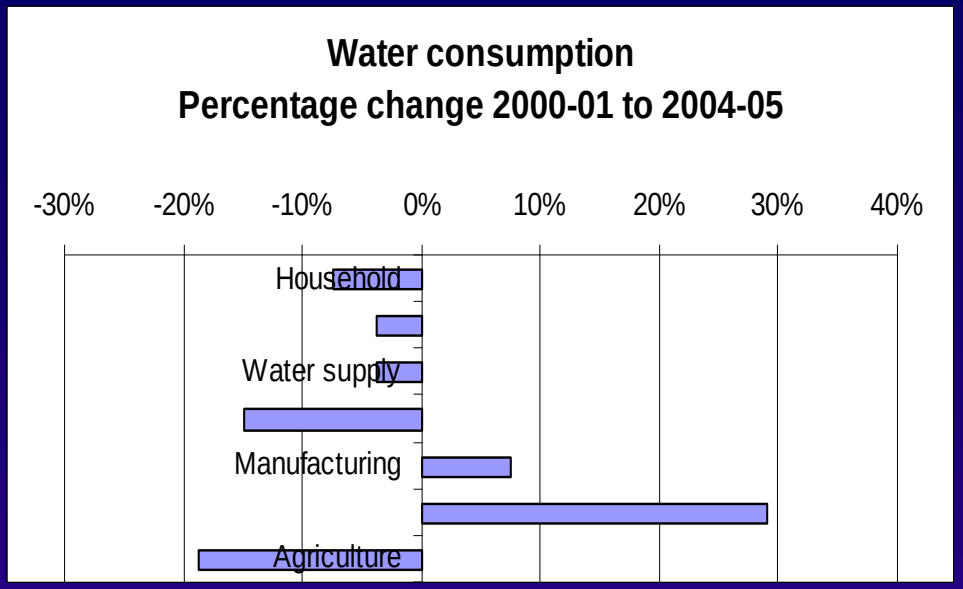

Key
Wastewater
Water
Reuse water
Australia – monetary water supply and use, 2004-05 (million AUD$)
Sewerage ISIC 37
Water Supply ISIC 36
55
252
97
772
2357
291
53
232
91
698
2147
Agriculture ISIC 1
Mining* ISIC 5-9
Manufacturing* ISIC 10-33
Electricity ISIC 35
Other ISIC 2,3,38,39, 45-99
Households
Inland Water Resources
The Sea
* Note shown is the supply of distributed water and reuse water by mining and manufacturing, 25 GL in total. No monetary available for these.

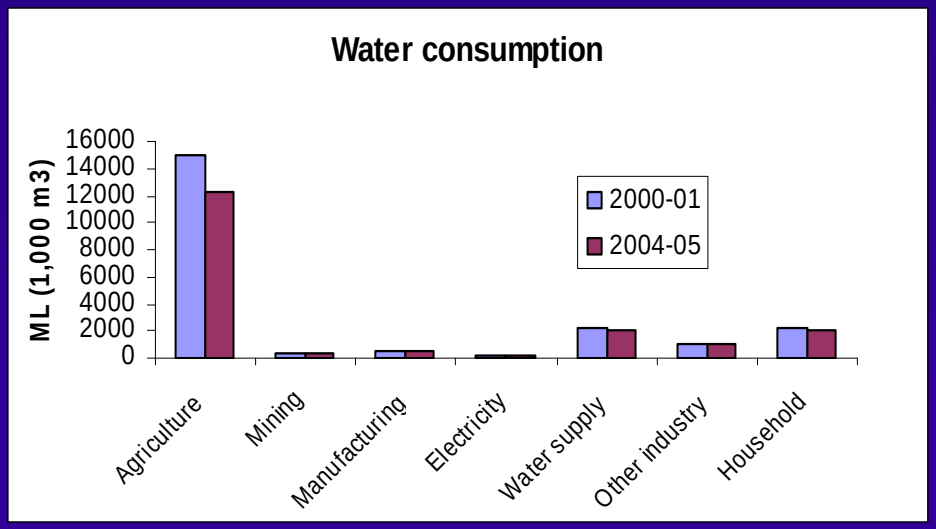
Australia 2004-05: monetary vs. physical use of distributed water (% of total use)



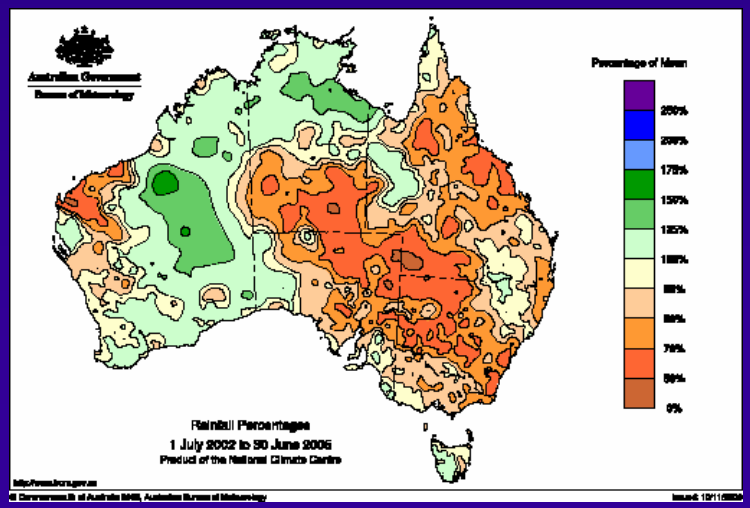
Percentage of mean annual rainfall 1998-99 to -2000-01







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



More detail for some industries

- E.g. Agriculture water use in Australia 2004-05

	Self-extracted	Distributed	Reuse	In-stream	Consumption
Agriculture					
Dairy farming	856993	1339473	79136	0	2275603
Vegetables	307033	132544	15796	0	455373
Sugar	404068	858767	6177	0	1269012
Fruit	306978	339315	1370	0	647662
Grapes	191363	522029	3655	0	717047
Cotton	1697245	122071	2194	0	1821509
Rice	224806	394158	11908	0	630872
Livestock, pasture, grains & other					
Livestock	935396	100078	0	0	1035474
Pasture	1000850	887144	39898	0	1927892
Grains	461815	582098	118356	0	1162268
Other	195887	51337	1436	0	248659
Total	2593948	1620656	159689	0	4374293
Total	6582435	5329012	279925	0	12191372

Source: ABS 2006. Water Account, Australia 2004-05:
http://www.abs.gov.au/ausstats/abs@.nsf/mf/4610.0

12 Standard Tables

1. Physical supply
2. Physical use
3. Gross and net emissions
4. Emissions by ISIC 37
5. Hybrid (Monetary and Physical) supply
6. Hybrid use
7. Hybrid supply and use
8. Hybrid water supply and sewerage for own use
9. Government accounts for water related collective consumption services (Monetary)
10. National expenditure for waste management (Monetary)
11. Financial accounts for waste water management (Monetary)
12. Asset account (Physical)

12 Supplementary tables

Physical water use: Standard Table I

Agriculture

Mining and manufacture

Energy

Water supply

Sewerage

Services

Physical units

		Industries (by ISIC categories)							Households	Rest of the world	Total
		1-3	5-33, 41-43	35	36	37	38,39, 45-99	Total			
From the environment	U1 - Total abstraction (=a.1+a.2= b.1+b.2):										
	a.1- Abstraction for own use										
	a.2- Abstraction for distribution										
	b.1- From water resources:										
	Surface water										
	Groundwater										
	Soil water										
	b.2- From other sources										
	Collection of precipitation										
	Abstraction from the sea										
Within the economy	U2 - Use of water received from other economic units										
U=U1+U2 - **Total use of water**											

Includes green water

Physical water supply: Standard Table II

Physical units

		Industries (by ISIC categories)							Households	Rest of the world	Total
		1-3	5-33, 41-43	35	36	37	38,39, 45-99	Total			
Within the economy	S1 - Supply of water to other economic units										
	of which: Reused water										
	Wastewater to sewerage										
To the environment	S2 - Total returns (= d.1+d.2)										
	d.1- To water resources										
	Surface water										
	Groundwater										
	Soil water										
	d.2- To other sources (e.g. Sea water)										
S - **Total supply of water** (= S1+S2)											
Consumption (U - S)											

Water emissions: Standard Table IV

Physical units

Pollutant	Industries (by ISIC categories)						Households	Rest of the world	Total
	1-3	5-33, 41-43	35	36	38, 39, 45-99	Total			
Gross emissions (= a + b)									
a. Direct emissions to water (= a1 + a2 = b1 + b2)									
a1. Without treatment									
a2. After on-site treatment									
b1. To water resources									
b2. To the sea									
b. To Sewerage (ISIC 37)									
d. Reallocation of emission by ISIC 37									
e. Net emissions (= a. + d.)									

Hybrid water use: Standard Table VI

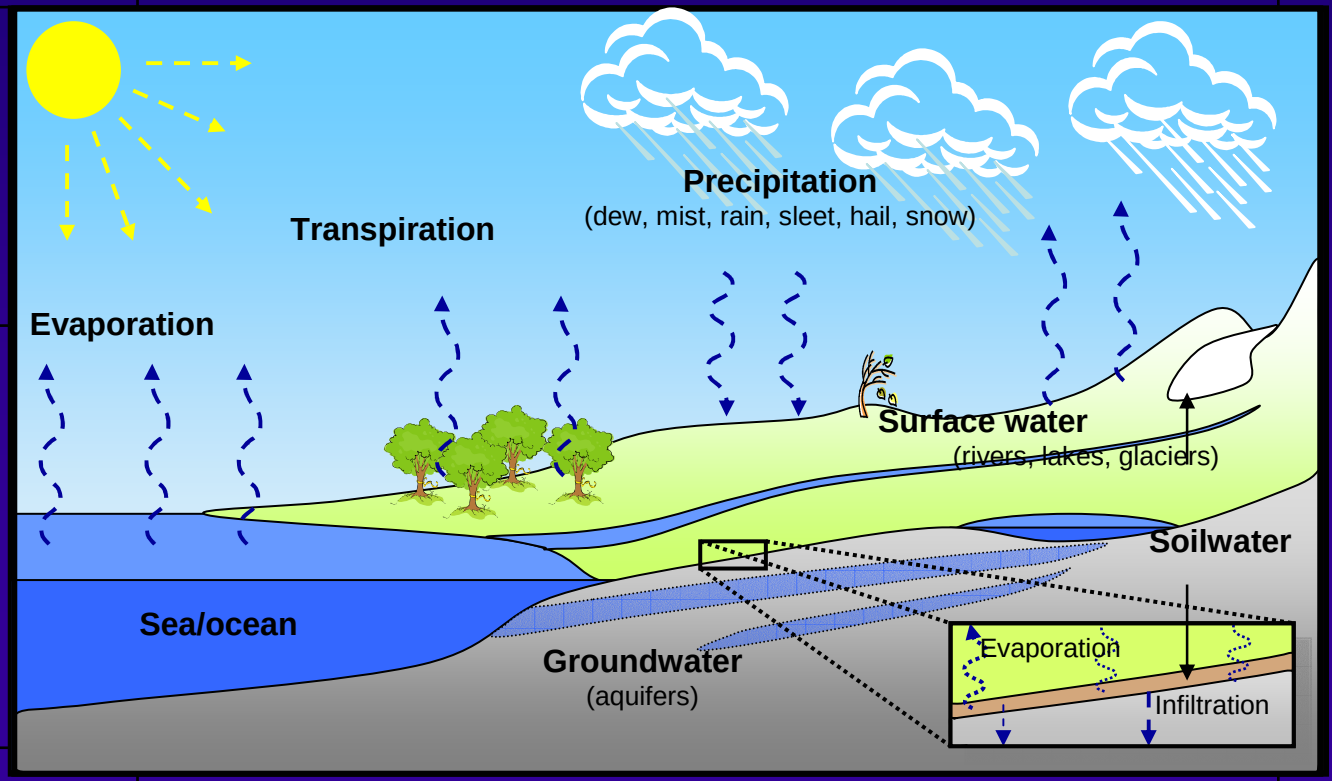
Physical and monetary units

	Intermediate consumption of industries (by ISIC categories)							Actual final consumption				Capital formation	Exports	Total uses at purchaser's price
			35					Households						
	1-3	5-33, 41-43	Total	*of which*: Hydro	36	37	38, 39, 45-99	Total industry	Final consumption expenditures	Social transfers in kind from Government and NPISHs	Total	Government			
Total intermediate consumption and use (monetary units) *of which*: Natural water (CPC 1800) Sewerage services (CPC 941) **Total value added** (monetary units)															
Total use of water (physical units) U1 - Total Abstraction *of which:* a.1- Abstraction for own use U2 - Use of water received from other economic units															

Physical water assets: Standard Table XII

physical units

	EA.131 Surface water				EA.132 Groundwater	EA.133 Soil water	Total
	EA.1311 Reservoirs	EA.1312 Lakes	EA.1313 Rivers	EA.1314 Snow, Ice and Glaciers			
Opening Stocks							
Increases in stocks							
Returns from the economy							
Precipitation							
Inflows							
from upstream territories							
from other resources in t territory							
Decreases in stocks							
Abstraction							
of which Sustainable use							
Evaporation/Actual evapotranspiration							
Outflows							
to downstream territories							
to the sea							
to other resources in the territory							
Other changes in volume							
Closing Stocks							



Some common problems in compilation of accounts

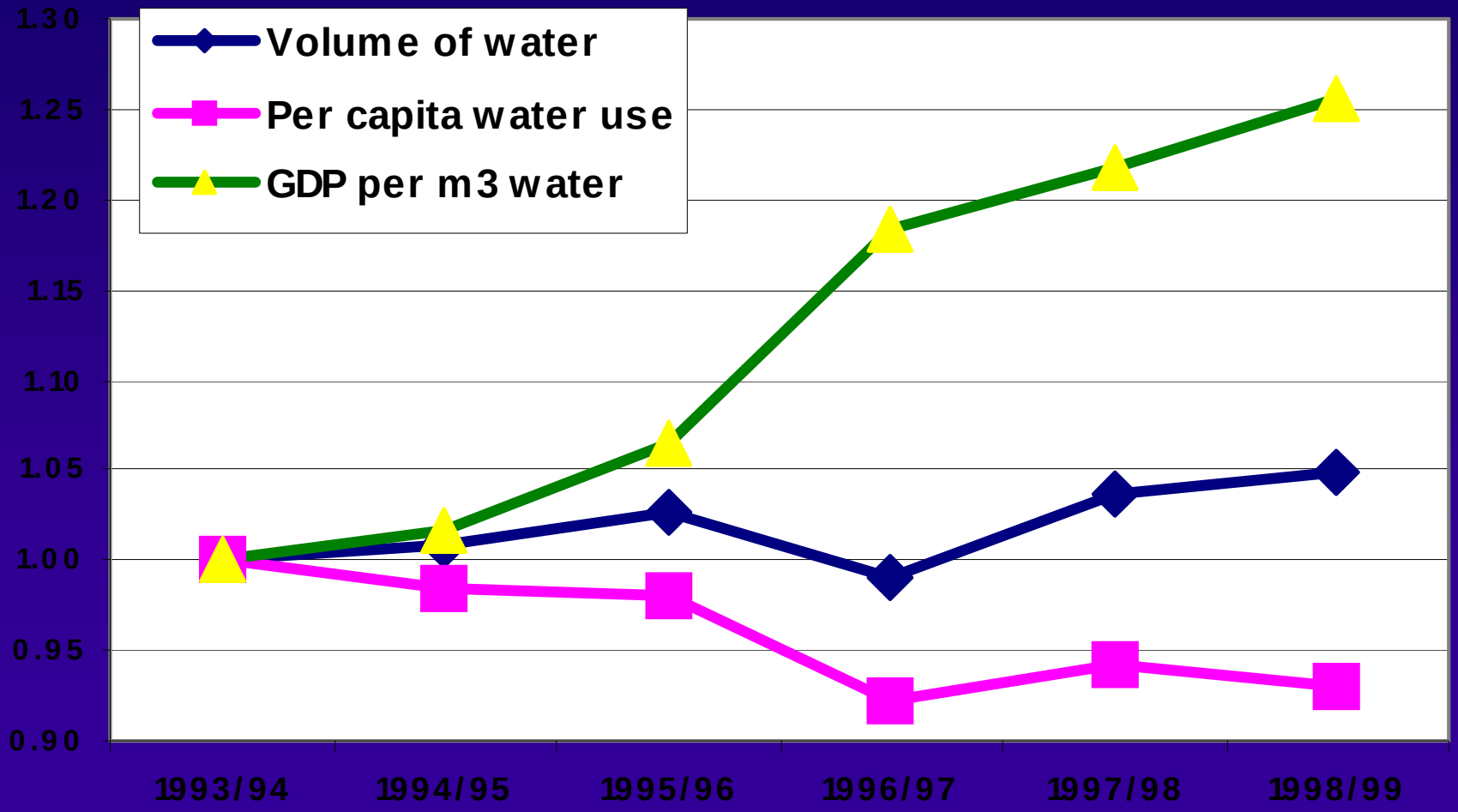
- Classification of units to industry in the case of multiple activities, especially those engaged in the activities of water supply, sewerage and hydro-electricity generation
- In most countries national accounts do not separate the water supply and sewerage industries
- In many countries the units supplying water or sewerage services are operated by government and in some they are incorrectly classified to government administration
- Spatial referencing – economic data refers to administrative boundaries while hydrological data refers to river basins
- Recording of losses in distribution and the flows for use of water in hydro-electricity and water for cooling
- Boundary between environment and the economy, especially artificial reservoirs

Use and indicators from SEEAW

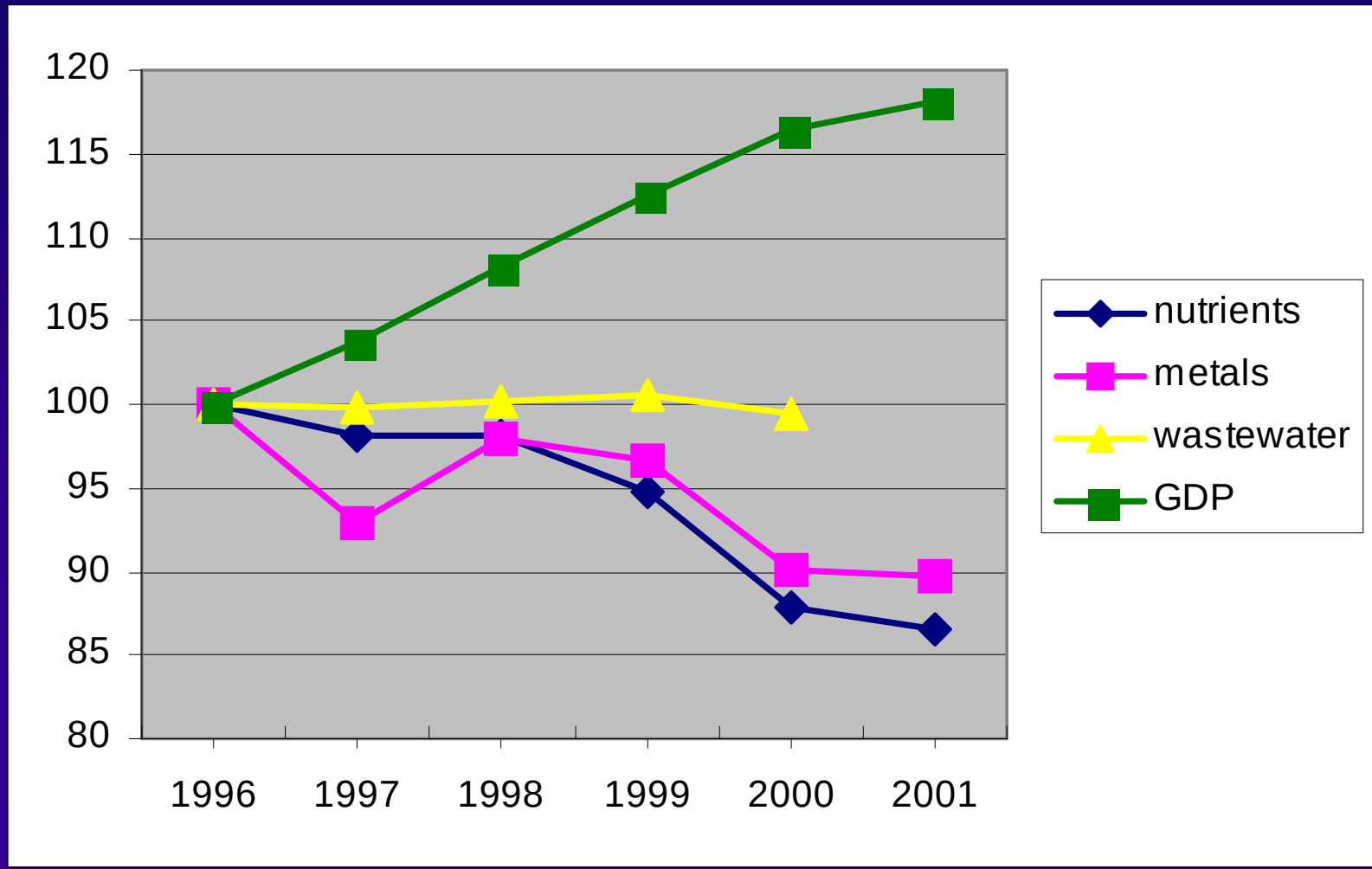
Source of pressure on water resources:

- Macro trends in total water use, emissions, water use by natural source and purpose, etc. 'Decoupling' economic growth and water use, pollution
- Industry-level trends: indicators used for environmental-economic profiles
- Technology and driving forces: water intensity/productivity and total (domestic) water requirements to meet final demand
- International transport of water and pollution

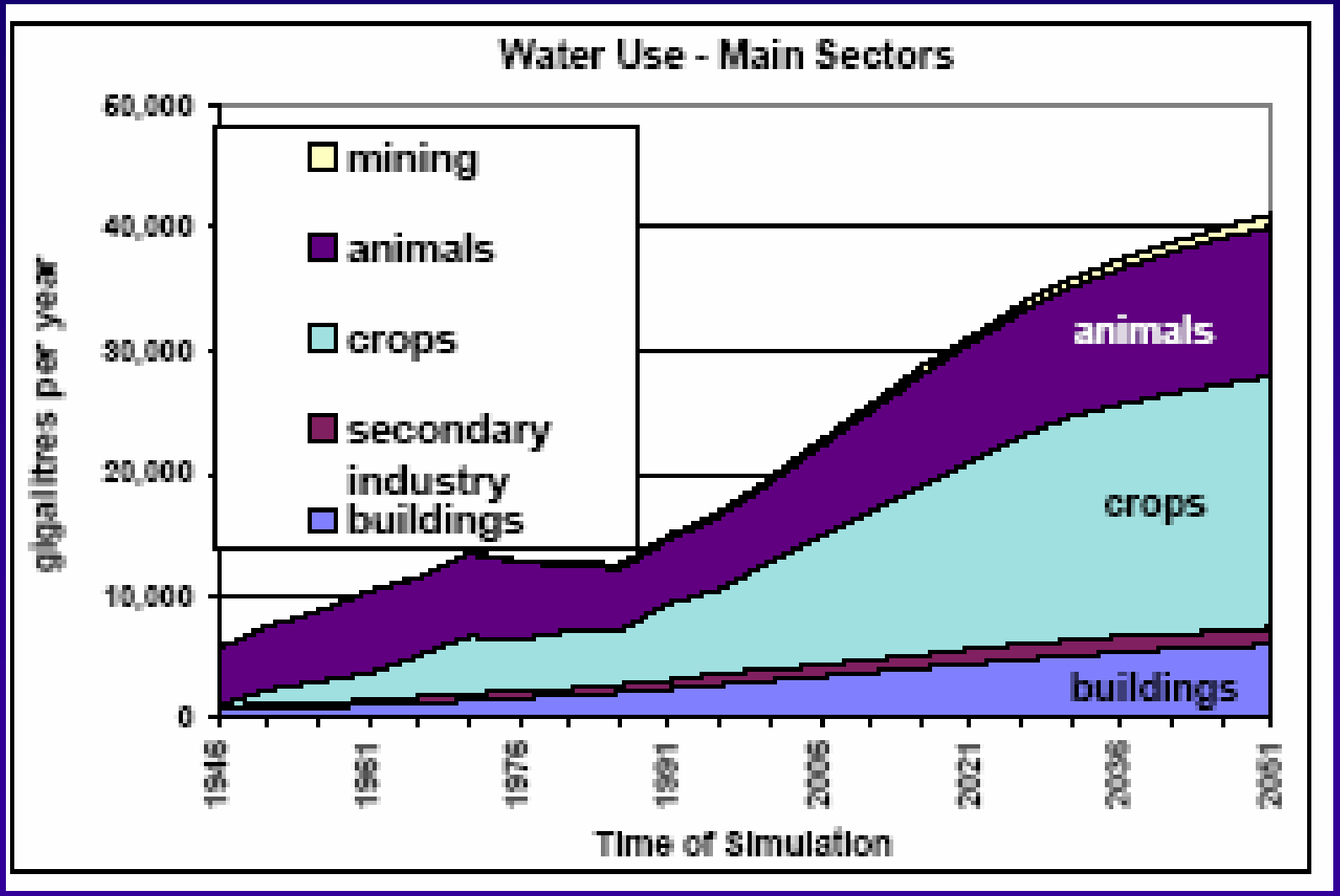
Botswana: water use and economic growth 1993-1998



Netherlands: water pollution and economic growth, 1999-2001



Projecting future water demands Australia 2050



Key findings of the Global Assessment and lessons from countries implementing SEEAW

1. Build on existing knowledge and recognise that a range of different systems are already in place
2. Cooperation is essential
3. High level support is needed
4. An agency needs to take the lead
5. A phased approach is needed and pilot or experimental accounts are very useful
6. A lot of progress can be made quickly

Build on existing knowledge and recognise that a range of different information systems are already in place

- Many institutions already have information
- Countries have developed information systems to meet their own data needs for management, including international obligations
- These institutions need to understand that their data is valuable and that others could use it for their purposes

Cooperation is essential

- The majority of countries report cooperation with other agencies in the production of water accounts (68%)*
- Despite this the lack of cooperation or data sharing was identified as an issue in 32% of countries for water accounts*
- Data are usually dispersed in many agencies (e.g. agricultural agencies collect information on irrigation water, water ministries collect information to construct water balances, etc.)*
- In many countries there are data gaps and in some countries there is duplication of statistical activity*

Cooperation in needed

- Within statistical offices
- Between statistical offices, water departments, economic/planning departments and agricultural departments
- With the water supply industry
- With the scientific and research communities
- Between users and producers of information

*Data from the Global Assessment of Water Statistics and Water Accounts

http://unstats.un.org/unsd/statcom/doc09/BG-WaterAccounts.pdf

High level support is needed

- The water accounts require a high degree of coordination within and between agencies, and so high level support helps to ensure that:
  - The proper legal and administrative processes are developed and used for the sharing and integration of data and that the duplication of activity is reduced between different agencies
  - Within agencies it paves the way for internal cooperation
  - There are no “turf wars” between or within agencies
- Resources need to be devoted to the production of the accounts.

An agency needs to take the lead

It is usual for one agency to take the lead in the coordination and production of the accounts.

- In the majority (53%) of case the agency is most often the NSO*
- The lead agency does the preliminary work, including learning the details of the SEEAW and investigating the available data

*Data from the Global Assessment of Water Statistics and Water Accounts

http://unstats.un.org/unsd/statcom/doc09/BG-WaterAccounts.pdf

A phased approach is needed and pilot or experimental accounts are very useful

- Start with the accounts that address the issues of most importance to countries:
  - In water scarce countries it has been water supply and use and asset accounts. In industrialized countries it has been pollution and emission accounts.
- Pilot accounts enable indicators and other policy uses to be demonstrated with data

A lot of progress can be made quickly

- Many countries already have much of the data needed to compile water accounts
- For example, China, Mexico, Jordan and Dominican Republic were all able to produce preliminary accounts within 6 months
- In addition it appears that UNSD/UNEP, OECD/Eurostat and the EEA already collect much of the data needed to produce some of the water accounts
- As such for many countries and agencies is a matter of re-arranging current data to match the format of the standard tables and to ensure they are consistent with the definitions and classifications of SEEAW
- In this process data gaps and deficiencies may be identified and, if important enough, these can be addressed

The main roles of NSOs*

- Usually the source of the national accounts
- Often collect water data for example on water abstraction, treatment and distribution , connection sewers, etc., through household and business surveys.
- Bring together the various stakeholders and help to ensure the commitment to the development and implementation of a multipurpose integrated information system (i.e. the SEEAW) in countries, to meet the needs of a wide variety of users needs. Making better use of existing resources would help to address problems with data availability and data quality, which were the main impeding factors for the compilation of water statistics and accounts in countries.
- Lead the development of a data collection strategy to improve and further develop the water statistics and accounts programme in countries.
- Assist in the process of harmonizing definitions and classifications related to water and ensure their harmonization with those used in economic statistics.

*From the Global Assessment of Water Statistics and Water Accounts

http://unstats.un.org/unsd/statcom/doc09/BG-WaterAccounts.pdf

UNSD activity to support the implementation of the SEEAW
(In accordance with the SEEAW Implementation Plan presented to the UNSC in 2008)

- Conducting of regional workshops
- Targeted country assistance
- Development of International Recommendations for Water Statistics
- Development of a knowledge-base to house practical material and countries experiences on the compilation of water statistics and accounts