Session 3: Water Accounting in Australia

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Content of session

• Water Accounting in Australia
  – Climate drivers and current players

• Water Account, Australia (ABS cat. no. 4610.0)
  – Overview
  – History
  – Data sources
  – Uses and users
  – Data snapshot
  – Challenges, data gaps and forward strategies
Environmental Accounting in Australia

- ABS Energy Account
- Experimental Waste Account
- ABS Experimental Land Accounts
- Experimental Ecosystem Accounts
- Victoria Water Account
- Water Account, Australia
- ABS Energy Account
- National Accounts Data
- Natural resources on National Balance Sheet
- Input-output analysis of energy and greenhouse gas emissions
- Researching ecosystem accounts
- National Water Account
- National Carbon Account

ABS Energy Account
Physical and monetary
SUT (ABS)

Experimental Waste Account
(ABS)

ABS Experimental Land Accounts
(ABS)

Experimental Ecosystem Accounts
(Victorian government)

Victoria Water Account
(Victorian government)

Australian Environmental - Economic Accounts (Annual)

Research for expanding the accounts produced and methodology
Environmental Taxes and subsidies, environmental protection expenditure, as well as valuation methods

Researching ecosystem accounts
Biodiversity, Carbon, Ecosystem condition
ABS, SEWPAC, BOM, DCCEE, DAFF
Murray-Darling Basin Authority, Victorian government
South East Queensland CMA
Wentworth group and universities

National Accounts Data
Natural resources on National Balance Sheet (Annual)

National Water Account
Physical asset account (Bureau of Meteorology)

National Carbon Account
(Dept. of Climate Change)

Australia’s climate
Australia’s climate
Figure 4. Mean annual rainfall over mainland south-eastern Australia (see inset map) from 1900 to 2009. Also shown is the 11-year running mean (solid black). (Source: Timbal et al., 2010)
Water accounting model

**ATMOSPHERE**

RAINFALL 2,789,424 GL

**TERRESTRIAL ENVIRONMENT**

RUN-OFF 242,779 GL

SELF-EXTRACTED WATER 69,447 GL

WATER PROVIDERS

- Eg: Water Supply, Sewerage and Drainage Service, Industry as well as some Mining, Manufacturing and Electricity businesses

WATER USERS

- Households
- Agriculture
- Mining
- Manufacturing and Other Industries
- Also includes use by Water Providers

**ECONOMY**

SELF-EXTRACTED WATER 11,337 GL

DISTRIBUTED WATER Supplied to Environment 1,005 GL

UNREGULATED Discharge (not quantified)

REGULATED DISCHARGE 62,456 GL

(Depends on in-stream use of 60,436 GL

E.g. Hydro-electric generation)

DISTRIBUTED WATER 10,332 GL

Sewage and other wastewater (not quantified)

REUSE WATER 425 GL

On-site/On-farm Recycling
Water Account Australia

History

- 1985 – Review of Australia’s Water Resources and Water Use (AWRC)
- 1994 – COAG Water Reform Framework
- **2000** – 1st *Water Account Australia* (ref period 1993-94 to 1996-97)
- **2004** – 2nd *Water Account Australia* (ref period 2000-01)
- 2004 – National Water Initiative
- **2006** – 3rd *Water Account Australia* (ref period 2004-05)
- **2010** – 4th *Water Account Australia* (ref period 2008-09) – 1st in a series of annual accounts
- 2012 – SEEA adopted as international statistical standard
- 2013 – ABS given official leadership role for SEEA-implementation in Australia
Australian water policy

- 1985 – Review of Australia’s Water Resources and Water Use (AWRC)
- 1994 COAG – water reform framework
- 2004 COAG – National Water Initiative (NWI) established to address the following concerns:
  - Availability of water for agriculture
  - Availability of water for human consumption
  - Ecological sustainability
  - Productivity and regulation of the Water Supply Industry
  - Water prices and return on assets
Water policy questions

• Is water flowing to the highest value users?
• Are water providers achieving full cost recovery?
• Are water markets open and efficient?
• Are water uses and the water supply infrastructure the supports this economically efficient and sustainable?
• Is there consistency in water pricing across sectors and between jurisdictions?
• Are environment and other public benefit outcomes being achieved?
• What are the economic, environmental and social impact of changes in water resources allocation and use?
Many users and producers of water data

• Government agencies responsible for:
  – Water, meteorology, hydrology, statistics, agriculture, environment, energy (especially hydro-power), planning, finance, geology
  – National, state/provincial or local government

• Water suppliers and wastewater treatment

• Water research organisations
  (e.g. government agencies, universities)

• Non-government organisations
  (e.g. water industry associations, farmer associations, conservation groups, etc)

• Investors (individual, public and private)
Institutional arrangements

- Water policy in Australia is supported by many government agencies (national and state level)

- Water Act 2007
  - Jurisdictional harmonisation (MDBA established)
  - Commonwealth Environmental Water Holder established
  - ACC enforces water charge and water market rules
  - BoM are given responsibility for water information functions including a National Water Account!!
History

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Water Accounting in Australia

- Water Account Australia (ABS)
- National Water Account (BOM)
- State Accounts
- Water Resource Plans (from 2019) (MDBA)

Related information
- Annual Climate statement (BOM)
- Water in Australia (BOM)

The BOM and State accounts can be mapped to the SEEA
What is in the publication?

- Physical Supply and Use Tables
- Corresponding monetary flows and implicit prices
- Additional industry detail (i.e. Agriculture, Water Supply Industry)
- National Accounts and water intensity measures
- Gross Value of Irrigated Production
- Data produced at the national, state/territory and selected drainage divisions
Water Account, Australia

- Provides a comprehensive picture of water use by different industries and households, over time
- Assists evidence-based policy decision-making
- Provides a data set that can be merged with other economic, physical and social statistics
- Helps predict future water needs
- Helps assess the impact of water use
Definitions and terminology

- Self-extracted water
- Distributed water
- Reuse water
- Regulated discharge
- In-stream use

Water consumption and water use

- \( \text{USE} = \text{distributed water use} + \text{self-extracted water use} + \text{reuse water use} \)

- \( \text{CONSUMPTION} = \text{USE} - (\text{Water supplied to other users} + \text{in-stream water use}) \)
Water Account Australia - Data sources

- ABS Collections/Surveys
- Annual Reports (Water Providers)
- State Water Accounts/Reports
- Performance Reports (Water industries)
- Government Agencies/Departments
- Industry Associations

Water Supply and Use
• **Water Supply and Sewerage Services Survey (annual)**
  - 350 Water and wastewater service providers across Australia

• **Agriculture Survey (annual)**
  - Non-census years @33,000, Census years @190,000 farms

• **Energy, Water and Environment Survey (EWES) (3-yearly)**
  - Over 14,000 – 18,000 units
  - All industries except Agriculture, Water Supply, Sewerage and Drainage Industry, Finance, Defence and General Government)
Water Supply and Sewerage Services Survey (annual)
- 350 Water and wastewater service providers across Australia
- Annual survey

Agriculture Survey/Rural Environment and Agricultural commodities survey (REACS) (annual)
- Non-census years @33,000
- Census years @190,000
- Establishments with estimated value of Agriculture operations of $5,000 or more

Energy, Water and Environment Survey (EWES) (3-yearly)
- Over 14,000 – 18,000 units
- All industries except Agriculture, Water Supply, Sewerage and Drainage Industry, Finance, Defence and General Government

Environmental Indicators Survey (EIS) (off-years)
- Over 5,000 units
- All industries except Agriculture, Water Supply, Sewerage and Drainage Industry, Finance, Defence and General Government
Water Account, Australia - data sources, external

- New South Wales Office of Water
  - Benchmark reports
  - 106 urban water utilities
  - Annual release

- Queensland Water Directorate
  - Statewide Information Management Report
  - 160 Urban water utilities
  - Annual release

- Bureau of Meteorology
  - Coordination with all other states in progress
Water Account, Australia

Key data items

Sources of Water
- Bulk supply
- Self extracted
  - Surface water
  - Groundwater
  - Desalination

Water supply and use
- Supplied to customers
  - Residential
  - Non residential (industry split)
  - Water suppliers (bulk supply)
- Own use
- Environmental flows
- Losses (i.e., real and apparent)

Recycled (reuse) supply and use
- Supplied to customers
  - Residential
  - Non residential (industry split)
  - Water suppliers (bulk supply)
- Own use
- Environmental flows

Sewerage and drainage services
- Collection, treatment and discharges to the environment

Financial
- Revenue and expenditure
Australia – monetary water supply and use, 2008-09 (million AUD$)

The Sea

Water Supply
ISIC 36

Sewerage
ISIC 37

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

Key

Wastewater
Water
Reuse water

Australia – monetary water supply and use, 2008-09 (million AUD$)

Note shown is the supply of distributed water and reuse water by mining and manufacturing, 25 GL in total. No monetary available for these.
Key users of the ABS Water Account

- Industry associations
- Policy departments (e.g. Productivity Commission, Dept. of Environment)
- NWC
- State govt
- Geoscience Aust
- BoM
- Water Supply Ind
- Data providers
- Researchers/academics
- ABARES
Australian water accounts - policy applications

• ABS Water Accounts relatively new tool for policy makers and researchers

• Potential in decision-making and analysis yet to be fully realised
Australian water accounts – example of policy applications

- Models developed to estimate the impact of increased water prices on water use in the southern MDB
- In short-term, demand for irrigation water unresponsive to water price
- In long term, respond by altering the crops they irrigate
- however, investment in on-farm water saving technology unlikely to be justified in terms of water saved.
Australian water accounts – examples of policy applications

- Assessing impact of restrictions of water availability in MDB
- Effect of population increase on Australian economy and price of water
- Australian industry – water use
- Input-output analyses
- The Industrial Ecology Virtual Library
- New BOM product – “Water in Australia”
Australian water accounts – forecasting demand

Water User - States

- NSW
- Vic
- Qld
- SA
- WA
- Tas
- NT
- ACT

[Graph showing water usage by states from 1946 to 2051]
Industry intensity of water use: 1996-97 to 2012-13
Monetary vs. physical use of distributed water (% of total use)

- Households
- All other Industries
- Electricity
- Water Supply
- Manufacturing
- Mining
- Agriculture

Value of water

Volume of water

2008-09
Australia, Water Consumption, by industry and households – 2013-14

Water Consumption, by State & Territory

Gigalitres (GL)

Select a different graph

Australia.
Water Account, Australia

Challenges

- Timeliness
- Data quality
- Consistency/quality of data from different sources
- Spatial referencing
- Combining and linking monetary water accounts with physical water accounts
- Greater disaggregation of industry data
- Treatment of losses
- Treatment of environmental flows, Environmental Water Holders
Spatial dimensions

- National
- State and Territories
- Drainage Divisions
- River Basins (?)
Water Account, Australia

Data Gaps

• Soil water use in agriculture (experimental estimates)

• Household rainwater tanks (experimental estimates)

• Discharges back to the environment
  – irrigation run-off
  – Environmental Flows and Environmental Water holders

• Discharges to sewerage (split by industry/households)

• Groundwater stocks

• Appropriate valuation of water and water infrastructure assets
Water Account, Australia

Forward strategies

- Broader awareness of the SEEA beyond ABS
- Linking Water accounts to other SEEA accounts
- Maintain a regular time series of relevant indicators
- Data-provider load – use of administrative data
- Research program
- Build, share and promote use cases
Water Account, Australia

References and links

- System of Environmental-Economic Accounting for Water
- International Recommendations for Water Statistics
- Draft Guidelines for the Compilation of Water Statistics and Accounts
- Monitoring Framework for Water
- Ross Alexander