A Monetary Water Account for Australia

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Presentation outline

1. Why are monetary accounts useful?
2. Water valuation issues
3. Experimental monetary water account
   - Methods and results
4. Future work?

Why produce a monetary water account?

- Enables the economic costs and benefits of water supply to matched with physical data on water stocks and flows.
- Informs more efficient water allocations:
  - ideally, require information on: physical water flows; prices paid for water used; value added of water users
- Costs and benefits can occur:
  - Now/later (temporal)
  - Here/there (spatial)
  - Public/private (and between industries), especially public water supply and private agricultural water use

Why produce a monetary water account? *continued…*

- Achieving cost recovery for water infrastructure assets
- Analysing trade-offs between alternative water and economic policies
- To reveal information necessary to calculate the value of the water itself (i.e. Net Present Value)

Water valuation issues

- The classification of water and water-related assets, products and industries
- Practical problems
  - Water pricing and zero resource rents
  - ‘Thin’ and imperfect markets for water trading
  - Data availability and data quality
- Subdivision of water supply industry
  - Rural: primarily for agricultural use
  - Urban: primarily for household and industrial (non-agricultural) use

Water and water-related assets

1. Water treatment / delivery infrastructure
2. Wastewater and sewerage (incl. EPE, both current and capital)
3. Water application and management infrastructure (e.g. flood mitigation works, sprinklers)
4. Water instruments – restrictive permits etc.
5. Water itself e.g. distributed water (wholesale and retail), re-use ('grey') water, surface water, groundwater and rainwater

Research paper: An experimental monetary water account for Australia, 2003-04

- Released 13 February 2007 – Authors: Rebecca Thomson, Michael Vardon and Peter Comisari
- Combines physical data from ‘Water Account, Australia 2004-05’; with
- Monetary data for 2003-04
- Scope: distributed water only
- Data considered ‘experimental’
- ABS Cat. No. 4610.0.55.004, see www.abs.gov.au

Water use in Australia and scope of the monetary account

	Self-extracted (GL)	Distributed Water (GL)	Reuse Water (GL)	In-Stream (GL)	Water Consumption (GL)
Agriculture	6,582	5,329	280		12,191
Mining	529	72	7	183	413
Manufacturing	246	341	13		589
Water Supply	11,160	2,045	39		2,083
Electricity and Gas	60,172	115	6	59,867	271
All other industries	862	1,561	78	386	1,021
Households	232	1,874	2		2,108
Total	79,783	11,337	425	60,436	18,676

Methods: Classification of products and assets

Four products were selected for revenue/expenditure data:

1. Urban distributed water
2. Rural distributed water
3. Bulk water
4. Wastewater/sewerage services

Three assets selected for asset values:

1. Urban water supply infrastructure assets;
2. Urban sewerage infrastructure assets; and
3. Irrigation and drainage infrastructure assets

Methods: Primary data sources, reference year 2003-04

Supply side:

- ABS Economic Activity Survey
- State government, industry association and company annual reports

Use Side:

- Households: State government reports, WSAA facts
- Agriculture: Water Use on Australian Farms
- Other industries: Economic Activity Survey
- Sewerage services: Environmental Protection Expenditure Account 1996-97

Supply table
Monetary: 2003-04; Physical 2004-05

	Monetary units	*Physical units*
Industry	*Distributed water (urban and rural) $m*	*Supply to other economic units GL*
Agriculture, forestry & fishing	–	–
Manufacturing	na	8
Mining	na	5
Electricity & gas supply	na	1
Water supply, sewerage & drainage	3,466	8,296
Cultural, recreational & personal services	–	–
All other industries	–	–
Total supply at purchasers prices	3,466	8,310

Notes: Monetary data relate to 2003–04, and physical data to 2004–05.

Monetary data in this table are considered experimental.

Use table
Monetary: 2003-04; Physical 2004-05

	Expenditure on water, 2003–04		*Physical use of water, 2004–05*	
	Distributed water $m	*Percent of total %*	*Distributed water GL*	*Percent of total %*
Intermediate consumption				
Agriculture, forestry & fishing	293	8	5,354	64
Manufacturing	235	7	341	4
Mining	51	1	72	1
Electricity & gas supply	92	3	115	1
Water supply, sewerage & drainage	2	0	23	0
Other Industries	746	22	531	6
Total intermediate consumption	1,419	41	6,436	77
Final consumption by households	2,047	59	1,874	23
Total use	3,466	100	8,310	100

Note: Monetary data in this table are considered experimental.

Household water use (2004-05) and expenditure on water (2003-04)

	Expenditure on urban water						
	Total $m	*Per capita* $	*Per household* $	*Population 30 Jun 04* '000	*Households 30 Jun 04* '000	*Water use 2004–05* GL	*Urban water* $/KL
New South Wales & ACT	768	109	285	7,055.3	2,698.8	576	1.33
Victoria	392	79	205	4,972.8	1,911.1	389	1.01
Queensland	405	104	270	3,882.0	1,498.1	458	0.88
South Australia	177	115	280	1,534.3	633.1	143	1.24
Western Australia	233	118	298	1,982.2	782.8	226	1.03
Tasmania	43	89	218	482.1	197.3	57	0.76
Northern Territory	28	140	507	199.9	55.2	25	1.10
Total	2,046	102	263	20,108.6	7,776.4	1,874	1.09

Note: Monetary data in this table are considered experimental.

Water supply and sewerage infrastructure assets, 2003-04

	Urban water infrastructure assets $m	*Waste water & sewerage infrastructure assets $m*	*Irrigation & drainage infrastructure assets $m*	*Total $m*
New South Wales & ACT	12,774	15,231	761	28,766
Victoria	4,943	5,114	2,610	12,667
Queensland	5,379	6,685	1,977	14,041
South Australia	4,859	3,578	329	8,766
Western Australia	2,949	3,583	297	6,829
Tasmania	775	626	48	1,449
Northern Territory	360	113	0	473
Total	32,039	34,930	6,022	72,991

Note: Data in this table are considered experimental.

Results for 2003-04 monetary water account

- Total output of water & sewerage services in was $7.3 billion, of which;
  - sewerage services generated $3.4 billion;
  - urban water sales generated $3.3 billion;
  - bulk water sales $0.5 billion; and
- sales of rural water were worth $0.3 billion
- water supply industry supplied 8,296 GL

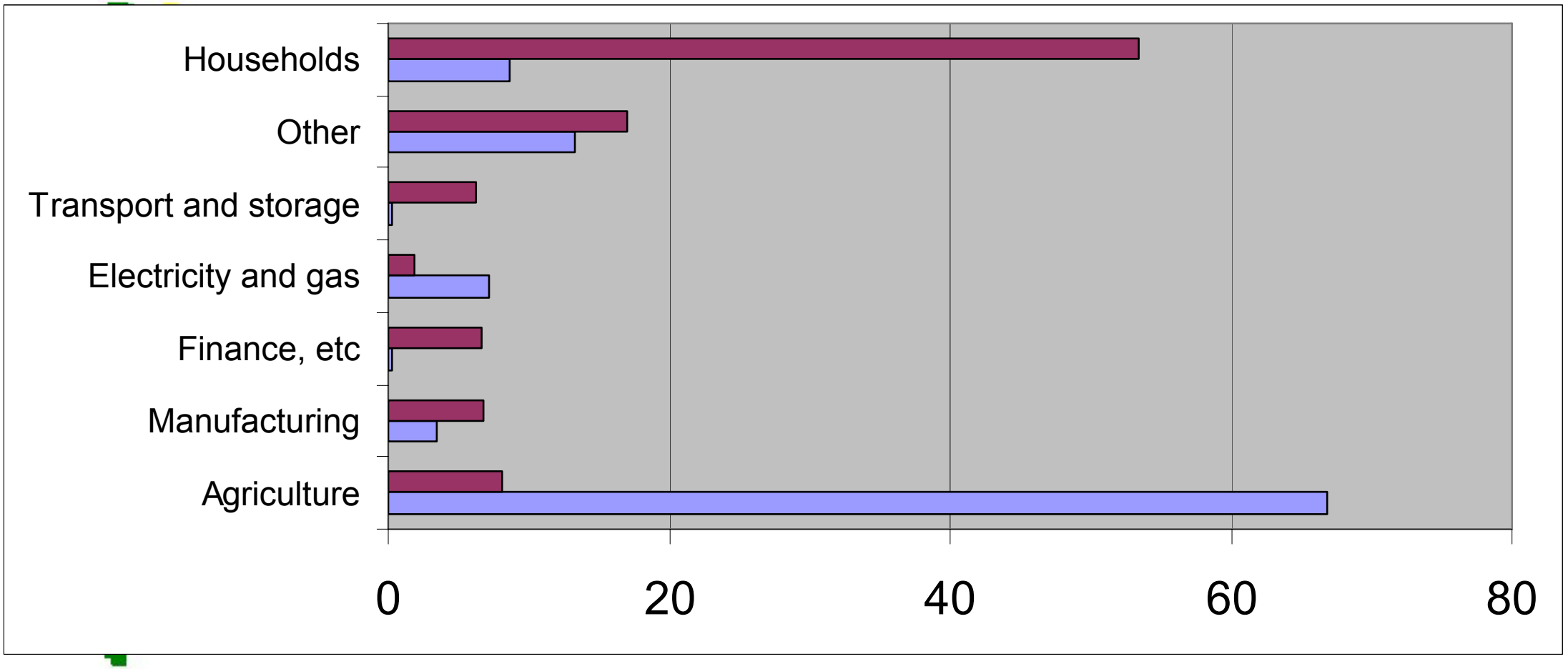
Results for 2003-04 monetary water account, *continued*...

- Households highest expenditure $2,046 million (59% of total), used 1,874 GL of water (23%)
- Agriculture spent $293 million (8%) for 5,329 GL of water (64%)
- Victoria lowest annual consumption per household (204 KL) and lowest expenditure per household ($205)
- Northern Territory highest annual consumption per household (453 KL) and highest expenditure per household ($507)

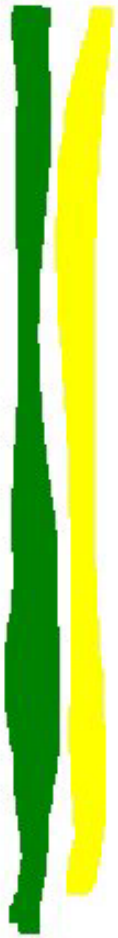
Results for 2003-04 monetary water account, *continued*...

- Total assets $73.0 billion
  - wastewater & sewerage assets - $35.0 billion
  - urban water infrastructure assets $ 32.0 billion
  - irrigation and drainage assets $6.0 billion

Monetary v physical use (%)



Key data issues



- Macro accounts v. micro level statistics
- Differing classifications used in water supply industry (Water Accounting v water accounting)
- Frequency of collection/reporting
- Repeatability of collection/reporting
- Accuracy and precision (±0.1%, 1.0% or 10%)
- Data access
- Level and change vs. cause and effect (i.e. aggregates vs. micro data for research)
- Perfection vs. realistically deliverable
- Degree possible vs. degree necessary

Future work?

- Work underway on an updated monetary water account
  - monetary and physical data both in respect of 2004-05
- Investigating extending scope to include self-extracted water
  - water trade data
  - resource rent valuation techniques
  - may wait for inclusion of questions on 2006-07 agricultural survey?

Future work? *continued*...

- Valuation of water infrastructure assets:
  – reported values? or;
  – link to discounted stream of expected future benefits arising from asset use?