Malaysia 2016 SEEA Training
Practical Guidance to Implementation: Data Sources

Regional Training Workshop on the System of Environmental-Economic Accounting with a Focus on Water Accounting

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Overview

1. Types of data and data sources
2. Setting data priorities
3. Practical guidance
4. Implementation steps
5. Lessons learned in building accounts
6. Data challenges

Types of data and data sources

1. Types of water data
   - Stock, supply, use
   - Water quality
   - Physical, monetary

2. Types of data sources
   - National
   - Sub-national
   - International
   - Governmental, non-governmental
   - Public, confidential
   - Census, survey, administrative, ad hoc

3. Data characteristics
   - Time step: Annual, daily, occasional
   - Spatial: National, drainage area, ecological area, administrative area

4. Other data quality
   - Fitness of use
   - Known accuracy
     - Accurate
     - Inaccurate
   - Unknown accuracy
   - …

Types of data and data sources

Data sources by type, for water accounts

- Survey data (e.g., agricultural survey)
- Administrative data (e.g., water consumption)
- Hydrological/meteorological data (e.g., streamflow, rainfall)
- Research data (e.g., case studies)
- Environmental science (e.g., ET)
- Geomatics (e.g. remote sensing)

Example: Canada MEFA for Water

Types of data and data sources

Data sources by agency, for water accounts

- 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 plants
- Water research organisations
  - e.g., government agencies, universities
- Non-government organisations
  - e.g., water industry associations, farmer associations, conservation groups, etc.

Types of data and data sources

Global data sources

A range of data on water and land cover are available from international agencies or research organisations. These include:

- FAO Aquastat
  http://www.fao.org/nr/water/aquastat/main/index.stm
- WHO World Climate Data and Monitoring Program (WCDMP)
  http://www.wmo.int/pages/prog/wcp/wcdmp/index_en.php
- WMO World Hydrological Cycle Observing System (WHYCOS)
  http://www.whycos.org/whycos/

Setting data priorities

Num	IRWS code	Name of Flow	Relevance	Availability of estimates	Availability of reliable statistics
1	B.1	Precipitation.	High	High	High
2	B.2	Inflows from other countries	Depends	Depends	Medium
3	C.1	Evapotranspiration	High	Medium	Low
4	H.1	Returns to Inland Water Resources	Medium	Low	Low
5	E.1	Abstractions of Inland Water Resources	High	High	Medium
6	E.2	Collection of precipitation	Low	Medium	Low
7	E.3	Abstractions from the sea	Depends	Medium	High
8	I.1	Losses	High	Medium	Low
9	F.2	Exported water	Depends	High	High
10	G.2	Imported water	Depends	High	High
11	F.1/G.1	Water supplied/Water Received	Medium	High	High
12	F.3.2/G.3.2	Reused water	Depends	Medium	Low
13	“Water consumption”	Final Water Use in SEEA-CF	Medium	Medium	Low
14	H.2	Returns to the sea	Medium	Low	Low
15	C.2.1	Outflows to neighboring countries	Depends	Medium	Medium
16	C.2.2	Outflows to the sea	Medium	Medium	Low

Practical guidance

Build on existing knowledge

Recognize 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

Practical guidance

Cooperate

1. The majority of countries report cooperation with other agencies in the production of water accounts (68%)
2. Despite this, the lack of cooperation or data sharing was identified as an issue in 32% of countries for water accounts
3. 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.)
4. In many countries there are data gaps and in some countries there is duplication of statistical activity

*Data from the Global Assessment of Water Statistics and Water Accounts
http://unstats.un.org/unsd/statcom/doc09/BG-WaterAccounts.pdf

Practical guidance

Cooperation is needed with …

1. Within statistical offices
2. Between statistical offices
3. Between statistical offices and water departments, economic/planning departments and agricultural departments
4. With the water supply industry
5. With the scientific and research communities
6. Between users and producers of information

Practical guidance

High level support is needed for …

- 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.

Practical guidance

An agency needs to take the lead in the coordination and production of the accounts**:** **Who, why?**

- In the majority of cases, the agency is the NSO
- The lead agency does the preliminary work, including learning the details of the SEEA-Water and investigating the available data

- NSO are more “policy-independent”, and in a better position to provide unbiased data and analysis

Practical guidance

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

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

Implementation steps

1. **Define,** for the account(s) of interest

1. the desired geographical scope and scale
2. the frequency of reporting (e.g., quiquennial, annual, quarterly)
3. the temporal basis (e.g., financial year, calendar year, hydrological year, seasonally, monthly) and
4. the desired level of industry and household detail.

- May be different for the different accounts

Adapted from ESA/STAT/AC.272, UNCEEA/8/7d
International Conference "Global Implementation Programme for the SEEA"
Eighth Meeting of the UN Committee of Experts on Environmental-Economic Accounting
New York, 17-21 June 2013

Implementation steps

2. **Identify** potential **data** sources
   - assess their suitability for accounts relative to the design choices made in Step 1.
   - In this step the metadata associated with the data sources should be closely examined.

3. **Secure** access t**o data**
   - including the data themselves, associated metadata and the rights to disseminate the accounts that are derived from that data.

Implementation steps

4. **Import** data and **prepare** data for analysis
   - noting that concordances may be required between the classifications of imported data and those used in SEEA

5. **Analyse** data
   - to identify data gaps, coherence between data sources, other data quality aspects, etc.;
   - make required adjustments for scope, definition, timing, classification as appropriate.

6. **Create** draft accounts and tables
   - including the analysis of time series where possible
     - recognize the likely need for multiple iterations in this step.

Implementation steps

7. **Disseminate** accounts
   - including material to assist interpretation such as indicators, methodological notes and statements of data quality.

8. **Archive** data
   - Including related methodological and other documentation.

9. **Review** accounts
   - Including data sources, methods and systems
   - Actively see user feedback.

Lessons learned in building accounts

- **Water accounting takes time**.
  - Countries should expect development in this area to be a medium to long term effort.
- **Institutional arrangements and cooperation** are particularly important
  - Water statistics and expertise often exist outside the national statistical office.
- **Linking the business register to environmental geographies**
  - link it with the business register was identified as a sound basis for beginning work on compiling water accounts.

Source: “Best Practices for Water Accounts”,
Summary of Discussions at the 21st London Group meeting
2-4 November 2015, Den Haag, The Netherlands

Lessons learned in building accounts

- The importance of **water use coefficients**
  - e.g., per employee, per unit of GDP, per unit of output, etc.) in the physical flow accounts was identified as an important consideration.

- **Variability** of water availability in both space and time
  - highlight the potential need for data at sub-national scales and sub-annual frequencies.

- **Micro-data validation** is an important consideration in water use surveys given the heterogeneity of water use within even detailed industry classifications.
  - The challenge of this and its relationship to generalized business survey processing models warrants consideration.

Lessons learned in building accounts

- **Hot and cold deck imputation** is important for allocating water use to non-surveyed industries and for industries where coefficients are not available or are not reliable.
  - This is particularly important for allocating treated water from municipal supply if billing data or direct consumption are not available.

- **Surveys are advisable for large water users**
  - such as electric power generation, paper manufacturing, agriculture, water treatment plants, and primary metal manufacturing.

- **Difficulties interpreting the data** were noted
  - e.g., looking at multiple instream uses such as hydro-electric power generation.

Lessons learned in building accounts

- The importance of estimating **leakages** was highlighted.
  - Leakages can account for a high proportion of the municipal water supply (up to 50%).
  - This is also important from the perspective of the Sustainable Development Goals (SDGs) where efficiency of the water supply system has been mentioned.

- The **complexity of the water supply and use tables** was identified as an impediment to implementation.

Lessons learned in building accounts

- The **measurement of stocks** was deemed to be problematic, especially given such difficult measures like soil water, for example.
  - Changes in water yield and flows might be better ways to analyse the resource.
  - However, artificial water reservoirs were identified as important stock measures in many developing countries.

- The **link to ecosystem accounts** was identified as important to mention.
  - The analysis of water flows can be a gateway to work in the domain of ecosystem provisioning services.

Examples of data challenges

1. Data does not exist at all
   - Estimates are not available and models cannot compensate
2. Data exists but are not available
   - Owner refuses or cannot share
3. Data exists but are scattered
   - Integrating the required data is too big an effort
4. Data exists but are incompatible
   - Different measuring instruments, classifications, vintage
5. Data exist but are of inappropriate quality
   - Precision, accuracy, coherence, timeliness, accessibility

Common problems in compilation of water accounts

1. Classification of units to industry especially those engaged in multiple activities (e.g., water supply, sewerage and hydro-electricity generation)

2. In most countries national accounts do not separate the water supply and sewerage industries

3. Recording of losses in distribution and the flows for use of water in hydro-electricity and water for cooling

4. Boundary between environment and the economy, especially artificial reservoirs

5. Spatial referencing – economic data refers to administrative boundaries while hydrological data refers to river basins

Examples of data challenges

Group Exercise

1. Identify a spoke-person for your group

2. Discuss 1 challenge and come up with a “work-around” solution

3. Report back to the group

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Thank You for your attention

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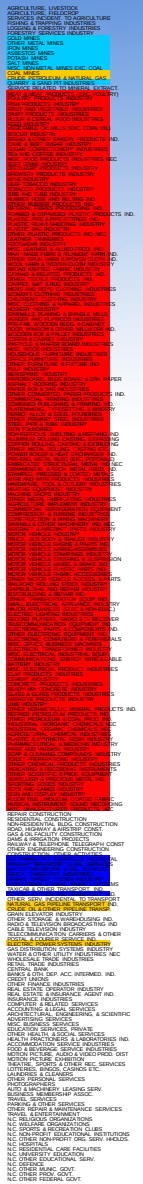
Use of water surveys data and coefficient to build water MEFA

Working level Input-Output classification
302 industries

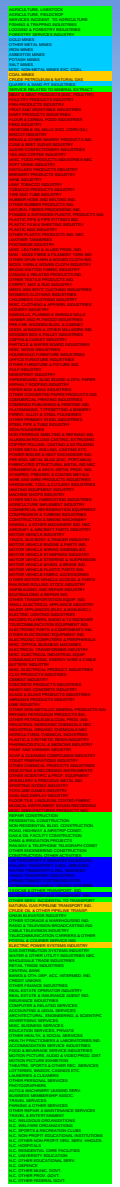
Intake of water by manufacturing activities ~16%

Intake of water by mining activities ~1%

Intake of water by thermal-electric ~64%



Intake by agricultural activities
~9%



Residual : Personal and government sector
(Σ intake– survey detail)
Allocated using coefficients
~7%

Back