Renewable Freshwater Resources (C-1)

Data sources, stumbling blocks and simple data validation techniques

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How to collect data?

How to make meaningful statistics (stumbling blocks)?

How to validate statistics and indicators before dissemination?
1. Data sources

Producing of statistics for template C-1 (Renewable Freshwater Resources) is a task of the National Hydrometeorological Institute.

National Statistical Offices should be in a position to ask them the right questions, to understand and to (roughly) validate the data.
Clarifications with Hydrometeorological Institutes

• Are annual water balances available, Long Term Annual Average (LTAA) or other?

• Does the national monitoring network qualify to calculate a national water balance?

• Which methods are used (e.g. following WMO Guide to Hydrological Practices), how are shared water bodies (e.g. border rivers) considered, etc.?

• Data is needed in terms of volume (not height)

• ACTUAL evapo-transpiration is needed
2. Stumbling Blocks

Data collection:
• Unit of measurement
• Transboundary waters
• ACTUAL evapotranspiration

Careful with the interpretation of results:
• Renewable freshwater resources:
  • Adding up (e.g. for a group of countries) will lead to double-counting
  • Ecological flow not considered
• National aggregates do not reflect seasonal or sub-national (river-basement) problems
Stumbling block: Unit of measurement

Often you will get the data on water resources in terms of mm/year, km³/year or another unit.

Unit of measurement of template C1: million m³/year!
Stumbling block: Transboundary waters

Follow multilateral or bilateral agreements according to UNECE Water Convention and/or River Basin Agreements.

Divide 50/50 between the two riparian countries if no agreement.
Stumbling block: ACTUAL evapotranspiration is needed!

You also might get data on the POTENTIAL evapotranspiration (ET), which is not needed for C1.

Potential ET represents the evapotranspiration rate of a short green crop (grass), completely shading the ground, of uniform height and with adequate water status in the soil profile. It is a reflection of the energy available to evaporate water, and of the wind available to transport the water vapour.
Stumbling block: Interpretation of renewable freshwater resources (I)

Country A:
Renewable freshwater resources = 210 = 200 + 10

Country B:
Renewable freshwater resources = 505 = 300 + 205

Renewable freshwater resources of countries A and B together?

a) 715?   b) 705?   c) 510?
Stumbling block: Interpretation of renewable freshwater resources (II)

Calculation of annual or LTAA renewable freshwater resources on country level provides important information for a range of indicators (e.g. water exploitation index, dependency ratio etc.), but does not consider:

- Ecological requirements (ecological flow)
- Multi- or bilateral agreements
- Seasonal and/or sub-national water stress situations
3. Simple Data Validation

Can the values be true?
### What is questionable here? Why?

(Size of country: 85 000 km²)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Unit</th>
<th>1990</th>
<th>1995</th>
<th>2000</th>
<th>2001</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>Precipitation</td>
<td>million m³</td>
<td>93000</td>
<td>85000</td>
<td>90000</td>
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<tr>
<td>2</td>
<td></td>
<td>Actual evapotranspiration</td>
<td>million m³</td>
<td>38000</td>
<td>-</td>
<td>30000</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Internal flow</td>
<td>million m³</td>
<td>55000</td>
<td>n/a</td>
<td>85000</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Inflow of surface and groundwaters from neighbouring countries</td>
<td>million m³</td>
<td>23000</td>
<td>20000</td>
<td>25000</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Renewable freshwater resources</td>
<td>million m³</td>
<td>78000</td>
<td>n/a</td>
<td>105000</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Outflow of surface and groundwaters to neighbouring countries</td>
<td>million m³</td>
<td>78000</td>
<td>70000</td>
<td>72000</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Outflow of surface and groundwaters to the sea</td>
<td>million m³</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Avoid empty cells. Is it "0" or “n/a”?

Careful: Templates contain formulas for internal flow and renewable freshwater resources.

### Double-check with other data sources, e.g:

- [FAO Aquastat](#)
- [World Bank](#) (average precipitation: divide volume / land area)
- [CIA World Factbook](#)
- Etc.

### Suggestion: Long Term Annual Average (LTAA) figures could be useful
Other experiences (collection, stumbling blocks, validation)? Please share them with us!

Thank you very much for your attention!

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