The European Commission’s science and knowledge service
Joint Research Centre

Water purification: economic valuation and accounting

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JRC approach for Ecosystem Service Accounting

Critical variables of the biophysical model

Biophysical model → Translation in monetary terms → Ecosystem service accounting

Spatially explicit

Potential flow

Enabling actors

Use (actual flow)
Graphical simplification of the procedure

Up-stream load

Diffuse sources

Point sources

Tonnes of N removed from point sources

Tonnes of N removed from diffuse sources

Introduction of a threshold concentration

Environmental engineering calculation of number of ha and costs of CW

Actual flow

Sustainable flow

Translation in monetary terms

Tonnes of N removed from diffuse sources

FWS CW ha

HF CW ha

€*ha

€*ha

Translation in monetary terms

Tonnes of N removed from point sources
Actual flow

Considering a threshold of 1mg/l

Potential flow

EC-JRC 2017

Non EU territories
Role of enabling actors: who drives changes in the actual flow...  ...what is the impact of these changes?

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<tbody>
<tr>
<td>Agriculture</td>
<td>18,467.93</td>
<td>18,417.70</td>
<td>18,372.09</td>
<td>18,317.43</td>
<td>18,223.31</td>
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<td>Other sectors</td>
<td>355.71</td>
<td>357.98</td>
<td>360.24</td>
<td>353.31</td>
<td>331.71</td>
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Actual Flow (Euro/km)

[Graph showing actual flow from 1985 to 2005]

Water bodies

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<td>-11,737.75</td>
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<td>-11,943.97</td>
<td>-10,777.94</td>
<td>-9,165.49</td>
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Water purification capacity (NPV)

Capacity trend 1985 - 2005

Capacity of water purification (Net Present Value)
Stock 1985 (in €)
0 - 100
101 - 100,000
100,001 - 1,000,000
1,000,001 - 10,000,000
> 10,000,000
Non EU territories

Changes in the capacity (Net Present Value)
changes 1985-2005 (€)
< -1,000,000
1,000,000 - -100
-100 - 100
101 - 1,000,000
> 1,000,000
Non EU territories
How much is it worth to decrease N inputs?

EU-27 (no Malta)

1991: Nitrates Directive

Long term ability to generate water purification
Issues that need to be discussed

- Motivations for the use of replacement cost
- Motivations for the use of CW as replacement cost
- NPV: lifetime (T)? Interest Rate?
- Approach for application in time series:

  If there is only one reference monetary value
  - CPI?
  - Constant prices /current prices?
  - Exchange rate?

  If there are more reference monetary values but not for all the time series
  - How to “mix” the values
References

Physical and monetary ecosystem service accounts for Europe: A case study for in-stream nitrogen retention

Alessandra La Notte, Joachim Maes, Silvano Dalmazzone, Neville D. Crossman, Bruna Grizzetti, Giovanni Bidoglio

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The role of enabling actors in ecosystem service accounting

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