Water footprint application at different geographical scales

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Erika Zarate, Maite Aldaya, Derk Kuiper
Water Footprint Network
Overview presentation

1. WF application at different geographical scales

2. Policy framework and measures

3. Framework of the WF application in geographical areas

4. Conclusions
WF application at different geographical scales
WF at different geographical scales

1. WF within a geographical area
   ▶ total amount of water that is used by all the production processes in the geography (green, blue, grey)
   ▶ virtual-water balance: net import of virtual water

2. WF of the consumers in the geographical area
   1. Internal water footprint – WF inside the geography
   2. External water footprint – WF in other geographies
WF at different geographical scales

- Literature review - Existing case studies (17)
- WF and VWT a powerful tool for IWRM
- More research is needed on:
  1. WF assessment technical aspects:
     - Database improvement
     - WF industrial goods
     - Grey WF
     - Sustainability assessment indicators
     - Practical guidance non-scientific community
  2. Insertion of WF assessment results into a decision-making system
Existing case studies

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<th>Geographic unit</th>
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<td>Indonesia</td>
<td>Bulsink et al. (2009)</td>
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<td>Spain</td>
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<td><strong>REGIONAL AND RIVER BASIN</strong></td>
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<td>Mancha Occidental Region</td>
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<td>Lower Fraser valley and Okanagan basins</td>
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<td>Heihe river basin</td>
<td>Chen et al. (2005)</td>
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Policy framework and measures
WF policy framework

WF assessment can:
► Inform cross sectoral policy making
► Build citizen awareness
► Inform water allocation decisions at different levels

Currently no systematic and practical framework exists

Better understanding and agreement needed on:
► Water offsetting and water neutrality
► VWT consideration in the Doha Development round of the WTO
► Developing countries
WF policy framework

**Water policy**

- National water statistics, national water plan and river basin plans
- Indicator beyond GDP
- Water pricing
- Allocating water more efficiently
- Drought management
- Financing water efficiency
- Fostering water efficient technologies and practices
- Development of a water-saving culture
- Improvement of knowledge
- Promote coherence between water and other policies: environmental, agricultural, energy, trade, foreign policy
WF policy framework

Agricultural policy

- Main water consumer (86% green and blue WF)
- Optimal cropping pattern planning (suitable to climate conditions)
- Allocate water where its value added is highest
- Increase water productivity
- Water-saving irrigation techniques along the whole supply chain (storage – distribution – application)
- Reduce/eliminate or reform of environmentally harmful subsidies
- Reduce pollution - Non-point source pollution indicator – Grey WF
WF policy framework

Environmental policy

► Include WF and VWT analysis in the river basin plans.
► Plan water allocation taking the environmental flows into account.
► Implement WF reduction measures ensuring environmental flow requirements and ambient water quality standards.
WF policy framework

Trade policy

Water saving through trade

► National water saving

A water scarce nation can save water by importing a water-intensive commodity instead of producing it domestically.

► Global water saving

International trade can save water globally if a water-intensive commodity is traded from an area with high to an area with low water productivity.

► WTO – Doha Development Round
Energy policy

The water sector is becoming more energy-intensive
► desalination
► pumping deeper groundwater
► large-scale (inter-basin) water transfers

The energy sector is becoming more water-intensive
► biomass
Framework of the WF application in geographical areas
WF assessment steps

Phase 1: Setting goals and scope
Phase 2: Water footprint accounting
Phase 3: Water footprint sustainability assessment
Phase 4: Water footprint response formulation
WF accounting framework

Direct water footprint
- Green water footprint
- Blue water footprint
- Grey water footprint

Indirect water footprint
- Green water footprint
- Blue water footprint
- Grey water footprint

Water withdrawal
Non-consumptive water use (return flow)
The traditional statistics on water use

Water consumption
Water pollution

[Hoekstra et al., 2009]
WS accounting framework

Internal water footprint of consumption + External water footprint of consumption = Water footprint of consumption

Virtual water export + Virtual water re-export = Virtual water export

Water footprint within the area + Virtual water import = Virtual water budget
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Conclusions
Conclusions

1. None of the existing studies includes the complete WF assessment
2. Common language between different sectors
3. Framework to inform and support decision-making
Conclusions

Further work is needed

Testing WF framework in different geographical areas:

► Lake Naivasha (Kenya)
► Sao Paulo (Brazil)
► Chile
► China (Beijing)
► Spain
► Peru
► India
► Nile basin
Key areas R&D

► Grey WF
► Analysis and testing of WF sustainability indicators
► Elaborate and test response scenarios (s. optimization)
► Test the framework in the context of business WF assessment
► Test the effectiveness of the framework in guiding decision making
Thank you