

## **E-Forum on Full-Cost Accounting of Food Waste Summary of Discussions of Week 3 (4 to 10 November 2013)**

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The third week of the E-forum was an opportunity for the participants to reflect on food waste impacts on water use and the related societal costs within the Full Cost Accounting (FCA) framework. The objective of this third week was to discuss the evaluation and monetization of water use impacts arising from food waste. The key points of the week discussions are presented below.

**Water use.** There are two different views regarding valuation of water wastage. In the Input Paper, the estimated water use from food wastage (250 km<sup>3</sup>/year) considered the consumptive water use (i.e. incremental evapotranspiration due to irrigation) while other studies consider the whole volume of water withdrawn. Estimates based on the volume of water withdrawn/allocated are much higher than the ones based on consumptive use (such as to Comprehensive Assessment of Water Management in Agriculture, (CA), IWMI (2007)). An argument to use water withdrawn is that dams/reservoirs are designed in function of water withdrawn, so investments in infrastructures and management refer to withdrawal. Using water withdrawals to calculate water wastage rather than using consumptive use implies always an over-estimation of the amount of water wasted. At the same time, using consumptive use to calculate water wastage implies an under estimation of the water wasted, because some of the return flow (water withdrawn for irrigation but not evaporated) may not be recoverable.

However, using water withdrawals rather than consumptive use may lead to erroneous policy advice, like for example the advice to save water by increasing irrigation efficiencies. Increasing irrigation efficiencies may lead to saving water because the same amount of crop can be produced with less water withdrawn. However, increasing irrigation efficiencies often does not lead to reducing the amount of water withdrawn, but it encourages farmers to increase the amount of area under irrigation which will lead to more water consumption rather than less.

**Use value of water.** Three suggestions were made:

- **Irrigation costs:** as a first approximation of the direct use value of water, the Input Paper suggested to use irrigation costs. Some irrigation costs proposed from literature search and benefit transfer seemed to be high, as experts are of the view that using water for agriculture is reasonable only if the price is below USD 1/m<sup>3</sup>. It was suggested that an indicative value could be 10 cents/m<sup>3</sup>, though this needs to be adapted to specific region/situation.
- **Cost/benefits ratio:** it was suggested to look at water use cost/benefits ratios of different food wastage mitigation measures. To do so, there is a need to consider as many socio-environmental components as possible.
- **Transaction and opportunity costs:** depending on the cost-estimate used, transaction costs can be or cannot be included, depending on each situation. Usually, transaction costs are not covered when using an opportunity cost methodology.

**Non-use value of water.** The Input Paper did not attempt to calculate the non-use value of water; apart from being very difficult to evaluate, it may not play a role when looking at water quantity itself. Indeed, the non-use value is the existence value of, for example, some wetlands, but not of the water included in the wetlands. Existence value is measured by the “willingness to pay”, that is how much people would be willing to pay to protect those ecosystems, even if they have no service provision function to society today.

**Scarcity.** In response to the Input Paper question on how to account for water scarcity, two suggestions were made. The approach developed by Ridoutt and Pfister (2009) integrates water scarcity considerations into water consumption volumes.. Also, the comparison of Water Scarcity Indices and Methodologies from Brown (2011) proposes different methodologies to account for water scarcities.

**Double counting.** When working on costing the effects of water use and scarcities, there is a need to be aware of possible double counting with other food wastage impacts. For example, ecosystem and biodiversity loss due to water scarcity should not be also included in the biodiversity accounting.

**Data issues.** The Input Paper illustrated the lack of data on water costs, while these are crucial for prioritizing action . Considering current uncertainties, the numbers that will be generated risk being highly subjective and inaccurate. Standardized protocols/standards/codes of practice are needed at the international level for valuing water use and water resources.

The E-forum participants mentioned several relevant information sources, including:

- Ridoutt, G., B., Pfister, S. 2009. A revised approach to water footprinting to make transparent the impacts of consumption and production on global freshwater scarcity  
<http://www.sciencedirect.com/science/article/pii/S0959378009000703>
- Brown, A. 2011. A Review of Water Scarcity Indices and Methodologies.  
[http://www.sustainabilityconsortium.org/wp-content/themes/sustainability/assets/pdf/whitepapers/2011\\_Brown\\_Matlock\\_Water-Availability-Assessment-Indices-and-Methodologies-Lit-Review.pdf](http://www.sustainabilityconsortium.org/wp-content/themes/sustainability/assets/pdf/whitepapers/2011_Brown_Matlock_Water-Availability-Assessment-Indices-and-Methodologies-Lit-Review.pdf)