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Research area: General aims

Environmental technology // Water

Key words:

Water footprint; blue, green, grey water footprint

Title: "Water Footprint" - Expert monitoring and exerting influence on establishing the methodology for determining the virtual water consumption in the paper industry**Background/Problem area**

The "Water Footprint" (WF) concept is modelled on the "Carbon Footprint" and is inextricably linked with virtual water consumption. Implementation of this concept is one of the declared goals of the UN. Virtual water is a term referring to any water that is directly or indirectly used in the production of a product. The water footprint consists of three components:

Green water (WF_green) is naturally occurring soil water and rainwater which evaporates during the growth of plants, for example.

Blue water (WF_blue) is the surface water or groundwater in agricultural plant production which is supplied by irrigation and which evaporates during the growth of plants.

Grey water (WF_grey) describes water that is polluted during production (fertilizers and pesticides, pollutants from industrial production, ...).

Two WF values have been circulating regarding paper products: for one sheet of A4 paper (80 g/m²) made from fresh water or recovered paper is equal to 10 or 0.10 L water. How these values were calculated and what boundary conditions were involved is unknown and unclear. The WF concept is intended to make it possible to evaluate environmental impacts, quite above and beyond this purely technical parameter of the WF value.

Objectives/Research results

The most important objectives of this project are to observe the current development of the methodology and to identify those issues that might be critical for German paper mills and diametrically opposed to the interests of the German paper industry.

The CROPWAT model was developed for rapidly growing plants and is designed to calculate evapotranspiration that is the basis used to determine the volumes of WF_blue and WF_green. It is unsuitable for tree growth. Corresponding activities on the part of large pulp and paper mills to further develop this concept are intended to bring about improvements.

At first sight, WF_grey appears to play only a minor part in the entire WF equation. However, it indicates the volume of unpolluted water required to reduce the effluent load to the extent of natural "background load". The "reference substances" relating to this background load, however, are currently not yet defined. If they are assumed to be industrial chemicals, then very high WF_grey values could result. This, however, could not be reconciled with the very high German state of the art that is typical of the effluent treatment in the paper industry. Basically speaking, the WF_grey value can also be calculated on the basis of the thermal effluent load.

New figures for the sum of WF_green and WF_blue for writing and printing paper are being cited in the most recent literature issued from the WF network. These new figures take the following factors into consideration: different types of trees, regions, climatic conditions, timber yield and the share of recycled recovered paper. This new basis of calculation will still have to be evaluated in detail.

Application/Economic benefits

It has to be ensured that in addition to an accurate and comprehensible purely technical parameter – water volume consumption per product unit – the environmental impacts of the respective share of the water footprint is adequately taken into consideration and properly assessed in the water footprint concept. For example, identical proportions of "green" and "blue" water in forestry have a different quality depending on the climatic zone. Since the "water footprint" concept is becoming an increasingly significant part of the political discussion, it is necessary to compare the methodology development and to set the stage from the point of view of papermakers.

Project period: 01.05.2010 – 31.12.2010

Remarks

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