



CAR-ES criticizes the proposed assessment of water footprints, where evapotranspiration becomes a major part of the water consumption. In Nordic ecosystems, evapotranspiration is a part of the hydrological cycle. The transpired water will be returned elsewhere as rainfall.
Photo: Mats Hannerz

Rules for Water Footprints disfavour wood from Nordic–Baltic forests

The SNS-supported project CAR-ES argues against a proposed standard for calculating water footprints. The draft standard includes evapotranspiration as a component of water consumption. This tremendously overestimates the water footprint of forest products in the Nordic/Baltic region, and draws attention away from more serious water problems. Martyn Futter, researcher at the Swedish University of Agricultural Sciences and part of CAR-ES, explains more.

CAR-ES: Centre of Advanced Research on Environmental Services from Nordic forest ecosystems. A Virtual Centre of Advanced Research supported by SNS. Read more on www.nordicforestresearch.org/car-es/

The human footprint

Citizens, consumers and corporations are increasingly concerned about their footprints, or the impacts their actions have on the environment. The carbon footprint is probably the best known, but footprints have also been developed to convey water-related impacts.

Water footprint. Photo: Istockphoto.



A number of methods based on estimates of the water consumed during the creation of a product or service have been developed for assessing human impacts on freshwaters. The Water Footprint Network Water Footprint (WFN-WF) is an ambitious tool for quantifying and communicating information about freshwater consumption. Water footprints are increasingly being incorporated into life cycle analysis and there is a draft ISO standard pertaining to water footprints.

If managed and used correctly, water footprints provide a potentially vital tool for consumers and corporations to assess the environmental impact of their actions. Unfortunately, they do not always deliver this function.

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10 litres for one A4-sheet!

According to the WFN-WF, 10 litres of water are consumed in the production of one sheet of A4 paper. This claim has attracted a great deal of interest from researchers in Fennoscandia. To understand it, it is helpful to take a closer look at the components of a water footprint. These are known as blue, green and grey water consumption.

Blue water represents the volume of surface water, *green water* the rainwater held in the soil which is consumed to create a product. *Grey water* is the volume of water that is polluted.

For both the WFN-WF and proposed ISO standard, blue and green water consumption are defined as the volume of water removed from a catchment during the production of a product.

Evapotranspiration is *not* equal to consumption

Earlier this year, CAR-ES researchers, led by Samuli Launiainen, showed that current representations of the water footprint are not appropriate for understanding the water-related impacts of Fennoscandian forests and forestry, or do not always reflect where the real problems lie.

The natural process of evapotranspiration, where plants return water to the atmosphere, is counted as part of the water footprint. This accounts for the great majority (60–99%) of the 10 litres presented as the water footprint of a sheet of paper. This is troublesome for a number of reasons:

First, Nordic/Baltic forests are typically not water limited. In most (but not all) cases, water which is returned to the atmosphere through transpiration is not needed for other purposes.

Second, unlike water, which is incorporated into a product, evapotranspired water can readily contribute to rainfall as part of the hydrological cycle. Water removed from a catchment through evapotranspiration is not really consumed, but it is transported elsewhere and is readily available for reuse.

Finally, focusing too much on evapotranspiration and volumetric measures of water consumption can divert attention from real forestry-related water resource issues. For example, water used by a plantation forest in a dry area might be lower than the water use of a Nordic/Baltic forest, but may have more severe consequences since the production system is water limited.

CAR-ES improves knowledge

Conceptual and detailed science is needed to understand water-forest relations in the Nordic/Baltic region better. Researchers in the CAR-ES network are developing a better understanding of the fate of precipitation falling on forests and the impacts of forest management on local and regional hydrology.

The research contributes to the sustainable management of forest ecosystem services delivered to cities like Copenhagen, which are partially



"Misunderstandings of the hydrological cycle will unfairly penalise Nordic/Baltic forestry", says Martyn Futter.
Photo: Private

dependent on forest areas for drinking water.

CAR-ES is also working on better methods and models for understanding the movement of water between forests and the atmosphere.

Penalises Nordic Wood!

Existing knowledge suggests that forests and forest management activities have a limited impact on the natural hydrological cycle in the Nordic/Baltic region. Methods of estimating water use and consumption based on misunderstandings of the hydrological cycle will unfairly penalise Nordic/Baltic forestry and fail to provide citizens and consumers with the necessary tools to assess the environmental consequences of their activities. Research in CAR-ES is helping to address these issues and is, hopefully, contributing to a more sustainable future for forests and the Nordic/Baltic region as a whole.

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Reference: Launiainen et al., 2013. *Is the Water Footprint an appropriate tool for forestry and forest products – the Fennoscandian case. Ambio (open access)*



Photo: Luca Lorenzi, Wikimedia commons.



Proud farmers who have recently started a tree seedling nursery to support agroforestry in the village of Mbazzi, Uganda. Vi-Agroforestry provided advisory during the establishment of the cooperative. Photo Mats Hannerz.

Vi-Agroforestry 30 years

"Vi Agroforestry" (Vi-skogen) is a Swedish development cooperation organisation that supports farmers in the Lake Victoria Basin in Eastern Africa. It started off as a tree planting project in Kenya in 1983, but has expanded to Uganda, Tanzania, Rwanda, and recently also to Malawi. Thus, 2013 marks 30 years of agroforestry and farming development, through this project, in Eastern Africa.

News & Views had the good fortune to visit Vi-Agroforestry in Uganda, where the head office in Masaka has coordinated the activities in the country since 1992.

In the early years, tree planting was the prime focus of the project. Since then, it has expanded to cover

the whole chain of farming, including animals, crops, adding value and financing. Trees are still fundamental, since they provide fodder, wood and soil protection.

The idea is to initiate village projects where farmers start to cooperate and gain competence in order to help themselves. It is a way of strengthening society.

A typical Vi-project in Uganda starts with three years of advisory activities and material support. Thereafter, the villagers – who could be organised into a cooperative – continue the development themselves with Vi-advisers as backup.

Kkingo farmers' coop society outside Masaka is a good example. The cooperative was formed in 2006, and received support from Vi until 2008. Since then, it has developed its

own microfinancing bank system and started enterprises in dairy cattle rearing, banana, maize and coffee plantations and tree seedling production for its 900 village members. /Mats Hannerz

Some figures from Vi-Agroforestry 2012

- 7 078 783 trees were planted
- 41 056 households participated in training about the importance of growing a variety of crops and how to obtain adequate nutrition from their diet.
- 30 330 families participated in training related to the effects of climate change.
- 16 477 people were trained in HIV and Aids issues.
- 4 547 households used alternative energy sources such as biogas, solar power and briquettes.
- 11 255 farmers began using methods that counteract soil erosion.
- 207 kitchen gardens were established at schools.
- The turnover was 62.8 million SEK, of which 42 million came from fundraising activities.

Source: www.viagroforestry.org



Mrs Betty Karyango, left, is the chair of the Kkingo Cooperative. She is proud to see so many farmers who now earn an income from their properties, through new products and a smarter mixture of crops. Photo Mats Hannerz.



One example of the importance of social science: Perceived uncertainty may be an important barrier for increasing the production of short rotation energy plantations. Photo: Mats Hannerz

The transition to a biobased economy needs social science

The SNS-supported workshop “The forest sector in the biobased economy: perspectives from policy and economic sciences” was organised in Uppsala 28-29 August 2013. One main conclusion was that the forest sector must take lessons from economic and political sciences to enhance the adaptation to a green economy.

The transition towards a biobased economy involves economic and policy challenges for the forest sector: in designing appropriate regulations and incentives, and in stimulating green forest business development. This warrants a better understanding of how policies and markets shape the

conditions for the biobased economy in the forest sector.

The presentations highlighted two key roles of the social sciences. The first involves the conceptualisation and definition of the idea of a biobased economy and the implications for society and the forest sector. This inquiry is crucial as the bioeconomy concept is vague and contested, and may therefore be used differently, and with different policy implications.

The second group of presentations dealt with the drivers, obstacles and effects of a biobased forest economy, including innovation processes, bioenergy policies, corporate strategies and consumer behaviour.

Together, the contributions underscored and illustrated how the transformation toward a biobased

economy needs to be further discussed, examined and even questioned in an open public exchange instead of being an issue just to be considered by ‘specialists’.

Further, the workshop clearly demonstrated that the forest sector’s contribution to the biobased economy must take into account decisions and behaviour among policymakers, industry and consumers.

The findings from the workshop will appear in published proceedings and selected contributions in a special issue of *Scandinavian Journal of Forest Research*.

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Read more: www.nordicforestresearch.org,
browse for SNS research project 115.

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