


Obituary

Obituary in Remembrance of Tony Allan

Winnie Gerbens-Leenes ^{1,*}  and Markus Berger ^{2,*}

¹ Integrated Research on Energy, Environment and Society, University of Groningen, 9747 AG Groningen, The Netherlands

² Multidisciplinary Water Management, University of Twente, 7522 NB Enschede, The Netherlands

* Correspondence: p.w.leenes@rug.nl (W.G.-L.); m.berger@utwente.nl (M.B.)

1. Introduction

It is with great sadness that we received the news that Tony Allan has passed away on the 15 April 2021. Tony was one of the giants in the field of water research. In less than two years, two important researchers have left us. In 2019, Arjen Hoekstra and now Tony Allan. In this letter of commemoration, we, Winnie Leenes, who worked closely with Arjen, and Markus Berger, as Arjen's successor, want to share our last discussions with Tony Allan.

In our recent editorial on water footprint and life cycle assessment, published in March 2021 in *Water* [1], we aimed to show the background of the methodological dispute between the water footprint (WF) and life cycle assessment (LCA) communities, and call for joint efforts to face the global water challenges. For this reason, we asked Tony Allan to contribute, as a senior in the water research field standing above the two communities. We had a very fruitful discussion in a video meeting in December 2020 and exchange of information through email. Tony helped us to put our editorial in a broader context. However, we deleted parts of his suggestions, as at that time, we thought they were too challenging for our careful attempt to bring the two communities together. Now, after this big loss, we would like to share Tony's viewpoints and final messages on the history of virtual water, the dispute between the WF and LCA communities, and a potential way forward.

First of all, in Tony's opinion, it was useless to have a conflict over a specific methodology. In his view, this is "a war of the modelers that has proved to be very unhelpful". In the following, we share comments that were deleted from the original editorial, and information from our discussions.

2. History of Virtual Water

In our video discussion, Tony explained to us how the virtual water concept had come about: "An important question being asked in the late 1980s in the water resources sector, when resource footprinting and LCA approaches were emerging, was 'Why no water wars?' The answer was that the international food system delivered underpriced food to the underpaid worldwide. Increases in water consumption efficiency provided part of the explanation of why international food commodity food prices have been falling for 200 years. But 'trade' in virtual water has been an important element in a food system that does not internalize the environmental costs of food production. By the first decade of the 21st century, a second question was beginning to be asked. It remains to be answered. If farmers are responsible for society's essential food production and for the essential stewardship of our environment, which they are, how does society and its legislators make it possible for farmers to have secure livelihoods in providing these absolutely essential services? The farmers manage the water, however, the food system is underpriced for water that is misused. The food system should become more resilient".

Tony's comments attempted to change the focus of the analysis from the modeling and their contradictory assumptions to policy relevance. He said: "I am sorry that you



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feel that my comments are too prescriptive for this introductory chapter. I guess they are too fundamental”.

3. Introduction of the Water Footprint Concept

Tony mentioned that the concept of the water footprint, following the lines of reasoning of virtual water, were introduced at an expert meeting on virtual water trade in Delft, the Netherlands in 2002 by Arjen Hoekstra. Tony was very much impressed by the work of Hoekstra and his team. In addition, they had always been in close contact.

4. The Dispute

Tony was well aware of the conflict between the WF and LCA communities and in his opinion, it was not helpful at all: “The war of the modelers has proved to be very unhelpful. It does not, for example, help to answer a second question. Why is the international ‘trade’ in virtual water and its negative impacts on water resources, soil health, biodiversity, and emissions still invisible to legislators and society? Additionally, why has this condition been firmly backgrounded?”

Further, Tony criticized both communities for being ignorant on relevant impacts of water footprinting: “As I am not a fully paid-up member of the WF or the LCA modelling communities, I have the privilege of making these choices.” For instance, Tony criticized the LCA community for the isolated focus on blue water: “By the end of the noughties, I was unhappy when I discovered that the LCA modelers judged that green water was irrelevant. It is an idea that appeals to the overly blue water hydrocentric.”

He further stated that: “The WF and LCA communities differ in their approach of green water, that is included in WF studies, but excluded in LCA. This disagreement is very significant. By ignoring green water, the LCA approach is in danger of making its approach irrelevant. Policymaking on water resources allocation and management is subordinate to global and local food systems. The global food system delivers underpriced food to the underpaid. Farmers manage and mismanage about 92% of the blue and green water consumed by society. They are also responsible for about 66% of the negative impacts on biodiversity and for between 10% and 35% of emissions. Ignoring the global food system and the farmers who manage food production is to be politically and practically blind.” He concluded that: “If analyses relate to versions of food-water security in the real world, then green water and trade cannot be ignored.”

While criticizing the ignorance of green water, Tony acknowledged the development of methods analyzing local consequences of water use by the LCA community “whom I respected for their very important ideas on impact”. “In the period 2001 to 2006, as a consequence of meetings attended by Arjen and the very good group in Madrid that worked on water footprinting, I adapted to the idea that the volume metrics were unsafe for a number of reasons.” He concluded that: “At the same time for an approach to be policy-relevant it must also be impact-aware.”

5. The Way Forward

In our editorial [1], we listed the main points of disagreement between the two communities, as well as points on which we agree, as a starting point for a constructive scientific exchange. Further, we identified challenges faced by both communities. According to Tony, these challenges must be solved by the WF and LCA communities “if their analyses are to be policy-relevant rather than ignored—except by the powerless academy, the not very influential NGOs, and the partial food system corporates.”

Both WF and LCA start with volumetric accounting and add a subsequent impact assessment step—the difference is the focus on volumes (WF) or impacts (LCA). In Tony’s opinion, “WF and LCA could be aligned.” Additionally, one of his final statements was that: “Both WF and LCA modelers must agree to broaden their scope and concepts.”

6. Our Heritage

From Tony Allan and Arjen Hoekstra, the scientific community inherited the concepts of virtual water and water footprinting. We see it as our duty to continue their mission and work towards a sustainable use of the world's freshwater resources.

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Reference

1. Gerbens-Leenes, P.W.; Berger, M.; Allan, J.A. Water footprint and life cycle assessment: The complementary strengths of analyzing global freshwater appropriation and resulting local impacts. *Water* **2021**, *13*, 803. [[CrossRef](#)]