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# Arjen Y. Hoekstra 1967–2019

Arjen Y. Hoekstra, creator of the water footprint concept, unexpectedly passed away at the age of 52. He changed the way we think about water.

Arjen Hoekstra introduced the water footprint in 2002<sup>1</sup>, building on the concept of virtual water<sup>2</sup> used by Tony Allan to discuss the role of trade in alleviating water scarcity in the Middle East. He thereby opened a new dimension in the debate around fair and sustainable allocation of fresh water resources. He laid the foundations to show the role of indirect water (that is, water used elsewhere to produce goods we consume) in our daily life beyond our direct use for drinking, cooking or washing. The water footprint is an indicator of direct and indirect water use by a producer or consumer, showing how water flows through our economies by tracing it through supply chains and trade.

Hoekstra was born and raised in Delft, a student town close to the Dutch North Sea coast. According to his two brothers, at a young age he was already known for his sharp mind, passion for reasoning and strong argumentation. Later he earned an MSc degree in Civil Engineering and a PhD degree in Policy Analysis from Delft University of Technology, after which he worked for few years at UNESCO-IHE, including in Zimbabwe.

In 2005, he began working as professor in water management at the University of Twente, developing a new interdisciplinary research field, water footprint assessment. Hoekstra became a highly recognized researcher, authoring influential articles such as the water footprint of nations<sup>3</sup>, the global water footprint of bioenergy<sup>4</sup>, of crops and crop products<sup>5</sup>, of farm animal products<sup>6</sup> and of humanity<sup>7</sup>. His assessments of global water stress including environmental flows are groundbreaking<sup>8,9</sup>. His books were translated into several languages and include *The Water Footprint of Modern Consumer Society*<sup>10</sup>, *The Water Footprint Assessment Manual*<sup>11</sup> and *Globalization of Water*<sup>12</sup>.

The activist in Arjen also wanted to put the theory into practice. In 2008, he co-founded the Water Footprint Network, a vibrant global community of over 200 partners including public, private, academic and non-governmental organizations. The network organized e-learning courses, followed by some 1,000 students, and partnered with companies such as Tata Steel, Ikea, Coca-Cola and Heineken to make their supply chains more water-sustainable.



Arjen Y. Hoekstra 1967–2019.

As demonstrated by its extensive uptake by global to local media outlets, the water footprint is effective and essential in raising awareness on the large quantities of water required to produce the goods we consume. Many citizens have numbers like 140 litres for a cup of coffee or 15,000 litres for a kilogram of beef in their collective memory. But the water footprint goes beyond that: with robust science, it informs governments, businesses and consumers how to achieve sustainable, efficient and fair water use. It convinced Arjen himself, to change his consumption behaviour, including becoming vegetarian.

Hoekstra also worked beyond his favourite resource. He authored an influential article on the environmental footprint of humanity<sup>13</sup>, recognized trade-offs between different footprints<sup>14</sup> and helped establish, together with leading global footprint experts, an environmental footprint family<sup>15</sup>. In 2019, he was rewarded with a European Research Council (ERC) Advanced Grant, Europe's most prestigious research grant, for his project Earth@lternatives.

Like many other Dutchmen, Arjen was an avid cyclist. During younger days, he

and one of his brothers used to tour parts of Europe on bicycles with only three gears. On 18 November 2019, while cycling home from work, he suddenly passed away, leaving behind his wife and three children.

The water and sustainability communities have lost a great scientist and the world a passionate advocate for highlighting water in sustainable development. His extensive network has lost a kind and warm person, and for many, a friend. And this, much, much too soon. Yet, by inspiring so many, his legacy will continue. According to different colleagues that Arjen worked with, he often said his goal was to change the world. Arjen has done more than his share of that. □

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