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Increasing water footprints of flex crops

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Flex crops—crops with multiple end-uses that can be flexibly interchanged—play an important role in our society. Due to high nutritional and energy contents, they became widely used in various industries, providing food, animal feed, biofuels, and other chemical components. However, a limited number of studies exists on the environmental pressures of such crops, specifically concerning water resources.

Here, we aim to quantify the water footprints of main flex crops—namely maize, oil palm, soya beans, sugar cane, coconut, cassava, rape seed, and sunflower—using a recently published database on gridded water footprints of the world's major crops in the 1990–2019 period. Our study reveals three key developments:

- All flex crops experienced large water-productivity gains in response to increasing crop yields (less water is needed per tonne).
- The global water footprint of flex crops has increased by more than one trillion cubic metres as productivity gains were insufficient to meet rapidly growing demand.
- The production of flex crops has been concentrating around main exporting regions, most notably in Latin America and South-eastern Asia.

As demand keeps increasing, this raises a need for further research addressing the sustainability of flex crops. In particular, regarding the potential links to green and blue water scarcity, exposure of global supply chains to socio-economic and climatic risks, and the role of flex crops in our society.