Comment

Supplementary information to:

Why we need a new economics of water as a common good

A Comment published in *Nature* **615**, 794–797 (2023)
https://doi.org/10.1038/d41586-023-00800-z

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This Supplementary information comprises:

1. Supplementary Box S1
2. Supplementary Figure S1
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Box S1: HOW MUCH WATER IS ENOUGH?
Planetary needs must be factored in

The UN has for decades assumed that 50 litres of freshwater per person per day represents a minimum human right to water for basic health and sanitation. Factoring in other needs, such as food and industry, as well as blue and green water supplies, we argue that this number should be far higher.

As a suggestion to start with, we propose a value of 3,200 l/p/d or 1,200 m^3/person/year. That assumes 50-150 l/p/d for domestic purposes (equal to 18-55 m^3/p/yr), some 50 m^3/p/yr for industrial use of blue water, and 1,100 m^3/p/yr of green and blue water for food (3,000 l/p/d for an adequate mixed 2,500 kcal/p/d diet) (see J. Rockström *et al. Proc. Natl Acad. Sci. USA* **104**, 6253–6260; 2007).

Recognising that humans need > 1,000 m^3/p/yr rather than approximately 100 m^3/p/yr, to meet freshwater provision for all direct human needs — still not including indirect needs, like water for maintaining ecological functions and carbon sinks — provides a benchmark and support for water resource management and policy making. When planning cities, mapping progress towards the SDGs, or designing water supply systems, this wider water resource requirement for human wellbeing should be considered. It also supports an integrated water resource and policy agenda that focuses on managing both green and blue water.

(Supplementary information continues on page 3)

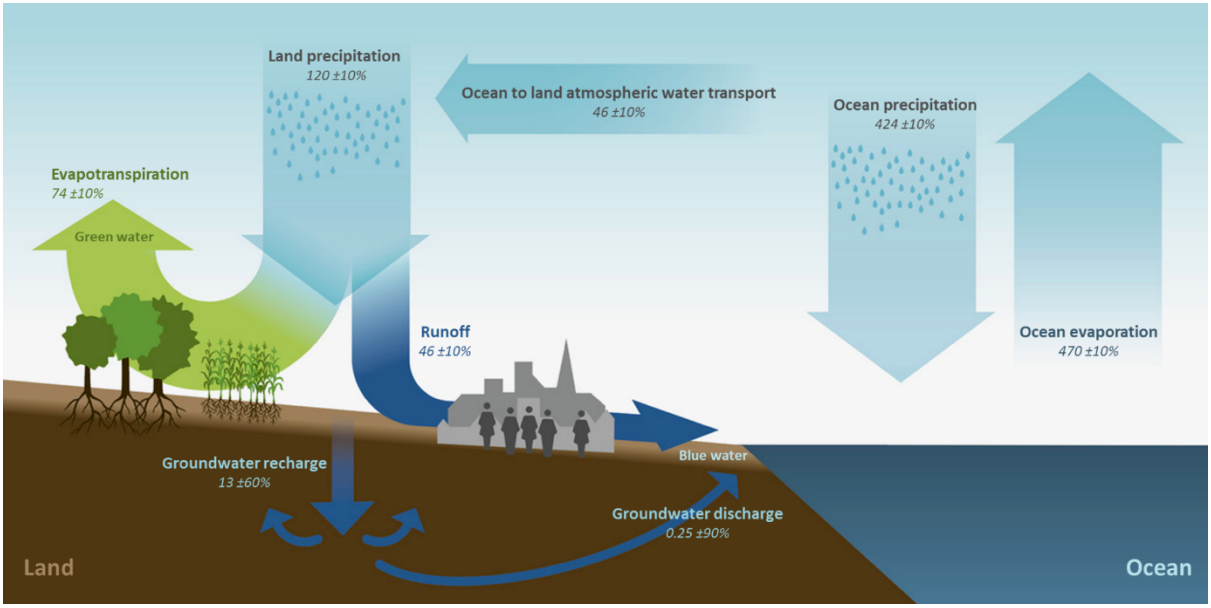
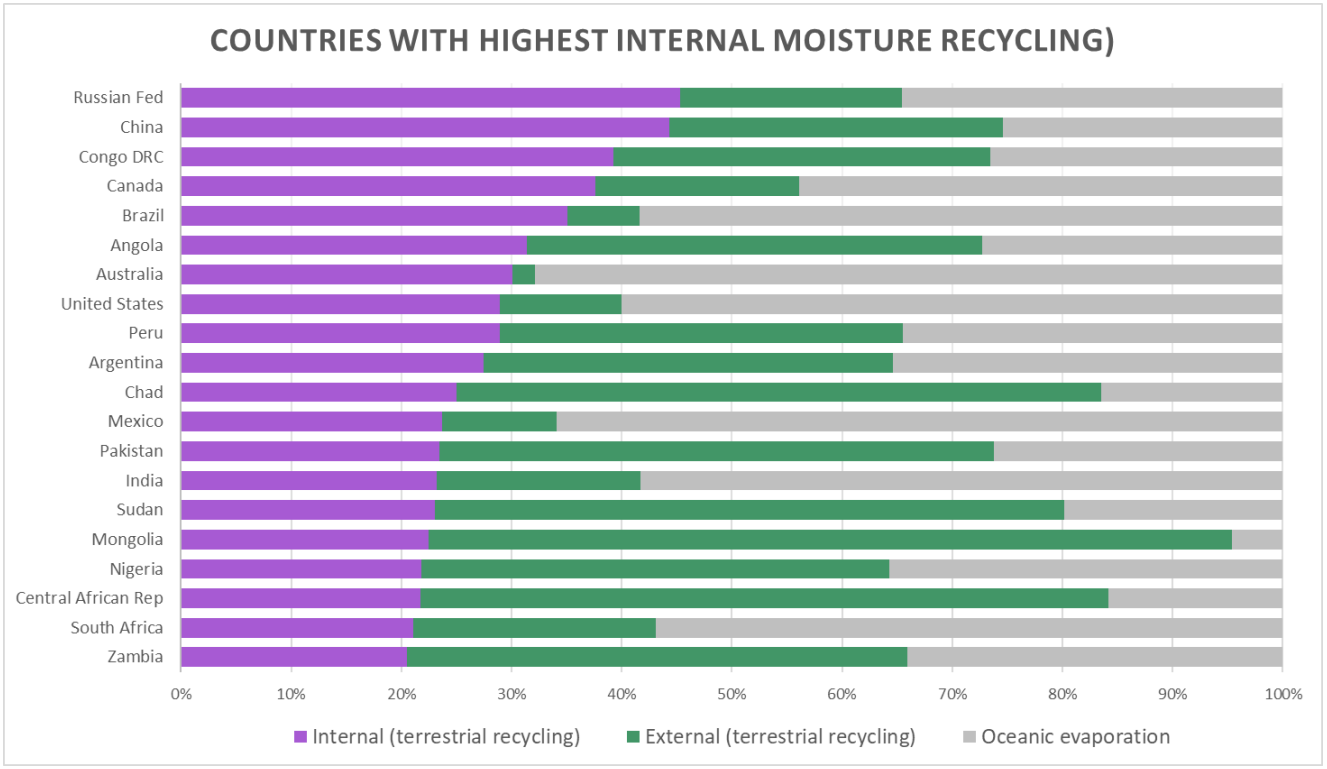


Figure S1: The global hydrological cycle [units in thousands of km^3 per year]. Precipitation over land (source of all freshwater) is partitioned into blue water flows (surface runoff in rivers and sub-surface runoff as groundwater flow) and green water flows (evaporation from land and inland water surfaces and transpiration from vegetation). Blue water is flowing and stored in rivers, aquifers, lakes and reservoirs. Green water is stored as soil moisture. The source of precipitation is evaporation of water from oceans, and the green water flows from land (defined as total evaporation in the text). Anthropogenic pressures, through global warming, direct water extractions and land use change, are pushing the global hydrological cycle out of balance.

(Supplementary information continues on page 4)

a)



b)

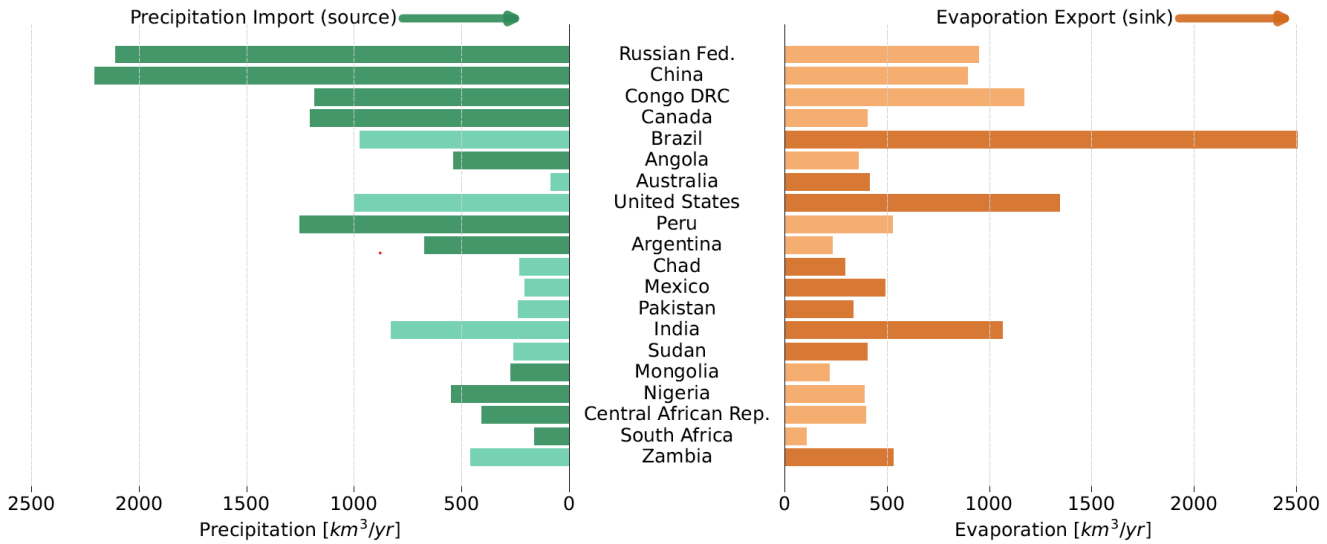


Figure S2: Countries with the highest ratio of internal moisture recycling. This is the proportion of evaporation from within their borders which returns as rain within their borders. In (a) and (b) the top 20 countries are shown in descending order. In (a) the proportion [%] of internal and external moisture source (from terrestrial recycling) and oceanic source (from ocean to land water vapour transport) is shown. So-called self-reliance in precipitation source increases with more internally recycled moisture. In (b) their characterisation as either net importers (darker green) or exporters (darker orange) of moisture is shown, given the amount of terrestrially generated precipitation [km^3/yr] which is externally sourced (i.e. from other countries) and the amount of their evaporation which is not internally recycled (i.e. exported to other countries), respectively.