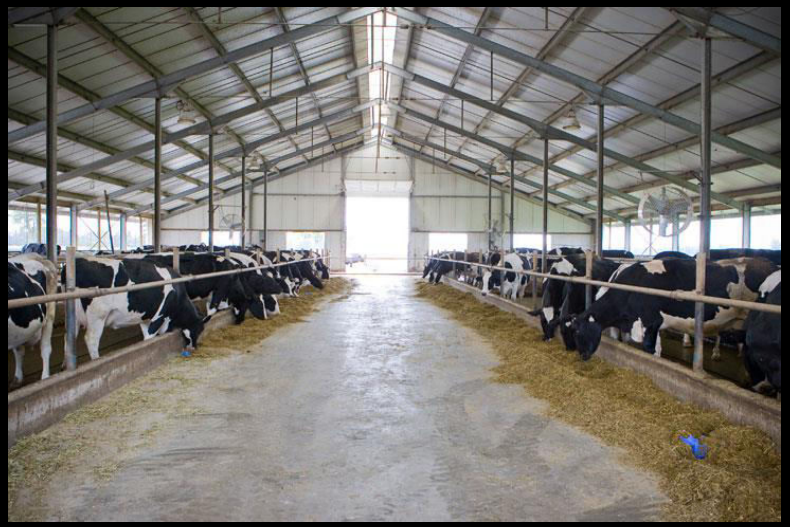
The water footprint of products, companies and consumers: what is sustainable, efficient and fair?

Arjen Hoekstra
www.ayhoekstra.nl



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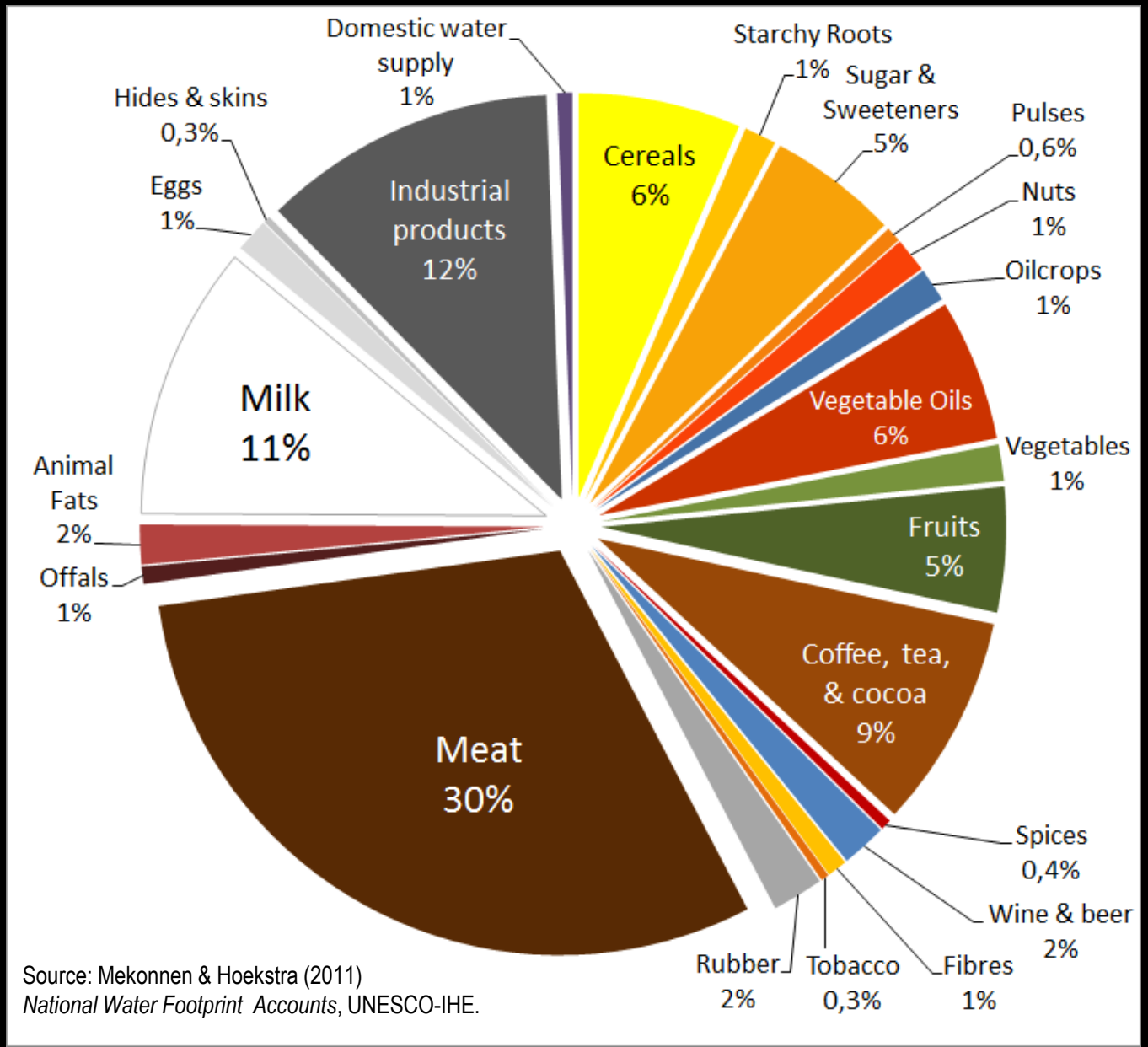
The average water footprint of a UK consumer

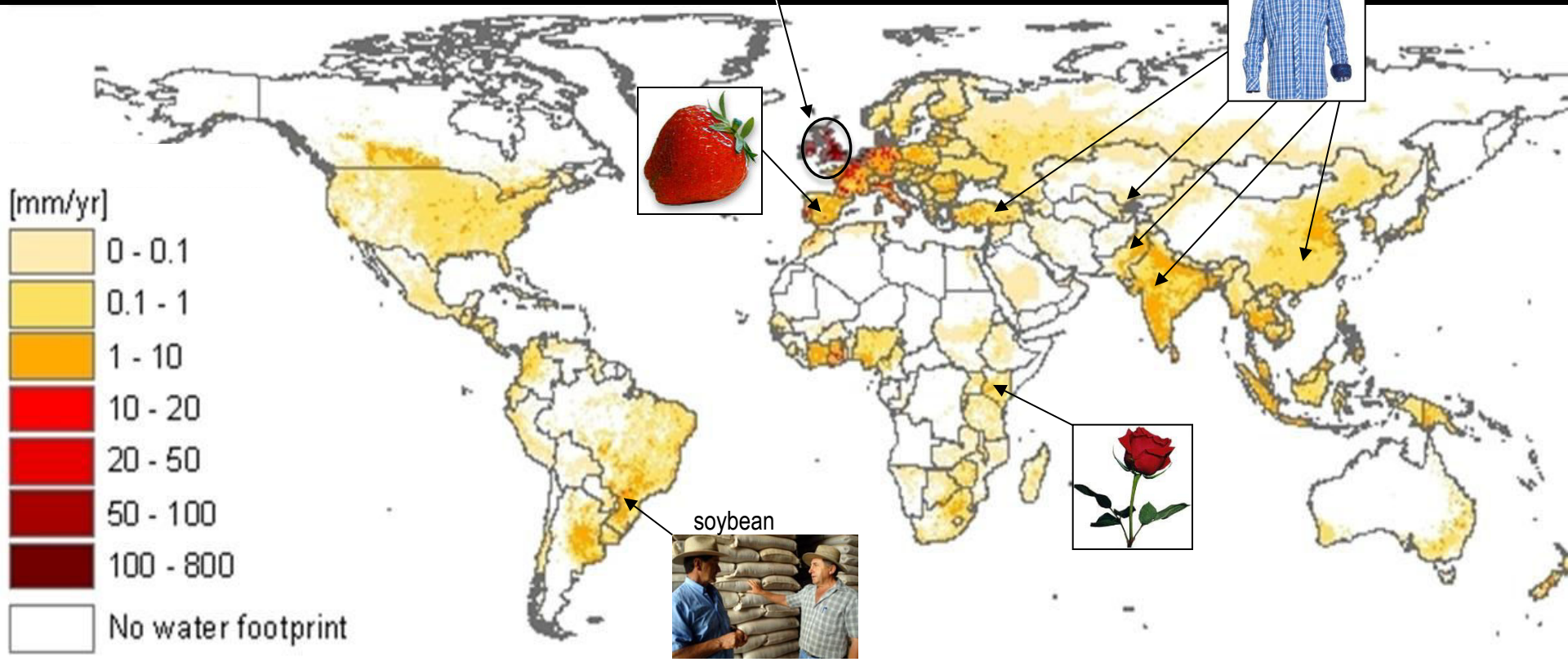


3450 litre/day

Source: Mekonnen & Hoekstra (2011)
National Water Footprint Accounts, UNESCO-IHE.

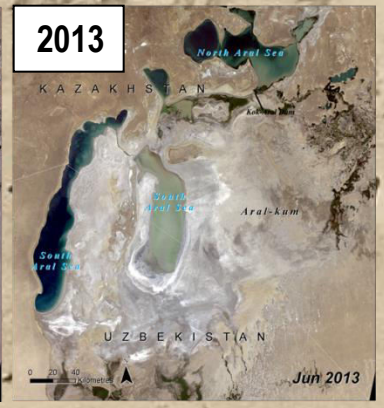
Global water footprint of UK consumption

75% of the water footprint lies outside the UK



Source: Mekonnen & Hoekstra (2011) *National Water Footprint Accounts*, UNESCO-IHE.

Cotton from the Aral Sea Basin, Central Asia



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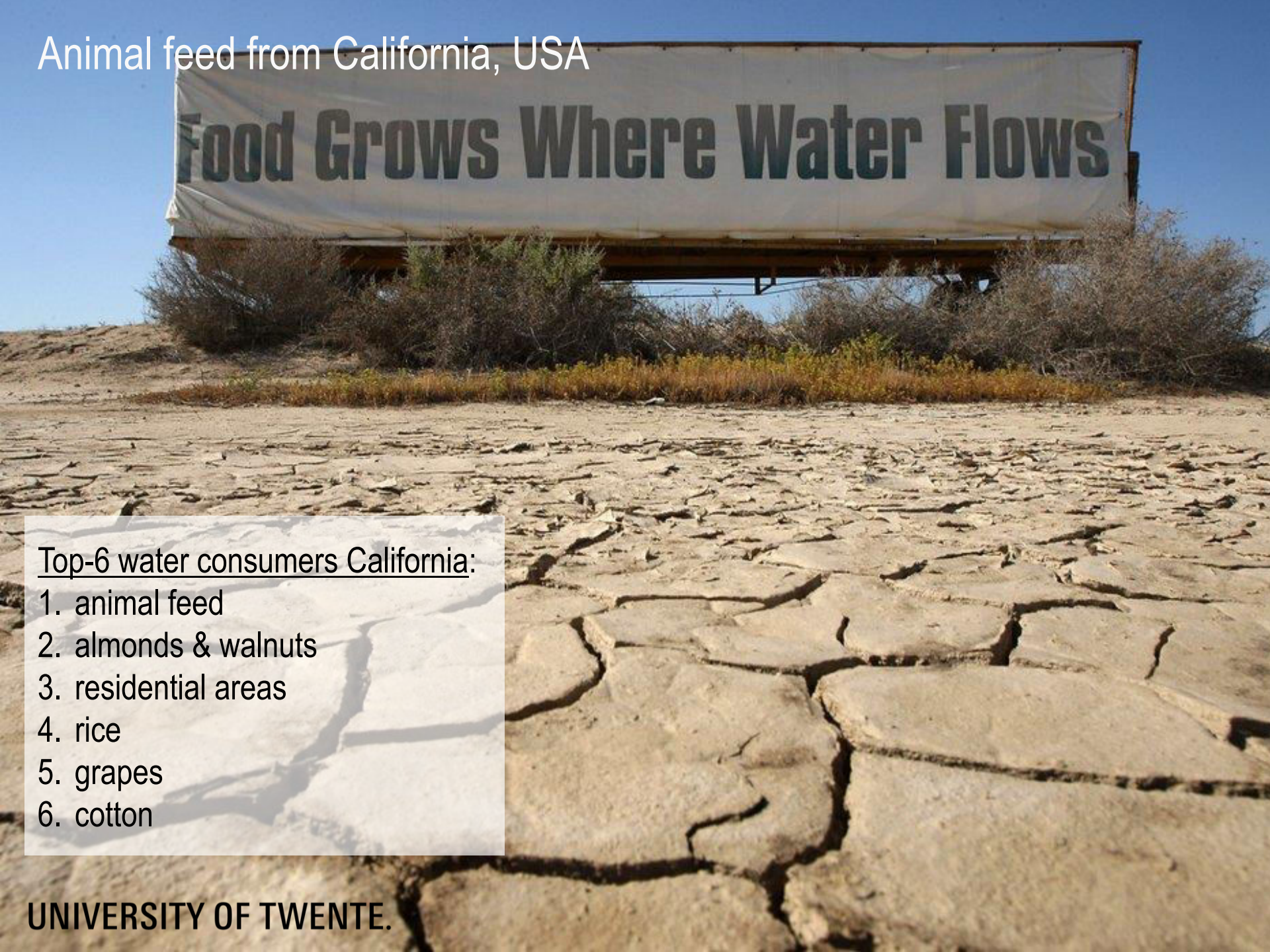
Animal feed from California, USA

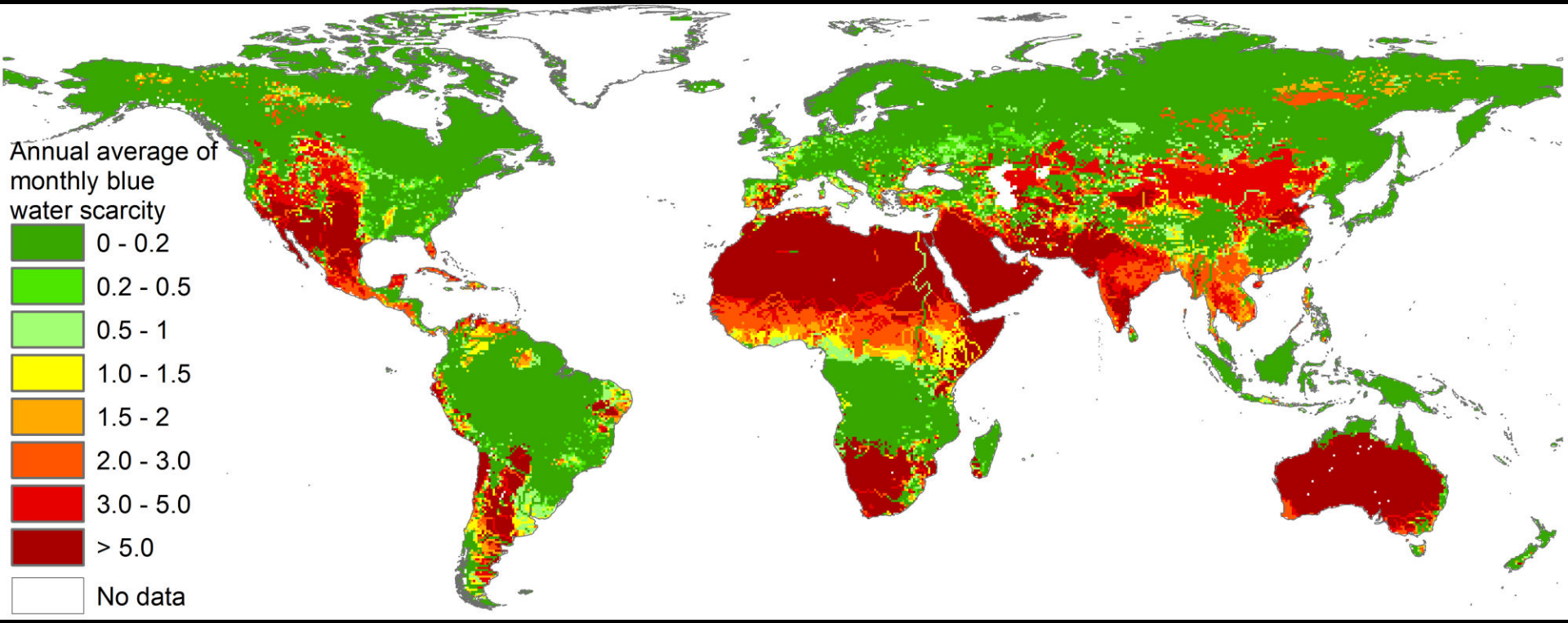


Top-6 water consumers California:

1. animal feed
2. almonds & walnuts
3. residential areas
4. rice
5. grapes
6. cotton

The water footprint of humanity: not sustainable

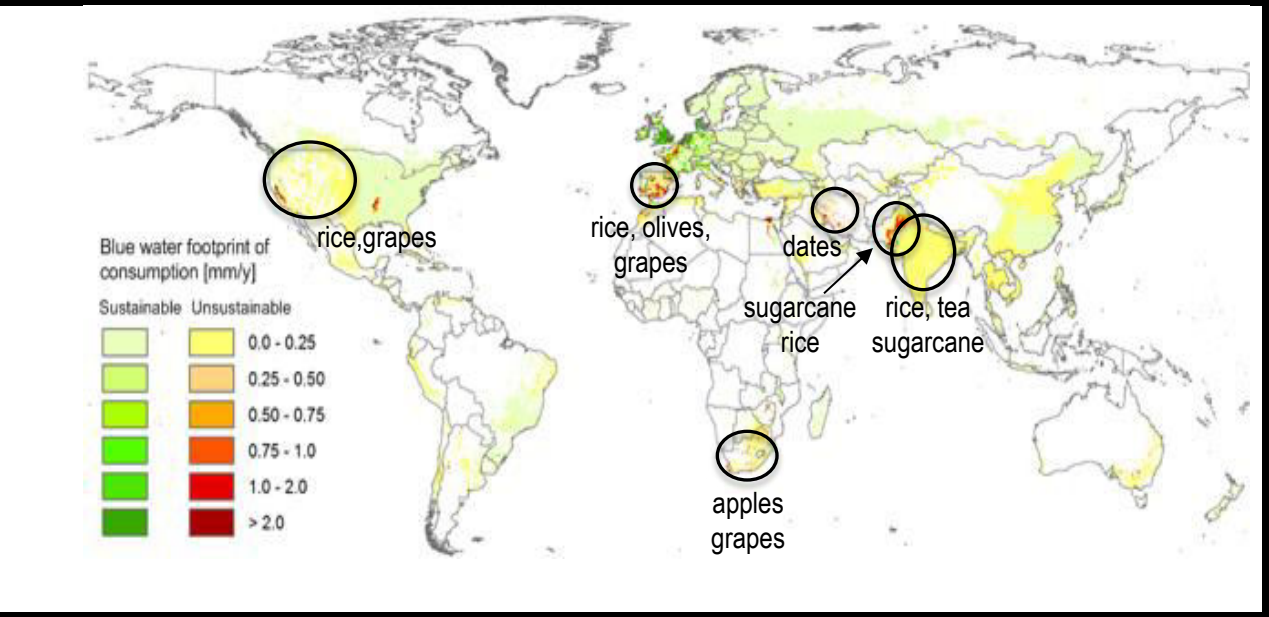
Blue water scarcity = blue WF / maximum sustainable blue WF



Source: Mekonnen & Hoekstra (2015)

We need water footprint caps per river basin (specified per month)

Global blue water footprint of UK consumption



Source: Hoekstra & Mekonnen (2015)

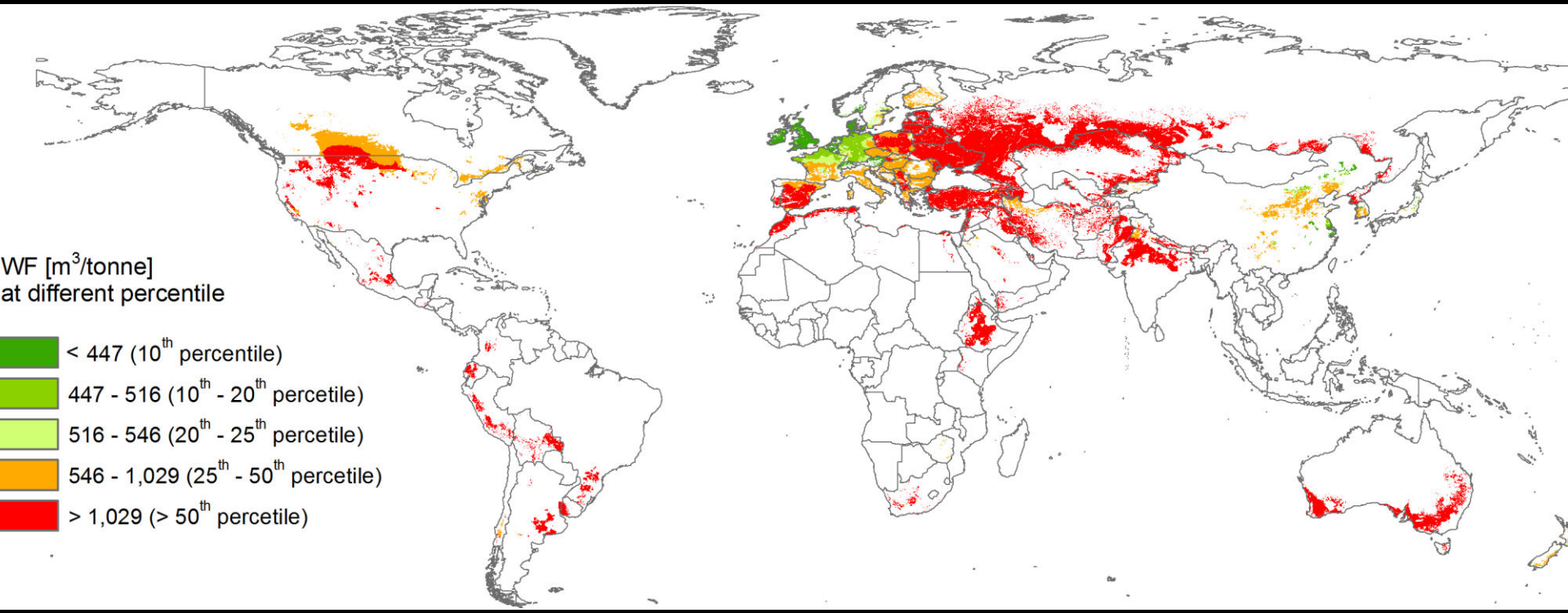
41% of UK's global blue WF is unsustainable (located in places where blue WF > max. sustainable blue WF)

51% of the unsustainable part of UK's blue WF is located in six countries:

1. Spain (15%)
2. USA (11%)
3. Pakistan (8%)
4. India (7%)
5. South Africa (6%)
6. Iran (5%)

The water footprint of humanity: not efficient

Spatial differences in the consumptive water footprint of barley



Source: Mekonnen & Hoekstra (2014)

We need water footprint benchmarks per product

Worldwide reduction of consumptive water footprints of crops to benchmark levels, set by the best 25% of global production, would result in a global water saving of 40%.

The water footprint of our food

Global average water footprint

	litre/kcal
starchy roots	0.5
cereals	0.5
sugar crops	0.7
pulses	1.1
vegetables	1.3
fruits	2.1
pork	2.2
poultry	3.0
beef	10.2

Source: Mekonnen & Hoekstra (2012) A global assessment of the water footprint of farm animal products, *Ecosystems*

The water footprint of our food

The WF of meat & dairy is 30% of the overall WF of our food,

in industrialized countries generally 40%

The water footprint of our choices

Stop showering = water saving of 50 litre/day

Stop eating meat = water saving of 800 litre/day

The two separate worlds of water and energy

- The water sector is becoming more energy-intensive

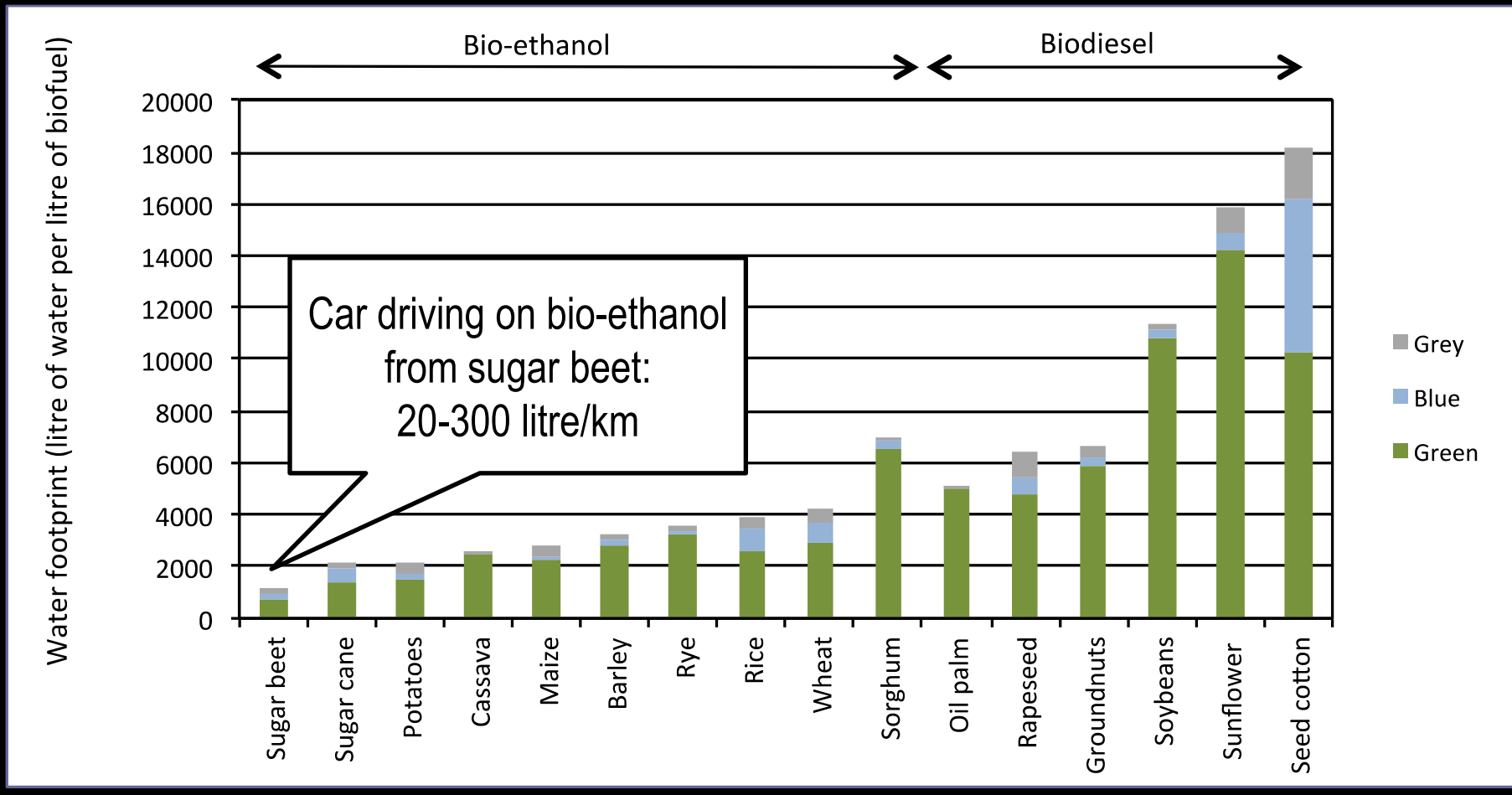
  - desalination
  - pumping deeper groundwater
  - large-scale (inter-basin) water transfers

- The energy sector is becoming more water-intensive

  - biomass
  - shale oil & gas

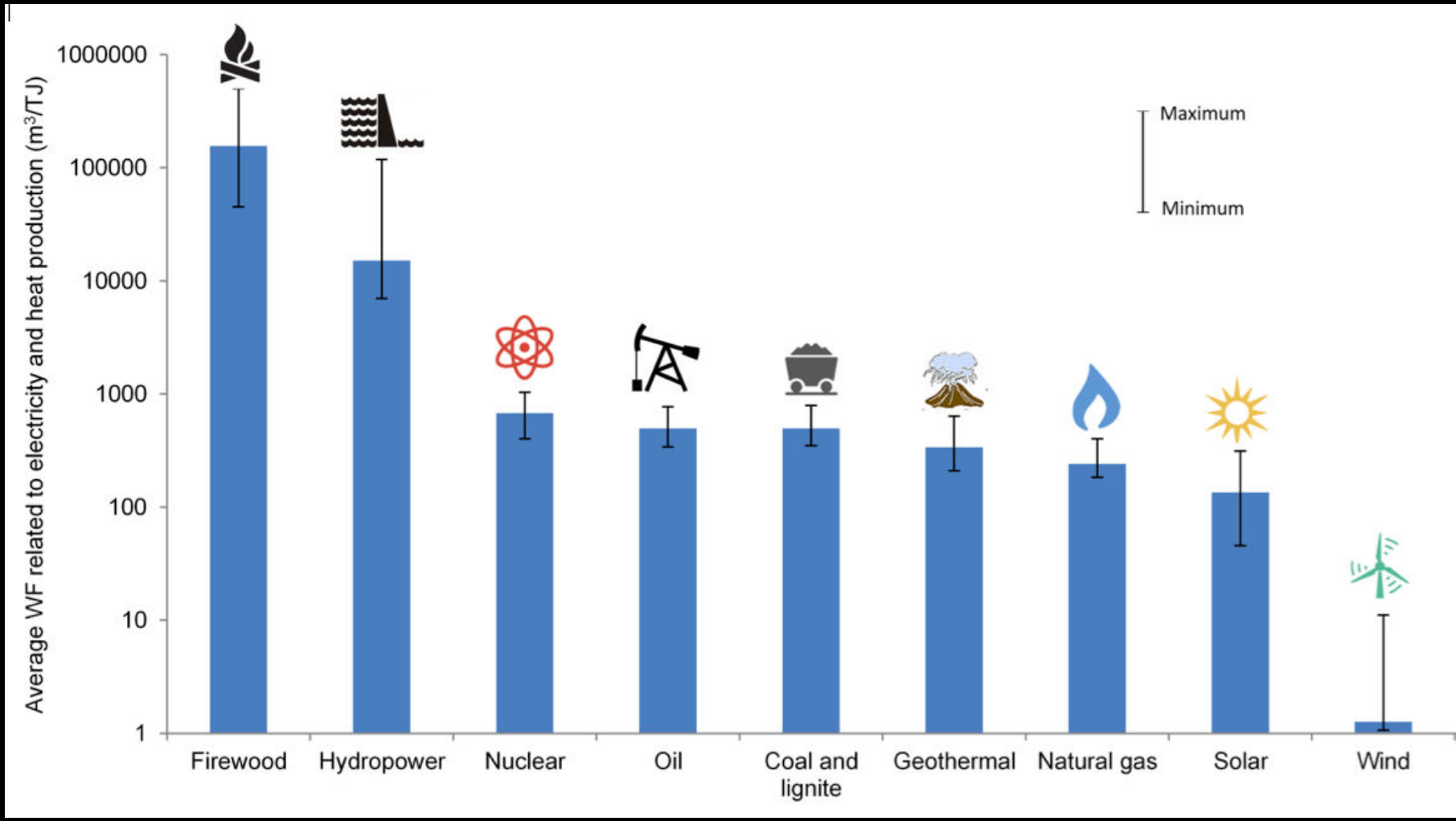
Source: Hoekstra (2013) *The Water Footprint of Modern Consumer Society*, Routledge, London, UK

The water efficiency of biofuels



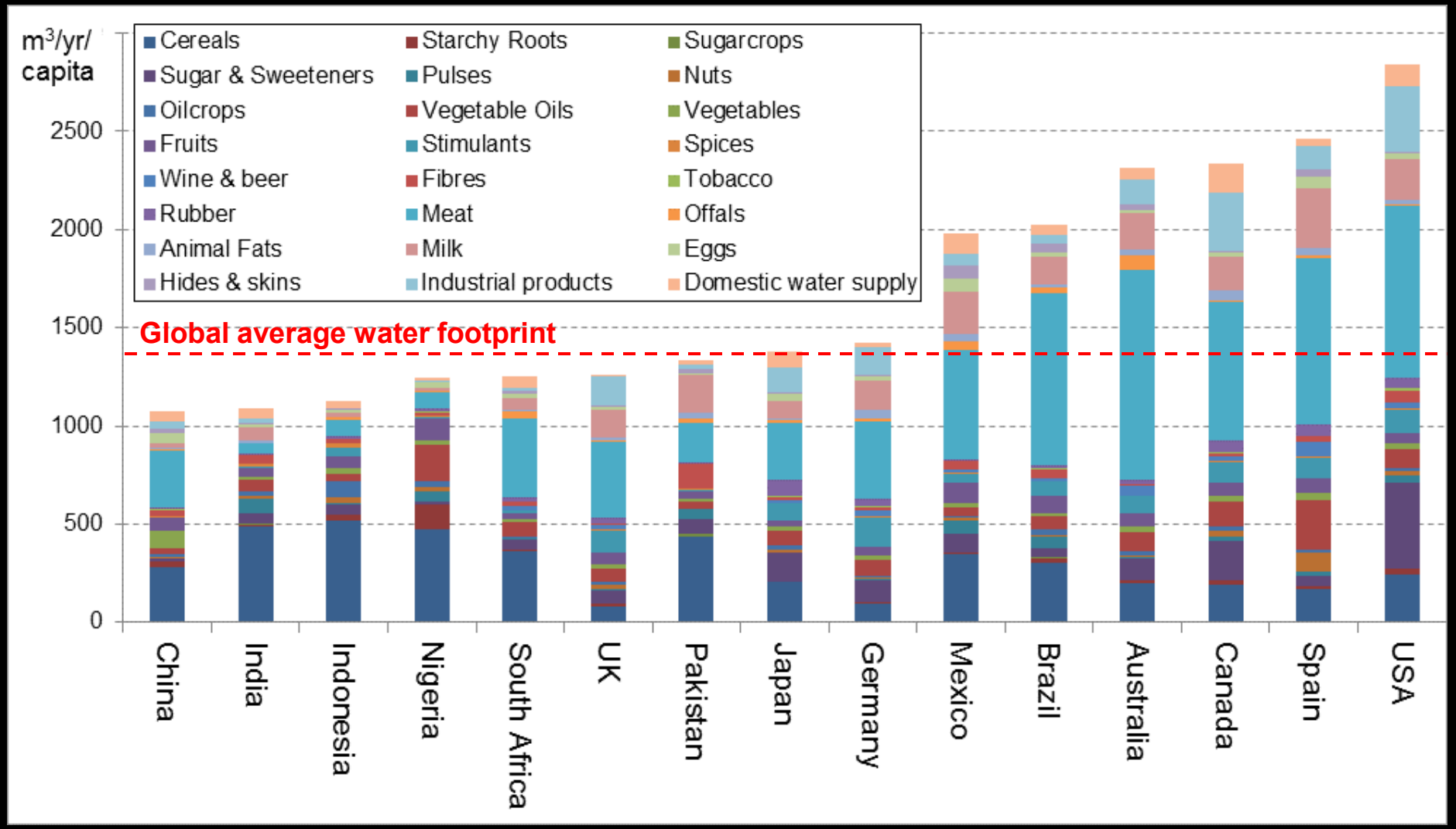
Source: Mekonnen & Hoekstra (2011)

The water efficiency of electricity



Source: Mekonnen, Gerbens-Leenes & Hoekstra (2015)

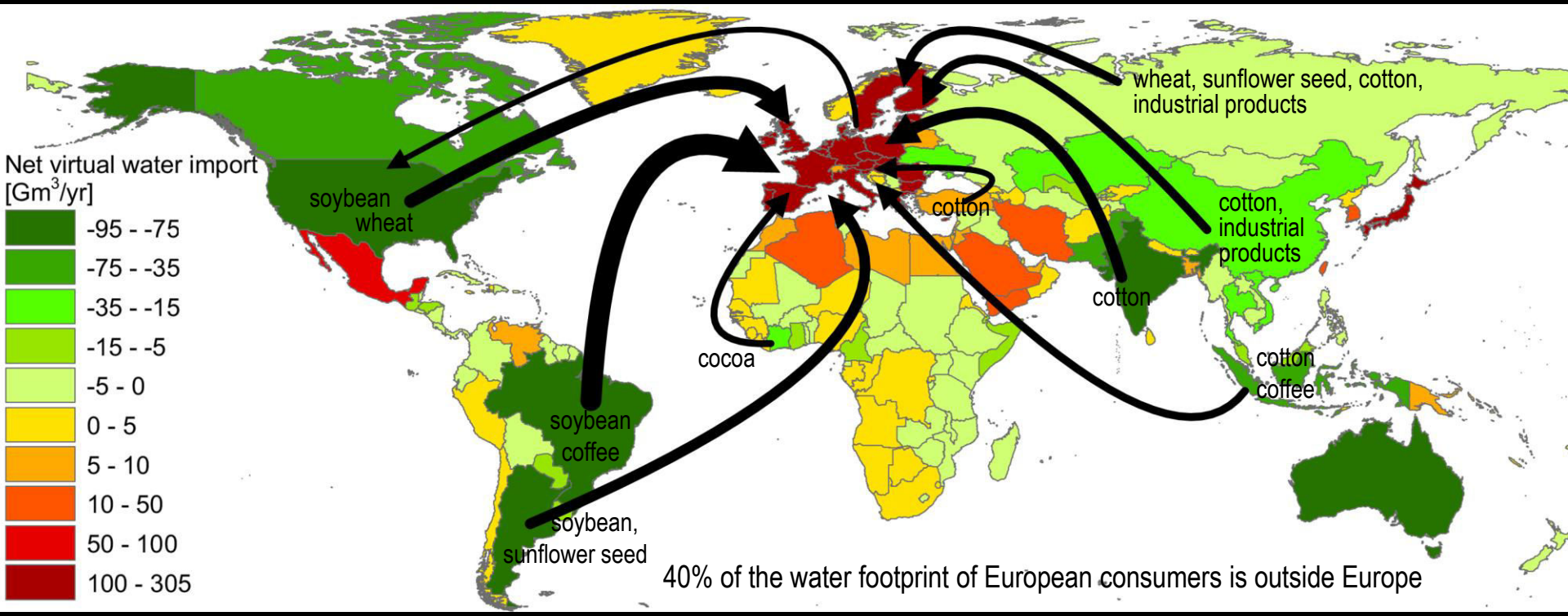
The water footprint of humanity: not fairly distributed



Source: Hoekstra & Mekonnen (2012) The Water Footprint of Humanity, *PNAS*

The water footprint of humanity: inter-regional dependencies

Example European Union

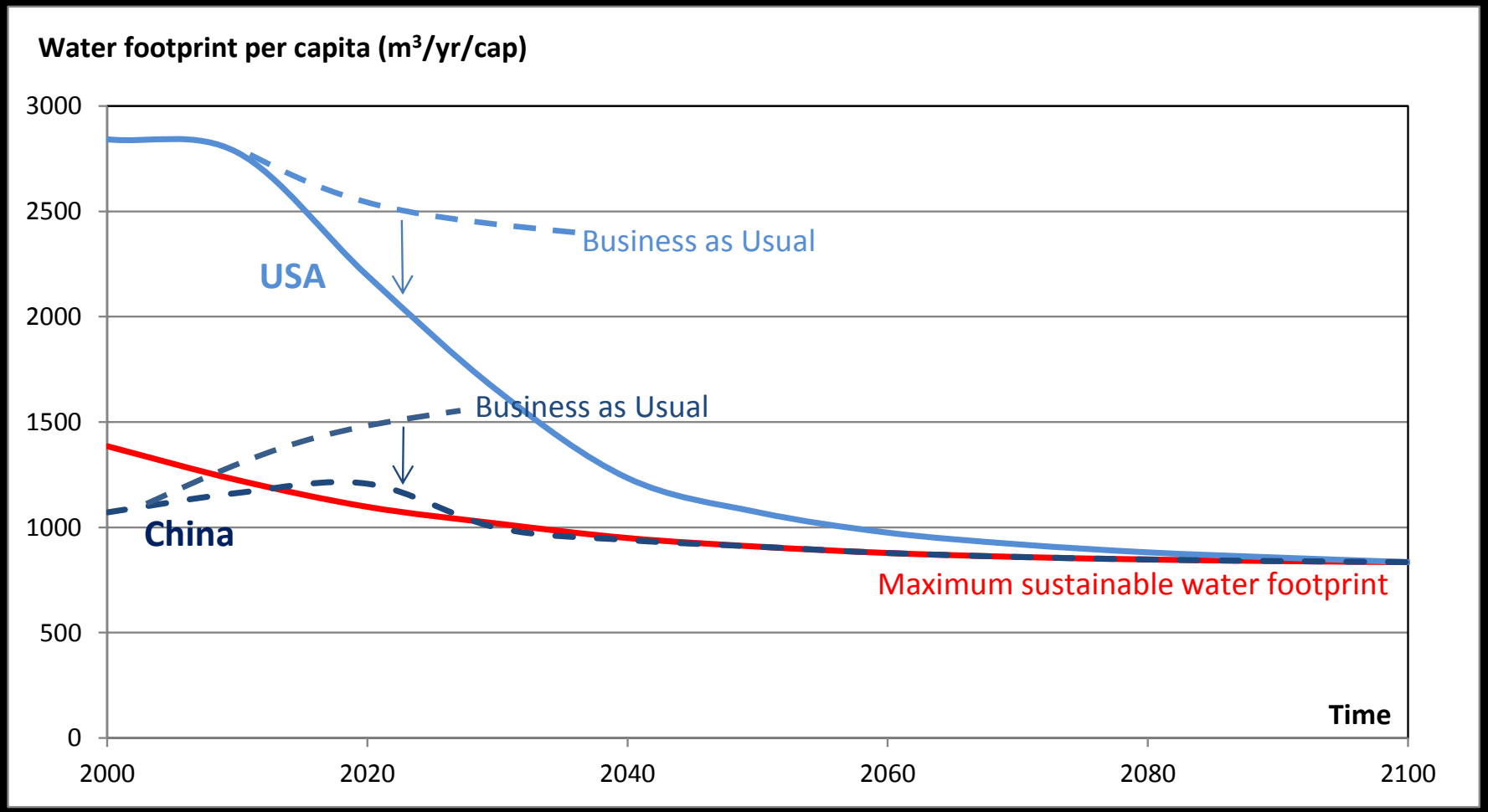


Source: Hoekstra & Mekonnen (2012) The Water Footprint of Humanity, *PNAS*

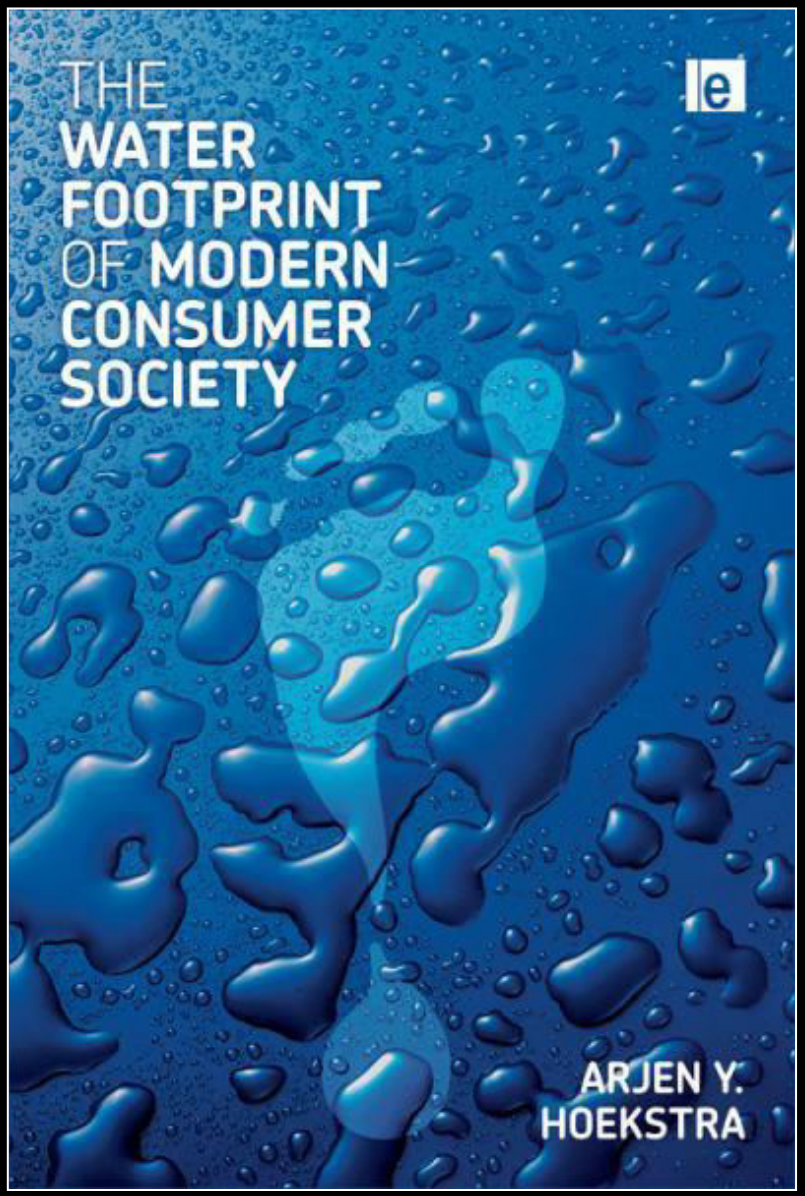
Wise water governance

- water footprint caps by river basin
- water footprint benchmarks by product
  - best available technology and practice
  - water disclosure
  - product transparency
- fair water footprint shares by consumer
  - national water footprint reduction targets
  - Kyoto protocol for water?
- greater levels of (water-food-energy) self-sufficiency

The need for contraction and convergence



Source: Hoekstra (2014) *Wise freshwater allocation*, UNESCO-IHE



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