



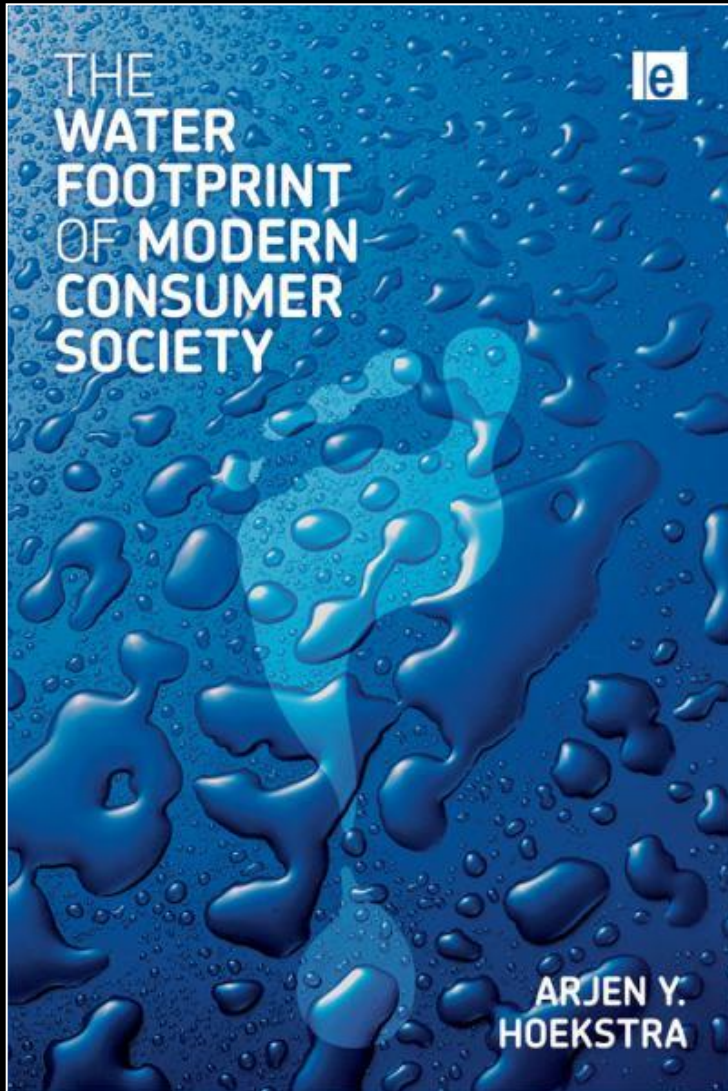
The water footprint

Closing the loop – towards zero water footprint in industry

Arjen Hoekstra

University of Twente, Netherlands





Overview

- ▶ The global dimension of water scarcity
- ▶ The water footprint concept
- ▶ Water footprint of business
- ▶ What can we do?



The total water footprint of the average consumer in the world

3800 litre/day



3.8% of the water footprint relates to home water use



96.2% of the water footprint is 'invisible',
related to the products bought on the market

91.5% agricultural products, 4.7% industrial products

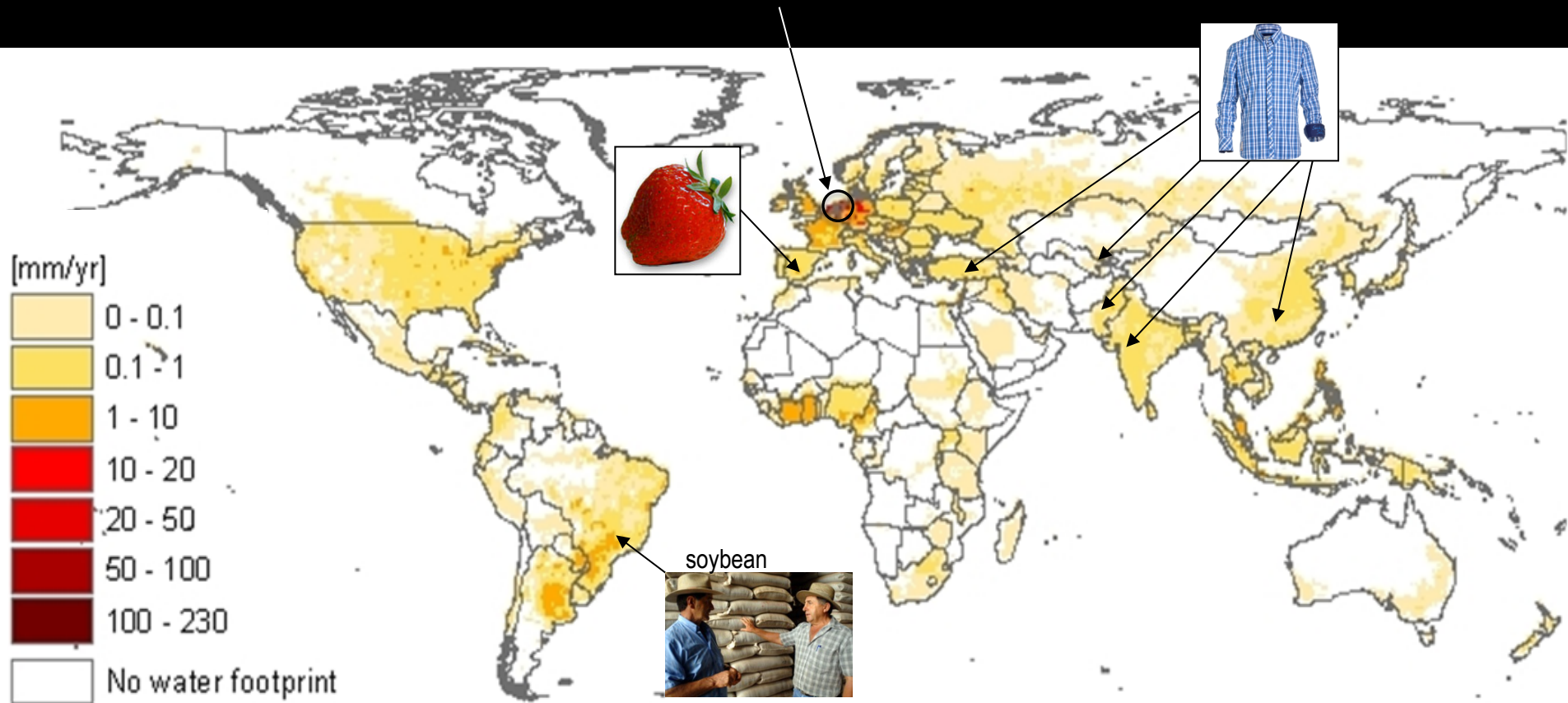


22% of the water footprint does not lie within the country of
the consumer, but other parts of the world



Global water footprint of Dutch consumption

95% of the water footprint lies outside the Netherlands



Source: Mekonnen & Hoekstra (2011) *National Water Footprint Accounts*

Cotton from the Aral Sea Basin, Central Asia

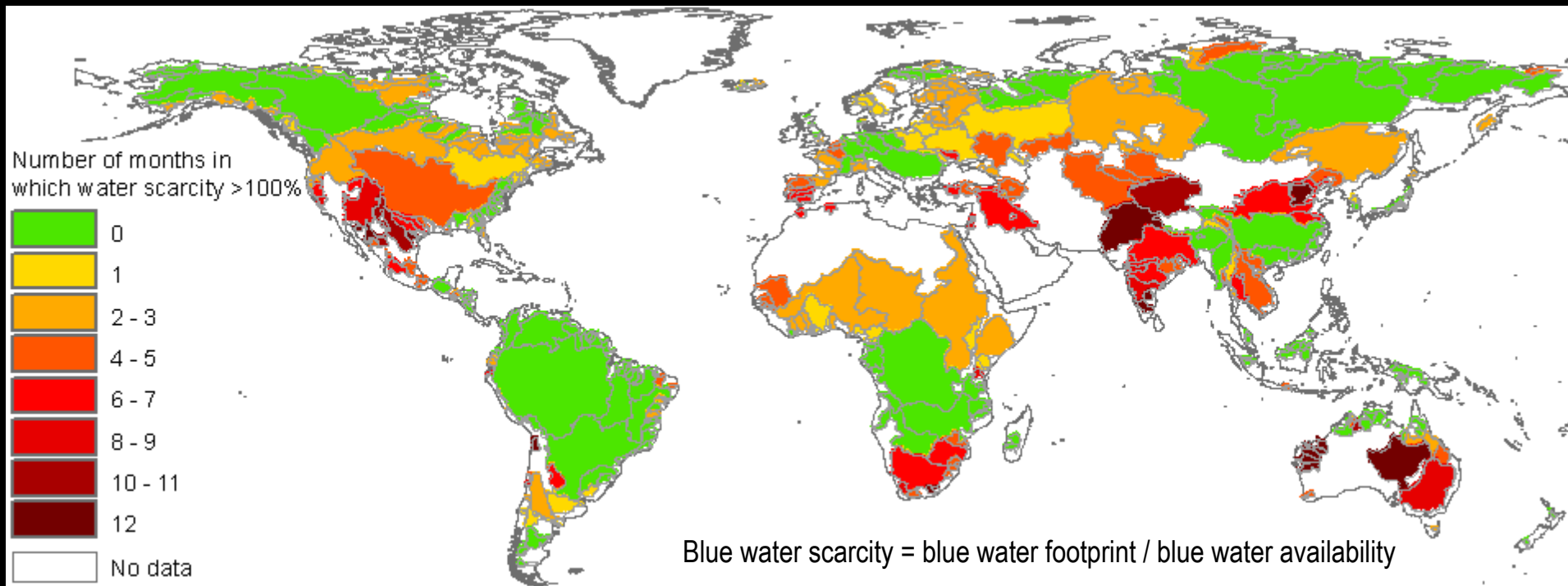


Source: NASA





Number of months with blue water scarcity > 100%



Source: Hoekstra et al. (2012) Global monthly water scarcity: blue water footprints versus blue water availability, *PLoS ONE*



The water footprint
concept



The water footprint of a product



Green water footprint

volume of rainwater evaporated or incorporated into a product



Blue water footprint

volume of surface or groundwater evaporated or incorporated into a product

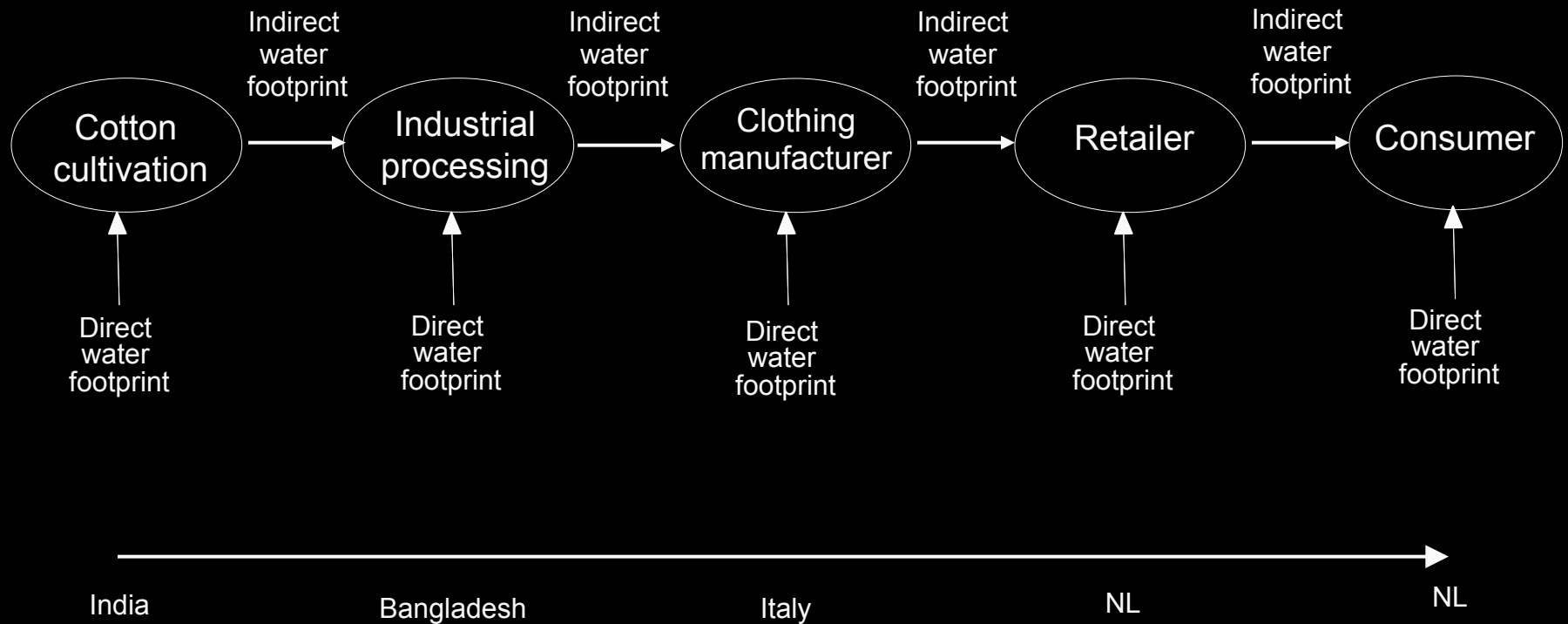


Grey water footprint

volume of polluted water

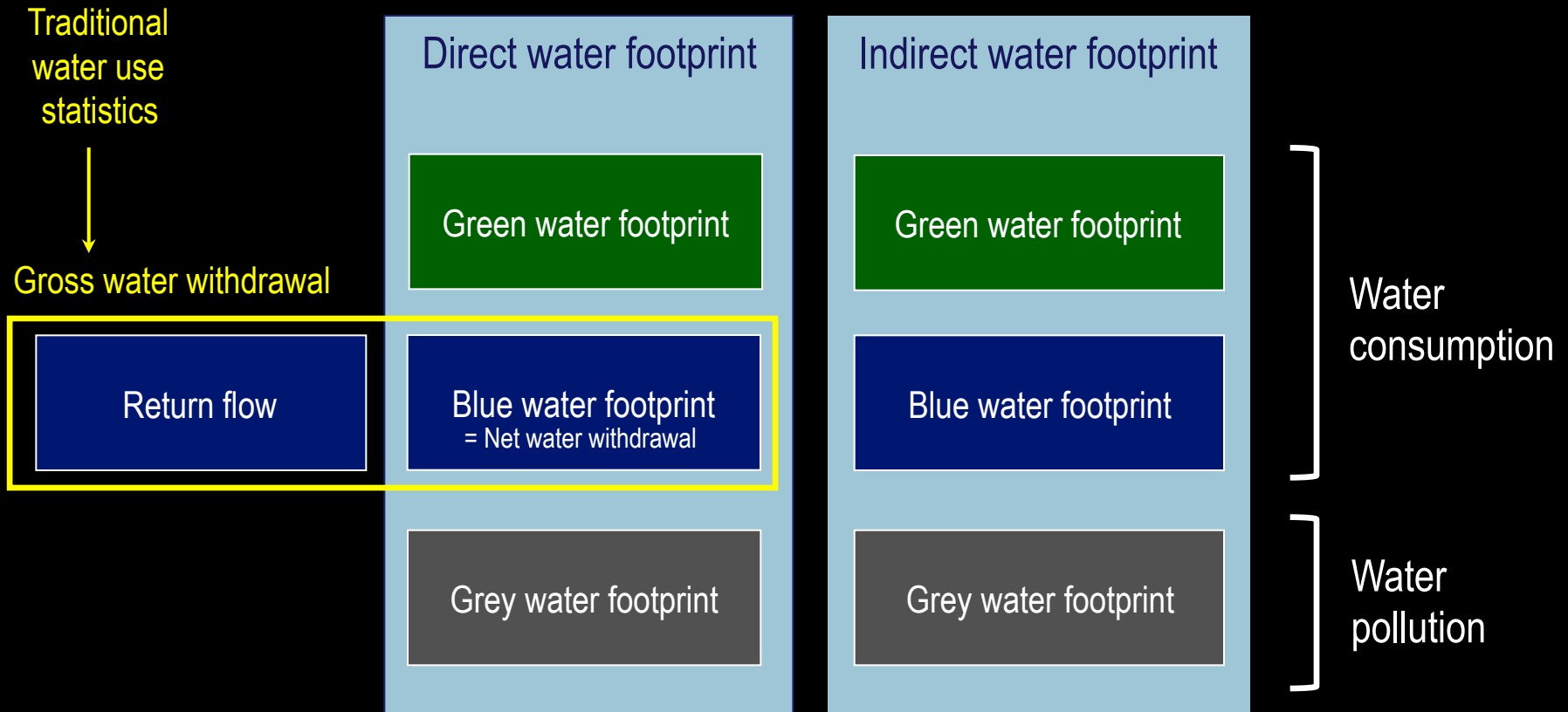


The water footprint of a product – example cotton





Components of a water footprint





The water footprint of business

The Coca Cola Company



New Delhi, 4 Oct 2006



Water footprint of a Coke



Water footprint of a 0.5 litre PET-bottle coke
as produced in the Dongen factory, the Netherlands

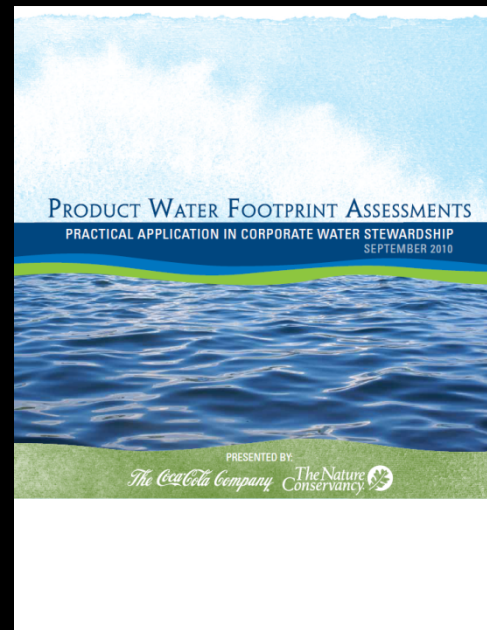
0.44 litre water content

27.6 litre for sugar

5.3 litre for PET bottle and closure

3.0 litre for other ingredients & overheads

36 litre total





Water footprint: why businesses are interested

Water risks for business

- Physical risk
- Reputational risk
- Regulatory risk
- Financial risk

Water opportunity for business

- frontrunner advantage
- corporate image

Corporate social responsibility





Water footprint: what's new for business

- From focus on own operations to supply-chain thinking
- From focus on water withdrawals to considering consumptive water use
- From securing the 'right to abstract' to assessing actual impacts
- From meeting 'emission permits' to assessing the company's contribution to pollution





Water Footprint Assessment – Examples from business



TATA
Steel, Automotive,
Chemicals, Power

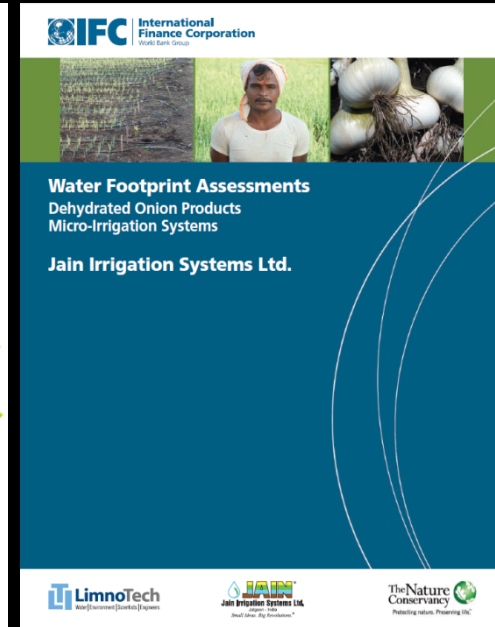
C&A
Apparel



CocaCola, SABMiller, Unilever, Nestlé
Food & Beverage

UPM
Pulp & Paper

Jain Irrigation, India
Water supply technology





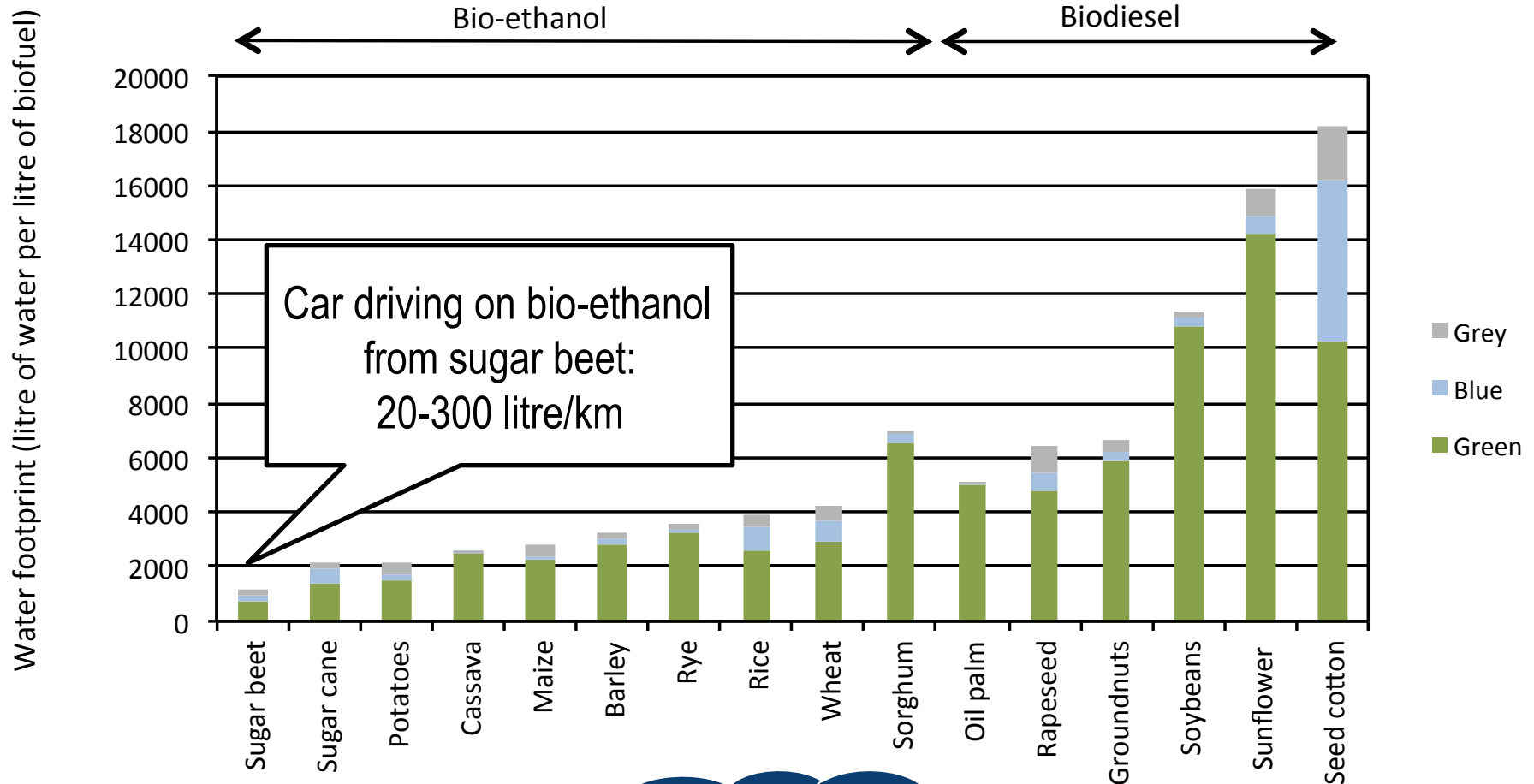
The water-energy nexus

- ▶ 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 gas



Water footprint of biofuels from different crops [litre/litre]



► coherent energy-water strategies?



What can we do?



Water footprint reduction: what can we do?

Industry



- ▶ Towards full water recycling in industries: zero blue water footprint
- ▶ Towards full recycling of materials and heat: zero grey water footprint

Agriculture



- ▶ Make rainwater more productive: lower green water footprint
- ▶ Towards supplementary or deficit irrigation & application of precision irrigation techniques: lower blue water footprint
- ▶ Towards organic or precision farming: zero grey water footprint



Reducing humanity's water footprint – Companies

Shared terminology & calculation standards

– Global Water Footprint Standard



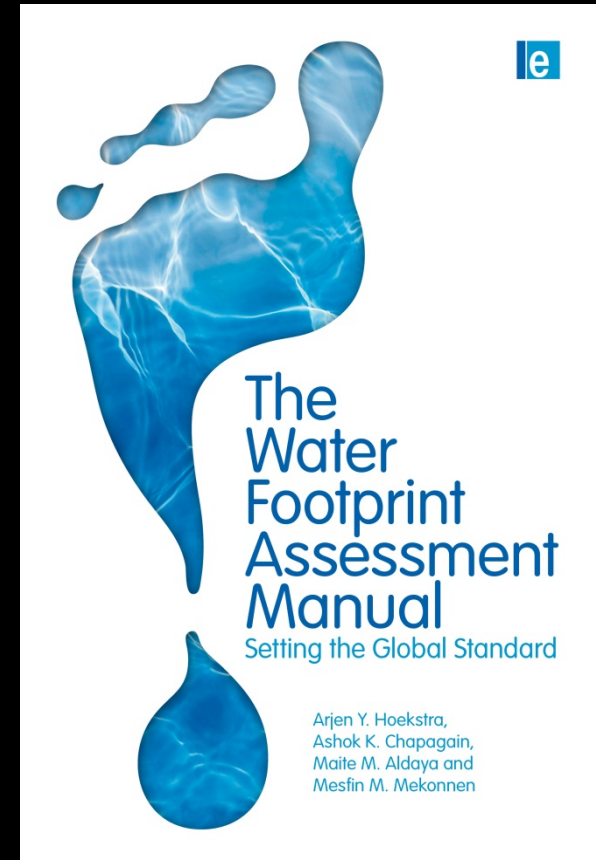
Product transparency

– water footprint reporting / disclosure

– labelling of products

Quantitative footprint reduction targets

– benchmarking



The Water Footprint Assessment Manual
Earthscan, London, UK, 2011



Current practices versus benchmarks



... common irrigation practice



... drip irrigation



... spraying pesticides



... organic farming

Current practices versus benchmarks



... open wet cooling towers



... closed circuit dry cooling towers



... discharging untreated wastewater



... treating wastewater



International water governance

- ▶ water footprint caps by river basin
- ▶ water footprint benchmarks by product
- ▶ product labeling? →
- ▶ certification of industries?
- ▶ water disclosure?
- ▶ global water footprint reduction targets?
- ▶ an international water pricing protocol?
- ▶ coherent energy-water strategies?

theguardian

News | Sport | Comment | Culture | Business | Money | Life & style

Professional | Guardian Sustainable Business | Hubs | Events | A

Water hub

From Guardian Sustainable Business

Will we ever see water footprint labels on consumer products?

Displaying water inputs on consumer items is an idea floated frequently, but is it any closer to becoming reality?

 **Will Henley**
Guardian Professional, Friday 23 August 2013 16.11 BST
[Jump to comments \(5\)](#)



On average it takes 15,400 litres of water to make 1kg of beef. Photograph: Bon Appetit/Alamy



Water Footprint

Water Footprint
NETWORK

Your Water Footprint » Extended Calculator

Introduction

Agenda

About WFN

Product Water Footprints

Your Water Footprint

National Water Footprints

Corporate Water Footprints

Global Water Footprint

Training Materials

Publications

Glossary

FAQ

Links

Contact

Your individual water footprint is equal to the water required to produce the goods and services consumed by you. Please take your time and feel free to use the extended water footprint calculator to assess your own unique water footprint. The calculations are based on the water requirements per unit of product as in your country of residence.

Note: put decimals behind a point, not a comma (e.g. write 1.5 and not 1,5).

Select a Country ▼

Food consumption

Cereal products (wheat, rice, maize, etc.)

kg per week

Meat products

kg per week

Dairy products

kg per week

Eggs

number per week

How do you prefer to take your food?

High fat ▼

How is your sugar and sweets consumption?

High ▼

Vegetables

kg per week

Fruits

kg per week

Starchy roots (potatoes, cassava)

kg per week

How many cups of coffee do you take per day?

cup per day

How many cups of tea do you take per day?

cup per day

Domestic water use

www.waterfootprint.org