

Water Footprint Accounting for Water Quality

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Globalization *of* Water

Sharing the Planet's Freshwater Resources



Overview Presentation

1. Introduction to water footprints
2. Accounting for water quality
3. The way forward



1

Introduction to water footprints

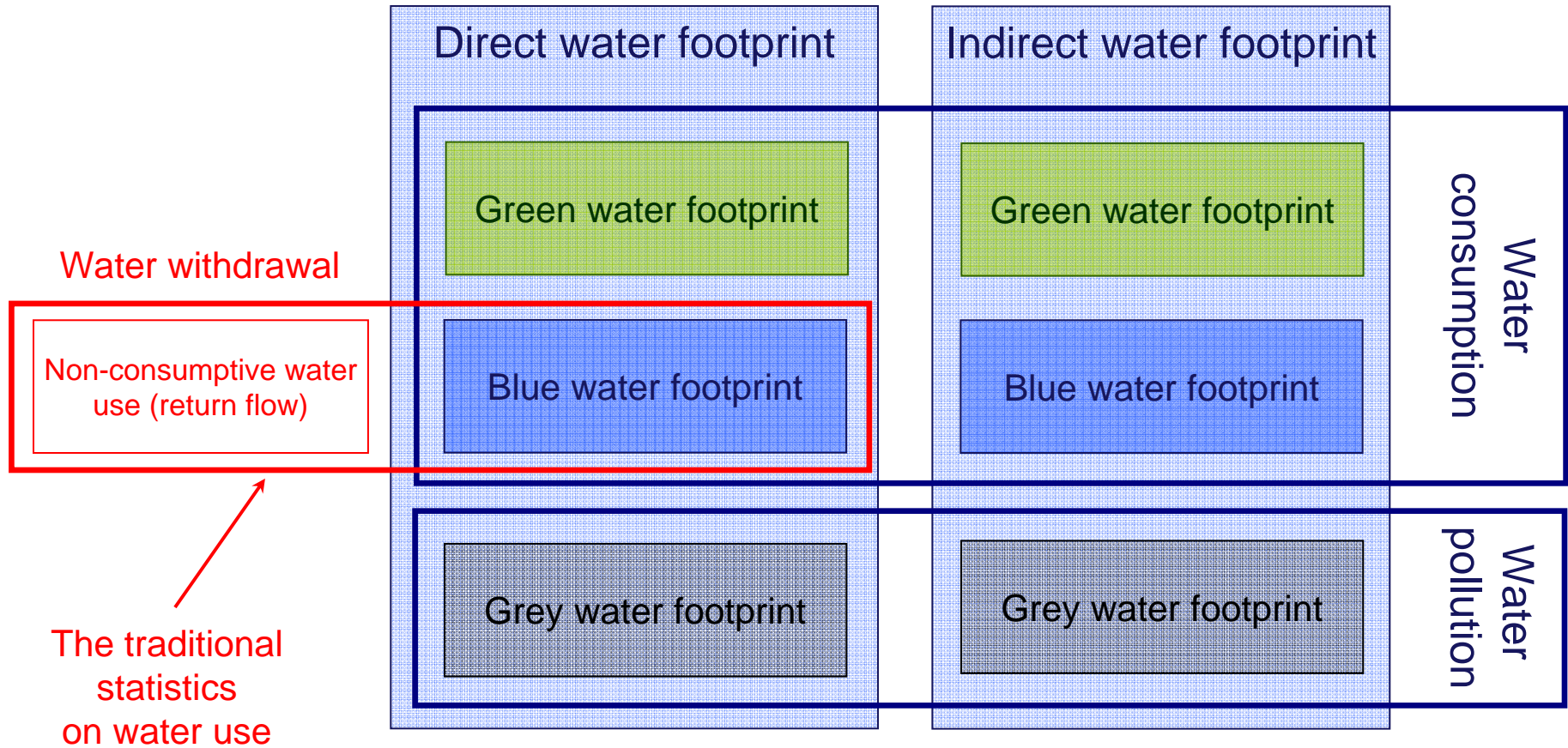


Water footprint of a product

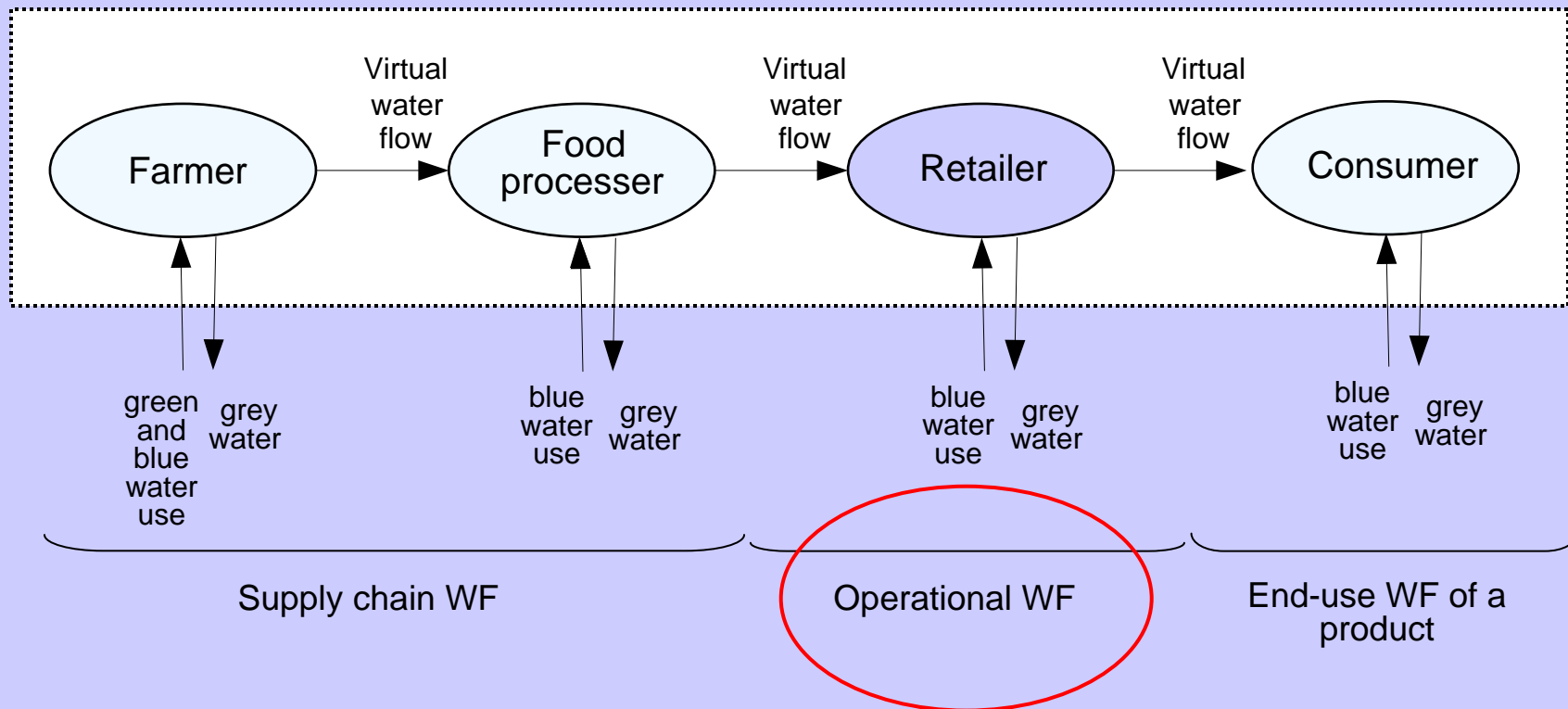
- ▶ the **volume** of fresh water used to produce the product, summed over the various steps of the **production chain**.
- ▶ when and where the water was used:
a water footprint includes a **temporal** and **spatial** dimension.
- ▶ type of water use:
 - Green water footprint**
 - Blue water footprint
 - Grey water footprint



Components of a water footprint



The water footprint of a business



The traditional statistics
on corporate water use



2

Accounting for water quality

Grey water footprint

- volume of polluted freshwater that associates with the production of a product in its full supply-chain.
- calculated as the volume of water that is required to dilute pollutants to such an extent that the quality of the water remains above agreed water quality standards.



Grey water footprint

- ▶ Total WF_{grey} of activity (m^3) = $\frac{\text{Load}}{\text{Standard}} = \frac{L}{c_{\text{max}}}$
- ▶ WF_{grey} per unit of product (m^3/ton) = $\frac{L / c_{\text{max}}}{Prod}$

L – Load of pollutants entering the water system (kg/yr)

c_{max} – Maximum acceptable concentration for the pollutant considered (kg/m^3)

$Prod$ – Production (ton/yr)



Grey water footprint

1. Estimation for the different pollutants
2. Select the pollutant with the highest dilution volume as the most critical one (if this pollutant has been sufficiently diluted, all the other pollutants have been sufficiently diluted as well)



Grey water footprint related to nitrogen

Grey WF related to cotton production in India

Applic. rate = 66 kg/ha

Leaching rate = 10%

$c_{\max} = 10 \text{ mg/l}$ *

$Y = 0.6 \text{ ton/ha}$

$L = 6.6 \text{ kg/ha}$

$$\begin{aligned} \text{Total } \text{WF}_{\text{grey}} \text{ of activity} &= \frac{L}{c_{\max}} \\ &= 5,887 \cdot 10^6 \text{ m}^3/\text{yr} \end{aligned}$$

$$\begin{aligned} \text{WF}_{\text{grey}} \text{ per unit of product} &= \frac{L / c_{\max}}{\text{Prod}} \\ &= 1,062 \text{ m}^3/\text{ton} \end{aligned}$$

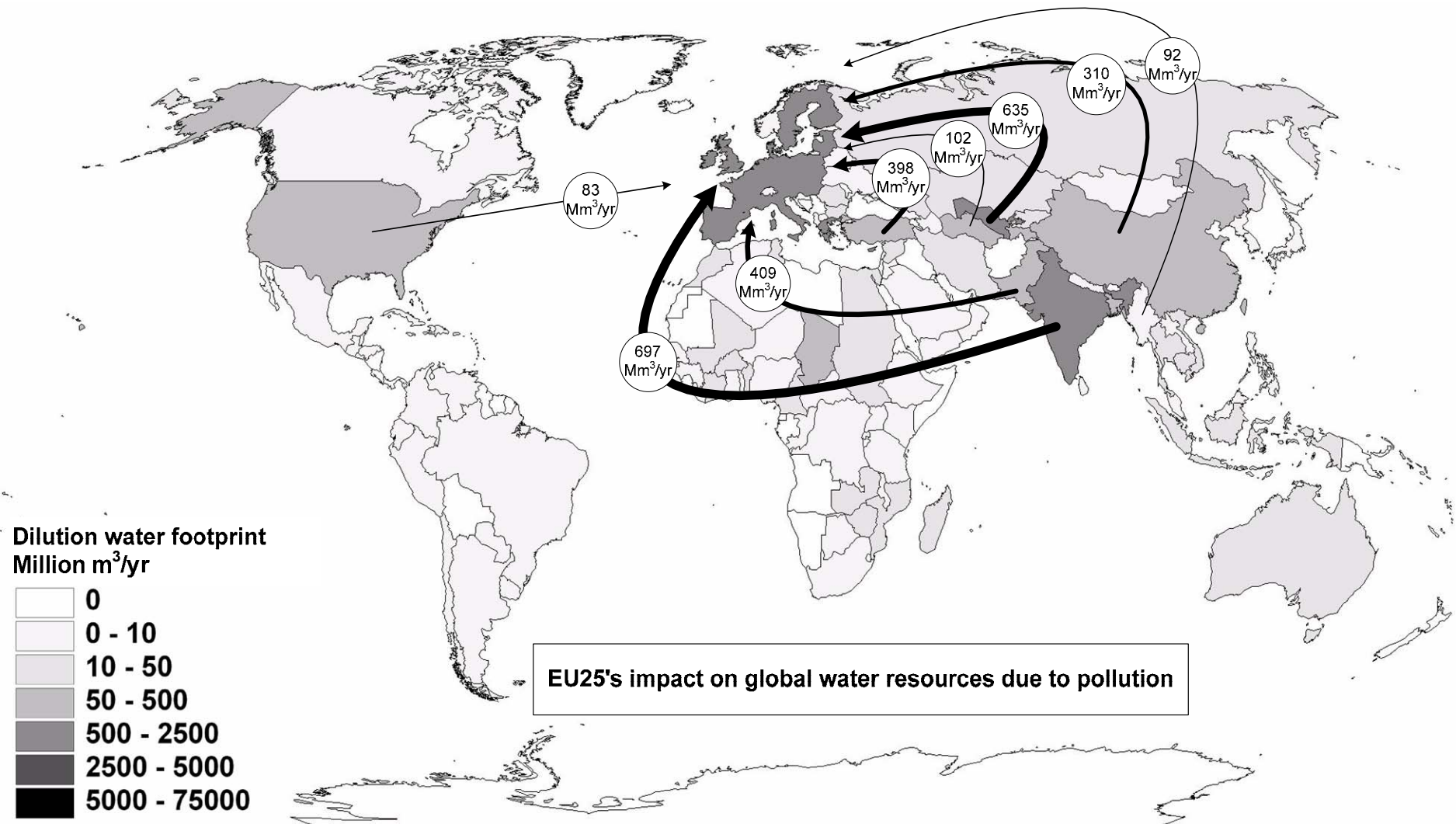


* EPA (2005)

[Hoekstra & Chapagain, 2008]



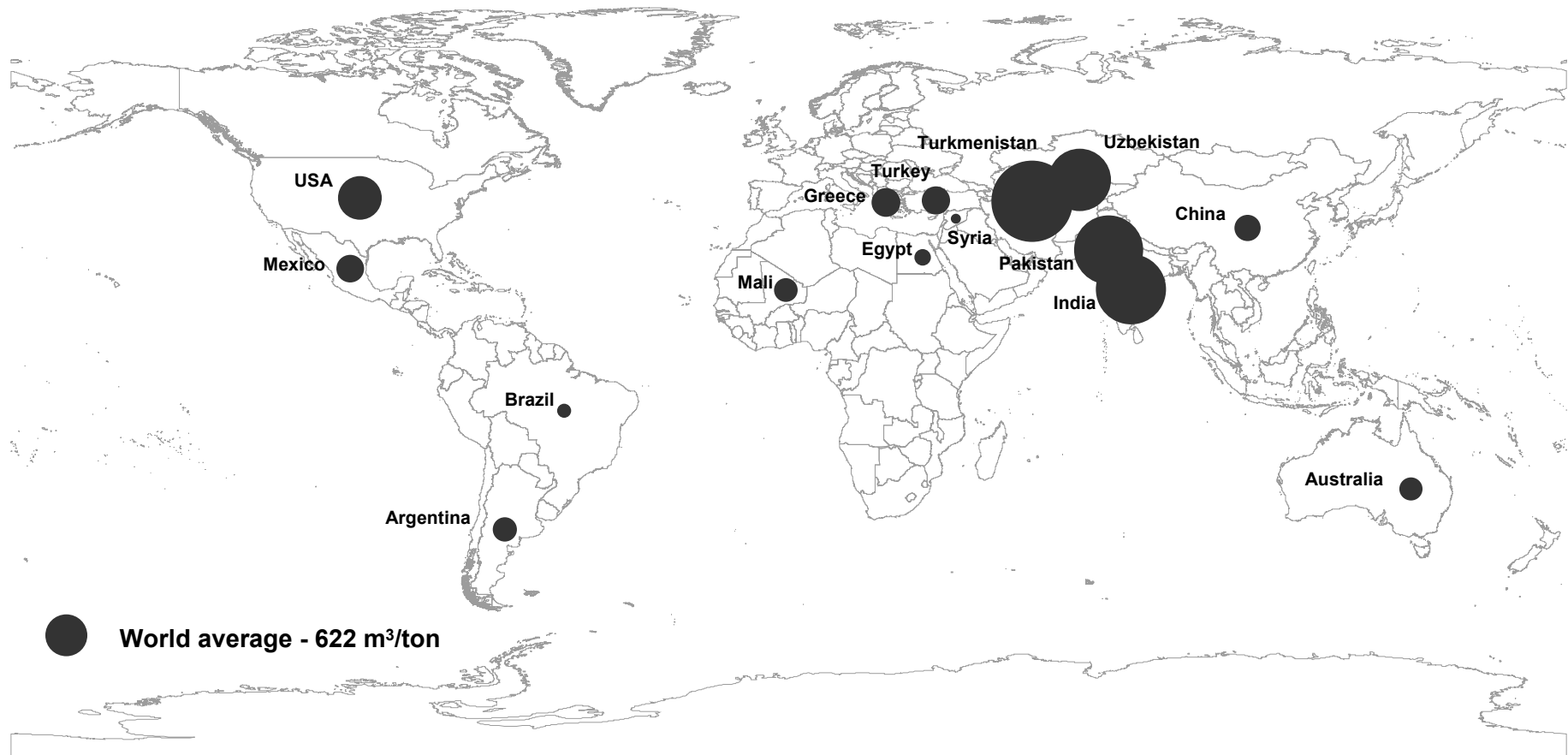
Grey water footprint related to nitrogen of EU's cotton consumption





Grey water footprint related to nitrogen used in cotton production

WF_{grey} per unit of product (m³/ton)





3

The way forward

Mission: Promoting sustainable, equitable and efficient water use through development of **shared standards** on water footprint accounting and guidelines for the reduction and offsetting of impacts of water footprints.

Network: bringing together expertise from academia, businesses, civil society, governments and international organisations.



Water Footprint

Water Footprint
NETWORK

Introduction

[\[Spanish\]](#) [\[Italian\]](#) [\[French\]](#) [\[German\]](#) [\[Turkish\]](#)

People use lots of water for drinking, cooking and washing, but even more for producing things such as food, paper, cotton clothes, etc. The water footprint is an indicator of water use that looks at both direct and indirect water use of a consumer or producer. The water footprint of an individual, community or business is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community or produced by the business.

16000 litres water



1 kg beef



The relation between consumption and water use

"The interest in the water footprint is rooted in the recognition that human impacts on freshwater systems can ultimately be linked to human consumption, and that issues like water shortages and pollution can be better understood and addressed by considering production and supply chains as a whole," says Professor Arjen Y. Hoekstra, creator of the water footprint concept and scientific director of the Water Footprint Network. "Water problems are often closely tied to the structure of the global economy. Many countries have significantly externalised their water footprint, importing water-intensive goods from elsewhere. This puts pressure on the water resources in the exporting regions, where too often mechanisms for wise water governance and conservation are lacking. Not only governments, but also consumers, businesses and civil society communities can play a role in achieving a better management of water resources."



New in 2008:
Book on 'Globalisation
of Water'

The 2007-paper on 'Water
Footprints of Nations'
[Water Footprints of Nations](#)

The 2008-paper on 'Water
Neutrality'
[Water Neutrality](#)

Download other publications

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Some facts and figures



Water Footprint

Product Gallery

Water Footprint
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Productgallery

Coffee

Water footprint: 140 litres for 1 cup of coffee.

It costs about 21000 litres of water to produce 1 kg of roasted coffee. For a standard cup of coffee we require 7 gram of roasted coffee, so that a cup of coffee costs 140 litres of water. Assuming that a standard cup of coffee is 125 ml, we thus need more than 1100 drops of water for producing one drop of coffee. Drinking tea instead of coffee would save a lot of water. For a standard cup of tea of 250 ml we require 30 litres of water.

The world population requires about 120 billion cubic metres of water per year in order to be able to drink coffee. This is equivalent to 1.5 times the annual Rhine



Water Footprint

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Your Footprint Calculator » Extended Calculator

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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

Indoors

How many showers do you take each day?

number per day

What is the average length of each shower?

minute per shower

Thank you