water
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Towards Global Sustainability:

How can water footprint help?

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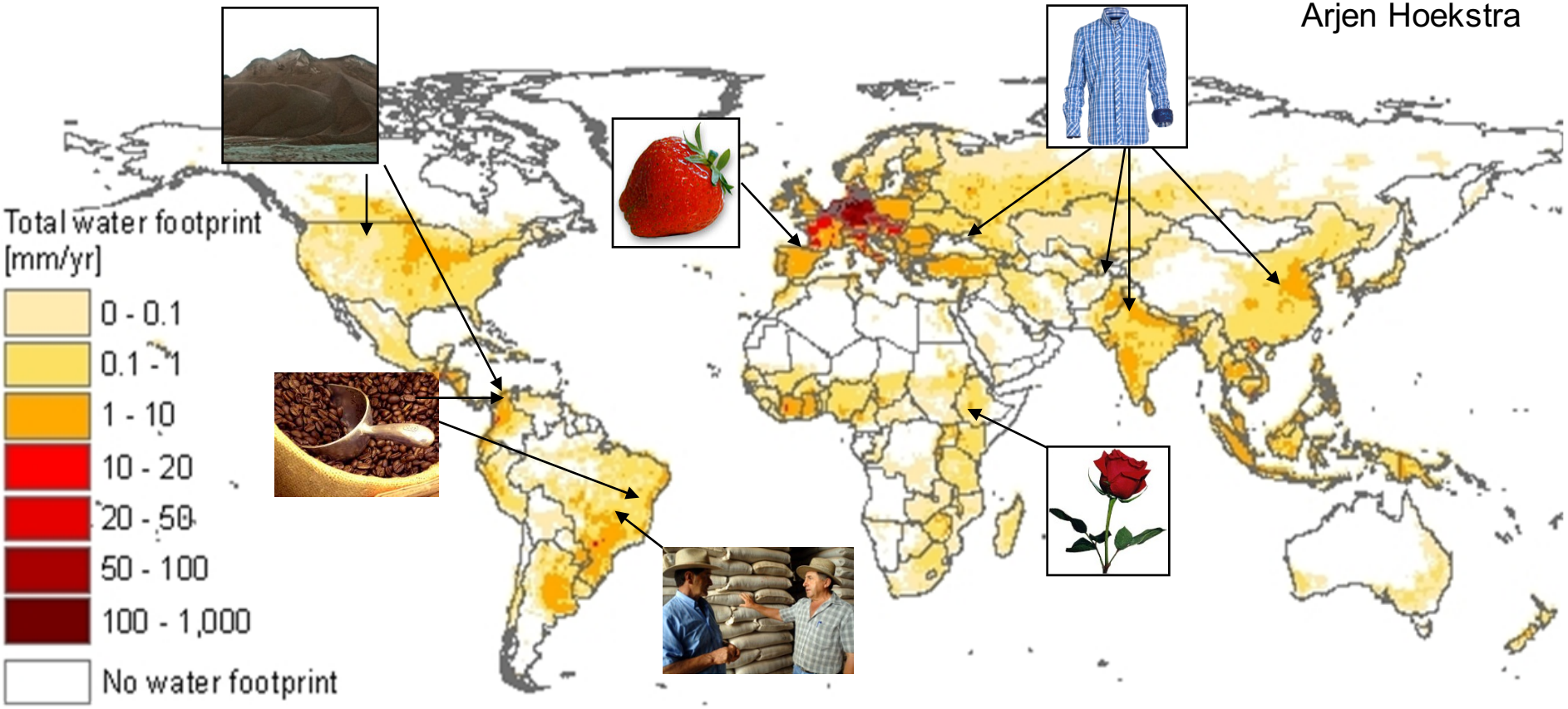
Globalisation of water

- Water problems - tied to the structure of the global economy
- Human impacts on freshwater systems - linked to human consumption
- Water shortages and pollution - consider production and supply chains



Water footprint concept

"Not only governments, but also consumers, businesses and civil society communities can play a role in achieving a better management of water resources."

Arjen Hoekstra

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What is the water footprint?

The **water footprint** maps and measures how, when and where we use freshwater resources.

► Water footprint is a measurement of the **volume of water consumed** (evaporated or otherwise not returned) or **assimilation capacity used.**

► The water footprint is a **geographically** & **temporally** explicit indicator.

► The water footprint is an indicator of water use that looks at both **direct** & **indirect** water use of a consumer or producer.

► A water footprint can be calculated for a **process**, a **product**, a **consumer**, **group of consumers** (e.g. municipality, province, state or nation) or a **producer** (e.g. a private enterprise, public organization).

[Hoekstra et al., 2011]

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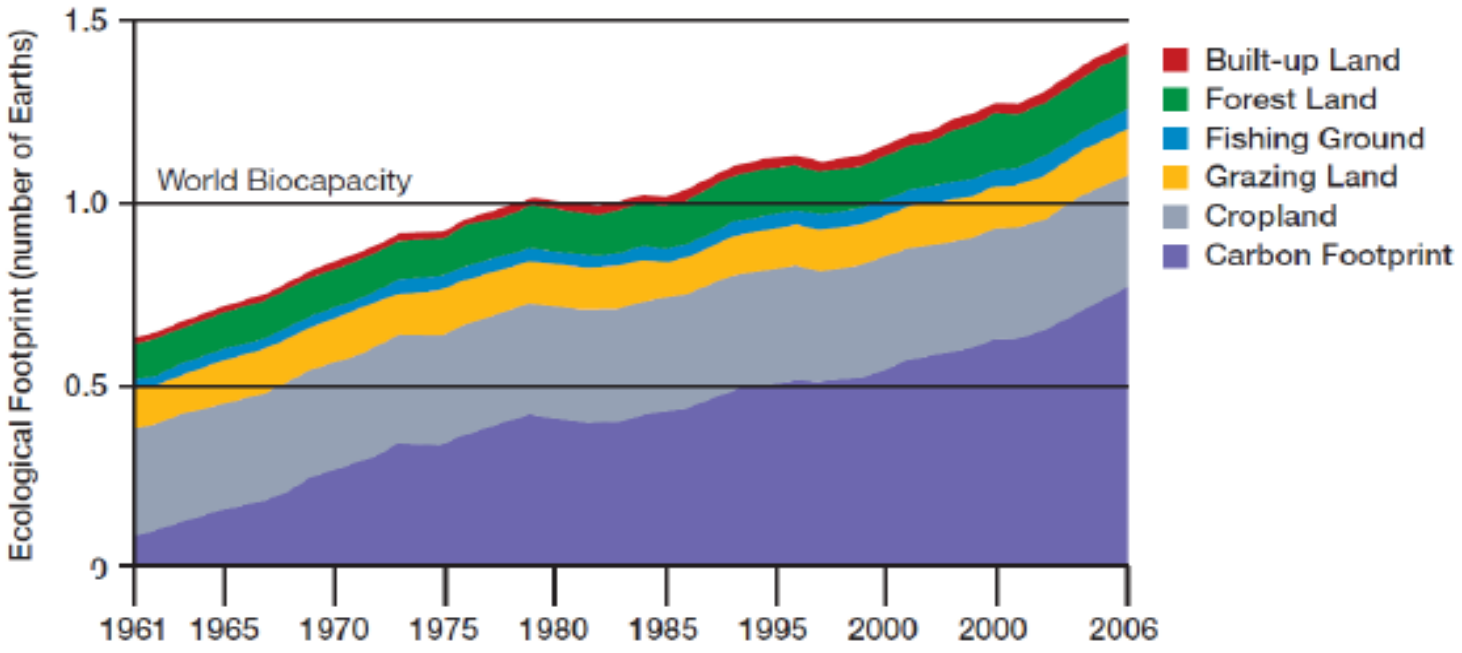
An analogy: The ecological footprint

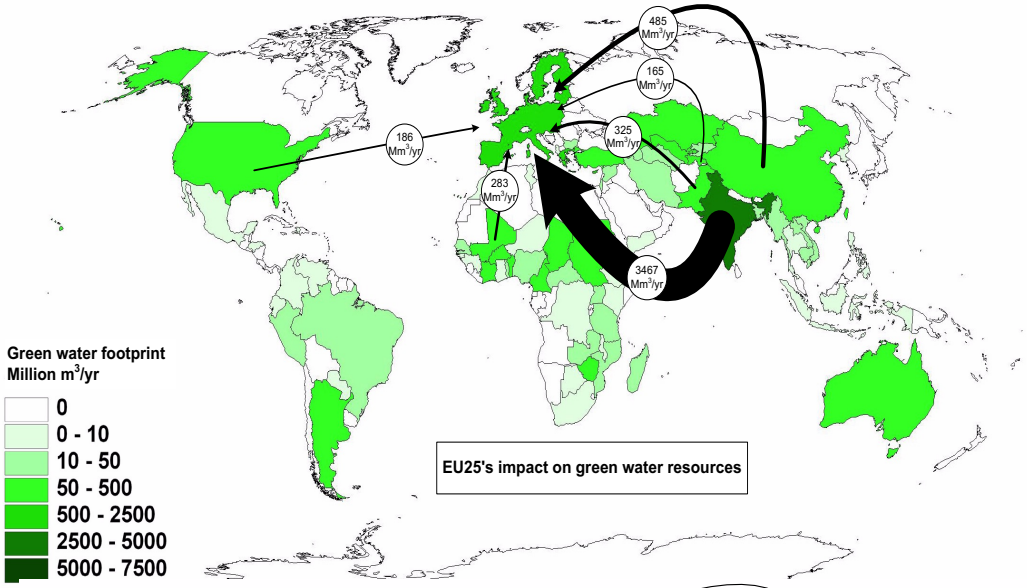
The pressure people put on land and water through the demand for goods and services and the assimilation of GHG emissions

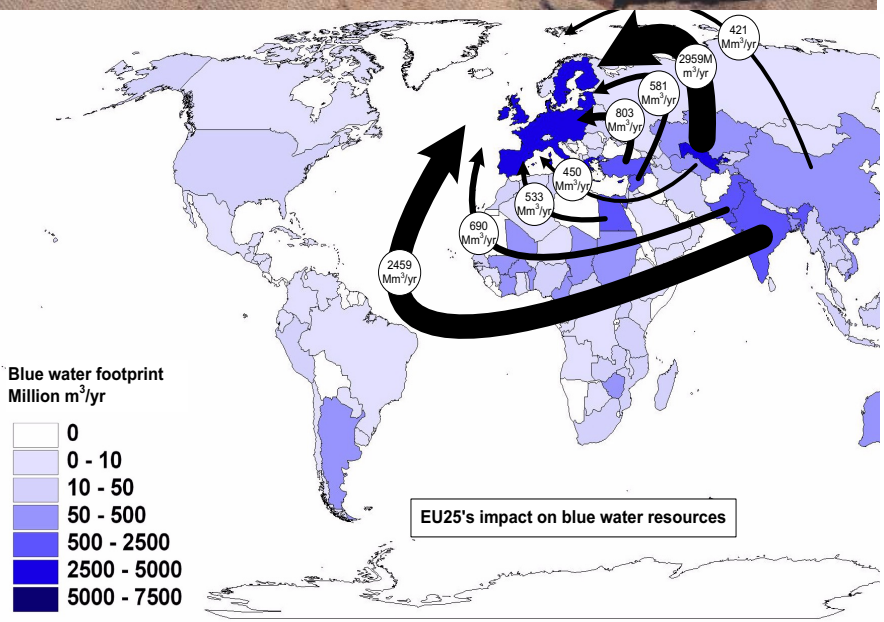
Biocapacity:
How much bioproductive area is **available to us**?

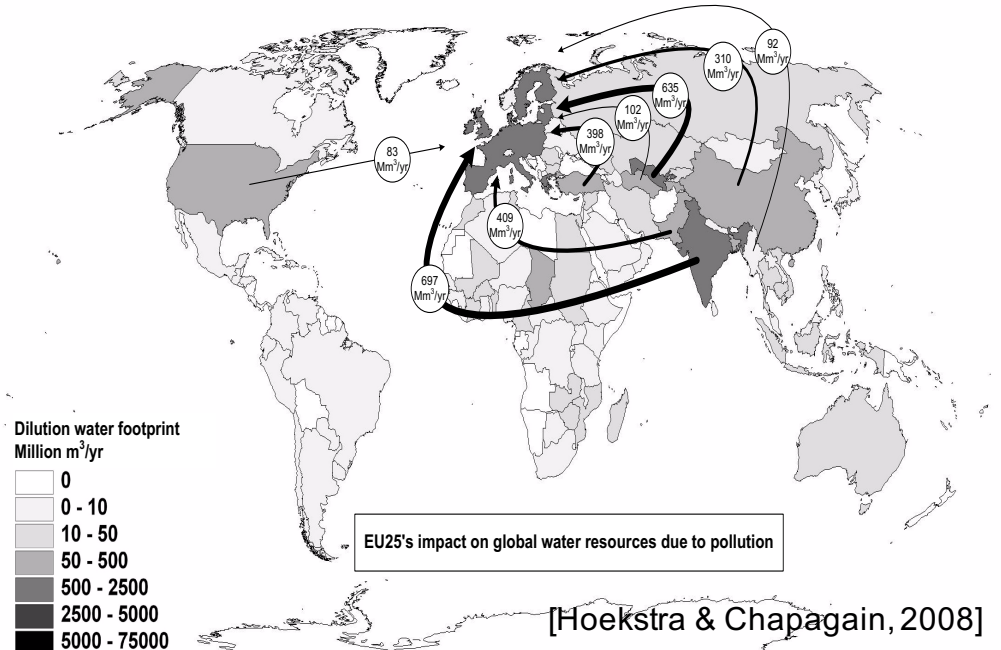
Ecological Footprint:
How much bioproductive area do we **demand**?



Water footprint of EU's cotton consumption







[Hoekstra & Chapagain, 2008]

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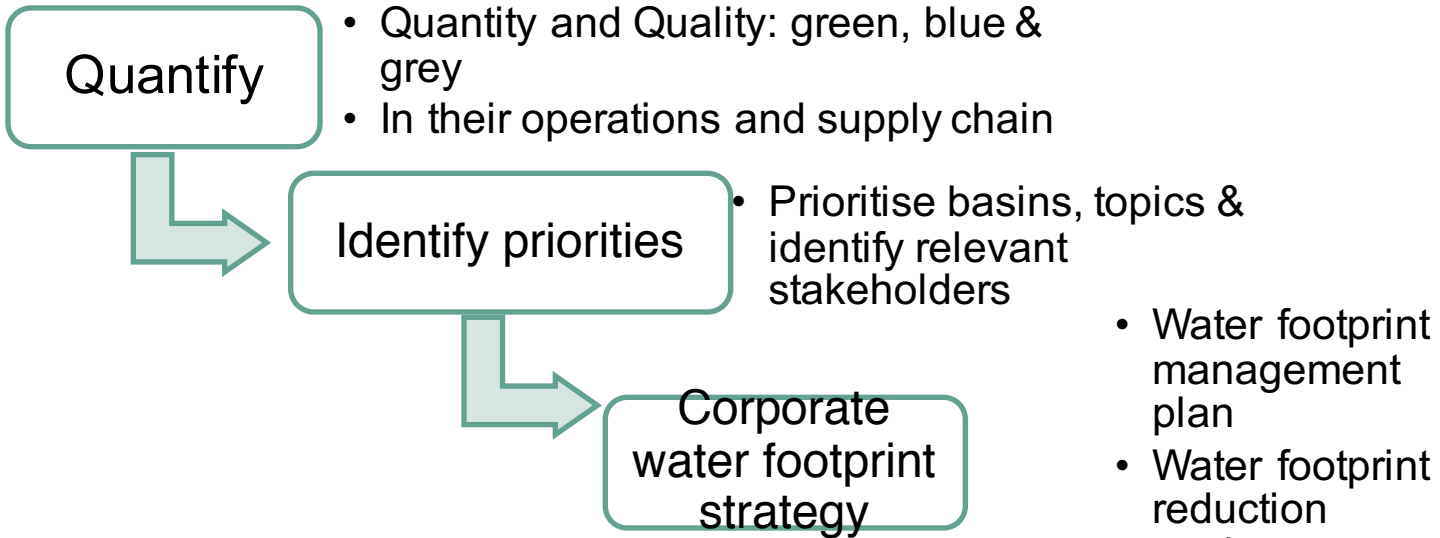
A framework for action: Water Footprint Assessment

- Understand the ***geographic & temporal allocation of water resources*** for industry, agriculture & domestic water supply
- Assess the ***sustainability, efficiency & equitability of water use***: consumption & pollution
- Identify the most ***strategic actions*** to be taken in local, regional, national & global scales, individually & collectively

Corporate Water Footprint Assessment



After prioritising locations & processes where water footprints are not sustainable, the next step is to **design appropriate action.**

Questions to be asked are:

- Is internal action sufficient e.g. improve your own water footprint? What are the management options?
- Do you need to work with external parties for collective action?
- If yes, with whom; around what?

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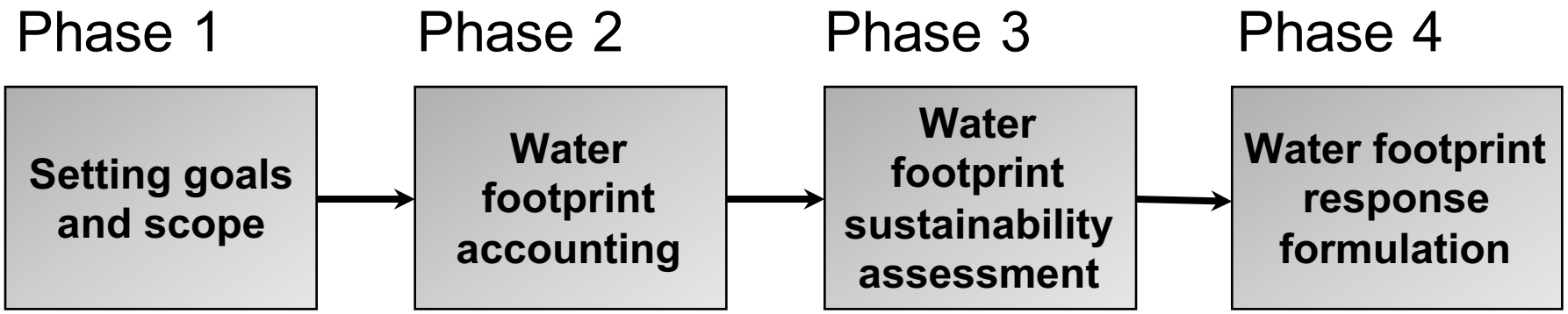
Four phases of Water Footprint Assessment



Where is my WF the largest?

Where is my WF unsustainable?

Where can my WF be reduced?

What is my green, blue, grey WF in my operations & value chain?

Is my WF environmentally sustainable, economically efficient & socially equitable?

How can I reduce my WF in my operations, value chain, sector, basin?

Where should I work first?

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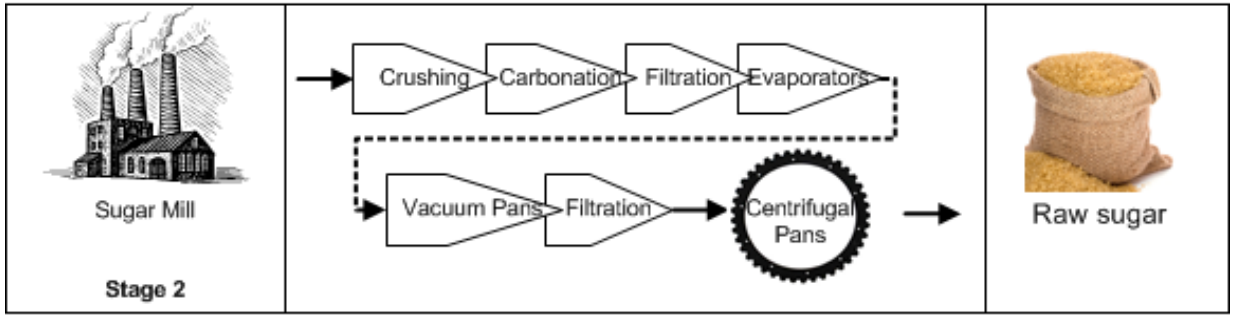
1 – Goal & Scope definition

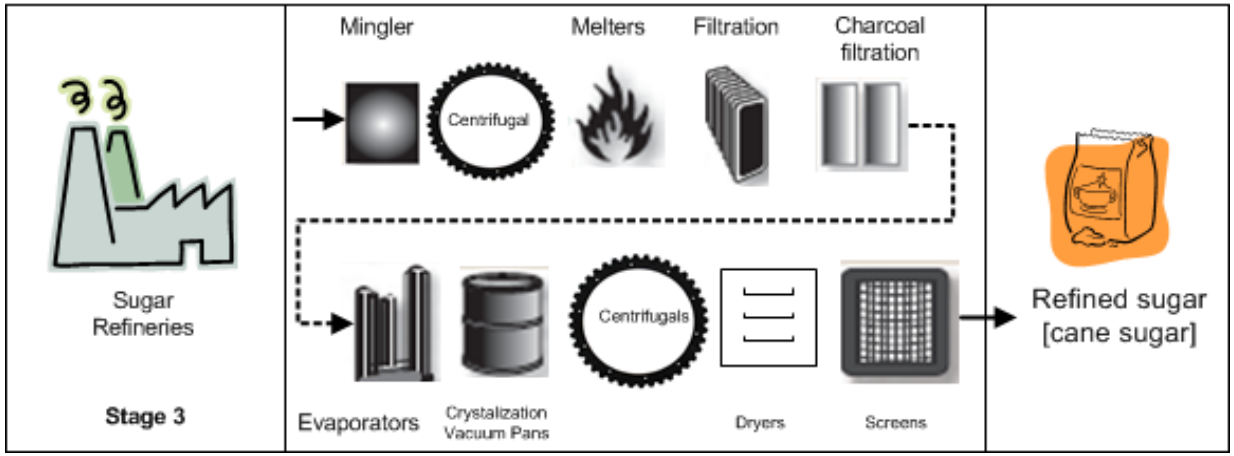
Sugarcane supply chain

Tier 3 Suppliers

Tier 2 Suppliers



Tier 1 Suppliers



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2 - Water footprint accounting

Integration in the Hydrological cycle: the colors of water

Green water footprint

- volume of rainwater evaporated or incorporated into product


Blue water footprint

- volume of surface or groundwater evaporated or incorporated into product, lost return flow




Grey water footprint

- an indicator of assimilation capacity used.

[Hoekstra et al., 2011]

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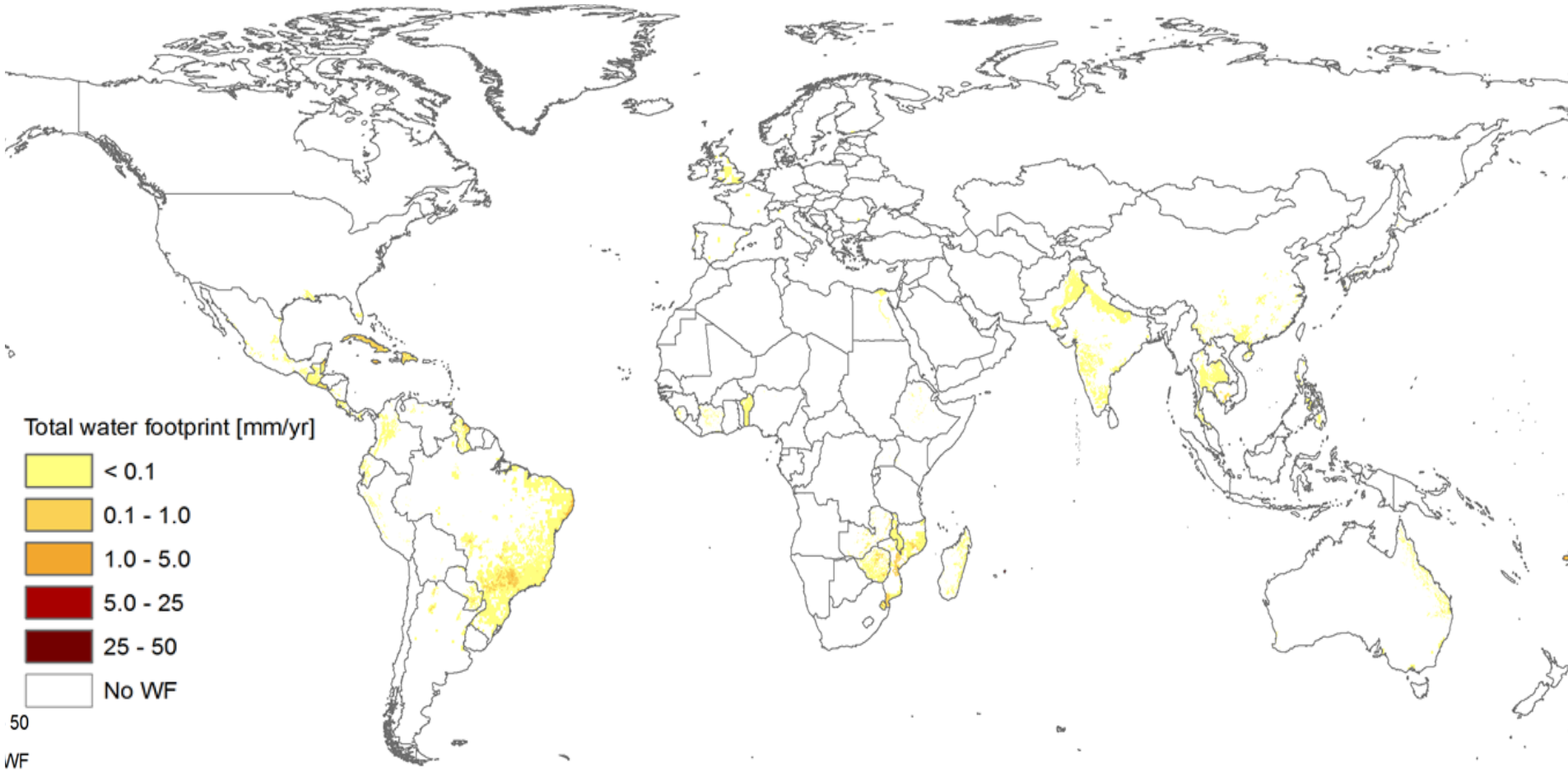
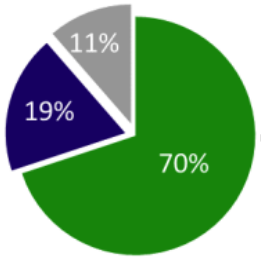
Global distribution of total water footprint



Total WF: 391,571,000 m^3/y

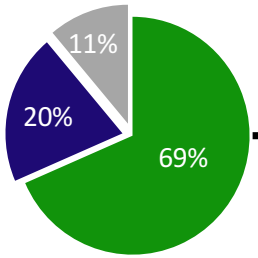
2 - Water footprint accounting



1600 litres water

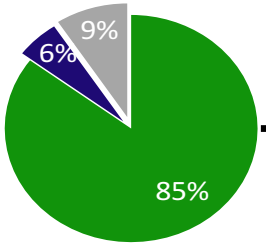
1 kg wheat bread

Global average water footprint



2500 litres water

1 kg rice



300 litres water

1 litre beer

Mekonnen & Hoekstra., 2012

3 - Water footprint sustainability assessment

Establish sustainability criteria

Environmental

Blue water footprint: environmental flow requirements, groundwater levels

Green water footprint: environmental green water requirements

Grey water footprint: ambient water quality standards

Social

- Basic human needs – drinking water, food security, employment
- Rules of fairness – equitable allocation, water user & polluter pays principle

Economic

Efficient allocation and use of water; value of water in the economy

[Hoekstra et al., 2011]

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3 - Water footprint sustainability assessment

Sustainability Assessments are a basis for stakeholder involvement, help to create good will & avoid situations where companies are caught off guard by new concerns or preferences.

Sustainability Assessments identify social sustainability issues & work toward solutions where needs are not being met.

Sustainability Assessments form a basis for watershed cooperation & thus can help in avoiding conflicts before they start.

[Hoekstra et al., 2011]

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Sustainability Assessment to guide sustainability strategy

Is the supply chain water footprint sustainable?

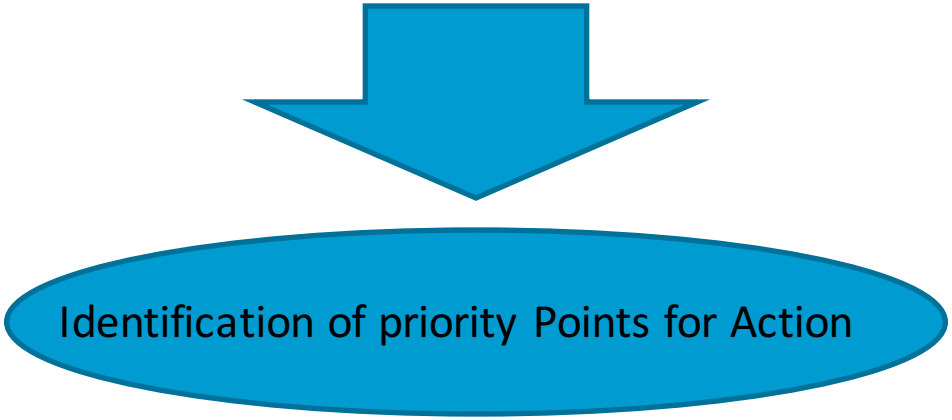
For each green, blue & grey water footprint component:

Geographic hotspots: Is the water footprint component located in a river basin & period of the year where environmental criteria are violated?

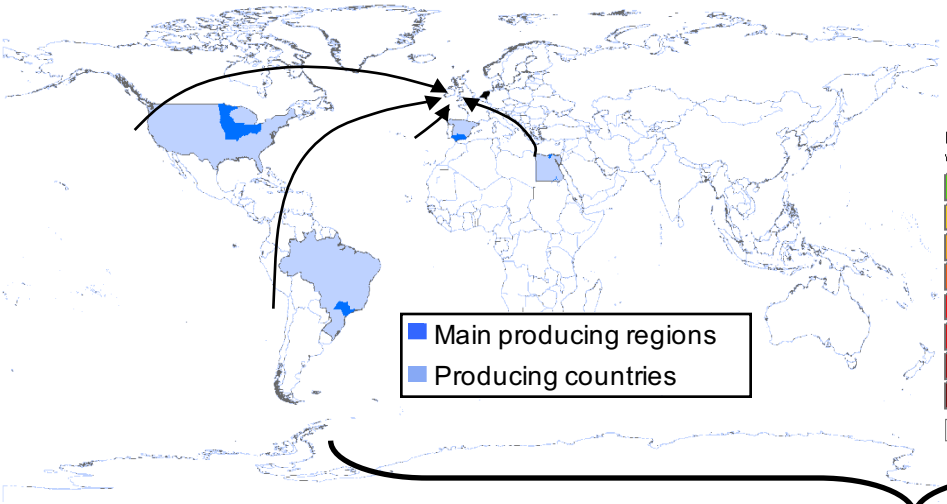
[checked using blue water scarcity & water pollution levels]

Process efficiency: Is the water footprint of the process itself unsustainable?

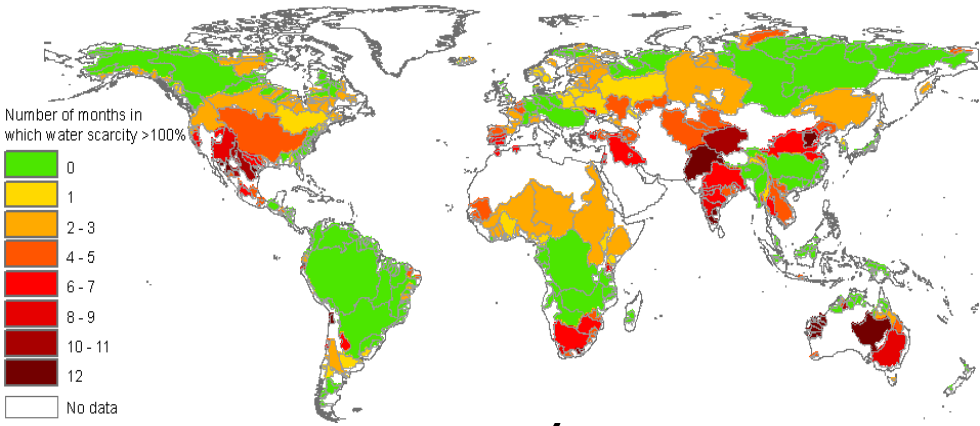
[checked using global benchmarks]



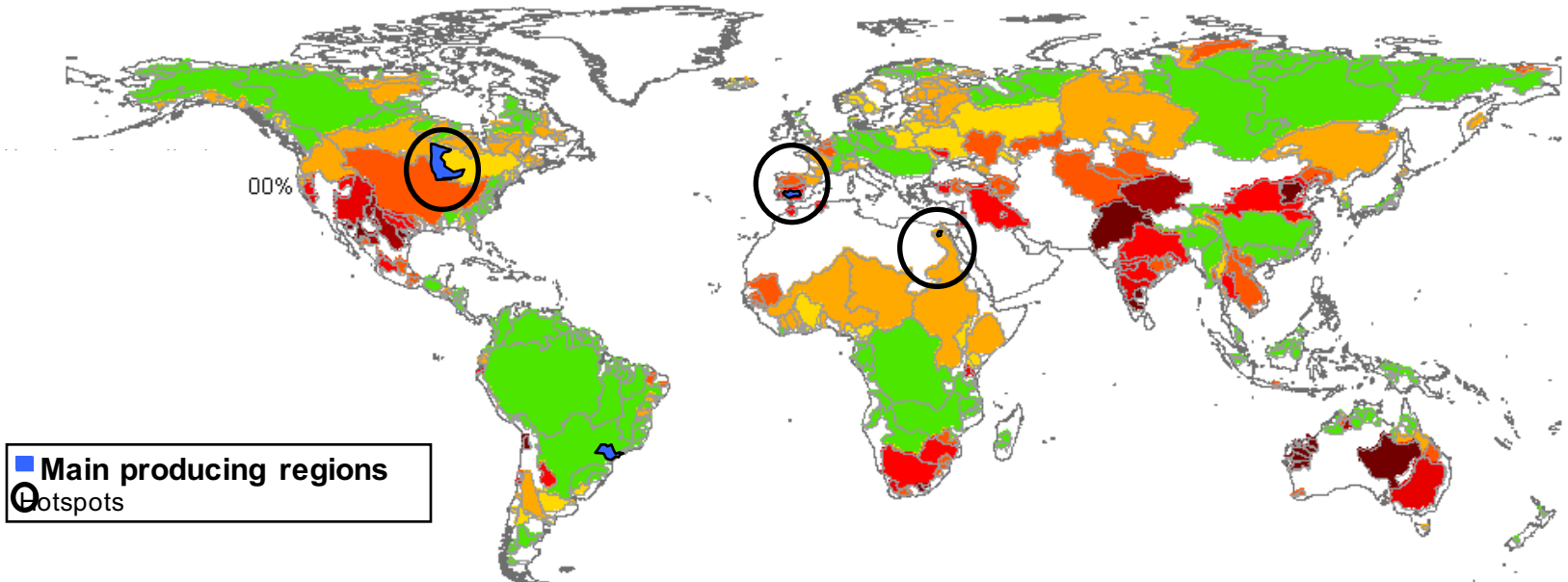
Global blue water footprint of a company located in the Netherlands



River basin hotspot map - per river basin the number of months with blue water scarcity > 100%



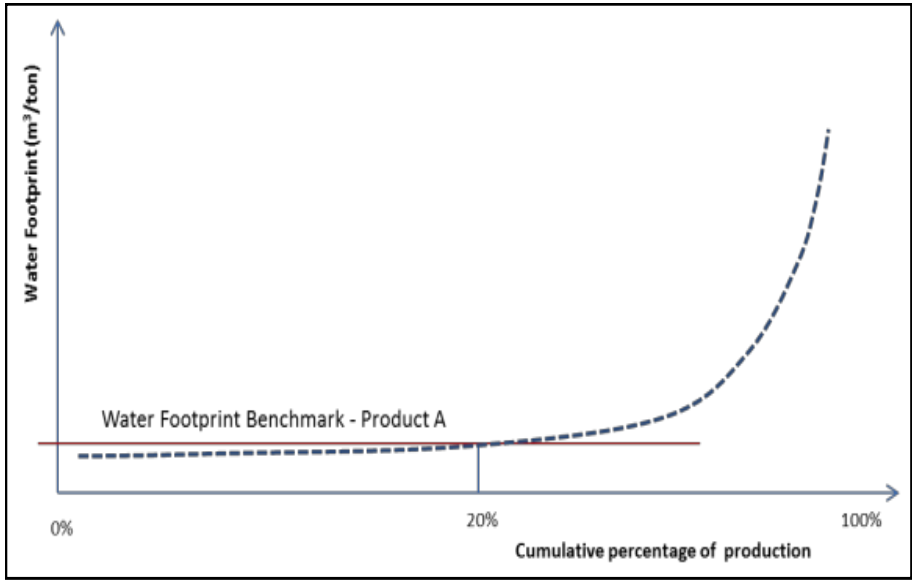
Unsustainable components of the company's blue water footprint

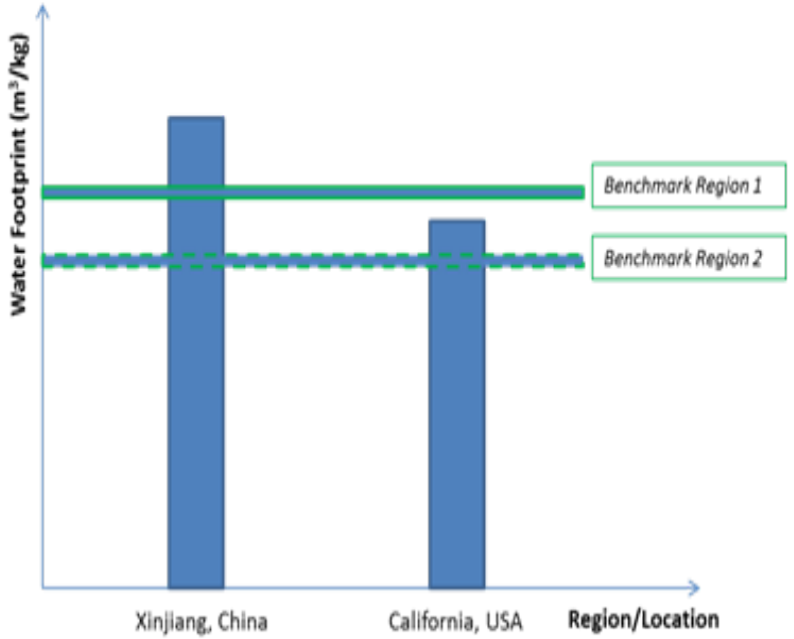


3 - Water footprint sustainability assessment

Efficient: Is water being used as efficiently as possible?

- *Benchmarking*
- *Best Available Practice & technology*
- *Progress evaluation*





4 - Water footprint Response Formulation

What can companies do?

Integrate Water Footprint Assessment into their sustainability & business strategy

- Set quantitative water footprint reduction targets
- Use standardized terminology & calculation methods
- Certification of Water Footprint Assessments
- Water Footprint reporting/disclosure

Use Water Footprint Assessment to engage in collective action

- In catchments: as a common language among multi-stakeholders
- With supplier: collaboration programmes & incentives; roundtables
- With consumers: Integration in communications

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Selecting priority river basins for strategic action

277 river basins

Raw sugar processing and sugarcane farming in supply chain occurs in 277 river basins around the world

Priority river basins

River basin 1 | River basin 2 | River basin 3 | River basin 4 | River basin 5 | River basin …

Priority regions

Region 1	Region 2	Region 3
• Priority river basins • Adjacent river basins	• Priority river basins • Adjacent river basins	• Priority river basins • Adjacent river basins

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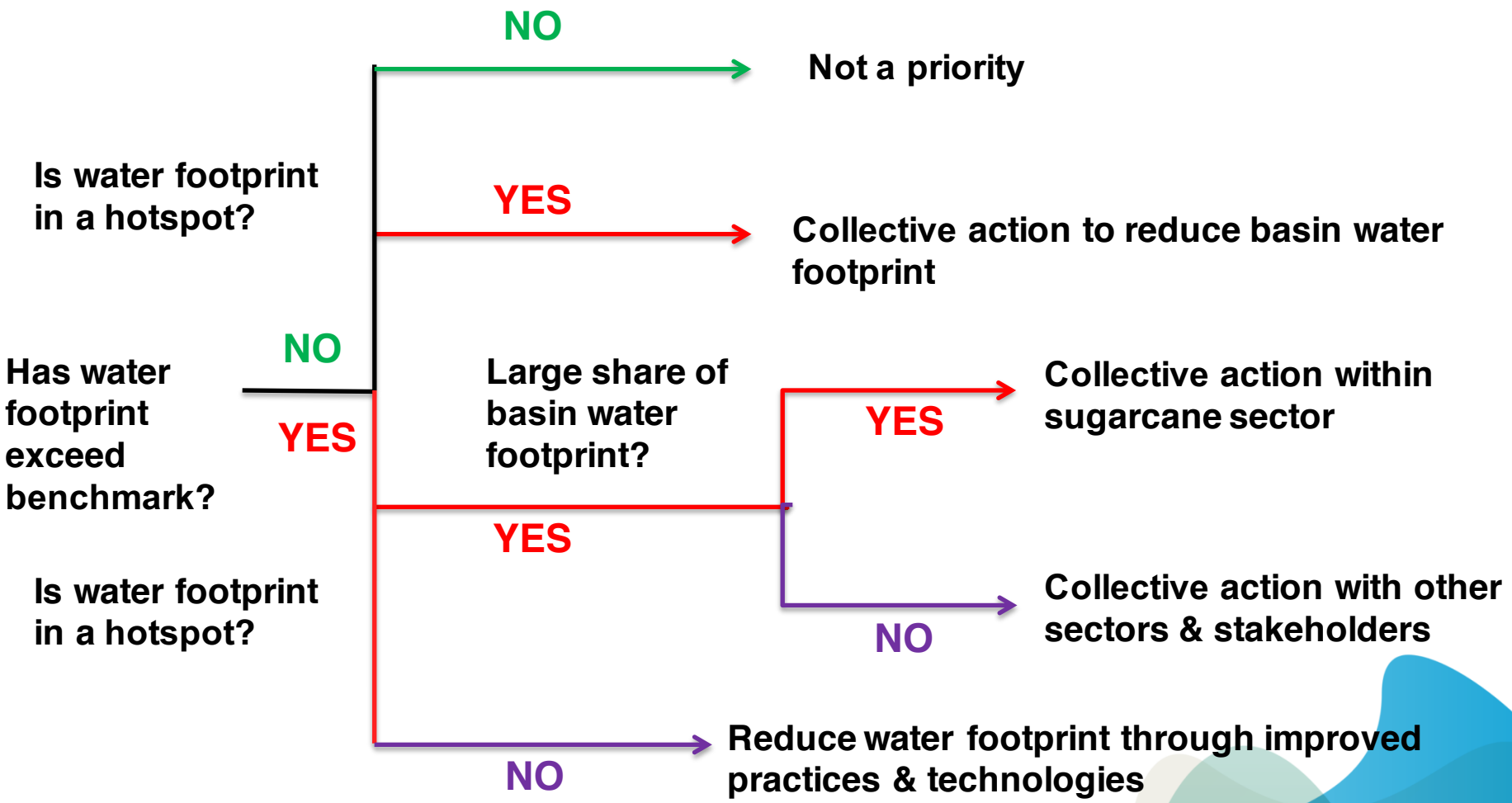
Strategic response formulation in priority river basins

Response formulation is guided by sustainability assessment



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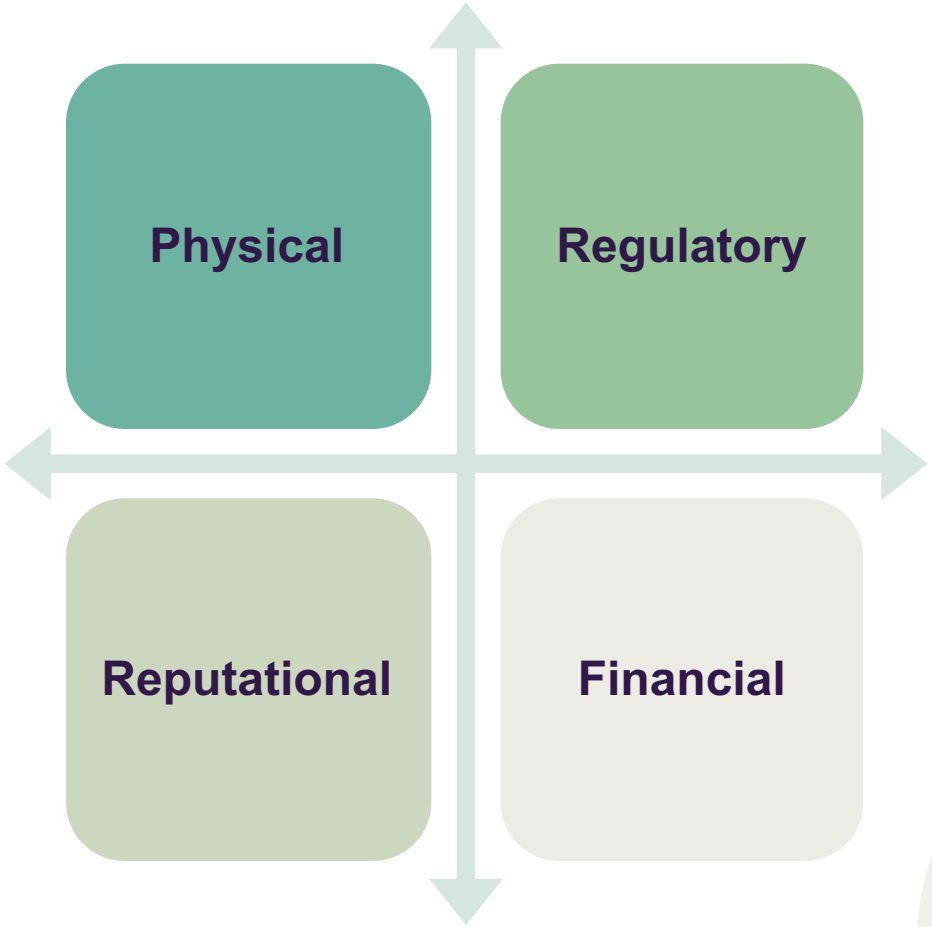
WHY? To address water-related business risk

Assessing and mitigating the water footprint of a business is a way to reduce risk



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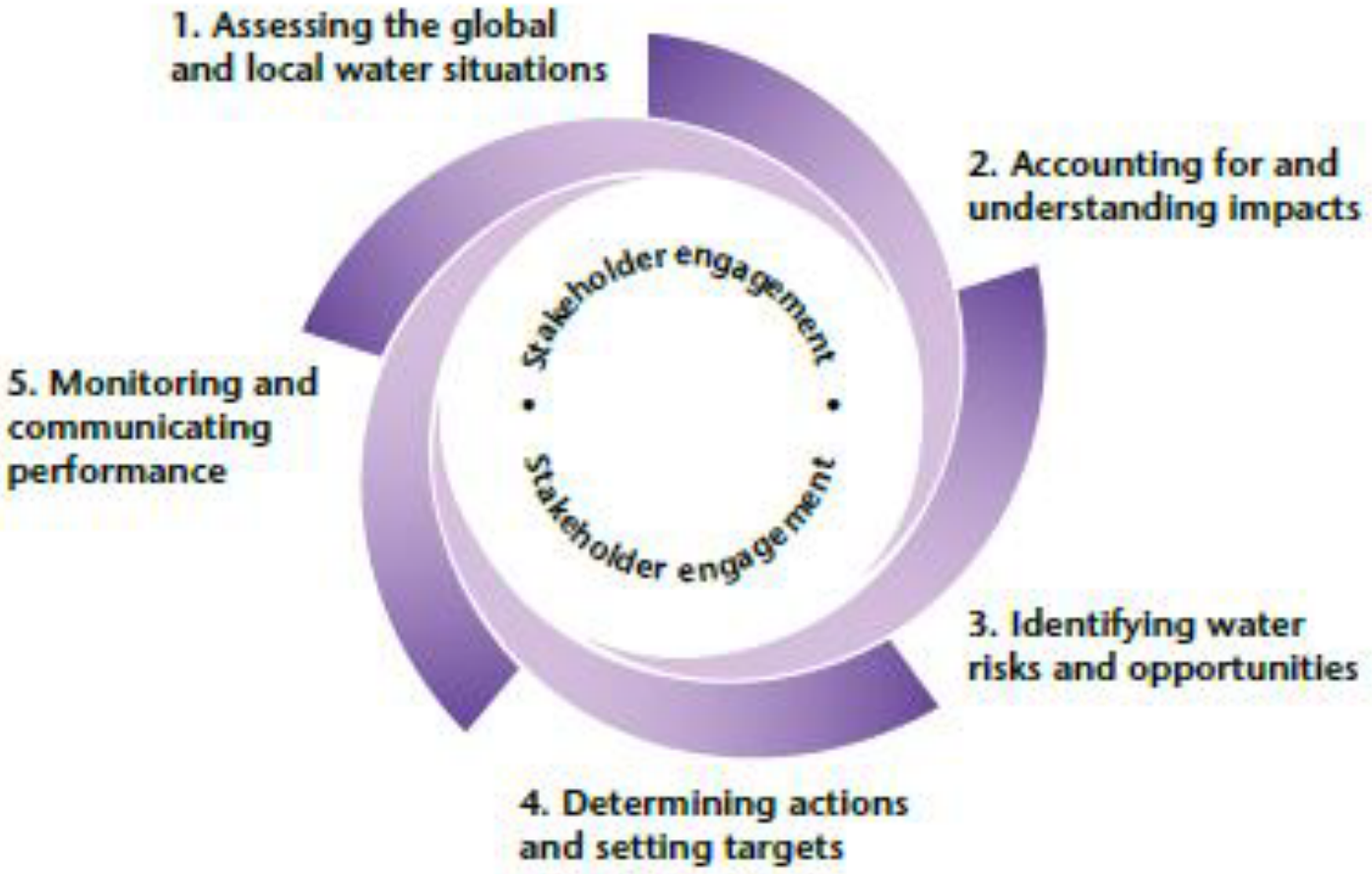
WHY? To support corporate sustainability strategy

General framework to address water risks & sustainability



(WBSCSD)

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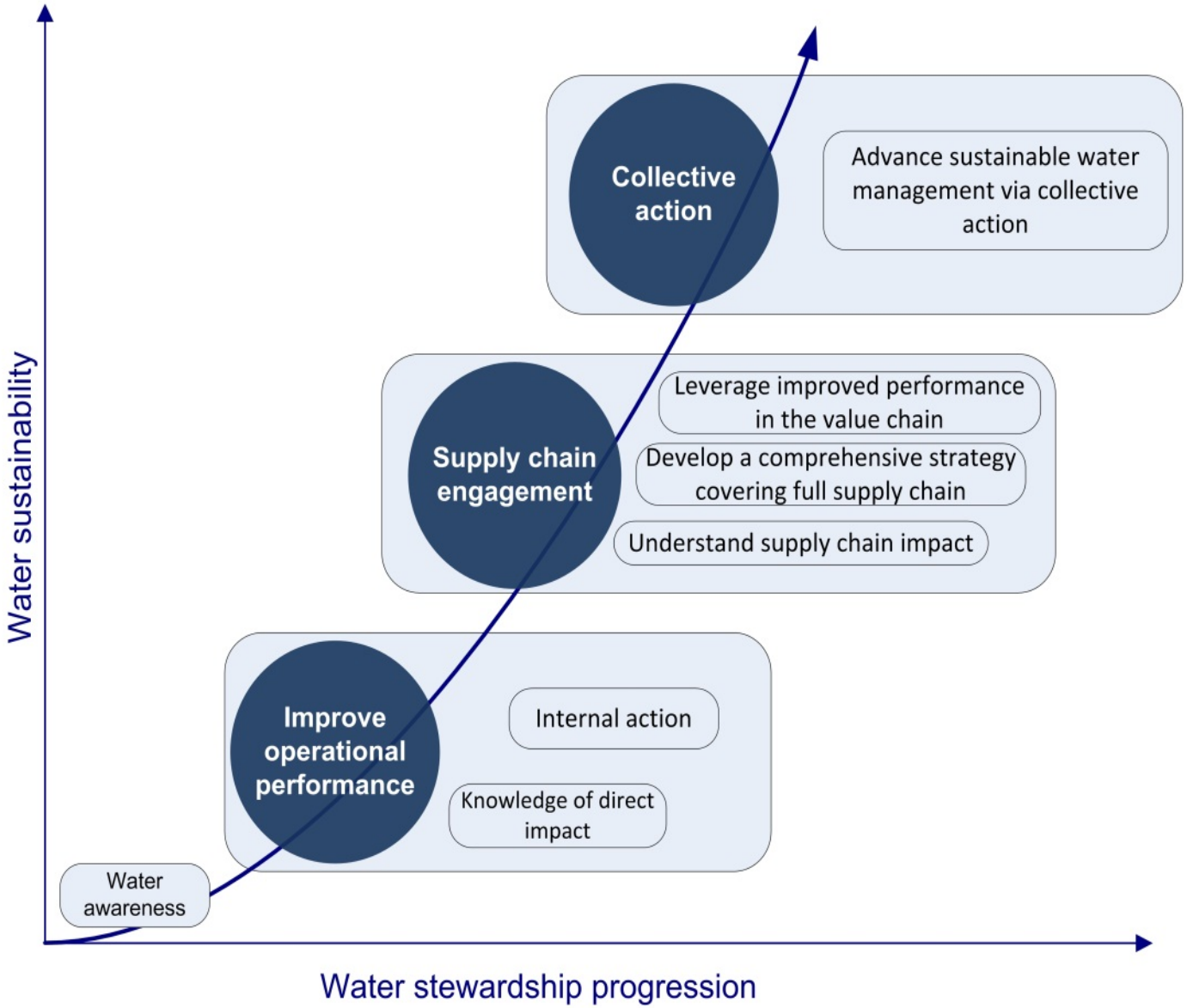
Developing a Corporate Sustainability Strategy



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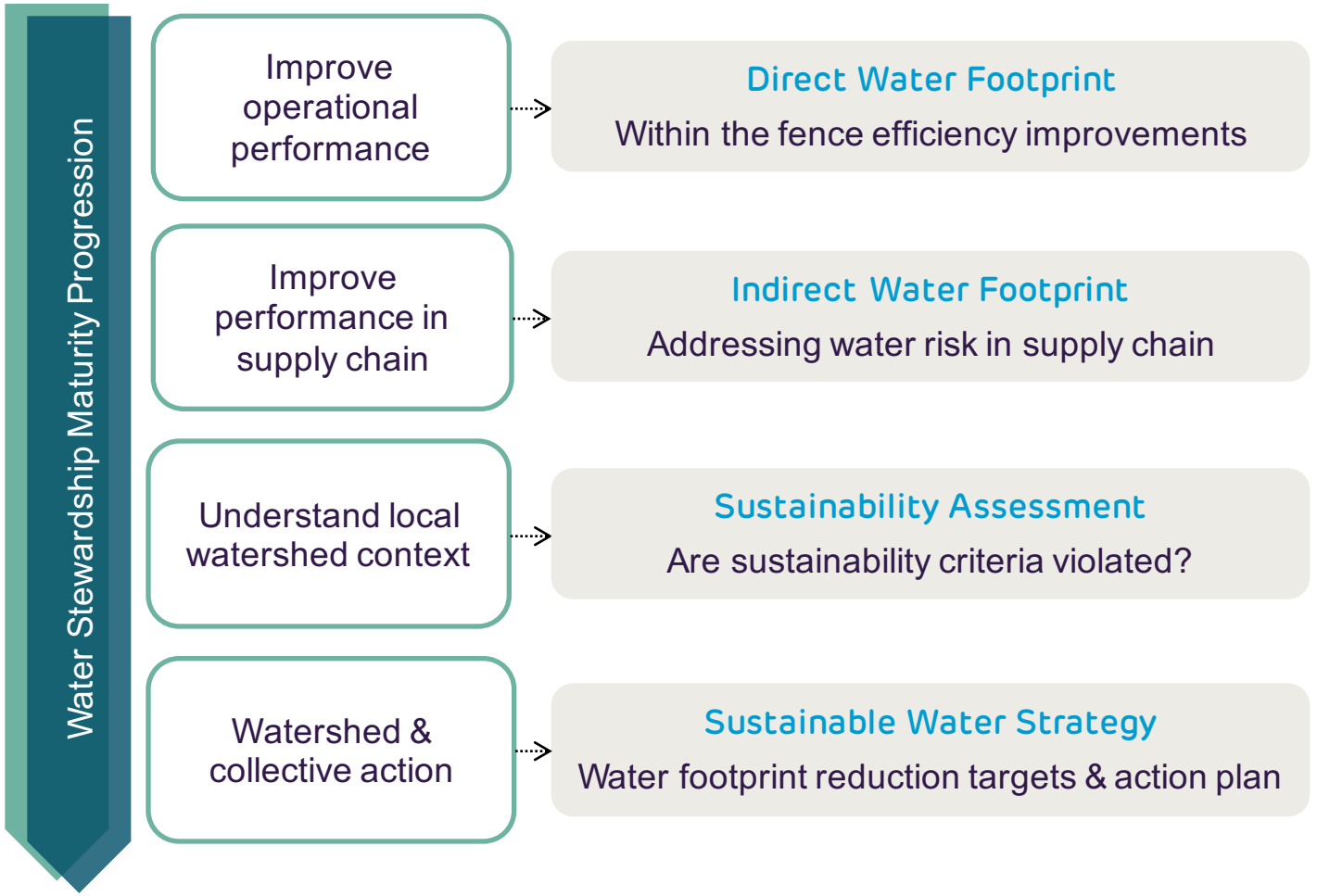
Water Footprint Assessment – Water Stewardship Progression



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Water Footprint Assessment: Conclusions

Water Footprint Assessment is a simple & elegant concept which enables us to:

- Understand the *geographic allocation of water resources* for industry, agriculture & domestic water supply
- Evaluate the *efficiency of water use*: consumption & pollution
- Determine the *sustainability of water use*: e.g. water scarcity & water pollution levels; social & economic issues
- Identify the most *strategic actions* to improve the sustainability, efficiency & equitability of water use

[Hoekstra et al., 2011]

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Water footprint: What's new for business?

- From operations to supply-chain thinking.
- Shifting focus from water withdrawals to consumptive water use.
- From securing the 'right to abstract & emit' to assessing the full range of economic, social & environmental impacts of water use in space and time.
- From meeting emission standards to managing grey water footprint.

[Hoekstra et al., 2011]

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The Water Footprint Network

WWF®

UNESCO-IHE Institute for Water Education

wbcsd

water neutral

University of Twente Enschede - The Netherlands

IFC International Finance Corporation World Bank Group

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Thank you!

info@waterfootprint.org

www.waterfootprint.org