Master Training Program on Water (Water Supply, In-house Processing, End-of-Pipe) in Textile and Garment factories

Promotion of Sustainability in the Textile and Garment Industry in Asia - FABRIC

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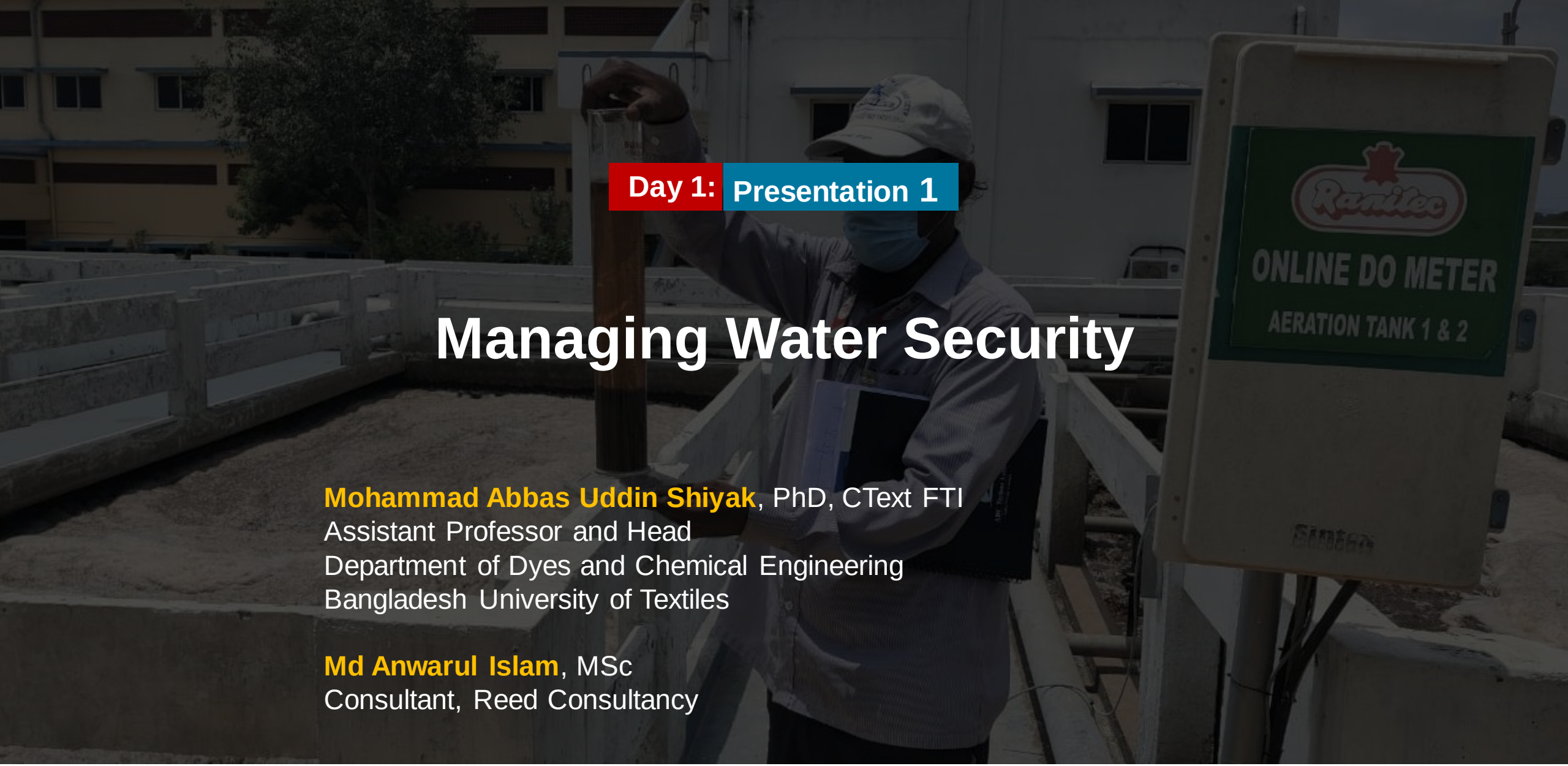
FABRIC Asia



Day 1: **Presentation 1**

Managing Water Security

Mohammad Abbas Uddin Shiyak, PhD, CText FTI
Assistant Professor and Head
Department of Dyes and Chemical Engineering
Bangladesh University of Textiles

Md Anwarul Islam, MSc
Consultant, Reed Consultancy

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Learning Outcomes

At the end of this module you will be able to

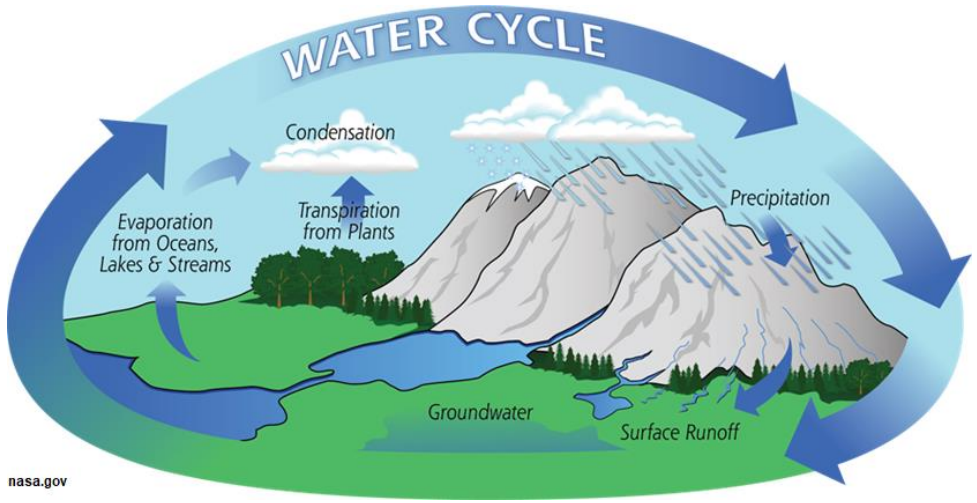
- Relate to water security challenges in the textile business supply chain
- Assess the risks to water security of your business
- Identify water security risk mitigation actions
- Refer to possible responses of businesses and governments at local and global level.

Resources

- GIZ Water Resources Security (WRS) Framework
- CEOWaterMandate
- Water Resource Group 2030

Water security

Introduction



Total amount of water in the water cycle on Earth always remaining constant. The challenge is the access to water as a resource.

- Water stress and security issues arising when
  - ✓ demand for water exceeding available amount during certain periods of the year; or
  - ✓ poor quality restricting water usage at certain location
- Major reasons for our water crisis on Earth:
  - ✓ Climate change
  - ✓ Water pollution
  - ✓ Population growth
- Apart from talking about water stress and water scarcity, we will also at the ways to analyze these.

Water in the Headlines

13 August 2022, The Guardian UK

Drought declared across eight areas of England

Expert group declares official drought amid prolonged dry spell, meaning water rationing may take place

● Live / Extreme heat warning in place for England and Wales as 500% increase in wildfires reported

Dorset and Wiltshire fire service says it has seen a 'massive' rise in wildfires compared to last year

Dorset Blaze probably caused by disposable barbecue – firefighters

UK drought Easy ways to save water

Water in the Headlines

Shrunken Aral Sea
Once the fourth largest lake of freshwater in the world, now only10% of its original area as source water rivers have been diverted for cotton crops in central Asia

Zero Day Water Crisis of 2018 in Cape Town
Three consecutive years of dry winters

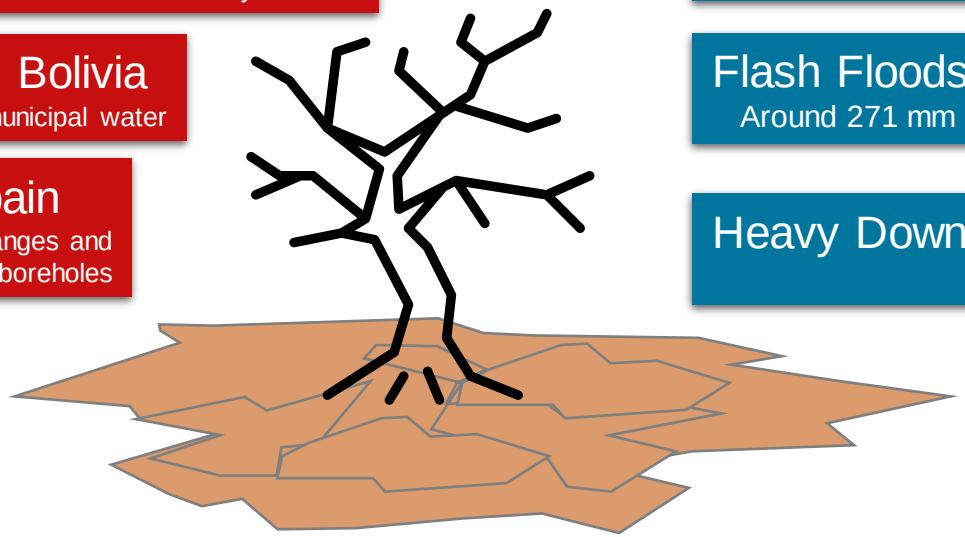
Water Crisis of 2019 in Chennai, India
Two years of deficient monsoon rainfall

Millennium Drought in Southeast Australia 1997-2009
Dry seasons

Water War of 2000 in Cochabamba, Bolivia
Privatization of municipal water

Water Crisis of Winter of 2022 in Spain
Poor rainfall due to climate changes and around a million illegal boreholes

Ongoing Water Crisis in Lebanon
70% of the people facing critical water shortages



Floods of 2010 in Pakistan
Over 20% of the land area of Pakistan affected

Flash Floods of 2021 in Europe
Around 271 mm for over a period of 48 hours

Heavy Downpour of 2021 in Henan, China
201 mm in one hour

Water stress

Concept and contributing factors

- Water-stressed region when 25% or more water withdrawn from its renewable freshwater resources
- Humans successful in harnessing natural water resources through a number of interventions
- building dams, wells, and irrigation channels/systems
- drilling boreholes.

Contributing factors

- Climate change
  - ✓ Climate change declared as the most serious threat for our near future.

- Water pollution
  - ✓ 80% of wastewater is released to the environment untreated.

- Global population growth

- Unsustainable energy production
- Unsustainable industrial practices
  - ✓ 12% of globally available water is consumed by industry.

- Less productive agriculture practices
  - ✓ 72% of all water withdrawals are used by agriculture

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Water scarcity

Concept

- A lack of sufficiently available water resources to meet demands of water usage of a region when surface and groundwater resources already overused.
- According to UN, by 2025, 1.8b people living in countries or regions suffering from absolute water scarcity.
- Two **types of water scarcity**
  - ✓ Physical scarcity
  - ✓ Economic scarcity
- Various ways to **analyze degree of water scarcity**
  - ✓ Not always dry areas subjected to water scarcity
  - ✓ Water scarcity including regions in which water withdrawals amounts to more than 75% of renewable freshwater available

Aral Sea formerly the fourth largest freshwater lake on earth

Water scarcity

Types

Physical scarcity

- Almost one-fifth of world's population living in areas of physical water scarcity; moreover, 500m people rapidly approaching such situation
- Aid receiving regions mostly associated with physical scarcity
- Determination of water scarcity based on man-made conditions as a function of volume of human water consumption relative to volume of water resources in given area.

Economic scarcity

- Regions with withdrawal of water to less than 25% of area's water availability
- When infrastructure or a lack of human, institutional or financial capacity inadequate to provide the required amount of water to users
- When water available but of such poor quality water and high treatment costs for making water useable limiting amount of water available to consumers.
  - ✓ For example in coastal areas, sea or ocean water:
    - Usage limited because of salt content in available water as such
    - Freshwater turning brackish due to saltwater intrusion into groundwater of costal areas

Water Supply and Demand

Emerging scenario

Access to safe water is essential for life and considered a basic human right regardless of ability to pay.

(Resolution 64/292 of the UN General Assembly)

What we will have to deal with:

- Global water withdrawals more than doubled since 1960s due to growing demand and no signs of slowing down.
  - ✓ Annual increase in global water demand amounting to around 2% per year in period 2005-2030 (McKinsey study)
- Demand for water exceeding supply by 40% in 2030
- Half of world facing severe water-stress conditions unless water usage decoupled from economic growth.

Water Supply and Demand

Supply side issues and opportunities

Issues

1. **Water quality declining** due to anthropogenic activities resulting in increased treatment costs for businesses
2. **Groundwater resources depleting** (physical scarcity) due to overuse resulting in increased costs for maintaining sustainable supply
3. Dwindling water resource contributing to rapidly **decreasing biodiversity** with increasing number of species coming close to extinction
4. Minimum environmental flows disturbed
5. Climate change effects in form of **droughts and floods** further complicating supply side of available water

Opportunities

1. Water supply augmentation
2. Replenishment initiatives
3. Source-water protection plans
4. Rainwater harvesting
5. Storm/Flood water harnessing
6. Desalination technologies

Water Supply and Demand

Demand side issues and opportunities

Issues

1. Population growth
2. Per-capita increase of consumption of resources and services
3. Inefficient usage of water by consumers (overexploitation)
4. Difficulties regarding access to water (financial scarcity) leading to conflicts
5. Coupling of economic growth and industrialization with water consumption
6. Untreated wastewater
7. Urbanization

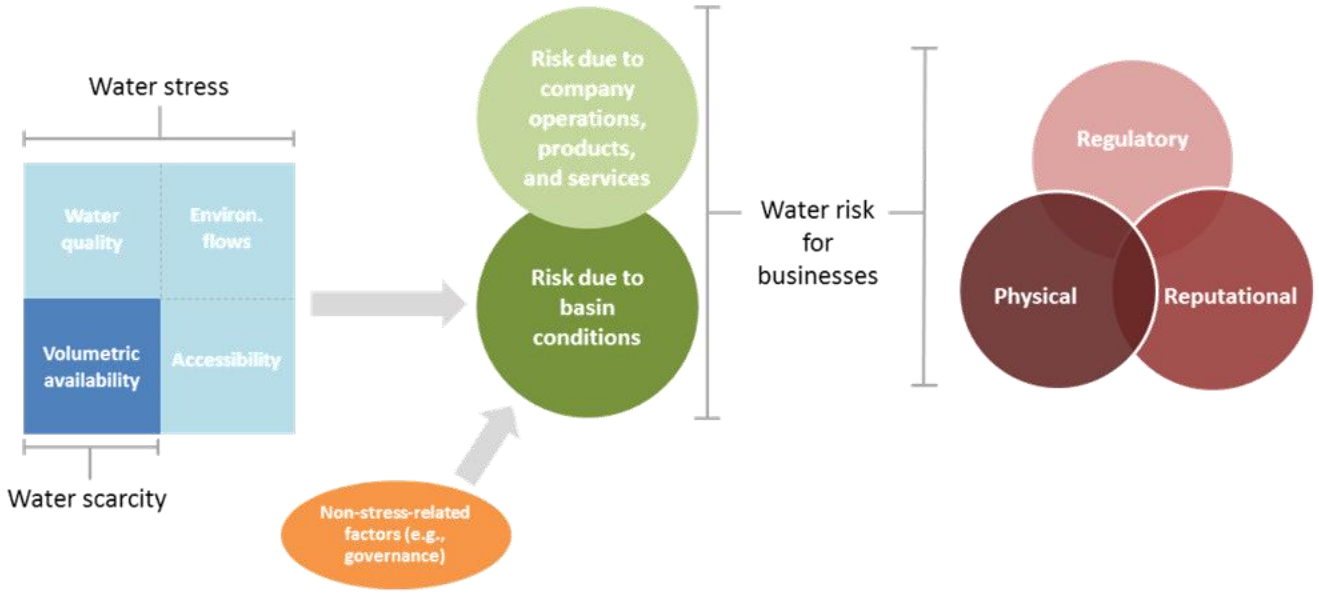
Opportunities

1. Employment of water efficient practices
2. Integrated approach to deal with water resources (IWRM) leading to policy measures and regulations
3. Water reuse and recycling to reduce mankind's overall footprint
4. Engineering and technology innovations for water…(?)
5. Nature-based solutions

Water supply and demand

Water risks at business level

- Probability of harmful water-related event.
- Perception of water risks differing by specific stakeholder
- Shared and simultaneous for various sectors simultaneously
- Several dimensions of water risk for businesses
  - ✓ Physical risks
  - ✓ Regulatory risks
  - ✓ Reputational risks



As per business reporting to CDP:

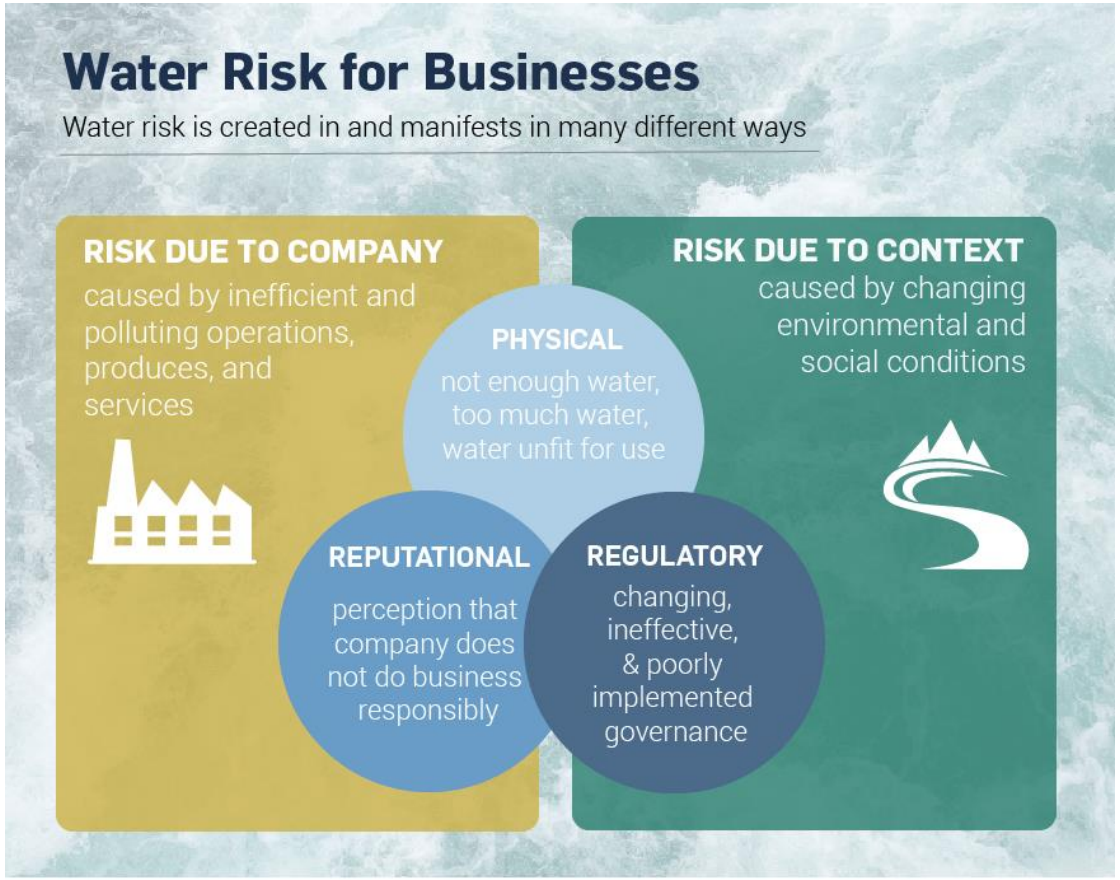
- 79% physical risks
- 15% regulatory risks
- 6% reputational risks

Water supply and demand

Water risks at business level

Textile businesses

- affected by water risks due to
  - ✓ own inefficient practices and procedures
  - ✓ other situations in area over outside their control.
- Major contributors to water risks for other stakeholders (communities, agriculture, and environment) through
  - ✓ excessive use of local water resources
  - ✓ discharge of untreated wastewater resulting in contamination of water table in affected area

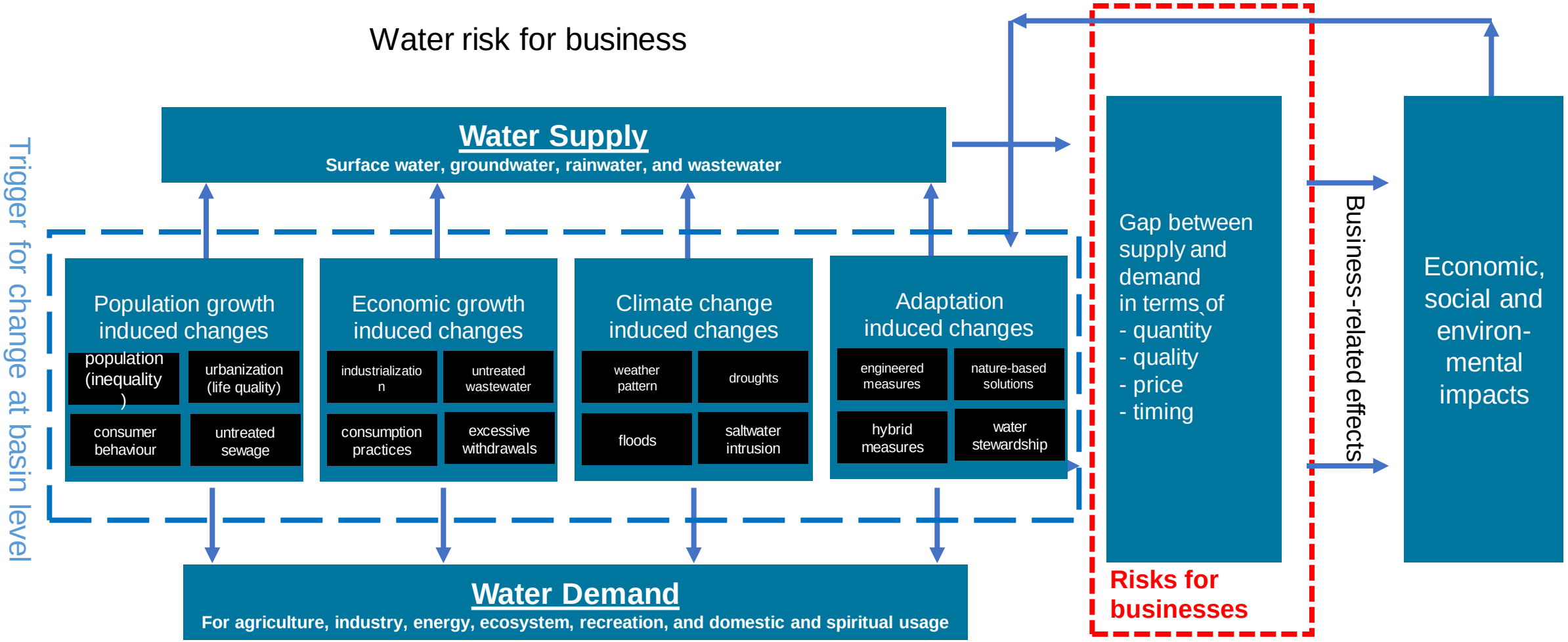


Water supply and demand

Water risks at business level

- Whether businesses are highly efficient in their employment of water or their water withdrawals are harmful for a water-stressed region and the rules and allocations there are not properly managed, businesses will nevertheless face water risks that can affect long-term profitability.
- **Water-related monetary losses** (as reported by companies to CPD):
  - ✓ 2018: $38b
  - ✓ 2019: Water issues estimated at around $425b of value chain in around 500 companies
- In 2021, 118 International businesses made it onto the CDP Water Security A List.

Water supply and demand



Water supply and demand

Textile industry and impact of water abstractions

- Most textile factories relying on groundwater extraction, using pumping with or without pre-treatment
- Around 40% of apparel sector organizations covered in CDP water analysis report of 2020 withdrawing in water stressed areas
- Groundwater resources built up through slow water infiltration in basin; as this slow process, groundwater cannot be replenished as easily as surface water. As groundwater needs to be pumped out of the ground from well below the surface, this requires energy input incurring additional expenses.

Example 1: Greater Dhaka region, Bangladesh

- Primary location of country´s textile industry with very high geographical concentration of factories, to a large extent in urban and semi-urban areas
- 79% of water requirements abstracted from groundwater and 21% from surface water
- Groundwater level dropping by 40m between 1996 and 2009
- Certain clusters expected to run out of groundwater as early as 2025

Water supply and demand

Textile industry and impact of water abstractions

- Most textile factories relying on groundwater extraction, using pumping with or without pre-treatment
- Around 40% of apparel sector organizations covered in CDP water analysis report of 2020 withdrawing in water stressed areas

Example 2: Karachi region, Pakistan

- Another major location of country`s textile industry
- Industry mainly relying on surface water because local groundwater brackish due to saltwater intrusion from Arabian Sea
- Most textile factories obtaining water supplied by water tankers at great expense, consequently, leading to widespread efforts in improving efficiency, recycling and reuse of water
- Critical issue of depriving areas surrounding Karachi

Water stress and scarcity

Indicators

Falkenmark indicator (FI) or **water stress indicator**

Water stress indicator	Countries with per capita water in m3
Water abundance	> 4000
Water sufficiency	1,700 - 4,000
Water stress	< 1700
Water scarcity	< 1000
Absolute/Extreme water scarcity	< 500

Water Resource Vulnerability Index (WRVI) relating national water availability/supply compared to total annual withdrawals (in %)

Water resource vulnerability index (WRVI)	Withdrawal amount
Water scarce	20-40% of water availability/supply country
Severely water scarce.	> 40% of water availability/supply

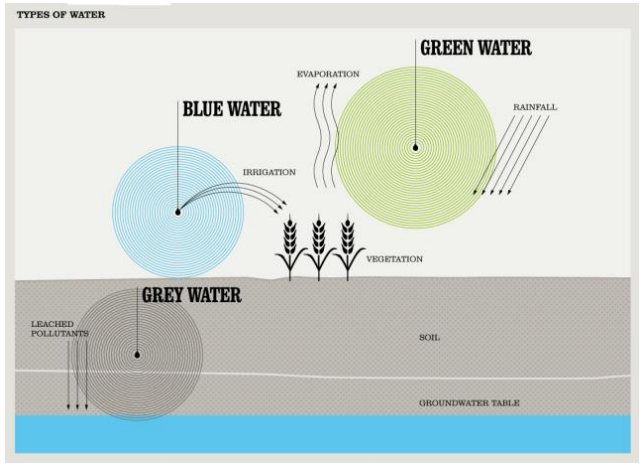
Physical and economic **water scarcity indicator** of International Water Management Institute (IWMI)

Water Poverty Index (based on the following five components)

- Access to water
- Water quantity, quality and variability
- Water usage for domestic, food and productive purposes
- Capacity for water management
- Environmental aspects

Managing water security

Mapping your water supplies



Common types of water supplies for textile facilities:

- **Blue water** (water stocks)
  - Surface water (including water from wetlands, rivers, lakes, and oceans)
  - Groundwater
  - Municipal water supplies or other public or private water utilities
- **Green water** (flux in natural ecosystems)
  - Stored rainwater (collected directly and stored by the organization)
- **Grey water** (freshwater needed to dilute and flush anthropogenic pollutants)
  - Water previously employed for industrial or domestic purposes without faecal contamination:
    - Wastewater recycled back into same process or to higher use of recycled water in process cycle
    - Wastewater recycled/re-used in a different process, but within same facility
    - Wastewater re-used at another facility

Managing water security

Mapping your water supplies

Taking a closer look at your blue water supplies

- **Groundwater**
  - ✓ Primary source of freshwater for textile industry found in aquifers, i.e., water contained in layers of rock, sand or gravel
  - ✓ Wells drilled to locations extending below the water table for extraction, usually based on resistivity surveys and after test hole drilling
    - **Perched aquifer well** (seasonal, drying up during the dry season, no sustainable source of water supply)
    - **Unconfined aquifer well (**water level corresponding to water table level of region; usually found along river basin, possible sustainable water supply in catchment area)
    - **Confined aquifer well** (water level above water table level since located in pressurized aquifer, usually in hilly or confined areas)
- Slowly replenished through rain and surface water percolating into aquifer

Managing water security

Mapping your water supplies

Taking a closer look at your blue water supplies

- **Surface water**
  - Renewable source of water primarily employed for irrigation in area of agriculture.
  - Some industries (e.g. major power plants) with very high cooling-water requirements intentionally located near surface water supplies and channels in order to exploit the availability of a high quantum of water with associated lower costs
  - Preferable to switch to surface water resources since rapidly replenished compared to groundwater

Responding Globally

17th June

World Day to Combat Desertification and Drought is a United Nations observance celebrated each year.

SDG Target	Objective	Monitoring Indicators
6.1	By 2030, achieve universal and equitable access to safe and affordable drinking water for all.	Proportion of the population using ***safely managed drinking water services***
6.2	By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.	Proportion of the population using ***safely managed sanitation services***, including a hand-washing facility with soap and water
6.3	By 2030, globally ***improve water quality by reducing pollution***, ***eliminating dumping*** and ***minimizing release of hazardous chemicals and materials***, ***halving the proportion of untreated wastewater*** and substantially ***increasing recycling and safe reuse***.	Proportion of ***wastewater safely treated*** Proportion of water bodies with good ambient ***water quality***
6.4	By 2030, ***substantially increase water-use efficiency*** across all sectors and ***ensure sustainable withdrawals*** and the supply of freshwater to address ***water scarcity*** and substantially ***reduce the number of people suffering from water scarcity***.	Change in ***water-use efficiency*** over time ***Level of water stress***: Freshwater withdrawal as a proportion of available freshwater resources

Source: Open Working Group on Sustainable Development Goals and UN-Water.

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Managing water security

Responding to water risks - Examples

All global textile brands and retailers very stringent on wastewater discharge quality in their supply chain, demanding treatment of all wastewater before discharging into the environment.

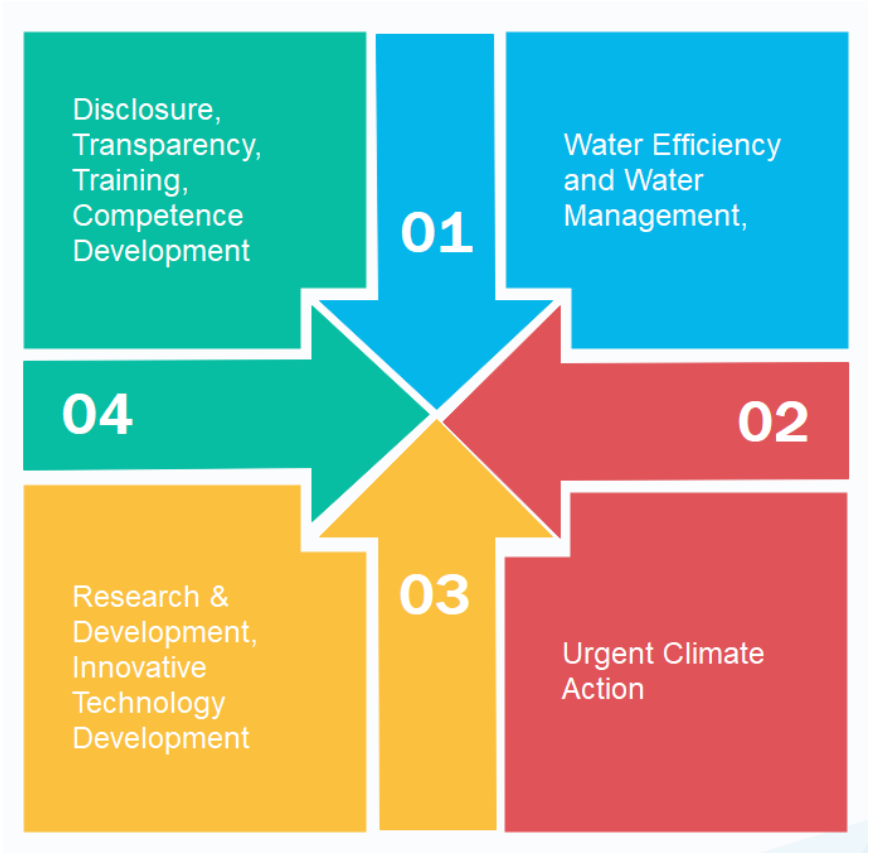
- Levi Strauss & Co committed to reducing water consumption in supplier manufacturing facilities located in high water-stressed areas by 50% against baseline of 2018.
- Textile brands encouraging water stewardship measures by their suppliers; for example, PVH working to improve water situation at five of most water-stressed basins where their suppliers being located.
- H&M Water Roadmap (2018 - 22) focusing on reducing water usage at supplier production facilities **by 25%**; supplier expected to employ rainwater instead of groundwater in 50% and up to 15% of recycled water at production facility.
- C&A setting target for their suppliers to reduce water consumption in production by **30%** against baseline of 2016
- Inditex supporting their suppliers through Water Action Plan to reduce impact of water across supply chain by **25%** by 2025.
- adidas Group targeting **40% water intensity reduction** at Tier 2 supplier facilities against baseline of 2017

Managing water security

Responding to water risks

Tackling water scarcity requires an urgent, holistic, comprehensive and collaborative response.

- Specific action on enhancing water efficiency and water management on and off the premises of factories
- Development and implementation of supportive programs and systems
- Targeted research & development on addressing supply and demand side challenges
- Overall measures for addressing climate challenges to prevent further deterioration of prevalent and emerging water risks



Success Stories

- **South Africa**
- South Africa avoided the implementation of the already planned *Cape Town Day Zero* measures through aggressive water conservation and efficiency campaigns as well through a timely subsequent period of rainfall.
- Cape Town successfully reduced its water consumption by more than half in three years, from 1.2b liters/day in February 2015 to 0.516b liters/day in 2018.
- **Australia**
- From 2001 to 2009 Australia reduced its water consumption by 40% while the economy grew by 30%.
- After the millennium drought of Australia in the first decade of this century, Melbourne like Cape Town accomplished the feat of reducing its water consumption significantly.

Image credit: www.hwmglobal.com

Key takeways

(1) Managing water security involves safeguarding the sustainable availability of, access to, and safe use of an adequate, reliable and resilient quantity and quality of water for health, livelihoods, ecosystems and productive economies.

(2) Water risks are related to factors on both the supply side and demand side of water. However, gaining a good understanding of these factors provides opportunities to address these risks.

(3) For assessing the water risks in your business and supply chain, readily available indicators can help you to assess water stress and water scarcity at the locations of your textile business.

(4) Since several types of water risks lie outside the direct control of businesses, collective action together with other water stakeholders is required to address long-term water risks.

(5) In this context, it is crucial to recognize that businesses are at risk due to the challenges of securing sufficient supplies of clean, affordable water; however, they themselves contribute to the water risk through their discharging significant amounts of contaminated wastewater without proper treatment back into the environment.

References

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Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn

Friedrich-Ebert-Allee 32 + 36
53113 Bonn, Germany
T +49 228 44 60 - 0
F +49 228 44 60 - 17 66

Dag-Hammarskjöld-Weg 1 - 5
65760 Eschborn, Germany
T +49 61 96 79 - 0
F +49 61 96 79 - 11 15

E info@giz.de
I www.giz.de

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH