

A black and white photograph of several water droplets of varying sizes resting on a textured, possibly woven fabric surface. The droplets are in sharp focus, reflecting light and showing the intricate details of the fabric's weave. The background is a soft-focus bokeh of the same fabric texture. The image is overlaid with a teal triangle on the left and a blue triangle on the right.

# **SWEDEN TEXTILE WATER INITIATIVE**

A global sustainability initiative

6 February 2020

**Water –  
Fashion Victim of the Textile Industry**

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## Agenda

1. Who is Stockholm Textile Water Initiative?
2. STWI Program Cycle
3. STWI Results
4. Textile Industry's Pressures on Water Resources
5. Textiles Manufacturing Process
6. Q&A

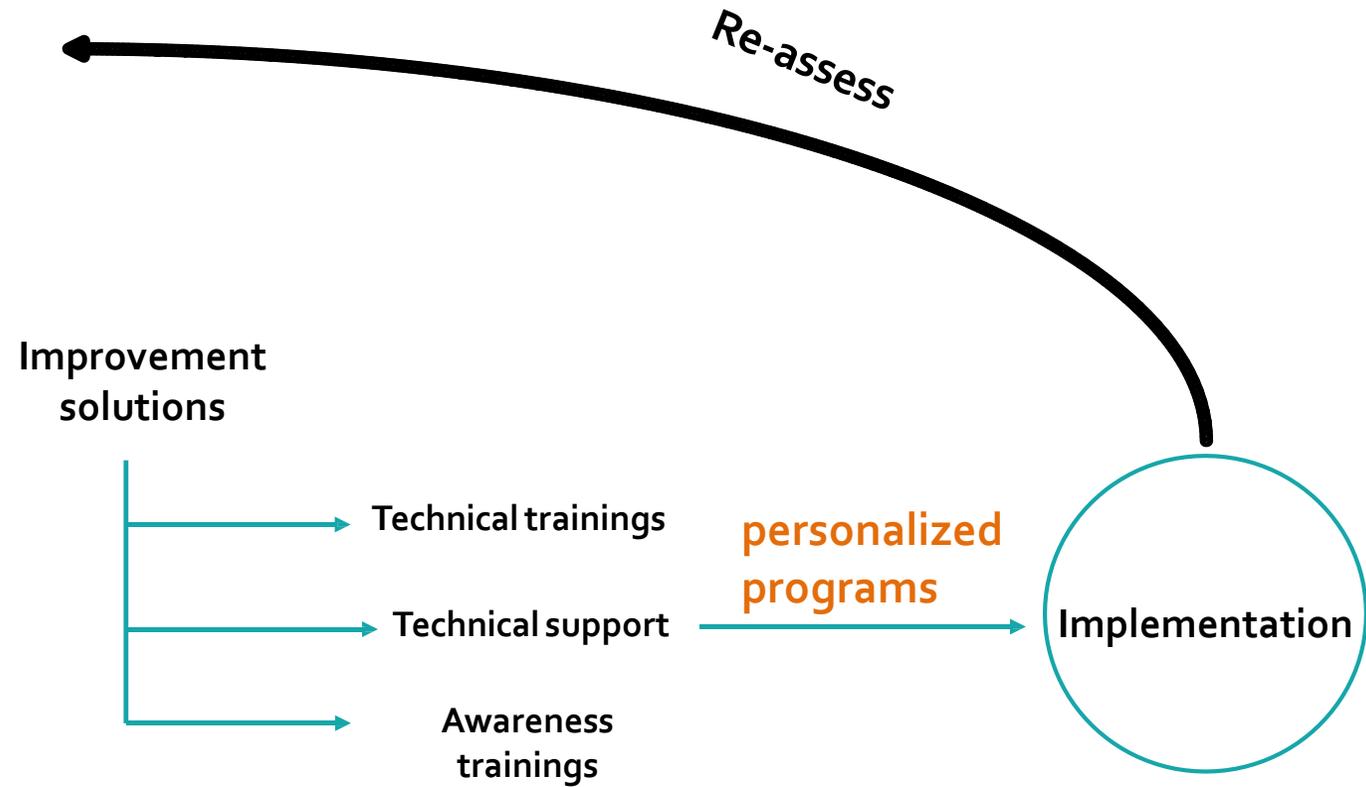
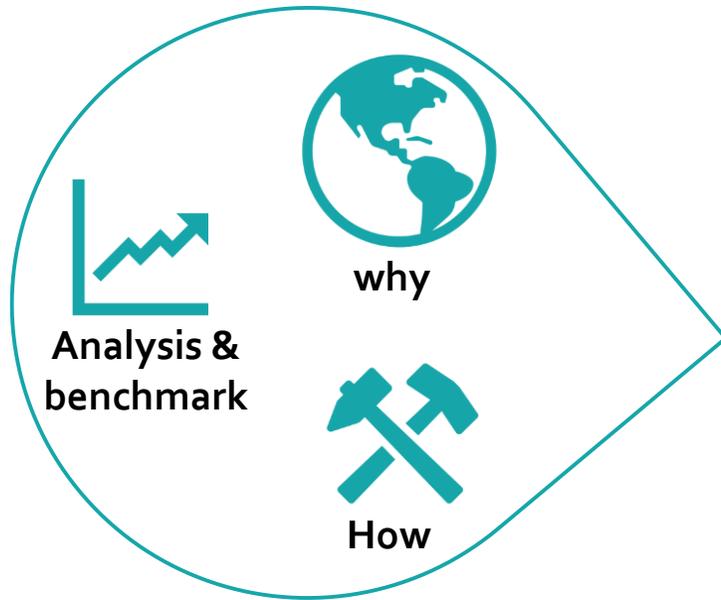


## Who is STWI?

- The **Sweden Textile Water Initiative** (STWI) housed by the **Stockholm International Water Institute**, a capacity building program towards improving the environmental performance of suppliers to private companies of the textiles industry.
- Focus on improving efficient use of **water, energy** and **chemicals**.
- Geographically in the **main production hubs** of textiles and apparel. This year the program is implemented in China, India, Bangladesh.
- STWI program is intended to **build capacities in the supply chain**.

**SWEDEN  
TEXTILE  
WATER  
INITIATIVE**





## Textiles industry pressures on water

- Textiles and apparel industry - a **thirsty business**.
- The industry is the **3<sup>rd</sup> largest user of water globally** (after oil and paper).
- It's estimated that the fashion industry currently uses around **1.5 trillion liters of water per year**.
- This is **2% of all freshwater extraction globally** and represents >1/10 of the water used by all types of industry.

1.5 trillion  
**liters of water**  
are used by the fashion industry  
**each year**

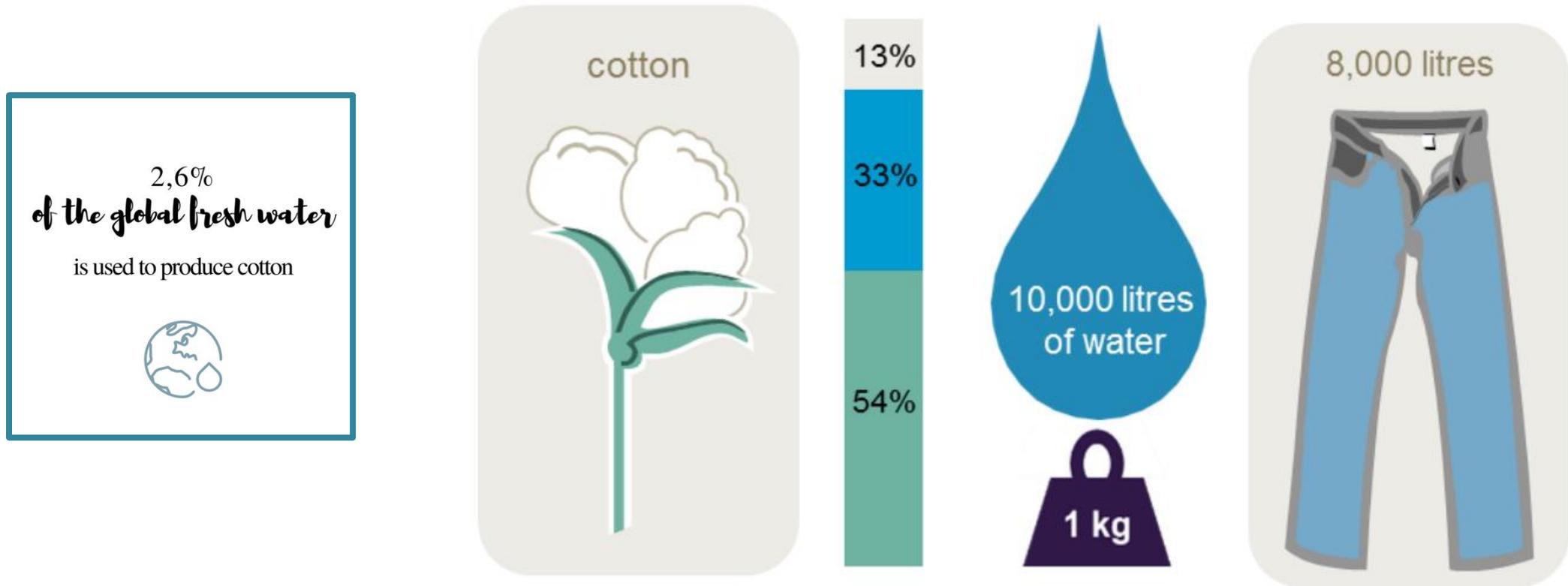


750 million  
**people in the world**  
DO NOT have access to  
drinking water



- The industry relies on water **throughout the production process** for textiles and garments.

For example, it takes on average **10,000 litres** of water to cultivate just **1 kilogram of raw cotton**.



Just to set these volumes in a more relatable context:

1 cotton shirt



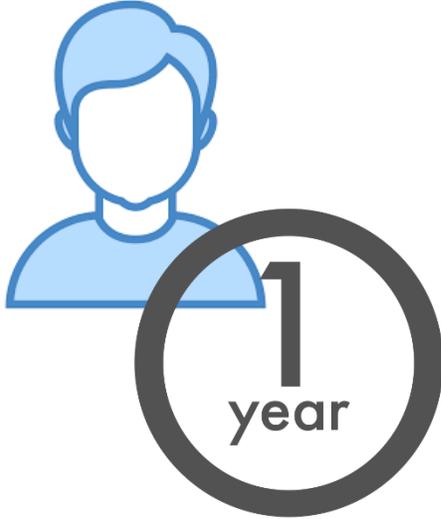
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12,680 glasses!!

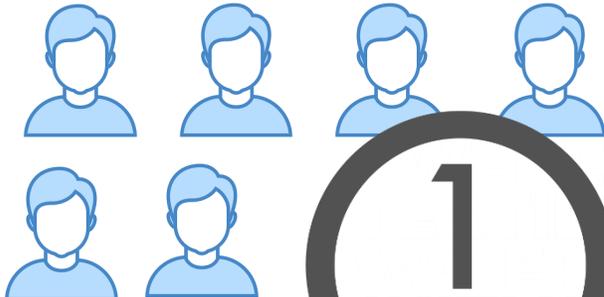


1 Textile Mill

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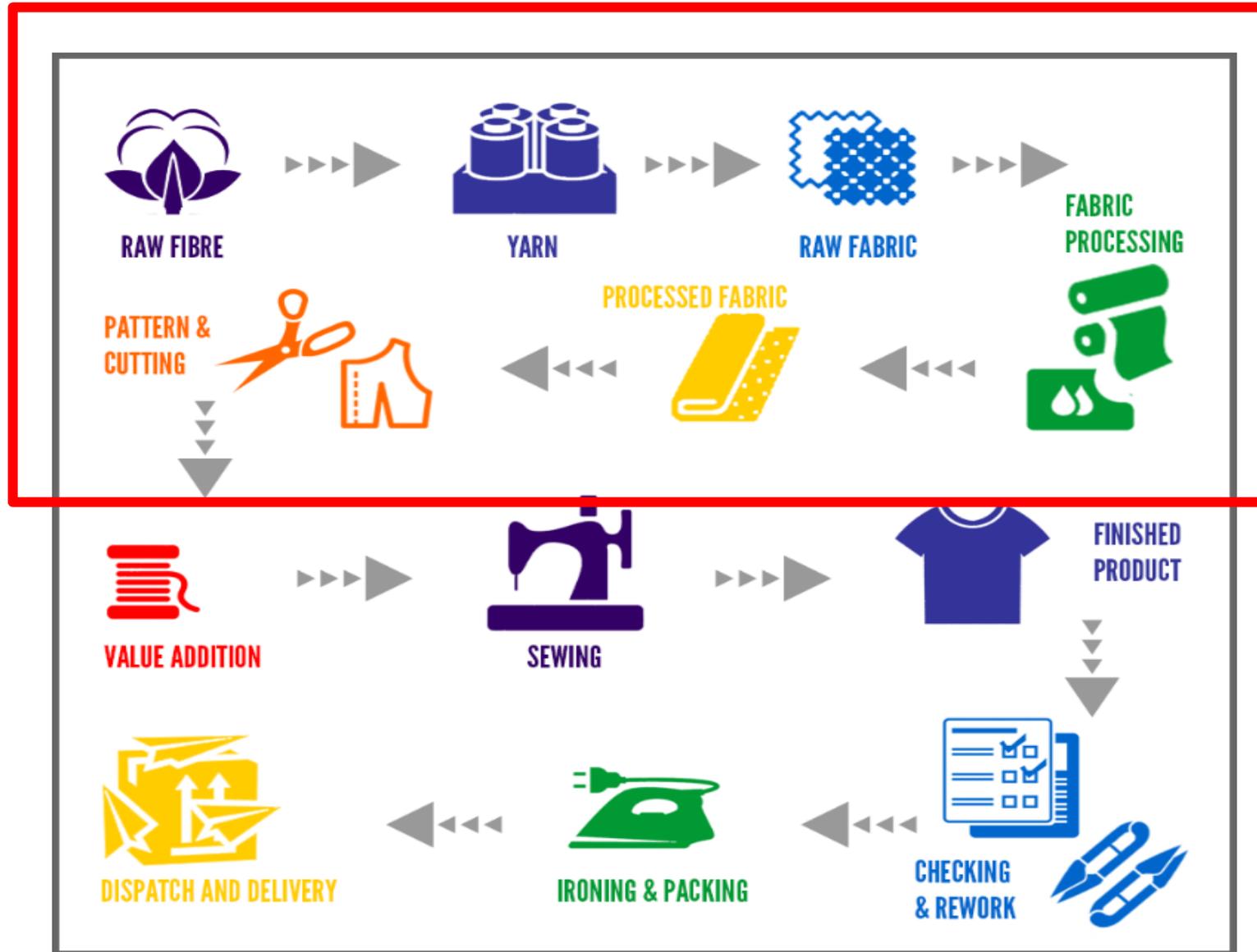
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5 000 a day

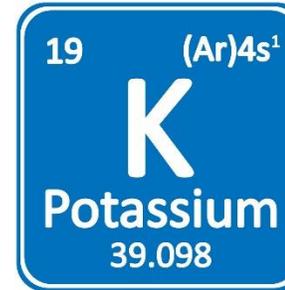
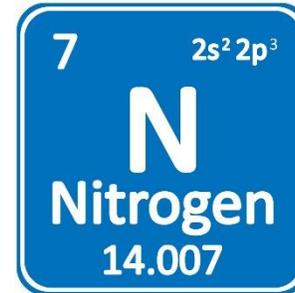
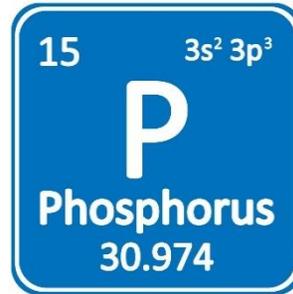
110 million

# Textiles manufacturing process





- Requires enormous amounts of **water**
- Requires enormous amounts of **fertilizers**

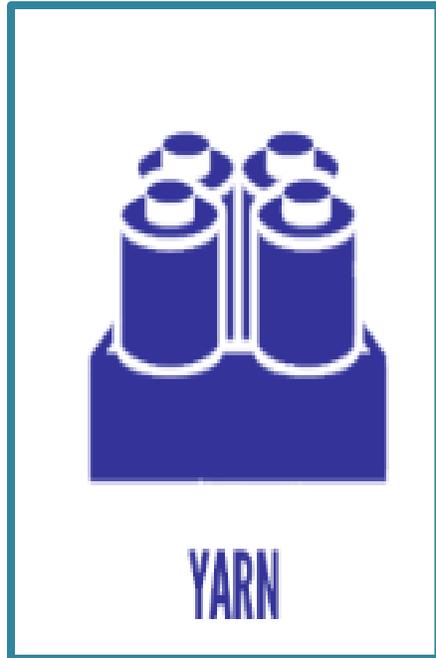


<https://www.pinterest.com/>

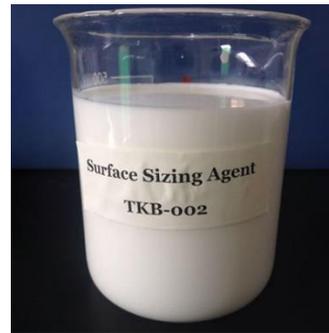
- Requires enormous amounts of pesticides (**pesticides** originally developed as toxic nerve agents during World War II)



<https://www.natracare.com/>



- Threads are prepared for weaving through a process called **sizing**, when yarns are **coated with chemicals** to reduce surface roughness.
- In this way sizing enables the weaving process and improves the processing behaviour of yarns.



<https://lansenchem.en.made-in-china.com>

- Sizing agents have to be removed from the fabrics by washing, which results in considerable pollution of effluents from textile finishing plants.

20% of industrial  
*water pollution*  
comes from  
*textiles treatment & dyes*



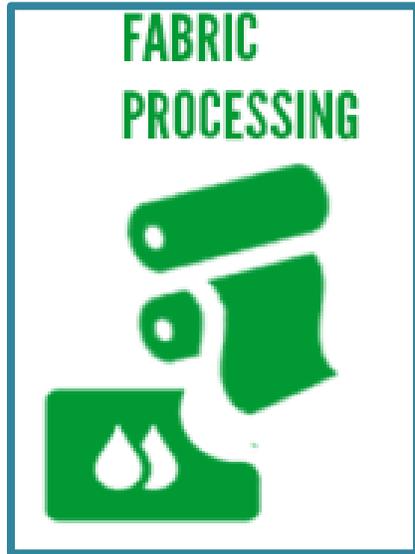
22,000 liters  
*of toxic waste*  
is dumped into rivers by  
tanneries in Bangladesh every  
day



200,000 tons  
*of dyes*  
are lost to effluents every year



<https://www.sustainyourstyle.org/>



- The **daily water consumption** of an average sized textile mill having a production of about 8000 kg of fabric per day is about **1.6 million liters**.
- 16% of this is consumed in dyeing and 8% in printing.
- Specific water consumption for dyeing varies from 30 - 50 liters/kg of cloth depending on the type of dye used. The overall water consumption of yarn dyeing is about 60 liters/kg of yarn.
- Dyeing section contributes to 15% - 20% of the total waste-water flow.



<https://eu.delawareonline.com/>





- Water is also required for **washing the dyed and printed fabric** and yarn to achieve washing fastness and bright backgrounds. Washing agents like caustic soda-based soaps; enzymes etc. are used for the purpose.

- Water color
- Mills of ca

Present  
composition  
and color  
Other l  
agents,



**Alkalis** to remove loose  
dyeing vessels.

**Highly toxic waste**, full  
of salts.

**Chromic acid, soaps, chromium  
d, cadmium, mercury, nickel,  
make the effluent highly toxic.  
Formaldehyde-based dye fixing  
bleaching chemicals.**

- The mill effluent is also often of a **high temperature** and **pH**, both of which are extremely damaging.

# Textiles manufacturing process

- The **colloidal matter** present along with colors and oily scum **increases the turbidity**.
- This interferes with **the Oxygen transfer mechanism at air water interface**.
- Effluent water flow in the fields results in **loss of soil productivity**.
- The wastewater that flows in the drains **corrodes the sewerage pipes**.
- Affects the **quality** of drinking water.
- Such polluted water can be a **breeding ground for bacteria and viruses**.



<https://www.revolvy.com/>



<https://www.chromres.com/blog/the-fundamentals-of-oxygen-scrubbing/>



<https://www.corrosionpedia.com/>



<https://pxhere.com/en/photo/961691>

# STWI Results



**11 million cubic meters** of total water savings  
= daily need for **220 million people**  
= annual need for **0.6 million people**



Electricity use reduced by **79 million kWh**  
Natural gas use reduced by **31 million cubic meters**  
Fossil fuel reduced by **705,309 tons**  
Green house gas emissions reduced by **464,766 tons**



Chemical use reduced by **24 million kgs**  
**2,083** projects completed during the program  
**100%** factories improved their Best Management Practices related to Environmental Management System



**5** Countries (Bangladesh, China, Ethiopia, India and Turkey)  
**276 factories**  
More than **13** brands with factories in the program  
**19** additional brands in STWI network  
Partnership with local stakeholders in these countries  
Partnership with SIDA



**37 454 workers trained** through awareness sessions in factories  
**1367 management executives** trained on energy and water efficiency, chemical management  
**412,283,545 SEK** invested by factory in **long-term projects**  
**325,109,944 SEK** saved by factories in **operational costs**  
Average **ROI** projects within **15-18 months**

**SWEDEN  
TEXTILE  
WATER  
INITIATIVE**

[www.stwi.se](http://www.stwi.se)



**SWEDEN  
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Thank you for your attention!

