Final Report

IRIS Fabrics Ltd.

Programme on Water Saving in the Textile and Garment Industries (WaSaTex)

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by:
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Reed Consultancy
Engineering Sustainability

Client	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH Dhaka, Bangladesh
Project no.	20.2121.0-001.00
Programme title	Water saving in textile and garment industries (WaSaTex)
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1 Executive Summary

IRIS Fabrics Ltd. is a cooperation partner of GIZ in implementing the 'WaSaTex' program under the SCAIP project. The company assigned seven participants to the online water-saving training, with 6 completing all modules and passing, resulting in an 86% completion rate. The company also received technical support from a GIZ-engaged contractor to identify hotspots through the development of eco-maps and corrective action plans. Additionally, the contractor provided ongoing technical support and ad-hoc advice to help the company achieve its water efficiency goals through the implementation of corrective action plans. Using the knowledge gained from the training and utilizing the support from expert consultations, the factory developed an eco-map to identify water hotspots and created an action plan to reduce process water consumption. As part of its active participation in WaSaTex, the factory developed four action plans, including three knit dyeing process modification measures and one utility-related measure. All three process modifications measures were implemented during the project period, with the remaining one to be implemented in the future.

Through these process modifications, the factory has achieved significant water savings: a 22% reduction in navy colour dyeing of single-part cotton fabric, a 18% reduction in medium colour dyeing of cotton-polyester blended fabric, a 14% reduction in light colour dyeing colour dyeing of cotton-polyester blended fabric.

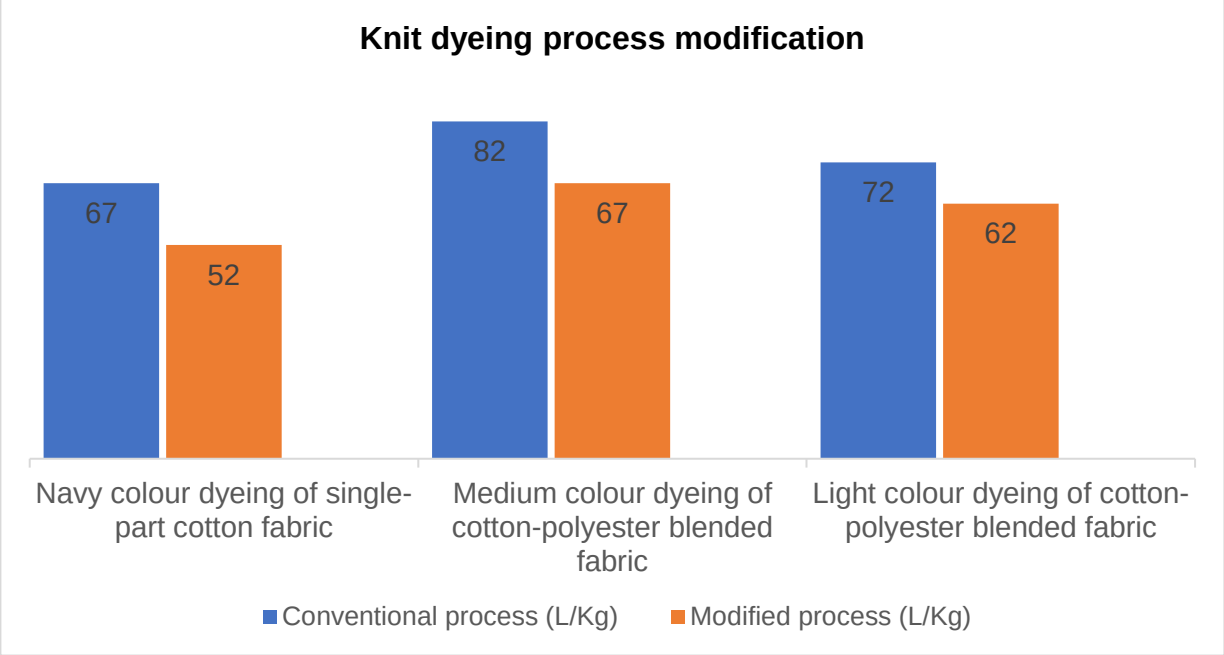


Figure 1 The outcome of the modified processes

2 Introduction

2.1 About the WaSaTex project

The Programme 'Water Saving in the Textile and Garment Industries (WaSaTex)' has been implemented under the scope of SCAIP project of GIZ. The programme aims to implement practical solutions to achieve a substantial reduction in water usage in the textile wet processing industries of Bangladesh by applying the best available techniques (BAT) and adopting low to no-cost measures. In this program GIZ collaborated with a prominent fashion brand and 50 of their textile wet processing factories in Bangladesh. The entire program was implemented batchwise in three consecutive distinct batches. Dedicated implementation teams were formed within each participating factory to focus on water usage reduction. These teams received online training on water saving, which included seven modules provided through the 'atingi'[1] platform to enhance their skills and prepare them for the programme. A brief overview of the training modules is provided in section 3.2. As part of the programme, factories developed eco-maps to identify water hotspots, created action plans to reduce process water consumption, and implemented these plans with expert support from the contractor. Experts conducted at least three visits to each factory, with an additional visit in special cases, to assist in developing action plans, implementing them, and validating the improvements achieved.

The journey of the WaSaTex programme for each of the three batches included the following steps:

1. A kick-off session was organized with the participant factory representatives, brand, and GIZ.
2. Online training on water saving was delivered to the personnel of the factory-nominated implementation teams.
3. Factories identified their water hotspots through eco-mapping.
4. The factories conducted gap analysis, set targets, and developed action plans.
5. Verification visits were conducted by the experts of the contractor.
6. The experts sent improvement reports with recommendations on process water-saving opportunities to the factories to support the development of action plans.
7. The factories received continuous support from the experts through online meetings, voice calls, and text messages in developing and implementing their process water-saving action plans.
8. Support visits were conducted by the experts to monitor the progress of the implementation of the action plans and provide on-site support as necessary.
9. In specific cases, trial visits were conducted to assist the factories with process modification trials in the presence of the experts.
10. Finally, validation visits were conducted to confirm the improvements made by the factories throughout the programme.

[1] 'atingi' is a digital learning platform commissioned and funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) and was implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

This structured approach ensured that each factory received the necessary guidance and support to significantly reduce water usage in their textile wet processing operations, contributing to the overall success of the WaSaTex programme.

Figure 2 Process flow of the WaSaTex programme

2.2 Kick-off meeting and factory onboarding

IRIS Fabrics Ltd. was included in the first batch of the WaSaTex programme which included a total of 18 textile wet processing factories.

The kick-off and onboarding of the first batch took place on 29 August 2023 through a meeting at the H&M office in Dhaka.

2.3 Factory information

a) Factory name: IRIS Fabrics Ltd.
b) Address: Zirani Bazar, Kashimpur, Gazipur
c) Factory contact person:

Name	Designation	Contact information
Ali Azam Miah	AGM- Maintenance	Mob: 01844-158802, Email: azam@irisgroupbd.com

Table 1 Factory contact person

d) WaSaTex implementation team

Name	Designation	Roles	Contacts
Mohammad Ahsan Halim	GM-Admin, HR & Compliance	Overall Follow-up	01817-049518
Md. Alamgir Khan	GM- Knitting & Dyeing	Implementation	01817-032975
Ali Azam Miah	AGM- Maintenance	Implementation	01844-158802
Sumon Chandra Dey	Sr. Manager- Dyeing & Finishing	Implementation	01844-158808
Shahadat Hossain	Asst. Manager- Sustainability (Environment & Social)	Monitoring & Coordinator	01847-160785
Md. Shariful Islam Mridah	Asst. Manager- Dyeing	Implementation	01717-162795
Md. Rokonuzzaman	Sr. Executive- ETP	Monitoring	01708-430571
Sagar Banik	Executive- ECR	Monitoring & Coordinator	01811-458204

Table 2 WaSaTex implementation team

e) Machine information

Type	No. of machines
Knit Dyeing	25
Finishing	6
Other machines	4

Table 3 Machine information

f) Process information

- Knit Dyeing
- Finishing
- Printing

Table 4 Process information

3 Training

As previously mentioned, seven tutor-guided self-paced e-learning training sessions on water-saving were conducted for each batch of factories. These sessions aimed to train factory personnel on state-of-the-art processing and water-saving technologies. Participants joined the tutor-led sessions, facilitated by an expert, to review lessons learned from the water-saving modules on the 'atingi' platform and to address any questions they had. The sessions were held weekly basis on the BigBlueButton [2]meeting platform, covering each of the seven water-saving modules. Each two-hour session included discussions on the selected modules, a Q&A segment, and activity monitoring.

3.1 Training information

The training information of the IRIS Fabrics Ltd.

Training start date	13 September 2023
Training end date	11 November 2023
Total number of participants	7 nos
The number of participants completed the training	6 nos
Pass rate (%)	86

Table 5 Training information

3.2 Training modules

A brief overview of the seven modules is provided below:

Module 1 (Monitoring and control of water supply measures), this module focuses on monitoring and control of water supply, including the monitoring of the operation of water treatment systems such as softening systems and membrane-based water treatment plants. After the completion of this module, participants should be able to select parameters and indicators for assessing and monitoring water supplies, set up a performance system (specifying location, methods, and frequency of monitoring the water supplies), monitor the operation of water treatment systems, and consider major aspects of maintenance.

Module 2 (Management of water demand), this module focuses on how to assess the overall and specific water consumption in a textile factory as well as how to use the assessment data to identify possible areas for reducing the water consumption and generation of wastewater in the factory. This module also explores how to compare the factory's performance overall and process-specific water consumption with available benchmarks.

Module 3 (Water conservation I), this module focuses on how the application of common good practices can help conserve water in the factories. The lessons should help the participants to distinguish between various basic approaches to water conservation, assess opportunities for

[2] 'BigBlueButton' is a open-source platform and was created by a community of dedicated developers passionate about helping improve online learning. It is constantly evolving and improving through a dedicated, growing international user and developer community.

the application of common good practices, and select and apply common good practices in your factory setting.

Module 4 (Water conservation II), this module explores more process technology-related approaches for water conservation. The lessons should help the participants to assess the impacts on water consumption due to possible changes to processes and production technologies, apply process-specific low water consumption technologies in selected production processes, and understand the effects of using “green” chemicals for reducing water consumption and controlling pollution.

Module 5 (Water recovery, reuse, and recycling), this module focuses on the approaches and techniques for water recovery, reuse, and recycling that complement water conservation practices. After completing this module, participants will be able to comprehend the concept of in-process water recovery, reuse, and recycling and distinguish between a variety of techniques for the reuse, recycling, and recovery of inhouse and in-process water of textile factories.

Module 6 (Economics of Water Conservation and Reuse), this module focuses on the economics of in-process measures related to the conservation and reuse of water. After completing this module, participants should be able to identify the factors influencing the economics of water conservation and reuse, understand the possible costs and benefits of typical measures, and employ these insights for the planning of water management at your factory.

Module 7 (Monitoring and control of water consumption), this module is directly related to the management of water demand. It should help participants monitor and minimize specific water consumption, both for an entire site and for individual textile manufacturing processes. At the completion of this module, participants will be able to formulate water use and conservation-related goals, select parameters and indicators for assessing, metering, and monitoring water use, and set up a performance monitoring system for water use and conservation.

4 Hotspot and Eco-mapping

IRIS Fabrics Ltd. implemented the lessons learned from the training to assess their facilities, conduct eco-mapping, and identify the water consumption hotspots to take action plans. The experts facilitated the hotspot identification and eco-mapping process and guided the factory team to complete this.

IRIS Fabrics Ltd. developed the following eco-map by identifying the water hotspots of their factory.

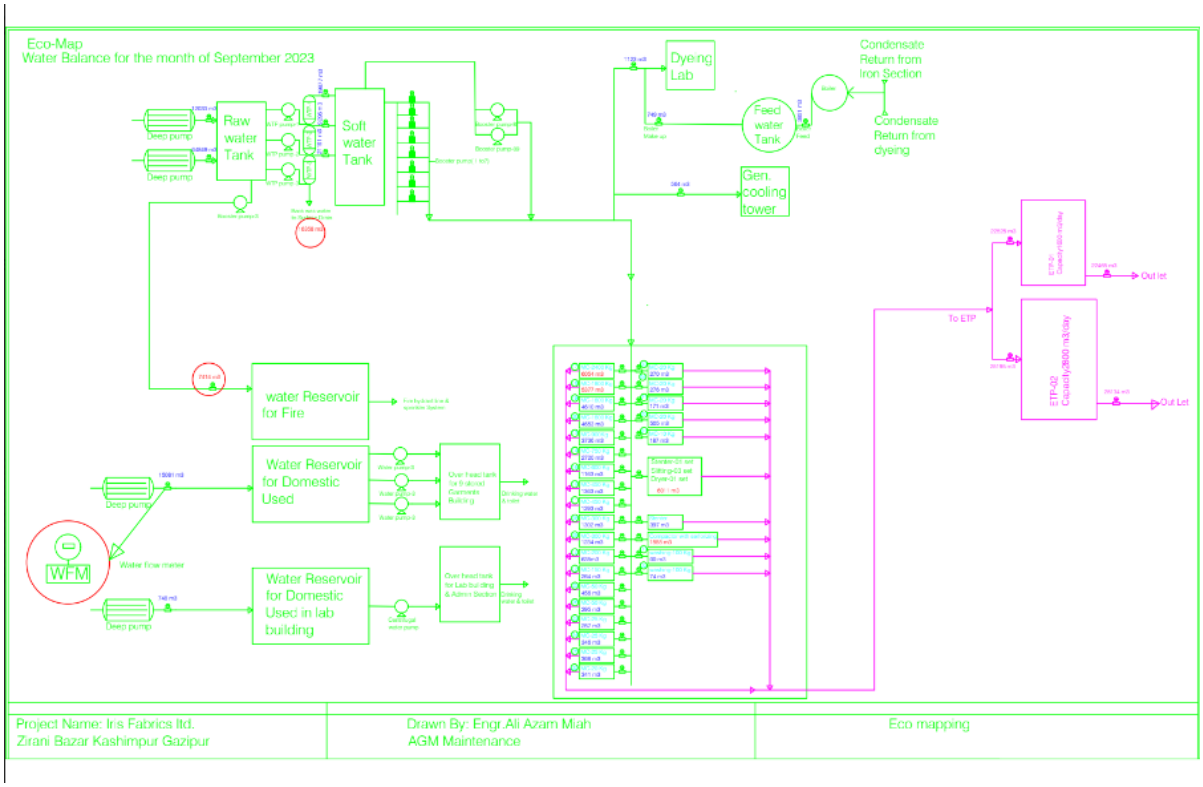


Figure 3 Water eco-map of IRIS Fabrics Ltd.

5 Visits and Observations

At the beginning of the implementation, experts visited the factories to verify the action plans and identify any additional improvement opportunities for modify or update the action plans. Midway through, they conducted another visit to monitor performance and offer support, including making process modification trials if necessary. Upon completing the implementation, a final validation visit was carried out to confirm the improvements made by the factories.

5.1 Factory visits conducted by the experts

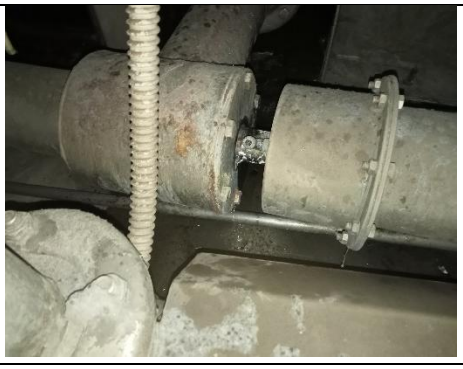
Visit	Date
Verification visit	21 December 2023
Support visit	28 February 2024
Validation visit	24 October 2024

Table 6 Factory visit information

5.2 Observations from the verification visit

There are many options to reduce the consumption of process water. Many options exist for process modification for knit dyeing and taking corrective action measures for finishing, printing, and utility sections. Detailed recommendations for process modification, liquor ratio optimization, and other areas have been mentioned in Section 6.

It was observed during the field visit that batch-wise water consumption for the dyeing machines was not recorded which makes it difficult to get the actual water consumption data for the batches of particular colours. Process steps for dyeing dark, medium, and light colours can be modified to reduce water consumption. It was also observed that liquor for Fong's and Canlar dyeing machines was 1:7, and for Brazzoli dyeing machines it was 1:5.5. There are options to reduce the liquor ratio and increase machine loading percentage to save water use in dyeing.

	
Leakages at the soft water lifting pumps	Leakages in the steam pipes of a dyeing machine

	
Leakages in a water pipe in the stenter machine	Hosepipe used for slitting machine cleaning kept open

Figure 4 Glimpse of some observations during the factory visit

The water flow in the fabric-wetting bath of the stenter machine could not be controlled as there is not any control valve which causes overuse of water. Some leakages were observed in the water-carrying pipes in the dyeing floors, soft water lifting pumps, and steam-carrying pipes. Water in the slitting machine can be reduced by optimizing the use of nozzles in the shower and optimizing the use of water in machine cleaning by using nozzles and valves in the hose pipes. The visiting also noticed a lack of awareness among the workers on the use of water in machine cleaning with hose pipes as well as in printing screen cleaning.

A robust monitoring system needs to be implemented by metering water consumption for the dyeing, printing, slitting, and stenter machines individually to compare with the benchmark, set targets, and track improvements.

6 Recommendations

Through the verification visit, the experts identified the many improvement opportunities to add to the action plan and provided the following recommendations. The recommendation for water reduction was focused more on process water reduction rather than other areas.

Factory Name:	**IRIS Fabrics Ltd.**		
Area/ Section	**Process/ Operation**	**Point of Concern**	**Action Measure**
Fabric Dyeing	Cotton dyeing	Process steps for reactive dyeing of knit fabric with bio-scouring can be modified	Conduct loading and pre-treatment (scouring and bio-polishing together) in the same bath. No hot loading is needed.
			Kill the enzymes and add 1-1.5 gm/L NaOH (if necessary) to remove Neps and run for 20 minutes at 90°C and then drain
			Fill and hot wash at 80°C X 10 mins and drain and drain (If NaOH is added)
			Fill and carry out dyeing and drain
			Fill and carry out block wash at 70°C X 10 mins and drain
			Fill and carry out wash run at 65°C X 10 mins and drain
			Fill and carry out wash run at 65°C X 10 mins and drain (if necessary, based on pH)
			Fill and add a *special soaping agent* that also neutralizes the fabric without any acid wash
			Fill and carry out hot wash at 80°C X 10 mins and drain
			Fill and carry out block wash at 60°C X 8 mins and drain
			Carry out fixing and softening if necessary
		Process steps for reactive dyeing with peroxide pre-treatment can be modified	Conduct loading, pre-treatment and drain
			Carry out normal hot wash at 80°C X 10 mins and drain
			Fill and carry out acid, peroxide killing (PC), kill enzyme, and drain
			Fill and carry out dyeing and drain
			Fill and carry out block wash at 70°C X 10 mins and drain

			Fill and carry out wash run at 65°C X 10 mins and drain (not required for pale to medium colours)
			Fill and carry out wash run 65°C X 10 mins and drain (if necessary, based on pH)
			Fill and add a *special soaping agent* that also neutralizes the fabric without any acid wash
			Fill and carry out hot wash at 80°C X 10 mins (for pale to medium colours, it is 70°C X 10 mins) and drain
			Fill and carry out block wash at 60 °C X 8 mins (not required for pale to medium colours)
			Carry out fixing and softening, if necessary
		Process steps for white dyeing of cotton can be modified	Fill and carry out the white process and drain
			Fill and carry out wash run at 90°C X 15 mins and drain
			Fill and carry out wash run at 60°C X 10 mins and drain
			Fill and carry out neutralization, peroxide killing (if necessary), and bio polishing process and drain
			Carry out wash at 50°C X 10 mins and drain
			Fill and carry out softening (if necessary)
	Polyester dyeing	Process steps for non-white dyeing of polyester fabrics with disperse dyes can be modified	Fill and carry out polyester dyeing and acid-based reduction and drain
			Fill and carry out the 2nd reduction, if necessary, for the dark colours
			Fill and run at 70°C X 10 mins and drain
			Fill and acid (if necessary) and run at 60°C X 10 mins and drain
		Process steps for dyeing cotton-polyester blend fabrics can be modified	Fill and carry out polyester dyeing and acid-based reduction and drain
			Fill and wash run at 60°C X 10 mins and drain
			Fill and carry out cotton dyeing and drain
			Fill and carry out block wash at 70°C X 10 mins and drain
			Fill and carry out wash run at 65°C X 10 mins and drain (not required for pale to medium colours)
			Fill and carry out wash run at 65°C X 10 mins and drain (if necessary, based on pH)
			Fill and add a *special soaping agent* that also neutralizes the fabric without any acid wash

			Fill and carry out hot wash at 75°C X 10 mins (for pale to medium colours, it is 70°C X 10 mins) and drain
			Fill and carry out block wash at 60°C X 8 mins (not required for pale colours)
			Carry out fixing and softening, if necessary
	General	General practices for knit fabric dyeing can be improved	Try with M:L ratio = 1:6.5 in Fong's and Canlar machines and M:L ratio = 1:5 in Brazzoli machines
			Options for the reuse of washing baths need to be implemented
			The number of reprocessing needs to be reduced
			Machine planning should be based on colours so that machine wash can be reduced
			Improve RFT% (Both lab to bulk and bulk to bulk)
			Selection of the right process for the right product to get the maximum outcome
			Proceed with bio-scouring for medium to dark colours
			Loading hot or wash is not necessary for dyeing
			Utilizing the maximum loading capacity of the machines
			For turquoise colour and other special cases, two soaping steps are recommended to use
			Batch-wise water consumption need to be monitored and recorded for each dyeing machine
Finishing	Slitting machine	Cleaning water use can be reduced	Optimizing the number of shower nozzles to make use of the optimum amount of water
			Using the optimum amount of water with hose pipe nozzles and valves during machine wash
			Reusing the water released from the J-box of the slitting machine
			Monitoring the water use through metering to set targets and track improvement
	Stenter machine	Water use can be reduced in machine	Using the optimum amount of water with hose pipe nozzles and valves during machine cleaning

		cleaning and fabric wetting	Optimize the water use for fabric wetting in the stenter machine by setting a valve to the water supply system to control the flow
			Monitoring the water use through metering to set targets and track improvement
Printing	Screen washing	Water use in screen washing can be reduced	Using hose pipes with nozzle and valves to ensure optimum use of water during screen cleaning
			Creating awareness, monitoring workers for unnecessary water use for screen wash, and monitoring the water use through metering
Utility	Boiler	Condensate recovery percentage can be improved	Repair the leakages in the steam-carrying pipes
	Soft water	Soft water use can be reduced	Repair the leakages in water-carrying pipes and machines across the production floors
			Avoid using good-quality soft water in areas such as floor cleaning, hand or face washing, etc.
			Ensure 100% cooling water recovery by avoiding water draining and repairing all leakages in the recovery system

Table 7 Recommendations from verification visit

7 Implementation

7.1 Development of action plan

Utilizing the lessons learned from the online training on water saving and based on the recommendations and continuous consultation from the experts, IRIS Fabrics Ltd. has developed the following action plan with a reduction target for particular processes to reduce the process water consumption.

Process/ Operation	Action Measure	Description of Action	Baseline	Reduction Target (%)	Start	End
Navy colour dyeing of single-part cotton fabric	Modifying the pretreatment process by using bioscouring agent in navy colour dyeing of single-part cotton fabric to reduce process steps	Implementing bioscouring in the pretreatment process reduced related to conventional scouring and bleaching in the navy colour dyeing of the single-part cotton fabric.	67 L/kg	20	27.4.2024	30.07.2024
Medium colour dyeing of cotton-polyester blended fabric	Process steps reduction for medium colour dyeing of cotton-polyester blended fabric by conducting the cotton pretreatment after the polyester dyeing	Conducting the cotton pretreatment after the polyester dyeing in medium colour dyeing of cotton-polyester blended fabric will eliminate the additional reduction clearing and neutralization steps in the after the polyester part dyeing.	82 L/kg	15	02.03.2024	02.05.2024
Light colour dyeing of cotton-polyester blended fabric	Process steps reduction for light colour dyeing of cotton-polyester blended fabric by conducting the cotton pretreatment after the polyester dyeing	Conducting the cotton pretreatment after the polyester dyeing in light colour dyeing of cotton-polyester blended fabric will eliminate the additional reduction clearing and neutralization steps in the after the polyester part dyeing.	72 L/kg	12	02.03.2024	15.05.2024

Process/ Operation	Action Measure	Description of Action	Baseline	Reduction Target (%)	Start	End
Water use in the production floor, machine cleaning, and water supply	Reduction in water use by optimizing water flow in the cleaning hose pipes with nozzle and valves, repairing leakages in the steam and condensate carrying pipes and creating awareness among the employees	Reduction in water use by optimizing water flow in the cleaning hose pipes with nozzle and valves, repairing leakages in the steam and condensate carrying pipes and creating awareness among the employees. Setting nozzle and valves in the hose pipes with the stenter machine, slitting machine, printing screen washing area.	N/A	N/A	N/A	N/A

Table 8 Action plan developed by the factory

7.2 Implementation of action plan

Through the validation visit conducted on 24 October 2024, the expert team has found that IRIS Fabrics Ltd. has successfully implemented the below action measures from the action plan and achieved the mentioned reduction in water consumption for the particular processes and other action measures. The comprehensive process optimization details have been provided in Annex 1.

Process/ Operation	Action Measure	Baseline Consumption	Consumption after Modification	Achieved Reduction %
Navy colour dyeing of single-part cotton fabric	Modifying the pretreatment process by using bioscouring agent in navy colour dyeing of single-part cotton fabric to reduce process steps	67 L/kg	52 L/kg	22
Medium colour dyeing of cotton-polyester blended fabric	Process steps reduction for medium colour dyeing of cotton-polyester blended fabric by conducting the cotton pretreatment after the polyester dyeing	82 L/kg	67 L/kg	18
Light colour dyeing of cotton-polyester blended fabric	Process steps reduction for light colour dyeing of cotton-polyester blended fabric by conducting the cotton pretreatment after the polyester dyeing	72 L/kg	62 L/kg	14

Table 9 Action measures implemented

The factory has yet to completely implement the following action measures which can also significantly impact the reduction of process water consumption.

Process/ Operation	Action Measure	Baseline Consumption	Reduction Target (%)	Target End Date
Water use in the production floor, machine cleaning, and water supply	Reduction in water use by optimizing water flow in the cleaning hose pipes with nozzle and valves, repairing leakages in the steam and condensate carrying pipes and creating awareness among the employees	N/A	N/A	N/A

Table 10 Action measures to be implemented

8 Conclusion

IRIS Fabrics Ltd. has completed all the activities of the WaSaTex programme through its active participation in online training, eco-mapping, action plan development, and implementing action measures. It has made good progress towards reducing process water consumption by modifying three dyeing processes. Process interventions were made to shorten the process steps in knit dyeing by implementing bioscouring and rearranging process steps. Still, the factory has many other options to reduce the process water consumption such as increasing the use of bio-scouring in pretreatment for dark to medium colours, using the neutral enzyme to conduct biopolishing in pretreatment bath or in dyebath, using the dyebath reduction cleaning chemicals for polyester dyeing, conducting cotton and polyester dyeing in the same bath, keeping records of batch-wise water consumption in both knit dyeing and garment washing for strict monitoring of water use, use of ETP water in floor cleaning instead of fresh water, increase use of recycled and reuse water in production processes, and rewarding staff for best performance in water use, etc. Its positive approach toward water efficiency made the overall implementation of the WaSaTex project successful in the factory.

9 Resource References

Schönberger, H.; Ullah, S., Water efficiency in textile finishing industries - Best practices on water saving in textile finishing industries, GIZ GmbH (2021), https://asiagarmenthub.net/resources

Best Available Techniques Reference Document for the Textiles Industry (2003) and the revised document (2022), https://eippcb.jrc.ec.europa.eu/reference/textiles-industry

Schönberger, H.; Schäfer, T., Best Available Techniques in Textile Industry, UBA-Texte 14/03 (2003), https://www.umweltbundesamt.de/sites/default/files/medien/publikation/long/2274.pdf

Annexes

Annex 1: Process optimization

Programme on Water Saving in the Textile and Garment Industries (WaSaTex)

Process Modification

Factory name: IRIS Fabrics Ltd.

Factory responsible person: Sumon Chandra Dey

Designation: Sr. Manager, Dyeing and Finishing

Contact: sumon.dey@irisgroupbd.com, 01844-158808

Expert name: Md. Akhtarujjaman

Designation: Expert, WaSaTex

Contact: akhtar@reedconsultingbd.org, +8801713435882

Programme on Water Saving in the Textile and Garment Industries (WaSaTex)

Colour 1: **Navy colour dyeing (single-part cotton fabric)**		
Existing process	**Process steps**	**Water (L/kg)**
	Fill + Pre-treatment (Scouring-bleaching)	7
	Fill + Hot wash	5
	Fill + Peroxide Killing and Neutralization	5
	Fill + Biopolishing enzyme	5
	Fill + Hot wash	5
	Fill + Dyeing	5
	Fill + Hot Wash	5
	Fill + Cold Wash	5
	Fill + Neutralization	5
	Fill + Soaping	5
	Fill + Cold wash	5
	Fill + Cold wash	5
	Fill + Cold wash	5
	Water consumption with existing process: 67 L/Kg	
Modified process	**Process steps**	**Water (L/kg)**
	Fill + Pre-treatment (Bio-scouring)	7
	Fill + Cold wash	5
	Fill + Dyeing	5
	Fill + Hot Wash	5
	Fill + Cold Wash	5
	Fill + Neutralization	5
	Fill + Soaping	5
	Fill + Cold wash	5
	Fill + Cold wash	5
	Fill + Cold wash	5
	Water consumption with modified process: 52 L/Kg. Total water reduction achieved: 22%	

Akhtaruzzaman 24.10.24
Expert, WaSaTex

Signature from RCB
(With name and designation)

Sr. Manager Degree

Signature from factory
(With name and designation)

Programme on Water Saving in the Textile and Garment Industries (WaSaTex)

Colour 2: **Medium colour dyeing (double-part cotton-polyester blend fabric)**		
Existing process	**Process steps**	**Water (L/kg)**
	Fill + Pre-treatment (Scouring-bleaching)	7
	Fill + Hot wash	5
	Fill + Peroxide Killing, Neutralization, and Biopolishing enzyme	5
	Fill + Cold wash	5
	Fill + Polyester dyeing	5
	Fill + Reduction clearing	5
	Fill + Cold Wash	5
	Fill + Neutralization	5
	Fill + Cotton dyeing	5
	Fill + Hot Wash	5
	Fill + Cold Wash	5
	Fill + Neutralization	5
	Fill + Soaping	5
	Fill + Cold wash	5
	Fill + Cold wash	5
	Fill + Cold wash	5
	Water consumption with existing process: 82 L/Kg	
Modified process	**Process steps**	**Water (L/kg)**
	Fill + Polyester dyeing	7
	Fill + Pre-treatment (Scouring-bleaching)	5
	Fill + Hot wash	5
	Fill + Peroxide Killing, Neutralization, and Biopolishing enzyme	5
	Fill + Cold wash	5
	Fill + Cotton dyeing	5
	Fill + Hot Wash	5
	Fill + Cold Wash	5
	Fill + Neutralization	5
	Fill + Soaping	5
	Fill + Cold wash	5
	Fill + Cold wash	5
	Fill + Cold wash	5
	Water consumption with modified process: 67 L/Kg. Total water reduction achieved: 18%	

Akhtaruzzaman 24.10.24
Expert, WaSaTex

Signature from RCB
(With name and designation)

Signature from factory
(With name and designation)

Programme on Water Saving in the Textile and Garment Industries (WaSaTex)

Colour 3: **Light colour dyeing (double-part cotton-polyester blend fabric)**		
Existing process	**Process steps**	**Water (L/kg)**
	Fill + Pre-treatment (Scouring-bleaching)	7
	Fill + Hot wash	5
	Fill + Peroxide Killing, Neutralization, and Biopolishing enzyme	5
	Fill + Cold wash	5
	Fill + Polyester dyeing	5
	Fill + Reduction clearing	5
	Fill + Cold Wash	5
	Fill + Neutralization	5
	Fill + Cotton dyeing	5
	Fill + Hot Wash	5
	Fill + Cold Wash	5
	Fill + Neutralization	5
	Fill + Soaping	5
	Fill + Cold wash	5
	Water consumption with existing process: 72 L/Kg	
Modified process	**Process steps**	**Water (L/kg)**
	Fill + Polyester dyeing	7
	Fill + Pre-treatment (Scouring-bleaching)	5
	Fill + Hot wash	5
	Fill + Peroxide Killing, Neutralization, and Biopolishing enzyme	5
	Fill + Cold wash	5
	Fill + Cotton dyeing	5
	Fill + Hot Wash	5
	Fill + Cold Wash	5
	Fill + Neutralization	5
	Fill + Soaping	5
	Fill + Cold wash	5
	Fill + Cold wash	5
	Water consumption with modified process: 62 L/Kg. Total water reduction achieved: 14%	

Akhtaruzzaman
24-10-24
Expert, WaSaTex

Signature from RCB
(With name and designation)

Signature from factory
(With name and designation)

Annex 2: Visiting photos

Verification visit

Visit of WaSaTex experts on the production floor

Production floor of the factory

Spray nozzle

Group photo of WaSaTex implementation team and experts in the factory

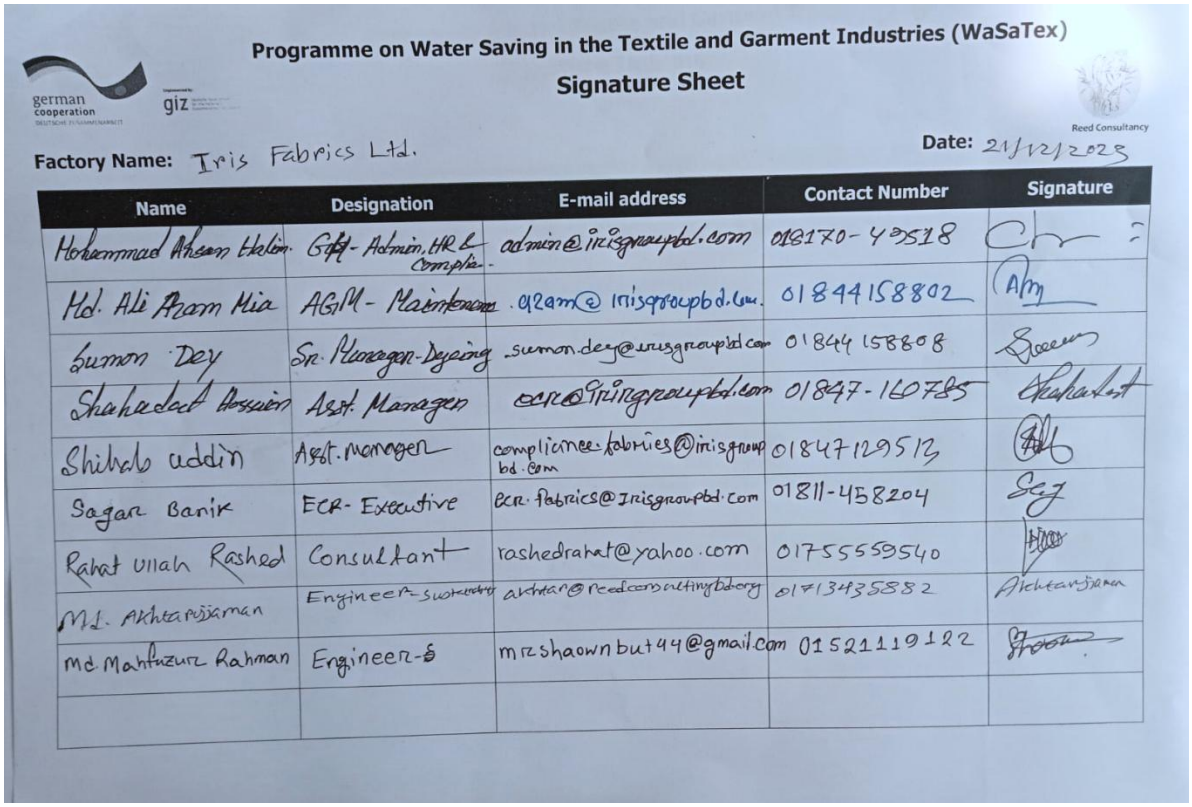
Validation visit

Production floor of the factory the visit

Group photo of WaSaTex implementation team and experts in the factory

Annex 3: Signature sheets

Verification visit



Programme on Water Saving in the Textile and Garment Industries (WaSaTex)

Signature Sheet

Factory Name: Iris Fabrics Ltd.

Date: 21/12/2023

Name	Designation	E-mail address	Contact Number	Signature
Mohammad Ahsan Ekelim	Gen- Admin, HR & Compli-	admin@irisgroupbd.com	01817O-493518	
Md. Ali Azam Mia	AGM- Maintenance	.azam@ irisgroupbd.com	01844158802	
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Shahadat Hossain	Asst. Manager	ecr@Irisgroupbd.com	01847-160785	
Shihab uddin	Asst. manager	complicnee.fabrics@irisgroup bd.com	01847129513	
Sagar Banik	ECR- Executive	ecr.fabrics@Irisgroupbd.com	01811-458204	
Rahat Ullah Rashed	Consultant	rashedrahat@yahoo.com	01755559540	
Md. Akhtaruzzaman	Engineer-Sustainability	akhtar@reedconsultingbd.org	01713435882	
Md Mahfuzur Rahman	Engineer-S	mrshaownbut44@gmail.com	01521119122	

Support visit

Programme on Water Saving in the Textile and Garment Industries (WaSaTex)

Signature In Sheet

Factory Name: IRIS Fabrics Ltd. (Support Visit) **Date:** 28/02/2024

Name	Designation	E-mail address	Contact Number	Signature
Md. Ali Azam Miah.	AGM - Maintenance	azam@irisgroupbd.com	01844-158802	
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Ataur Rahman	Sr. Mgr - Complian	compliance@irisgroupbd.com	01811-458210	
Sagar Banik	Executive - ECR	ecr.fabrics@irisgroupbd.com	01811-458204	
Sumon Chandra Dey	Sr. Manager	Sumon.dey@irisgroupbd.com	01844-158808	
Md. Akhtaruzzaman	Engineer-Sustainabil	akhtar@reedconsultmybd.org	01713435882	

Validation visit

Programme on Water Saving in the Textile and Garment Industries (WaSaTex)

german cooperation giz

Signature In Sheet

Reed Consultancy

Factory Name: IRIS Fabrics Ltd. (Validation) **Date:** 24.10.24

Name	Designation	E-mail address	Contact Number	Signature
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