

This series showcases success stories of PaCT (Partnership for Cleaner Textile) partner factories in the Bangladeshi textile sector that have implemented cleaner production (CP) projects.

Processing operations in the textile industry consume a lot of water. While the mechanical aspects involving spinning and weaving need little water, the wet processing operations use water extensively, for example, to dye, finish and wash clothes. In addition, other processes such as prepping the fabric (removing starch, cleaning fibers,) and fabric preparation steps, including desizing, scouring, bleaching, etc. involves aqueous solutions. However, the water required for textile processing varies from factory to factory, depending on the fabric they produce, the equipment they use, and the dyestuff they prefer. The longer the processing sequences, the more water you need. This is because the bulk of water is used for washing at the end of each process. According to recent PaCT assessment reports, average water consumption in Bangladesh's washing, dyeing, and finishing (WDF) factories is 100 to 150 liter/kg of fabric production.

A growing demand for clean water—given the declining water tables, reduced sources of clean water, residential growth, and pressure from industry—has resulted in higher costs. Water and effluent costs account for as much as 5 percent of production costs. To reduce water consumption in WDF factories, a PaCT expert team identified several opportunities including reducing, reusing, and recycling water. For example, countercurrent flow in a continuous washing machine is a proven technology that significantly reduces water consumption in fabric washing. It allows clean water to enter at the final wash box and flow counter to the movement of the fabric along the wash boxes. Recovery and reuse of blanket cooling water in a sanforizer—a shrinking machine—is another option for water saving.

### ***Reusing water***

Countercurrent washing, relatively simple and inexpensive, is the most popular and successful way to reuse wash water, saving both water and energy. With this method, the least contaminated water from the final wash is reused for the next-to-last wash until the water reaches the first wash stage, where it is finally discharged. Most new textile factories factor in direct countercurrent washing into their process flow sheet. This can also be implemented in existing factories without much hassle.

### ***Sanforizing machine***

A sanforizing machine is used to stretch cotton and mix cotton fabric before it is washed. This prevents the fabric from shrinking. What the sanforizing machine does for plain woven fabric is similar to what a compactor does for knitted fabrics — pre-shrinking and stabilization. The difference is that the shrinkage is done by a thick rubber belt using steam and mechanical pressure on the first unit of the machine. A sanfor blanket is used mainly for two purposes: the first is to dry the wet fabric coming from the shrinking unit and the second is to improve fabric handling. Hot dry fabric coming out from the sanforizing machine is passed over cooling cylinders where cooling water is used. This water can be filtered and cooled down, using a small cooling tower and a circulation pump, which has the required capacity.



*Image of a sanforizing machine.*



The PaCT cleaner production expert recommended that we use countercurrent flow in continuous washing range along with recovery-reuse of blanket cooling water. By adopting these two recommendations, we have reduced 14 percent water consumption. The PaCT program, by raising awareness, has helped us become more resource efficient. We found some simple and quick return options in resource efficiency.– ETL Factory Management

### Factory Status

Evince Textiles Limited (ETL) has a sanforizing machine with a capacity of 50,000 yard/day. Water is used for blanket cooling at a rate of 8 m3/hr. During the baseline visit, PaCT cleaner production experts found cooling water—coming out of the sanforizing machine—draining into the effluent treatment plant (ETP). This resulted in loss of hot and fresh cooling water, increasing the ETP load.

### Water Saving at ETL

PaCT team recommended recovering the blanket cooling water and using it in any hot water application in the wet processing section. Another option was to reuse it after filtering and cooling down with a small cooling tower and the right circulation pump.

Following these recommendations, ETL implemented the two water-saving options by rearranging the existing piping and water flow direction. This required an investment of \$3,899 (BDT 328,697) along with training and awareness-raising sessions on using countercurrent flow in continuous washing machine, which saves 169,920 m3 of water per year. In -

addition, an investment of \$475 (BDT 40,000) in blanket cooling water recovery saves 56,640 m3 of water per year. These two water-saving options reduce ETP load by 226,560 m3/yr.

### Environmental Benefits

#### Use of countercurrent flow technology in continuous washing machine



**169,920 m3/year  
Water Saving**



**169,920 m3/year  
Wastewater  
Avoided**

#### Recovery and reuse of blanket cooling water in sanforizer (shrinking range)



**56,640 m3/year  
Water Saving**



**56,640 m3/year  
Wastewater  
Avoided**

Implementation	Investment	Annual Savings
Use of countercurrent flow technology in continuous washing machine	\$2,835	\$2,860
Recovery and reuse of blanket cooling water in Sanforizer	\$14,238	\$2,870



#### Ground Water Consumption (m3/year)

Before	1,60,000
After	1,37,000

### IFC-led Advisory Partnership for Cleaner Textile (PaCT)

is a holistic program that supports the entire textile value chain – spinning, weaving, wet processing and garment factories – in adopting cleaner production (CP) practices. PaCT engages with brands, technology suppliers, industrial associations, financial institutions, and the government to bring about systemic and positive environmental changes to the Bangladesh textile sector and contribute to its long-term competitiveness and environmental sustainability.

### WHAT PaCT DOES:

- Chemical Management Assessments
- Basic Cleaner Production Assessment
- In-Depth Cleaner Production Assessment
- Water & Energy Management
- Rooftop Solar PV Pre-feasibility Study
- Rooftop Solar Calculation
- Online Resource Monitoring

#### DEVELOPMENT PARTNERS



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