

# Accepted Manuscript

Water efficiency and wastewater reduction in an integrated woolen textile mill

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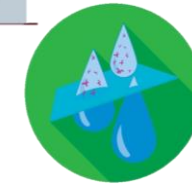
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# Water Efficiency



**Preparing Cleaner Production Policy**

- Saving: 3-5 %
- Reduction: 3-5 %
- Payback: <24 months

**Better Process Monitoring and Control**

- Saving: 1-3 %
- Reduction: 1-3 %
- Payback: 12 months

**Reuse of specified process wastewater after treatment**

- Saving: 20-23 %
- Reduction: 20-23 %
- Payback: 60 months

**Direct reuse of process wastewater**

- Saving: 16-25 %
- Reduction: 26-34 %
- Payback: 12-24 months

**Reuse of fixing boiler waters without treatment**

- Saving: 1-3 %
- Reduction: 1-3 %
- Payback: <30 months

**Reuse of RO concentrates without treatment**

- Saving: 1-2 %
- Reduction: 1-2 %
- Payback: <12 months

**Development of right-first-dyeing techniques**

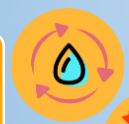
- Saving: 3-8 %
- Reduction: 3-8 %
- Payback: <24 months

**Use of leveling dyeing techniques**

- Saving: 3-8 %
- Reduction: 3-8 %
- Payback: 12 months

**Optimization of washing and rinsing processes**

- Saving: 8-12 %
- Reduction: 8-12 %
- Payback: 18 months



**Process Analysis**  
Analysis of input and output in all basic and auxiliary processes

**Benchmarking Study**  
Comparing water consumptions, wastewater generations and its pollutant loads with similar textile mills and determining of potential savings/reductions

**Determination of Minimization Techniques**  
Determination of the most suitable minimization techniques for the mill by using MCDM Methods

**Feasibility Analysis and Application**  
After the implementation of determined minimization techniques in the mill, calculation of potential saving/reduction in water consumptions, wastewater amounts and its pollutant loads

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