WATER STEWARDSHIP IN THE INDIAN TEXTILE INDUSTRY: A HANDBOOK OF RECOMMENDED GOOD PRACTICES

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Report Authors (in alphabetical order):

Institute for Sustainable Communities (ISC)

Ishita Kapur, Senior Program Officer

Namrata Rastogi, Consultant

Richa Sharma, Program Officer

Romit Sen, Associate Director

Tarini Sahoo, Program Officer

Report Reviewers:

Brent Habig, Vice President of International Programs, ISC

Gap Inc. team

Report Design:

Lindsey Chamberlin, Graphic Designer, ISC

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PREFACE

Water is a critical resource, essential not only for the survival of life on earth but also an important component of poverty eradication, sound public health, and a thriving economy. Recent estimates indicate that more than 163 million people in India do not have access to clean water.[1] In their 2018 assessment, India's National Institution for Transforming India (NITI) Aayog (Hindi for Policy Commission)[2] pronounced even more grim circumstances. According to the Composite Water Index published by NITI Aayog, about 600 million people in India face high to extreme water stress and India is ranked 120th out of 122 countries in terms of water quality. It is projected that by 2030, India's water demand will be twice the available supply, resulting in an eventual ~6% loss in the country's GDP[3].

As a shared resource with multiple uses, water faces competing demands from domestic, agricultural, and industrial sectors. Increasingly, it is being consumed at unsustainable rates that threaten humanity's existence and prosperity. The Indian textile sector is one of the largest users of water and contributes significantly to water pollution through the discharge of toxic waste into waterways. In addition, water use remains inefficient with average water consumed per ton of cotton cloth produced in India between 200-250 cubic meters, compared to the global best of 100 cubic meters.[3] However, the textile sector is a mainstay of the Indian economy, contributing 3% to GDP, and is second only to agriculture in terms of employment.[4] Since the textile industry uses a significant amount of water and involves processes that pollute freshwater sources, they have considerable impact on the availability of clean water in surrounding communities. In addition, associated water-related risks, exacerbated because of changing climate, can hamper business continuity and reputation.

Recognizing the importance of water stewardship, Gap Inc., a leading international specialty retailer, has built its strategy on the principle that clean, safe water is both an environmental goal and a basic human right. Key elements for Gap Inc. are to ensure that the process of making clothes is safe for people and communities and working directly with women to help them gain access to clean, safe water.[5]

The Women + Water Alliance (the W+W Alliance) is a partnership between the United States Agency for International Development (USAID) and Gap Inc. committed to improve and sustain the health and well-being of women and communities touched by the apparel industry— from communities in cotton growing regions to surrounding fabric mill producers and garment factories.

This Handbook is a result of Pillar 3 of the W+W Alliance, implemented by the Institute for Sustainable Communities (ISC). It is based on research carried out by ISC that led to over 100 recommendations for improving water use efficiency and water quality across the entire textile value chain, from cotton production through secondary processing, and includes "outside the fence" practices that encourage collaboration with external stakeholders such as communities and policy makers. With guidance from the Advisory Committee[6] and other experts, ISC and Gap Inc. compiled this Handbook to share recommended good practices[7] for advancing water stewardship through improvements in water use efficiency and water quality, focused on primary and secondary processes[8] in textile mills in India. The Handbook serves as a resource for textile mills and factory units that are embarking on their water stewardship journeys and are interested in learning more about the recommended good practices "inside the fence" in the primary and secondary processes.

Women and Water Alliance – A Unique Public-Private Partnership Model

The W+W Alliance is a unique public-private partnership model where one of the largest global apparel retailers, Gap Inc., is working with USAID and other partners to bring about change in water stewardship practices along its value chain. In the W+W Alliance, Gap Inc.'s globally tested P.A.C.E. program is being used to enhance the knowledge, life skills, and capacities of women to champion water, sanitation, and hygiene. The W+W Alliance sets the stage for a new way of collaboration, one that promotes adopting water stewardship practices in a holistic manner by engaging and connecting businesses with the community, government, and NGOs. The W+W Alliance is finding new ways to enable the industry to better understand and mitigate the adverse impact they have on water and the surrounding communities as well as collaborate with external stakeholders – across the value chain – to drive collective action on effective water management practices.

These practices, if implemented correctly, can result in significant water savings for textile mills and factory units. Water savings are critical to maintaining business continuity, which is increasingly facing risks related to the availability, accessibility, and quality of water. These risks are exacerbated in today's world because of inter-sectoral competing water demands, regulations, water pollution, and climate change. The implementation of the practices recommended in this Handbook can enable textile mills and factory units to manage their water-related risks by improving water use efficiency and reducing water pollution. This also serves as an opportunity for businesses to gain a competitive advantage by driving transparency, reducing regulatory interventions, and thereby improving their reputation with local community, government, employees, and buyers.

[1] https://www.downtoearth.org.in/news/water/19-of-world-s-people-without-access-to-clean-water-live-in-india-60011

[2] https://niti.gov.in/. Established in 2015, NITI Aayog replaced the Planning Commission and is Government of India's policy think tank.

[3] http://pibphoto.nic.in/documents/rlink/2018/jun/p201861401.pdf

[4] https://www.unido.org/news/creating-sustainable-value-chains-indias-textile-industry

[5] https://www.gapincsustainability.com/environment/creating-solutions-women-water

[6] ISC and Gap, Inc. established a W+W Alliance Advisory Committee comprised of experts in the water and textile industry to advise on recommended practices and pilot project identification and implementation. More details about the Advisory Committee can be found here https://sustain.org/wp-content/uploads/2020/06/Advisory-Committee-6.24.20.docx.pdf

[7] Good practice is defined as a method or technique that has been generally accepted as superior to any alternatives because it produces results that are superior to those achieved by other means or because it has become a standard way of doing things.

[8] Primary processing refers to the process of converting cotton to fiber. Secondary processing refers to the process of converting fiber to fabric.

PURPOSE OF THE HANDBOOK

What is the Purpose of this Handbook?

This Handbook provides an overview of recommended good practices for water stewardship only in the primary and secondary processing units in textile mills in India. Most of these practices involve upgrading technologies, or changing practices in the unit, and can be undertaken independently by mills/unit owners. The Handbook is not to be considered an exhaustive list of good practices. It serves as a starting point for those exploring water stewardship as a larger concept and for mill owners who want to familiarize themselves with the range of "recommended good practices." The Handbook describes the concept of water stewardship in the context of Indian textile mills and provides a list of recommended good practices and their potential for impact, estimates of investment needed, and additional references.

Who should use this Handbook?

Textile mills and factory units that have primary and/or secondary processing units located in India that are considering adopting and implementing water sustainability and stewardship practices within their operational boundaries. The Handbook provides an overview of recommended practices, providing mill and factory owners a range of practices currently being undertaken by different factory units in India. The Handbook is meant to be a starting point for mill owners as they start their journey for implementing water stewardship practices. It is not meant to be a comprehensive list of practices. To identify specific practices that may be applicable or best suited to a mill/unit, the mill/unit must conduct additional analysis with technical experts to determine the best options based on each individual units/mills specifications such as the size of the mill, production practices, and current practices/technologies being used. The Handbook will also be a useful resource for academia and civil society organizations that are involved in water stewardship in the textile industry in India and need an overview of water stewardship practices recommended for the industry.

How to use this Handbook?

Users are advised to browse through the Handbook to identify which practices they find most relevant (based on several categories such as value chain, impact potential, investment etc.).

The following tables serve as a guide for the user to easily navigate the Handbook, depending on the kind of investments, impact, and water improvements that the user is looking for. It is recommended that the user refer to the key definitions before learning about the recommended practices, tools, and guidelines outlined in the following sections.

Table 1: Recommended best practices, categorized by value chain, impact, investment, and potential improvements

VALUE CHAIN	IMPACT	INVESTMENT	IMPROVEMENTS IN WATER QUANTITY OR IMPROVED WATER USE EFFICIENCY	IMPROVEMNETS IN WATER QUALITY	IMPROVEMNETS IN BOTH WATER QUANTUTY (WATER USE EFFICIENCY) AND WATER QUALITY
BOTH PRIMARY AND SECONDARY PROCESSING	High	Low		1.2 Undertake a certification system to ensure that products are tested for harmful substance	1.1 Undertake a certification system that requires compliance with high-level environmental criteria and social criteria along the entire organic textiles supply chain
	High	Medium/High		1.5 Eliminate the use of harmful substances in primary and secondary manufacturing 1.6 Adopt requirement to have products contain a certain % of recycled products in their product targeted at manufacturers	1.3 Certify facilities against a water stewardship standard 1.4 Measure the environmental/sustainability performance and impact of facilities
	Low/Medium	Low	1.10 Undertake an integrated approach to water resources planning		1.7 Undertake a water risk assessment to measure and understand the water risks and opportunities for a facility/operation/region 1.8 Evaluate water footprint and sustainability of the whole supply chain and operations 1.9 Adopt reporting practices for disclosure of corporate water-related information 1.11 Use an Environmental management system to enhance its environmental performance
PRIMARY PROCESSING	High	Low		2.2 Use of ecofriendly chemicals	2.1 Recycle/reuse of water-jet weaving wastewater
	High	Medium/High	2.3 Use of moisture management device		
	Low/Medium	Low	2.4 Reuse condensate water 2.5 Reuse the starch		
SECONDARY PROCESSING	High	Low		3.1 Enzymatic scouring 3.2 Reuse in the second wash wastewater for the next batch 3.3 Recycle the scouring bath after adding make up chemicals 3.4 Recycle the cooling water coming out of the jet dyeing machines 3.5 Application of activated peroxide bleaching new-process 3.6 Production management by color. Good production management during the day or week, starting from light colors to darker ones 3.7 Implementation of Chemical Management System 3.8 Reuse alkali bath in scouring 3.9 Reuse dye bath with addition of requisite make-up (auxiliary) chemicals 3.10 Re-use of collected water from various bleaching process 3.11 Reuse the acidic water from neutralization process step 3.12 Reuse process water	
	High	Medium/High		3.14 Use of sustainable dyeing technology to reduce water consumption 3.15 Monitor, benchmark and improve supply chain by measuring chemical utilization 3.16 Automatic color kitchen (batching plant), used both for the preparation of printing colors than for finishing and dyeing 3.17 Recycle of treated wastewater to non-critical areas 3.18 Dye-house automation including automatic dispensing, dissolving/mixing, transportation and distribution of liquid and solid dyes and chemicals according to customer's dyeing recipes and procedures 3.19 Selection of low liquor ratio jet dyeing machine 3.20 Primary, secondary and Tertiary wastewater Treatment systems 3.21 Collection of steam condensate from jet dyeing machines and zero finish machines and reusing it as boiler feed water 3.22 Reverse Osmosis Treatment systems	3.13 Implementation of Zero Liquid Discharge (ZLD)
	Low/Medium	Low	3.23 Evaluate water consumption in secondary processing 3.24 Water meter installation to control material to liquor ratio and for further data generation on water consumption 3.30 Use low Total Dissolved Solids (TDS) water in the drumming operation which is a high temperature operation.	3.25 Selection of textile dyes and auxiliaries according to their wastewater relevance 3.26 Enzymatic after soaping in reactive dyeing 3.27 Optimize & use of minimum chemical quantity based on the strength required 3.28 Develop proper cleaning method- Use of nozzle-based cleaning 3.29 Reduction of water consumption in cleaning operations	

			3.31 Installation and proper operation of accurate Flow and Water meters		
	Low/Medium	High		3.32 Use scrapper mechanism to remove residual color	

Table 2: Tools and guidelines, categorized by value chain

VALUE CHAIN/ TOOL OR GUIDELINE	TOOL	GUIDELINE
BOTH PRIMARY AND SECONDARY PROCESSING	1.1 WWF Water Risk Filter 1.2 WRI Aqueduct Water Risk Filter 1.3 GEMI Local Water Tool 1.4 Higg Index 1.6 Ceres Aqua Gauge 1.7 Water Evaluation and Planning Tool 1.8 WBCSD Global Water Tool 1.9 Water Footprint Assessment Tool 1.14 Water Risk Monetizer 1.15 WASH Sustainability Index Tool	1.5 Zero Discharge Hazardous Chemicals (Roadmap to Zero Programme) 1.10 Global Organic Textile Standard (GOTS) 1.11 Oeko-Tex Certifications 1.12 ISO 14001:2015 Environmental Management System 1.13 Global Recycle Standard 1.16 Alliance for Water Stewardship 1.17 CEO Water Mandate Disclosure Guidelines
SECONDARY PROCESSING	2.1 Water Calculation Tool for the Wet Processing Sector 2.3 BVE3 Environmental Emission Evaluator	2.2 Blue Sign System

WHAT IS WATER STEWARDSHIP?

The Merriam Webster dictionary defines stewardship as "the careful and responsible management of something entrusted to one's care."[9] Water stewardship is a concept that has emerged over the years driven by the recognition that water is a shared resource facing competing demands from various multiple uses resulting in increased scarcity of water. Businesses are recognizing that water-related risks are emerging due to unsustainable water practices and that they have a significant role to play in the management of this critical resource. However, businesses need to expand beyond their traditional approach of managing water only within their operational boundaries to include a more holistic approach, embodying their role as stewards where responsibilities exist within the business and "beyond the fence" to include supporting communities and the larger population and ecosystem. There are several definitions of water stewardship:

- The Alliance for Water Stewardship, a global, membership-based collaboration, defines water stewardship as the use of water that is socially and culturally equitable, environmentally sustainable, and economically beneficial, achieved through a stakeholder-inclusive process that includes both site- and catchment-based actions.[10]

- The CEO Water Mandate, a UN Global Compact initiative, defines water stewardship as a set of practices to be used by businesses, utilities, communities, and others that promote and foster the sustainable and equitable management of freshwater resources. Water stewardship practices range from water use efficiency at an organization's own operations, to engagement with suppliers, to long-term multi-stakeholder river basin projects, and beyond. Water stewardship helps ensure that water users not only manage their own risks and seize opportunities related to water (e.g., ensuring businesses have the water they need to continue production processes), but also promote long-term water security for all. It is the use and treatment of water in ways that are socially equitable, environmentally sustainable, and economically beneficial. Ultimately, stewardship is a key practice to address these critical water challenges, drive sustainable water management, and achieve the Sustainable Development Goals.[11]

- World Wildlife Fund for Nature (WWF), a global NGO, describes water stewardship[12] as actions on the part of companies who seek to improve the water footprint of their internal operations and in their supply chain, while also facilitating the sustainable management of shared freshwater resources through collaboration with other businesses, governments, NGOs, communities, and others. Stewardship implies that there is both internal and external components to water issues. In turn, these issues will require a much broader response, as well as an appreciation of how water is managed as a shared and public resource.

- The Pacific Institute defines corporate water stewardship as an approach that allows companies to identify and manage water-related business risks, understand and mitigate their adverse impacts on ecosystems and communities, and contribute to more sustainable management of shared freshwater resources.[13]

While the definitions above take slightly different viewpoints on water stewardship, there are three foundational elements:

1. water is a shared resource,
2. there are emerging risks associated with its unsustainable use, and
3. a broad response is needed that involves all stakeholders including businesses, community, policy makers, and other decision makers.

For the purposes of this Handbook, drawing on the above, ISC developed its own working definition of water stewardship that incorporates several elements as outlined in the textbox.

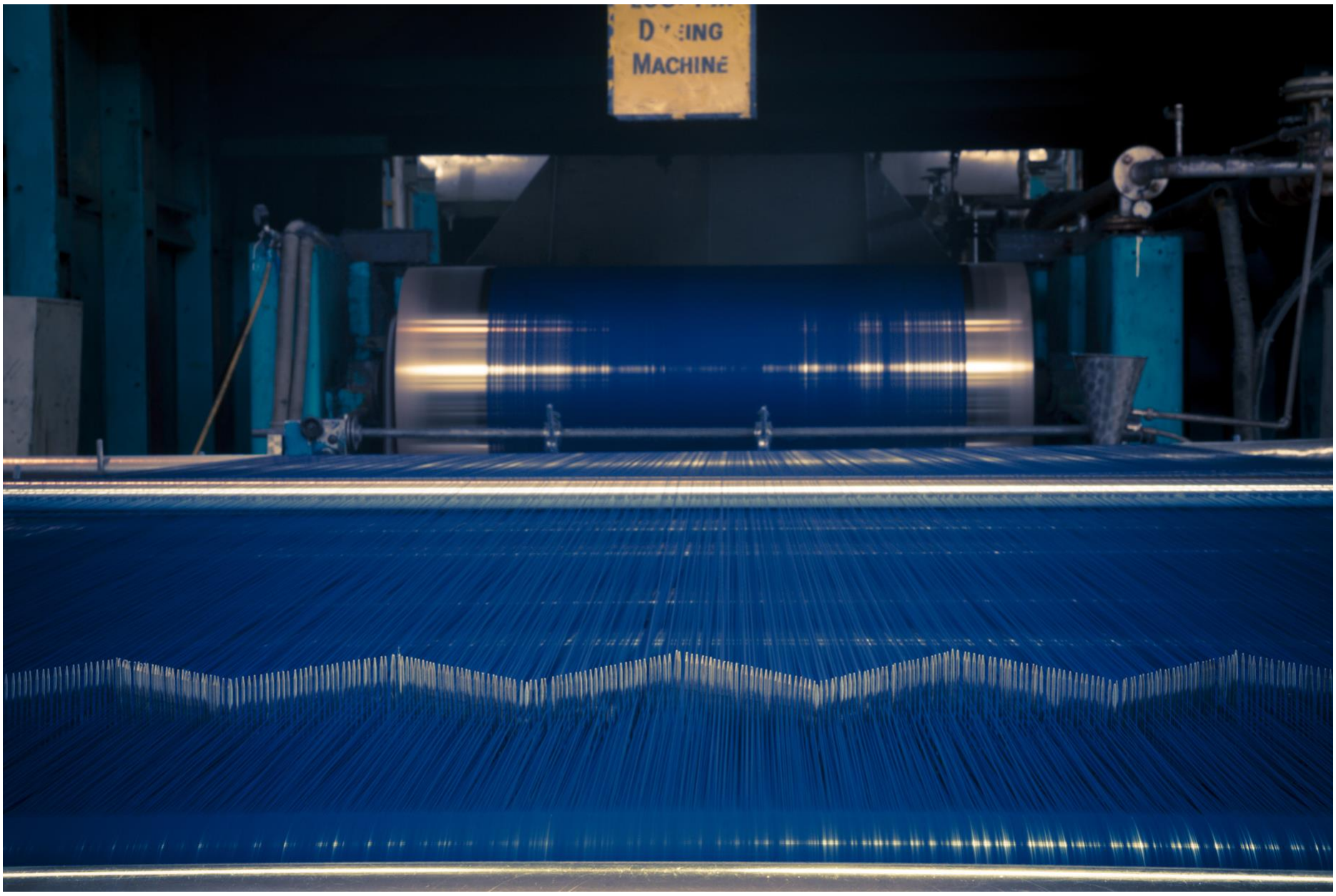
[9] https://www.merriam-webster.com/dictionary/stewardship
[10] https://a4ws.org/about/
[11] https://ceowatermandate.org/university/101-the-basics/lessons/what-is-water-stewardship/
[12] http://awsassets.panda.org/downloads/ws_briefing_booklet_lr_spreads.pdf
[13] https://pacinst.org/corporate-water-stewardship/

How does this Handbook address Water Stewardship?

The Pacific Institute defines corporate water stewardship as an approach that allows companies to identify and manage water-related business risks, understand and mitigate their adverse impacts on ecosystems and communities, and contribute to more sustainable management of shared freshwater resources.[14] To be effective corporate water stewards, businesses must engage in several actions both within their operations ("inside the fence") and actions that extend across their supply chain and enhance engagement with communities and other external stakeholders ("outside the fence"). One of the first steps that a corporate leader must undertake when embarking on a water stewardship journey is to assess and analyze practices to provide sanitary and hygienic water conditions, increase water use efficiency, improve water performance, and reduce pollution across its operations. Following these initial steps, the responsible corporate water steward then should explore "beyond the fence" efforts to enhance water use across its supply chain, advance collaborative efforts for sustainable water management practices in the community/ecosystem, and engage in a dialogue with all stakeholders.[15] This Handbook provides information to future corporate water stewards in the first step of this journey and focuses on "inside the fence" actions. The Handbook provides users an overview of the potential practices that they may want to consider in their primary and secondary processing units to provide increased water efficiency and reduce pollution within their operations.

ISC's Working Definition for Water Stewardship

- The basis of water stewardship is shared risk.
- The starting point for water stewardship is at the corporate/business level. Water-related risks need to be analyzed holistically across operations and supply chains. Water stewardship requires a broad response that includes not only the business, but also governments, NGOs, communities, and other stakeholders. The response should incorporate external stakeholders for sustainable water management at a larger scale – be it river basin, catchment, or site level.
- When starting on the water stewardship journey, internal business operations must be examined. Resulting actions should be driven primarily by regulatory risk: water efficiency, water accounting, water footprint, use efficiency, audit, demand management, best operating practices, best available technologies, etc.
- As corporate water stewards, businesses must recognize the responsibility of managing the water resources for the larger community and corporate actions should be naturally derived from that basis. These will include risk assessment and mitigation, tools and approaches for watershed management, and enhanced participation in local and national water policy debates.



[14] https://pacinst.org/corporate-water-stewardship/

[15] https://ceowatermandate.org/university/101-the-basics/lessons/what-is-water-stewardship/

* Good practice is defined as a method or technique that has been generally accepted as superior to any alternatives because it produces results that are superior to those achieved by other means or because it has become a standard way of doing things.

RESEARCH METHODOLOGY

ISC employed several research methods to identify and curate the list of recommended good practices that textile mills and factory units can undertake to advance their water stewardship journey. As mentioned above, research was focused only on practices "inside the fence," specifically for primary and secondary processing units. Research methods employed include:

- Desk research to identify and collate practices identified by reputable publications as recommended good practices for the Indian textile industry. These included technical manuals, industry association documents, and publications by NGOs.
- Interviews with experts including members of the Advisory Committee constituted under W+W Alliance.[16] Through these interviews, several practices that have consistently shown superior results in relation to water management/stewardship and/or toxic pollution management were identified as industry benchmarks.
- Validation through field visits of factories and mills.

Facility-level interactions

Facility-level interactions covered the following broad objectives:

- Validation of the desk assessment of good water stewardship practices
- Benchmarking and identification of barriers to adoption of good water stewardship practices

The methodology developed by ISC to meet the above objectives is detailed below for developing a common and shared understanding.

Desk Research on Good Water Stewardship Practices

Desk research on good practices from secondary data sources covered research recommendations, certification protocols, export requirements, promotion council and facilitating agency guidelines, and norms and rules to understand the required and relevant practices. This generated a long list of management practices (MPs), operating practices (OPs), and available technologies (ATs) relevant to water quality management and improved management of chemicals in fibre production and textile processing.

Consistent with the objective of the project and with water stewardship as a guiding principle, product water footprint at water-intensive value chain points was a key factor considered for the identification of good management practices. The major secondary resources covered under the desk assessment include the national and international guidelines and regulatory and voluntary certification systems.

The extensive repository of 123 practices were filtered to a shorter list of 69 good practices, tools, and guidelines for primary and secondary processing, based on awareness, adoption, and active participation by the industry. Those practices that centered around general level implementation, including housekeeping and maintenance, were sieved out to finalize the list for validation from the field-level interactions.

Field Validation

Following the initial shortlisting, ISC visited a mix of factories to understand adoption across different value chain points and across a range of size and scale of factories (especially small and medium scale enterprises, SMEs).

Based on the research conducted, ISC developed a database of 69 recommended good practices, tools and guidelines. Certain practices have specific tools and/or guidelines that are recommended, and these were included in the database as well.

Key Definitions

The database defines various terminology as follows:

- **Recommended Good Practice:** A method or technique that has consistently shown results superior to those achieved with other means and that can be used as a benchmark. *Example: Reuse Condensate Water*
- **Tools:** A compilation of information, data, maps, models, or other analyzed information that is an invaluable resource and enables the user in decision making. *Example: WWF Water Risk Atlas*
- **Guidelines:** A document/statement by which to determine a course of action. It aims to streamline particular processes according to a set routine or sound practice. *Example: Business for Social Responsibility Water Quality Guidelines*

For each recommended good practice, the following information has been provided:

- Name of practice
- Description and references
- Notes

[16] See Annex 1 and 2

- Quality/quantity/Water Sanitation and Hygiene (WASH)
- Process flow
- Business benefit

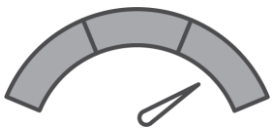
To help provide a better understanding of the practice, two criteria – investment and impact of the practice – have also been included.

Investment: Whether an academic is trying to better understand the water stewardship landscape in the textile industry or a mill owner is considering undertaking "inside the fence" actions to increase water efficiency, the amount of investment needed to implement a practice is critical information. Based on initial research, and in interviews with experts and mill owners, ISC identified ballpark average investment ranges for each of these practices. However, these ranges/figures should not be taken as absolute, and the user (mill owner, academic, or other) must be cognizant of the fact that investment costs may vary significantly based on each mills' specifications. For actual budgeting purposes when a mill/unit owner plans to undertake any of these practices, they must receive expert advice to provide them with detailed investment details.

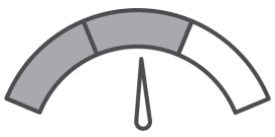
For this Handbook, the ranges for investment are categorized as follows:

- **$ - Very Low:** No cost to USD 7,000; under INR 5,00,000
- **$$ - Low:** USD 7,000 to 30,000; INR 5,00,000 to 20,00,000
- **$$$ - Medium:** USD 30,000 to 70,000; INR 20,00,000 to 50,00,000
- **$$$$ - High:** Greater than USD 70,000; INR 50,00,000 and above

Impact Potential: To adopt and implement new practices requires resources, time, and effort. When implementing water stewardship practices, having an understanding of impact that the practice would have on the environmental good, in this case water, can be extremely helpful to decision makers. ISC used a subjective, comparative framework to analyze each of the listed practices and categorized them based on their impact potential on water quality and/or water quantity. For this Handbook, the impact potential is categorized as follows:



High: Actions that have a large impact on the water quality and the quantity of water consumed, i.e. actions that address the blue and green water footprint (related to water consumed from freshwater, groundwater and rainwater = water quantity) as well as the grey water footprint (an indicator of pollution = water quality).



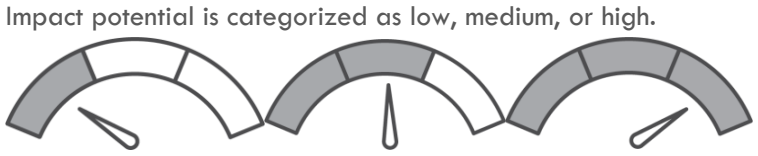
Medium: Actions that have a medium to high impact only on the water quantity, i.e. green and blue water footprint.

Low: Actions that have a low impact on the water quantity, i.e. green and blue water footprint.

These are subjective judgements based on the information that was available at the time the research was conducted. A decision maker, researcher, or other user of this Handbook must confer with a local expert if they are to undertake any specific practices. The analysis presented in this section should be used only as an indicator and not as an absolute result.

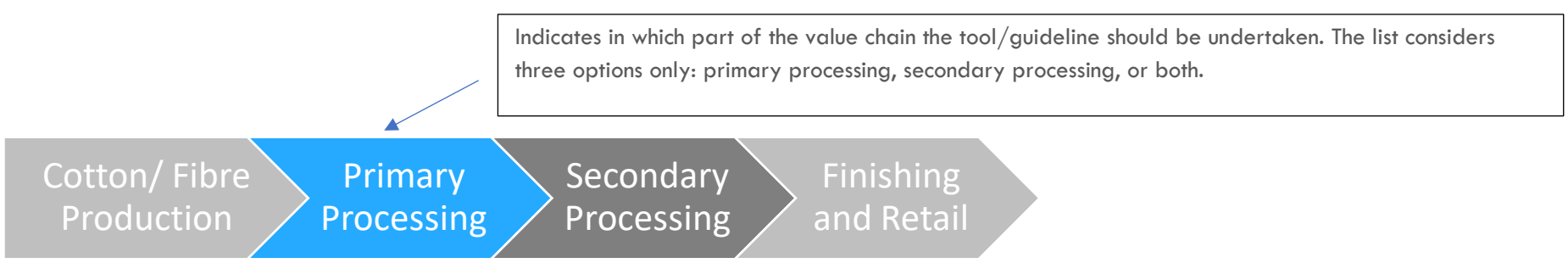
For each recommended practice, the information is provided in the following format:

Indicates in which part of the value chain the practice should be undertaken. The list considers three options only: primary processing, secondary processing, or both.

Name	As the category suggests, this lists the official name. If an official name does not exist, ISC developed one that encapsulates what the practice aims to do and/or achieve.
Description	Brief description providing information to the user on the recommended practice. It includes the aim of the practice (i.e. reduced water use, improved water quality or improvements in WASH), any projected or realized results, where it is used, and other pertinent information.
References	Main web links and reference documents from where information was extracted. Any additional weblinks provided as well.
Investment	The investment is determined as follows: Very Low: **$** Low: **$$** Medium: **$$$** High: **$$$$**
Impact Potential	Impact potential is categorized as low, medium, or high. 

Quality/Quantity/WASH	Indicates whether the practice impacts Quality of water (usually related to pollution), Quantity of water (related to water efficiency practices), or to WASH.
Notes/ Additional Considerations	Any additional useful information.
Business Benefit	Indicates whether the practice has benefits to the business in terms of Environmental Compliance, Social Impact for Stakeholders, Resource Optimization, Community Stewardship, Sustainability Reporting and Disclosure Mechanism, and/or Risk Mapping.

For identified tools and guidelines, the following information is provided:



Name	Name of the tool or guideline.
Description	Overview of the tool/guideline.
Users	Users of the tool/guideline both from an industry perspective and from a geographical perspective.
Track Record	Provides examples and case studies of the tool/guideline in use.
Investment	Any additional information related to the potential for investment.
References	Main web links and reference documents from where information was extracted. Any additional weblinks provided as well.
Notes	Any additional relevant information.
Business Benefit	Indicates whether the tool/guideline has benefits to the business in terms of Environmental Compliance, Social Impact for Stakeholders, Resource Optimization, Community Stewardship, Sustainability Reporting and Disclosure Mechanism, and/or Risk Mapping.

SUMMARY OF RECOMMENDED GOOD PRACTICES, TOOLS, AND GUIDELINES

The following lists of good practices, tools, and guidelines comprises 49 recommended practices across the value chain. Of the recommended practices 40 address toxic pollution, while 15 address the volume (quantity) of water consumed. 12 practices address both primary and secondary processing. 5 address primary processing and, since secondary processing (or wet processing) is the more water intensive aspect of the textile value chain, 32 are in the secondary processing part of the value chain, with most of these addressing toxicity (quality) of water. 29 of the listed practices require the use of tools, standards, and guidelines. There is a list of 20 tools and guidelines. 12 of these are tools and 8 are guidelines. 17 are for both primary and secondary processing and 3 are for secondary processing only.

As outlined in Figure 1, all the water stewardship good practices can be divided into four quadrants: (1) high impact & medium/high investment, (2) low/medium impact & medium/high investment, (3) low/medium impact & low investment, (4) high impact & low investment. Based on this, the practices that fall in the fourth quadrant can create high positive impact on water use and water quality with low investments and therefore may be the most attractive to be implemented in mills/factory units. Practices that fall in high impact-low investment category have been highlighted in the following tables using a yellow star ★. Two of these are applicable to both primary and secondary processing, two are for primary processing, and 12 are for secondary processing.

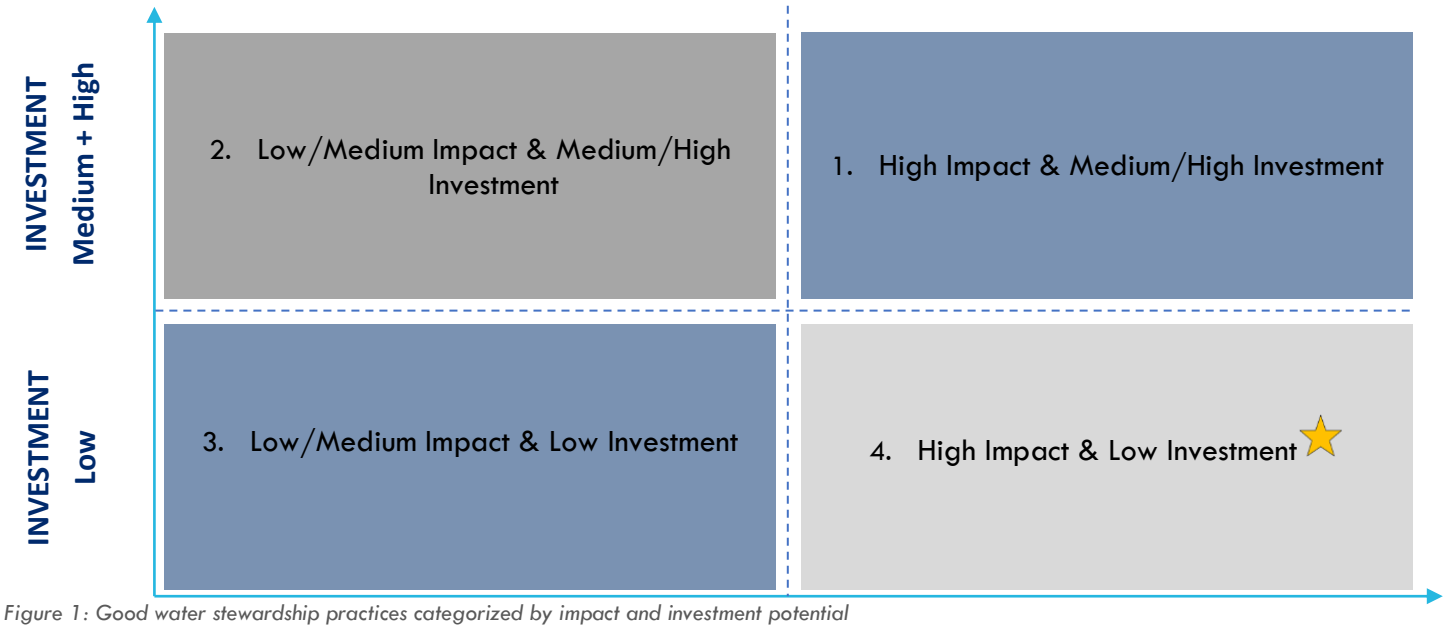


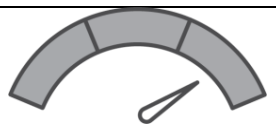
Figure 1: Good water stewardship practices categorized by impact and investment potential

LIST OF RECOMMENDED GOOD PRACTICES

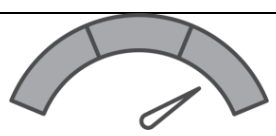
Cotton/ Fibre Production | Primary Processing | Secondary Processing | Finishing and Retail

HIGH IMPACT and LOW INVESTMENT

1.1 ★ Undertake a certification system that requires compliance with high-level environmental criteria and social criteria along the entire organic textiles supply chain

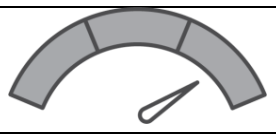
Description	Must contain a minimum percent of certified organic natural fibers; all chemical inputs such as dyes and auxiliaries used must meet a set of environmental and toxicological criteria along with a wastewater management treatment plan for wet processing. Reduced chemical residues are achieved through sustainable cotton cultivation and processing, and therefore impact a reduced grey water footprint.
References	See Relevant Tools and Guidelines section below.
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality and Quantity
Notes/Additional Considerations	Global Organic Textile Standard (GOTS), Organic Cotton Standard, Responsible Environment Enhanced Livelihoods (REEL), Cotton Programme, and Bluesign would be certification systems.
Business Benefits	Environmental compliance, social impact for stakeholders

1.2 ★ Undertake a certification system to ensure that products are tested for harmful substance

Description	Certification to have products tested for harmful substances by independent institutes, and to optimize production conditions and supply chains with regard to sustainability.
References	See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Oeko-Tex, GOTS, Bluesign would be certification systems.
Business Benefits	Environmental compliance and resource optimization

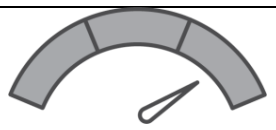
HIGH IMPACT and MEDIUM/HIGH INVESTMENT

1.3 Certify facilities against a water stewardship standard

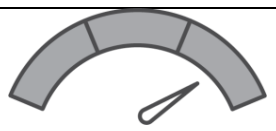
Description	Certify facilities to understand their water use and impacts and work collaboratively and transparently for sustainable water management within a catchment context.
References	See Relevant Tools and Guidelines section below
Investment	$$$$
Impact Potential	
Quality/Quantity/WASH	Quantity and Quality
Notes/Additional Considerations	Relevant standards: Alliance for Water Stewardship Standard
Business Benefits	Community stewardship, sustainability reporting, and disclosure mechanism

1.4 Measure the environmental/sustainability performance and impact of facilities

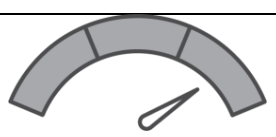
Description	Measuring the social and environmental performance of facilities can include regular assessments that are independently verified or providing benchmarks. Some tools create engagement opportunities among supply chain partners so that businesses at every tier in the value chain collectively perform better.
References	See Relevant Tools and Guidelines section below
Investment	$$$$

Impact Potential	
Quality/Quantity/WASH	Quality and Quantity
Notes/Additional Considerations	Tools such as the Higg Facility Tool, which is increasingly used as a compliance performance standard, requires an extended period of time to monitor, assess, and implement environment, energy efficiency, and social compliances. The Higg tool provides the benefit of a consolidated platform to manage outcomes of management systems including ISO14001, ISO50001, SA8000, etc. Therefore, for successful implementation of the Higg tool, a facility may have to incur costs commensurate to their respective scale and linked requirements.
Business Benefits	Environmental compliance, resource optimization, and sustainability reporting

1.5 Eliminate the use of harmful substances in primary and secondary manufacturing

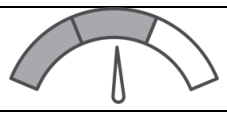
Description	Actions that eliminate or minimize of the use of chemicals, including priority hazardous chemicals.
References	See Relevant Tools and Guidelines section below
Investment	**$$$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Can use Zero Discharge Hazardous Chemicals (Roadmap to Zero Programme) and Bluesign system. Cost of screening chemicals in formulation lies with the chemical supplier and not the mill. However, the cost implication for a mill to procure ZDHC-compliant chemicals would be marginal (5-10% increase in cost).
Business Benefits	Environmental compliance, resource optimization

1.6 Adopt requirement to have products contain a certain percent of recycled products in their product targeted at manufacturers

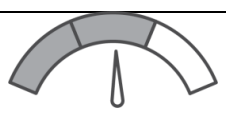
Description	This practice is for companies that are seeking to verify the recycled content of their products (both finished and intermediate products) and to verify responsible social, environmental, and chemical practices in the production of their products. It sets requirements for third-party certification of recycled content, chain of custody, social and environmental practices, and chemical restrictions.
References	See Relevant Tools and Guidelines section below
Investment	**$$$$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Global Recycle Standard, which has suppliers in India, Pakistan, Bangladesh, Turkey, China, Spain, Japan, Germany, Italy, Portugal, etc. Certified suppliers in India include Arvind, Geetanjali Woollens, and Pratibha Syntex
Business Benefits	Sustainability reporting and disclosure mechanism, environmental compliance, social impact for stakeholders

LOW/MEDIUM IMPACT and LOW INVESTMENT

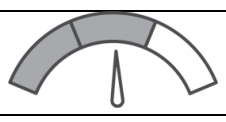
1.7 Undertake a water risk assessment to measure and understand the water risks and opportunities for a facility/operation/region

Description	Assess the water risk and opportunity to a company's operations, site/facility and provide information to make strategic long-term choices. Methods used to evaluate risk vary from tool to tool, using physical water scarcity and/or economic water scarcity as a proxy for risk. To start, a facility will need to be familiar with a monitoring/measurement regime before they are in a position to manage the resource. Assessment of water risks highlight the scope for mitigation based on qualitative/quantitative/both indicators specific to the facility carrying out the assessment. Such assessments are useful in prioritization of action.
References	See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality and Quantity
Notes/additional considerations	Water risk assessment tools have been used by several industries (including textile) worldwide including in India. Tools include Water Risk Monetizer, WWF Water Risk Filter, WRI Aqueduct, GEMI Water Tool, WBCSD Global Water Tool, CERES Aqua Gauge
Business Benefits	Risk mapping, sustainability reporting and disclosure mechanism

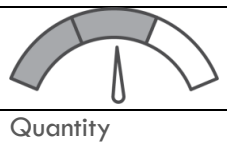
1.8 Evaluate water footprint and sustainability of the whole supply chain and operations

Description	A company can conduct a water footprint assessment to compare its direct and indirect water footprint and the sustainability of its various water footprint components to help prioritize response strategies and set water footprint reduction targets.
References	See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality and Quantity
Notes/Additional Considerations	Tools such as Water Footprint Network's Water Footprint Assessment Tool
Business Benefits	Resource mapping and optimization

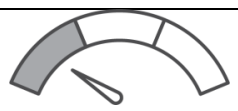
1.9 Adopt reporting practices for disclosure of corporate water-related information

Description	Companies follow corporate water disclosure practice to report to stakeholders the current state of its water management, its implications for the business and its stakeholders, and the development and implementation of strategic responses.
References	See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality and Quantity
Notes/Additional Considerations	Disclosure platforms like CEO Water Mandate Water Disclosure Guidelines
Business Benefits	Sustainability Reporting and Disclosure Mechanism

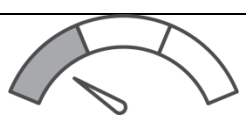
1.10 Undertake an integrated approach to water resources planning

Description	Undertake an integrated approach to water resources planning by providing equal footing to demand-side issues such as water use patterns, equipment efficiencies, re-use strategies, costs, and water allocation schemes and supply-side topics such as stream flow, groundwater resources, reservoirs, and water transfers. Provides a comprehensive view of the broad range of factors that must be considered in managing water resources for present and future use.
References	See Relevant Tools and Guidelines section below
Investment	**$**
Impact Potential	
Quality/Quantity/WASH	Quantity
Notes/Additional Considerations	Tool such as Water Evaluation and Planning tool (WEAP)
Business Benefits	Resource mapping and optimization

1.11 Use an environmental management system to enhance environmental performance

Description	This helps an organization achieve the intended outcomes of its environmental management system, in managing environmental resources through activities, processes, and services that provide value for the environment, the organization itself, and interested parties.
References	See Relevant Tools and Guidelines section below
Investment	**$$**
Impact Potential	
Quality/Quantity/WASH	Quality and Quantity
Notes/Additional Considerations	Relevant Standard ISO 14001 Environmental Management System: 2015
Business Benefits	Environmental Compliance, Resource Mapping and Optimization

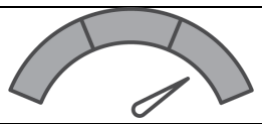
1.12 Assess water sustainability, sanitation, or hygiene interventions using a range of qualitative and quantitative indicators within the facility

Description	Use a framework to assess the likely sustainability of water, sanitation, or hygiene interventions after they have been implemented. This includes institutional arrangements, management practices, financial conditions, and technical operations and support.
References	See Relevant Tools and Guidelines section below
Investment	**$**
Impact Potential	
Quality/Quantity/WASH	WASH
Notes/Additional Considerations	Relevant tools: WASH Sustainability Index Tool, Strengthening the business case for WASH
Business Benefits	Community stewardship, sustainability reporting and disclosure mechanism

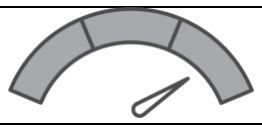
Value Chain for the following:

HIGH IMPACT and LOW INVESTMENT

2.1 ★ Recycle/reuse of water-jet weaving wastewater

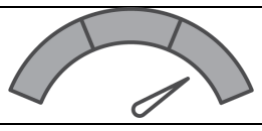
Description	Wastewater generated during water-jet weaving can be reused within the jet looms. It can also be reused in the desizing or scouring process, provided that fabric impurities and oils have been removed by in-line filters.
References	Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003.
Investment	**$$**
Impact Potential	
Quality/Quantity/WASH	Quantity and Quality
Notes/Additional Considerations	Field verified at primary processing areas at two composite mills visited in Madhya Pradesh Linkages with ZDHC/Higg Index
Business Benefits	Environmental compliance and resource optimization

2.2 ★ Use of eco-friendly chemicals

Description	Using eco-friendly chemicals ensures the load to the Effluent Treatment Plant (ETP) is reduced. Thus, the treatment cost and load to pollution parameter are reduced. Also, when using enzymes, the overall process is simplified and consumes very few supporting chemicals as compared to a conventional process. It also saves water and energy consumption by reducing the number of baths.
References	See Relevant Tools and Guidelines section below
Investment	**$$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Field verified at composite mills visited in Madhya Pradesh Linkage with GOTS, OEKOTEX, ZDHC
Business Benefits	Environmental compliance and resource optimization

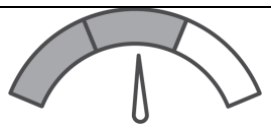
HIGH IMPACT and MEDIUM/HIGH INVESTMENT

2.3 Use of moisture management device

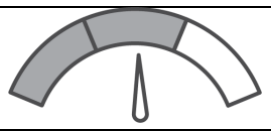
Description	In a textile mill, maintaining moisture maintenance is crucial. Humidification is done by forcing steam into the weaving area. A humidifier does not have an auto cutoff system and supplies steam constantly, resulting in significant water consumption. A moisture management device has an auto cutoff system when a desired humidity is achieved. Automatic management devices are crucial where the environmental area has low humidity; however, in coastal areas and hill stations where the humidity is high, additional humidification is not required and, in some places, dehumidification by air conditioning might be suggested.
References	See Relevant Tools and Guidelines section below
Investment	**$$$$**
Impact Potential	
Quality/Quantity/WASH	Quantity
Notes/Additional Considerations	Field verified at primary processing areas at two composite mills visited in Madhya Pradesh Linkage with Higg index
Business Benefits	Resource optimization

LOW/MEDIUM IMPACT and LOW INVESTMENT

2.4 Reuse condensate water

Description	Cooling water and condensate water are non-process water uses. Many cooling water systems are operated on a once-through basis. Condensate water includes water from heat exchangers in dyeing machines, drying ranges, and cooling cans on continuous ranges, while cooling water includes hot water from jet dyeing machines and compressors (if water cooled). In the knit industry for example, the amount of cooling water utilized in the process is equivalent to 13% of total fill and rinse water. Traditionally, jet dyeing machines are equipped with common heat exchangers that are used for both heating and cooling, which is normally drained with other effluent and thus increases freshwater consumption as well as effluent quantity and load at effluent treatment plant.
References	Field verified at primary processing areas at two composite mills visited in Madhya Pradesh. Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003
Investment	**$$**
Impact Potential	
Quality/Quantity/WASH	Quantity
Notes/Additional Considerations	Linkage with ZDHC/Higg Index
Business Benefits	Environmental compliance and resource optimization

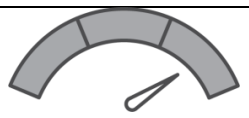
2.5 Reuse the starch

Description	Generally, starch is considered a harmless product and does not contribute to the effluent load. However, cooking starch consumes more water. In the process, some quantity of starch that remains in the bath or in the cooking chamber is disposed. By reusing this starch, reduced quantity of starch top-up will be required and thus reduce the overall consumption of water. This is possible only if the next batch starts immediately before the cool off of starch. Cooled starch should not be reused as it could clog the system.
References	See Relevant Tools and Guidelines section below
Investment	**$**
Impact Potential	
Quality/Quantity/WASH	Quantity
Notes/Additional Considerations	Linkage with Higg index
Business Benefits	Resource optimization

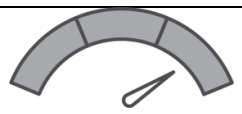
Value Chain for the following:

HIGH IMPACT and LOW INVESTMENT

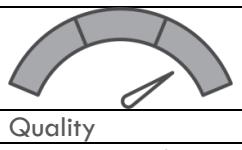
3.1 ★ Enzymatic scouring

Description	With the increasingly important requirement for textile industries to reduce pollution in textile production, the use of enzymes in the chemical processing of fibers and textiles is rapidly gaining wider recognition because of their non-toxic and eco-friendly characteristics. The bio-scouring process results in textiles being softer than those scoured in the conventional sodium hydroxide process. About 75 enzymes are commonly used in textile industry processes. The principal enzymes applied in textile industry are hydrolases (amylases, cellulases, proteases, pectinases, and lipases/esterases) and oxidoreductases (catalases). Scouring is removal of non-cellulosic material present on the surface of the cotton. The bio-scouring process is built on protease, pectinase, and lipase enzymes that act on proteins, pectins, and natural waxes to effect scouring of cotton. The use of enzymes not only make the process less toxic by substituting enzymatic treatments for harmful chemical treatments and eco- friendly, they also reduce costs associated with the production process and consumption of natural resources (water, electricity, fuels), while also improving the quality of the final textile product.
References	See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Case studies from the reference document Linkage with GOTS, Higg Index, ZDHC
Business Benefits	Environmental compliance and resource optimization

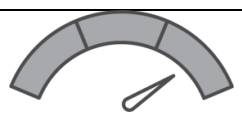
3.2 ★ Reuse in the second wash wastewater for the next batch

Description	The significant advantages of an automatic dosing system are ease of management, execution speed, accuracy, and repeatability of the recipes. Therefore, accurate recipe prediction is possible, which helps in right first-time dyeing and subsequently water consumption due to errors and approximations.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011, Page No. 35/Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003 See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Prevalence of the practice was validated from visits to five secondary/wet-processing units across Maharashtra, Madhya Pradesh and Tami Nadu Linkage with ZDHC/Higg Index
Business Benefits	Environmental compliance and resource optimization

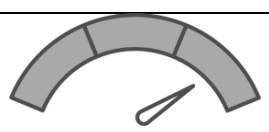
3.3 ★ Recycle the scouring bath after adding make-up chemicals

Description	The practice uses make-up (auxillary) chemicals to retain the process chemicals and thereby reduces the amount of chemicals in the next process and also water consumption. The number of wash cycles in every step is reduced.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011. See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Prevalence of the practice was validated from visits to five secondary/wet-processing units across Maharashtra, Madhya Pradesh and Tami Nadu Linkage with ZDHC/Higg Index
Business Benefits	Environmental compliance and resource optimization

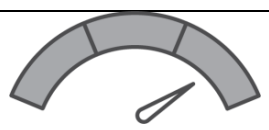
3.4 ★ Recycle cooling water from the jet dyeing machines

Description	Cooling water is generally let off into the stream and wasted, but can be reused for non-critical processing and reduce water consumption.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011 See Relevant Tools and Guidelines section below
Investment	$$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Prevalence of the practice was validated from visits to six secondary/wet-processing units across Maharashtra, Madhya Pradesh, and Tami Nadu Linkage with ZDHC/Higg Index
Business Benefits	Environmental compliance and resource optimization

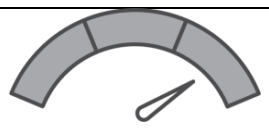
3.5 ★ Application of activated peroxide bleaching new-process

Description	This process uses reduced alkali, which in turn reduces subsequent wash off cycles and neutralization requirements.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011, Page No. 35/Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003
Investment	$$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC
Business Benefits	Environmental compliance and resource optimization

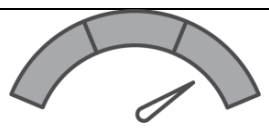
3.6 ★ Production management by color: good production management during the day or week, starting from light colors to darker ones

Description	Dyeing process by this procedure means less washing machine requirements are necessary between different batch processes allowing water saving.
References	Good Management Environmental Practices from Alternatives for waste volume reduction in the textile sector through the application of minimization measures in the production process and in the consumption LIFE05/ENV/E/000285 See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Prevalence of the practice was validated from visits to six secondary/wet-processing units across Maharashtra, Madhya Pradesh, and Tami Nadu Linkage with ZDHC/Higg Index
Business Benefits	Resource mapping and optimization

3.7 ★ Implementation of Chemical Management System

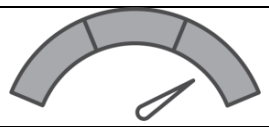
Description	This practice reduces unsupervised use and misuse of chemicals that may lead to spillages, waste, and overuse in process bath. All such practices may interfere in production cycle and may require more water,
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011/Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003 See Relevant Tools and Guidelines section below
Investment	$$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Prevalence of the practice was validated from visits Linkage with ZDHC/Higg Index Gap Inc. promotes Chemical Management System (CMS) manual use in the mills for best chemical management practices
Business Benefits	Environmental compliance

3.8 ★ Reuse alkali bath in scouring

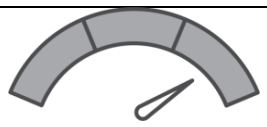
Description	Reusing the baths of each separate pre-treatment process, such as desizing, scouring, and bleaching by standing bath method without further replenishment of water or chemicals but maintaining the material-to-liquor ratio (MLR) by adjusting the size of fabric material accordingly.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011, Available from: http://bit.ly/3aSQTed [accessed Oct 06 2018] See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Prevalence of the practice was validated from visits to four secondary/wet-processing units across Maharashtra, Madhya Pradesh, and Tami Nadu Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization

3.9 ★ Reuse dye bath with addition of requisite make-up (auxiliary) chemicals

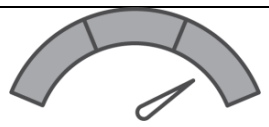
Description	More than 50% of cotton production is dyed with reactive dyes, owing to their technical characteristics. This class of dyes is also the most unfavorable one from the ecological point of view, as the effluents produced are relatively heavily colored, contain high concentrations of salt and exhibit high Biological Oxygen Demand/Chemical Oxygen Demand (BOD/COD) values. Dyeing 1 kg of cotton with reactive dyes requires an average of 70–150 L water, 0.6 kg NaCl, and 40 g reactive dye. This practice reduces the amount of chemicals in the next process and also water consumption. Number of wash cycles in every step is also reduced.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011 See Relevant Tools and Guidelines section below
Investment	$

Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Prevalence of the practice was validated from visits to four secondary/wet-processing units across Maharashtra, Madhya Pradesh, and Tami Nadu Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization and environmental compliance

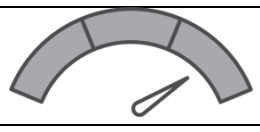
3.10 ★ Re-use of collected water from various bleaching process

Description	Reduces the amount of chemicals in the next process and also water consumption. Number of wash cycles in every step is reduced.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011 See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Found to be practiced at two wet processing units of the six factories visited Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization and environmental compliance

3.11 ★ Reuse the acidic water from neutralization process step

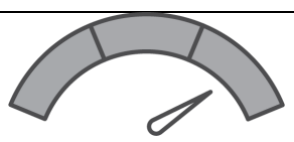
Description	Reduces the amount of chemicals in the next process and also water consumption. Number of wash cycles in every step is reduced.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011 See Relevant Tools and Guidelines section below
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Prevalence of the practice was validated from visits to four secondary/wet-processing units across Maharashtra, Madhya Pradesh, and Tamil Nadu Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization and environmental compliance

3.12 ★ Reuse process water

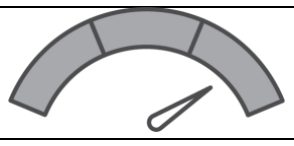
Description	Some sources of process water can be collected and reused for other processes instead of discharged directly to wastewater treatment. For example, after dyeing fabric must be rinsed multiple times. At some factories darker colors go through eight rinses, with each rinse consuming six or seven tons of water per ton of fabric. With each successive rinse, the effluent is cleaner. Factories that reuse the last rinse water as feed for the first rinse can save huge amounts of water. While even the smallest presence of dye may make this water unsuitable for reuse in some equipment, this practice is a safe way to reuse rinsing water at least during the same color run. Process water from bleaching and mercerizing must be evaluated for water quality before reuse, but where it meets quality requirements, it can beneficially be reused in scouring after simple removal of fibers.
References	https://www.nrdc.org/sites/default/files/responsible-sourcing-guide.pdf
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quality
Business Benefits	Resource optimization and environmental compliance

HIGH IMPACT and MEDIUM/HIGH INVESTMENT

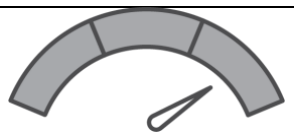
3.13 Implementation of Zero Liquid Discharge (ZLD)

Description	A ZLD system involves a range of advanced wastewater treatment technologies to recycle, recover, and re-use treated wastewater and thereby ensure there is no discharge of wastewater to the environment. A typical ZLD system is comprised of Pre-treatment, Reverse Osmosis, Evaporator & Crystallizer.
References	https://www.aquatech.com/solutions/zero-liquid-discharge/; https://www.arvindenvisol.com/zero-liquid-discharge-zld/
Investment	$$$$
Impact Potential	
Quality/Quantity/WASH	Quantity and Quality
Notes/Additional Considerations	Used in: 1. Copper rod manufacturing, Canada 2. Recycle paper manufacturing, Saudi Arabia 3. Paper plant, Sweden 4. Landfill leachate treatment, Finland 5. Aluminum chromating process, Finland 6. Textile dyeing industry, India 7. Bottle washing plant, India 8. Flue gas condensate cleaning, Finland textile industry, steel and metal industry, mining industry pulp and paper, food and feed industry, landfill leachate, groundwater remediation, seawater desalination, chemical industry, electronic industry, power plants, pharmaceutical industry ZLD units are specific to India and are a mandatory requirement in South India. However, it is high on energy and chemical use.
Business Benefits	Resource optimization and environmental compliance

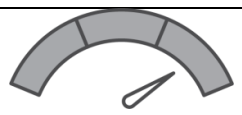
3.14 Use of sustainable dyeing technology to reduce water consumption

Description	Based on the Denim-Ox and Pad/Sizing-Ox dyeing processes, Archroma's Advanced Denim dyeing technology is said to allow savings of up to 92% in water, 87% in cotton waste, and 30% in energy compared to a conventional denim dyeing process. The EarthColors patented range of "biosynthetic" dyes for cotton and cellulose-based fabrics are made from waste left over by the agricultural and herbal industry after extraction, such as almond shells, saw palmetto, and rosemary leaves.
References	https://www.archroma.com/markets/clothing-textiles-leather-materials/
Investment	$$$$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	The EarthColors produce strong earth tones: red, brown, and green colors. They have been adopted by brands such as Patagonia, Kathmandu, and G-Star, and won an Outdoor Industry Award in 2017. They are suitable for GOTS and Bluesign approval.
Business Benefits	Resource optimization and environmental compliance

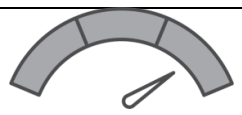
3.15 Monitor, benchmark and improve supply chain by measuring chemical utilization

Description	Industry takes a proactive approach in chemical input management and identifies area of improvement in chemical usage and discharge.
References	https://www.archroma.com/solutions/coloration-denim-casual-wear
Investment	$$$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Relevant tool - BVE3 Environmental Emission Evaluator
Business Benefits	Resource optimization and environmental compliance

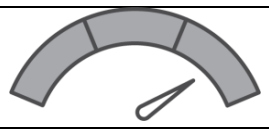
3.16 Automatic color kitchen (batching plant), used for the preparation of printing colors, finishing, and dyeing

Description	The significant advantages include ease of management, execution speed, accuracy, and repeatability of the recipes. Therefore, accurate recipe prediction is possible, which helps in right first-time dyeing and subsequently water consumption due to errors and approximations.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011 See Relevant Tools and Guidelines section below
Investment	$$$$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization

3.17 Recycle of treated wastewater to non-critical areas

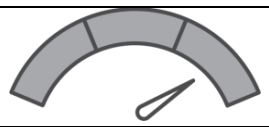
Description	Reduces the amount of chemicals in the next process and also water consumption. Number of wash cycles in every step is reduced.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011 See Relevant Tools and Guidelines section below
Investment	$$$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization

3.18 Dye-house automation including automatic dispensing, dissolving/mixing, transportation and distribution of liquid and solid dyes and chemicals according to customer's dyeing recipes and procedures

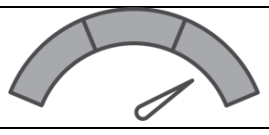
Description	Accurate recipe prediction is possible, which helps in right first-time dyeing and subsequently reduced water consumption due to errors and approximations.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011/Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003 See Relevant Tools and Guidelines section below
Investment	$$$$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization

3.19 Selection of low liquor ratio jet dyeing machine

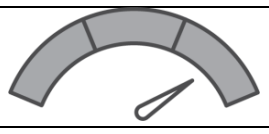
Description	Fabrics are generally processed with a ratio of 10 kilograms of water to every one kilogram of fabric, which is high. Use of water efficient machinery reduces this consumption by more than half to 4 kilograms water per kilogram of fabric.

References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011/Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003 See Relevant Tools and Guidelines section below
Investment	**$$$$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization

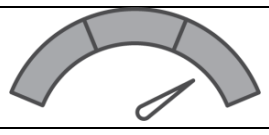
3.20 Primary, secondary, and tertiary wastewater treatment systems

Description	Essential for preventing untreated effluent from entering ground water sources or surface streams, thereby polluting available water resources.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011/Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003 See Relevant Tools and Guidelines section below
Investment	**$$$$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC/Higg Index
Business Benefits	Environmental compliance and resource optimization

3.21 Collection of steam condensate from jet dyeing and zero finish machines for reuse as boiler feed water

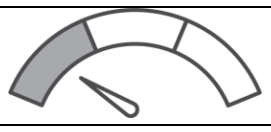
Description	Steam is generally wasted and let off into atmosphere. Condensation and collection of steam provides reusable water for boiler reheating. As steam condensate has a high temperature, reuse not only preserves about 60% of water through recovery, but also saves energy (boiler).
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011 See Relevant Tools and Guidelines section below
Investment	**$$$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization

3.22 Reverse osmosis treatment systems

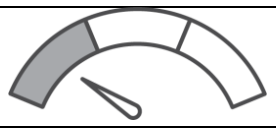
Description	Reverse osmosis is a water treatment process that removes contaminants from water by using pressure to force water molecules through a semipermeable membrane, thereby filtering and flushing out the contaminants. This is a costly process, but prevents pollution and reduces water consumption, as the processed water quality is good enough for reuse. The treated water that can be reused is almost 80% of the consumed water; hence water consumption can be reduced as high as 80%.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011/Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003 See Relevant Tools and Guidelines section below
Investment	**$$$$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC/Higg Index
Business Benefits	Environmental compliance and resource optimization

LOW/MEDIUM IMPACT and LOW INVESTMENT

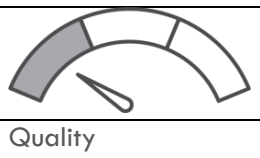
3.23 Evaluate water consumption in secondary processing

Description	Companies assesses their water footprint to make informed decisions about how to manage water consumption in their supply chains. Reporting usually includes an overview of water consumption and some provide comparisons with regional available indicators of best practice.
References	See Relevant Tools and Guidelines section below
Investment	**$**
Impact Potential	
Quality/Quantity/WASH	Quantity
Notes/Additional Considerations	Tools used include: Water Calculation Tool for the Textile Wet Processing Sector
Business Benefits	Resource mapping and optimization, sustainability reporting

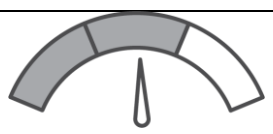
3.24 Water meter installation to control material-to-liquor ratio and generate data on water consumption

Description	Liquor ratio is an expression used in dyeing or finishing of textiles that defines the ratio of the weight of liquor used to the weight of material (textiles) being treated. Manual error in water quantity will lead to either dilute the dyes and chemicals or increase concentration, which in turn will affect the quality and might trigger reprocessing leading to higher water consumption.
References	https://eippcb.jrc.ec.europa.eu/reference/BREF/txt_bref_0703.pdf
Investment	**$$**
Impact Potential	
Quality/Quantity/WASH	Quantity
Notes/Additional Considerations	
Business Benefits	Resource mapping and optimization

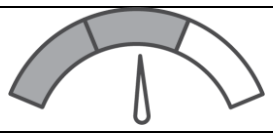
3.25 Selection of textile dyes and auxiliaries according to their wastewater relevance

Description	High affinity dyes are extremely efficient, as waste produced by hydrolyzed dyes is minimal, water consumption is reduced due to multiple washings, and load in effluent is reduced.
References	See Relevant Tools and Guidelines section below
Investment	**$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC, Oeko-Tex
Business Benefits	Environmental compliance, resource mapping and optimization

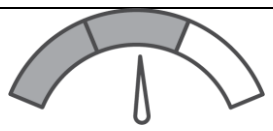
3.26 Enzymatic after soaping in reactive dyeing

Description	The amount of rinsing steps can be reduced by means of an enzymatic aftertreatment. In addition to the use of environment-friendly enzymes, savings in consumption of detergents, water, and energy are the main advantages.
References	Environmental Research of the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety, Research Report 200 94 329 UBA-FB 000325/e, Best Available Techniques in Textile Industry, March 2003, Page no. 236 See Relevant Tools and Guidelines section below
Investment	**$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with GOTS/ZDHC/Higg Index
Business Benefits	Resource optimization

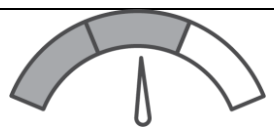
3.27 Optimize use of minimum chemical quantity based on the strength required

Description	In process like printing, general practice is to prepare fresh dye paste each time. Remaining paste that is sticking to the containers or the machine is washed off and sent to the effluent treatment plant. Estimating the strength and quantity of the wasted materials (scrapped off from containers and machineries) and calculating how much is required for the next batch allows these waste materials to be reused.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011, Page No. 35 See Relevant Tools and Guidelines section below
Investment	**$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC, Higg Index
Business Benefits	Resource mapping and optimization

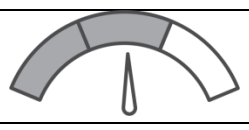
3.28 Develop proper cleaning method / use of nozzle-based cleaning

Description	Cleaning is done by flooding the whole machine and washing with huge amounts of water. However, by using nozzle-based sprayers, the water can be forcefully applied to target areas where cleaning is required. Due to the nature of the nozzle spray, minimal water is used and the force is strong enough to clean the machine effectively. Most industries do not use nozzle-based cleaning systems as they consume time and result in production loss. However, the open-ended machines like jigger and dye tanks can be cleaned using such system.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011, Page No. 35/Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003 See Relevant Tools and Guidelines section below
Investment	**$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with Higg Index
Business Benefits	Resource optimization

3.29 Reduction of water consumption in cleaning operations

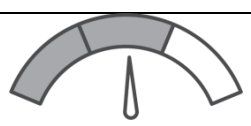
Description	The equipment used around printing machines (e.g. screens, buckets, and the print paste feed system) need careful cleaning before it can be used for new colors. In connection with cleaning operations there are several ways of reducing water consumption.
References	Integrated Pollution Prevention and Control (IPPC), Reference Document on Best Available Techniques for the Textiles Industry, July 2003, Page No. 368 See Relevant Tools and Guidelines section below
Investment	**$**
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	Linkage with ZDHC/Higg Index
Business Benefits	Resource optimization

3.30 Use low Total Dissolved Solids (TDS) water in the drumming operation, which is a high temperature operation (setup of water softener plant required)

Description	Prevents the precipitation of dyes and chemicals, which in turn reduces the water consumption due to the subsequent washing off.
References	Best Available Techniques Implementation in Textiles Sector, by Gujarat Cleaner Production Centre, 2011, Page No. 35 See Relevant Tools and Guidelines section below
Investment	**$$**
Impact Potential	
Quality/Quantity/WASH	Quantity

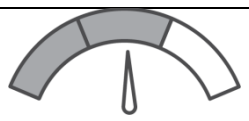
Notes/Additional Considerations	Prevalence of the practice was validated from visits to six secondary/wet-processing units across Maharashtra, Madhya Pradesh, and Tami Nadu Linkage with ZDHC
Business Benefits	Resource optimization

3.31 Installation and proper operation of accurate flow and water meters

Description	Accurate measurement of on-site water use is critical in accounting for current costs and recognizing the benefits of efficiency measures. Meters help in understanding patterns and trends of water use in different parts of the mill. It is common for a plant to have a single, plant-level water meter, but no additional submeters anywhere in the factory. While plant-level data is essential to track trends like gallons of water used per cubic meter of fabric processed, it cannot identify where waste might be occurring. Metering is regarded as more effective and provides the greatest value for the money as part of a water and energy management system operated at the site level. Some of the meters recommended by National Research Development Corporation (NRDC) are Mechanical water meters, electromagnetic flow meters, and ultrasonic flow meters.
References	https://www.nrdc.org/sites/default/files/responsible-sourcing-guide.pdf
Investment	$
Impact Potential	
Quality/Quantity/WASH	Quantity
Notes/Additional Considerations	
Business Benefits	Resource mapping and optimization

LOW/MEDIUM IMPACT and HIGH INVESTMENT

3.32 Use scrapper mechanism to remove residual color

Description	Machine cleaning is a water intensive process in which scrapping all thick material will reduce the total water required for cleaning machineries.
References	https://eippcb.jrc.ec.europa.eu/reference/BREF/txt_bref_0703.pdf
Investment	$$$
Impact Potential	
Quality/Quantity/WASH	Quality
Notes/Additional Considerations	
Business Benefits	Resource optimization

LIST OF TOOLS AND GUIDELINES

Value Chain for the following:

1.1 WWF Water Risk Filter – TOOL

Description	The Water Risk Filter can be used to assess water-related risks for operations, suppliers, or growth plans and provide trend analysis information for strategic (long term) supply chain decision-making, mitigation responses, case studies, and country profiles. The latest version includes an agricultural water risk assessment with specific indicators, questionnaire, and responses. The tool quantifies water risks through a system of weighted risk indicators. It provides a highly structured set of risk indicators covering all relevant elements of water risk, all industries (standard classifications), and all countries. It interprets the best available scientific data and translates it into risk numbers based on a questionnaire. One can then map their assessed facilities or investments on numerous water-related map overlays. Finally, a structured set of responses and up-to-date case studies provide a start in mitigating risk and developing a water stewardship strategy. The Water Risk Filter combines the functionality of numerous existing tools into one. For example, it uses the detailed river scarcity data from Water Footprint Network, while providing answers to <80% of the questions of the CDP Water questionnaire. The latest version will have several additional functionalities including insight into on-the-ground collective action.
Users (geography and industry)	Bangladesh, France & Ghana H&M, Ecotextil, Telenic, Quali-lait
Track Record	1. H&M - Yearly water risk assessments of more than 3,000 sites of H&M stores and warehouses. Focus on water use and geographical location to act where we have most impact. Yearly water risk assessments of all 500 supplier factories with wet processes. Focus on water use, water discharge, and geographical location to act where we have most impact (Reference Link). 2. M&S started working with WWF to look at future "water risk hot spots" in their supply chain using the WWF Water Risk Filter. Using the Water Risk Filter, which draws on global data sets for water scarcity, pollution and climate change predictions, a number of water risk hotspots were identified in the Western Cape. Working with Woolworths, WWF and AWS, M&S has been working with Western Cape farmers to implement the international standard. Every farm has developed its own tailored water stewardship plan, based on their assessment outcome, specific to their farm size and financial capacities (Reference Link).
Investment	The tool is free to use, but the responses that need to be developed as part of an action plan have associated costs.
References	http://waterriskfilter.panda.org/ https://medium.com/@WWF/how-wwfs-unique-tool-can-help-transform-business-response-to-water-risk-6272d40c2be
Notes	This tool is available in the Higg Index Fem Module Section for "Water" where facilities needs to assess their location's water stress index and answer the "Water" Section accordingly
Business Benefits	Risks mapping and sustainability reporting

1.2 WRI Aqueduct Water Risk Filter – TOOL

Description	Aqueduct's global water risk mapping tool helps companies, investors, governments, and other users understand where and how water risks and opportunities are emerging worldwide. The Aqueduct Water Risk Framework brings together 12 indicators into three categories of water risk and an overall aggregated score. The framework is based on a thorough review of the literature and available global data, and includes several indicators developed exclusively for Aqueduct. It is structured, in particular, to help companies and investors understand indicators of water-related risk to their business, but is intended for all users, including government and civil society to better understand geographic water issues.
Users (geography and industry)	The Dow Chemical Company, Dupont, GE Power and Water, Goldman Sachs, McDonald Corporation, Proctor and Gamble, Owens Corning
Track Record	For water stress indicators, Cummins worked with an external consultant to develop a composite picture of current and future water stress by combining data from the WRI Aqueduct Tool, WBCSD Global Water Tool, and technical expertise of the consultants in the countries/regions where it operates (Reference Link) Case Study: Aqueduct Informs Owens Corning Corporate Water Strategy
Investment	The tool is free to use, but the responses that need to be developed as part of an action plan have associated costs.
References	https://www.wri.org/our-work/project/aqueduct

Notes	• This tool is available in Higg Index Fem Module Section for "Water" where facilities needs to assess their location's water stress index and answer the "Water" Section Accordingly • Aqueduct falls short of implementing sustainability context, company's proportional impacts within social and ecological limits, which is the most robust and accurate form of measuring sustainability. • This tool can be used for high level understanding of water stress in the region where a facility is operating.
Business Benefits	Risks mapping and sustainability reporting

1.3 GEMI Local Water Tool – TOOL

Description	The GEMI Local Water Tool™ (LWT) is a free tool for companies and organizations to evaluate the external impacts, business risks, opportunities, and management plans related to water use and discharge at a specific site or operation. This tool provides interconnectivity between global and local water risk assessments and a uniform approach between site assessments. It also provides a central repository of information for the individual user to create reports for internal and external stakeholders. The GEMI LWT™ was developed in cooperation with the World Business Council for Sustainable Development (WBCSD).
Users (geography and industry)	Europe, Russia, North America, South America ConocoPhillips, Abbott, Cargil Inc., DuPOnt, FedEx, and others http://gemi.org/localwatertool/about.html
Track Record	The GEMI LWT is used by ConocoPhillips as a key tool for evaluating water risk for global operations following involvement in the development of the tool and the pilot testing (Reference Link).
Investment	The tool is free to use, but the responses that need to be developed as part of an action plan have associated costs.
References	http://gemi.org/localwatertool/
Notes	• Rudimentary assessment of relative risks. No quantified results. • Excel based complex tool widely used by the Oil & Gas sector, a customized version of WBCSD Global Water Tool. • In line with industry unified approach (SAC), it's recommended to use WRI or WWF tools for Textile Sector.
Business Benefits	Risks mapping and sustainability reporting

1.4 Higg Index – TOOL

Description	The Higg Index, developed by the Sustainable Apparel Coalition, is a suite of tools that enables brands, retailers, and facilities of all sizes — at every stage in their sustainability journey — to accurately measure and score a company or product's sustainability performance. The Higg Index delivers a holistic overview that empowers businesses to make meaningful improvements that protect the well-being of factory workers, local communities, and the environment. Manufacturers use the Higg Facility Tools to measure the social and environmental performance of their facilities. Users conduct the assessments at least once a year, and these assessments are then verified by SAC-approved, on-site assessors. Benchmarking by facility type allows facility managers to compare their performance against that of their peers. The modules aspirational questions give manufacturers clear guidance on hotspots for improvement and outline current best practices in the field. The Higg Facility Tools create opportunities for open conversation among supply chain partners so businesses at every tier in the value chain collectively perform better.
Users (geography and industry)	Gap Inc., Patagonia, Abercrombie, C&A, Asos, Asics, Aldo, Adidas group, Fjall Raven, Burlington Industries, LLC, Burton Snowboards, Cascade Designs, Columbia Sportswear, Cone Denim, LLC, Eagle Creek, Farm to Feet, JanSport, Kathmandu, Keen, MEC, Mountain Hardwear, Mountain Khakis, MSR, Nester Hosiery, Orvis, Packtowl, Pearl Izumi, Platypus, Point6, Prana, REI, Safety Components Fabric Technologies, Inc., Salomon, SealLine, Smartwool, The North Face, Therm-a-Rest, Timberland, Toad & Co, and W. L. Gore , Aditya Birla, Arvind, Dupont See more https://apparelcoalition.org/brands-retailers/
Track Record	1. At Patagonia, the Higg Index suite of tools have become essential to developing, implementing, and tracking strategic goals. Patagonia set goals around packaging and transportation based on insights generated from the Higg Index and restructured its sustainability team to align with the Higg Index Brand, Facility and Product Modules (helping to better integrate Higg Index measures into core business functions). 2. ANN INC. asked its key strategic suppliers to complete the Facility Environment Module. As part of helping them complete the Higg Index, ANN INC. provided support for the facilities to conduct energy audits. During the audits, one facility found over $200,000 in potential energy savings (Reference Link)
Investment	Implementation involves several factors including Environmental Management Systems, energy & GHG emissions, water use, wastewater effluents, air emissions, waste management, and chemical management, which account for a considerable investment.
References	https://apparelcoalition.org/the-higg-index/ https://apparelcoalition.org/wp-content/uploads/2015/08/Higg_BusinessValue_Oct22_FINAL.pdf

Notes	Participating in Higg Index FEM Module+ SLCP (Module in progress) is Gap Inc.'s requirement from the preferred mills under "Mill Sustainability Program."
Business Benefits	Environmental compliance, sustainability reporting, and social impact for stakeholders

1.5 Zero Discharge Hazardous Chemicals (Roadmap to Zero Programme) – GUIDELINE

Description	Zero Discharge of Hazardous Chemicals (ZDHC) goal is to eliminate the use of priority hazardous chemicals by focusing on the following areas: Manufacturing Restricted Substances List (MRSL) & Conformity Guidance, Wastewater Quality, Audit Protocol, Research, Data and Disclosure, and Training. The ZDHC Foundation oversees implementation of the ZDHC Programme.
Users (geography and industry)	The Zero Discharge of Hazardous Chemicals (ZDHC) Programme is a collaboration of over 50 signatory brands, value chain affiliates and associates working towards the elimination of hazardous chemicals.
Track Record	1. Levi Strauss & Co. advanced its commitment to chemical stewardship by joining the Joint Roadmap Toward Zero Discharge of Hazardous Chemicals (ZDHC Roadmap) to drive systemic change with a goal of zero discharge of hazardous chemicals by 2020. Levi Strauss & Co. also signed a Detox Solution Commitment with Greenpeace International, further outlining commitment and actions toward zero discharge of hazardous chemicals (Reference link). 2. REWE Group in Bangladesh also adopted the program and aims to eliminate restricted hazardous chemicals from the production process of private label textiles (Reference Link).
Investment	The cost of screening chemicals in formulation lies with the chemical supplier and not the mill. However, the cost implication for a mill to procure ZDHC-compliant chemicals would be marginal (5-10% increase in cost).
References	https://www.roadmaptozero.com/
Notes	Gap Inc. is a ZDHC signatory brand and promotes the tool and enabler developed by ZDHC. To include Gap Inc.'s requirements under ZDHC programs from mills (as a part of Mill Sustainability Program).
Business Benefits	Environmental compliance and resource optimization

1.6 Ceres Aqua Gauge – TOOL

Description	The Aqua Gauge is a comprehensive, Excel-based assessment tool and associated methodology that allows investors to scorecard a company's water management activities against detailed definitions of leading practice. Its primary aims are to help equity investors interpret and evaluate the information provided by companies on their management of water issues, and to provide a framework to guide investor engagement and dialogue with companies.
Users (geography and industry)	Coca-Cola Company, Suncor Energy
Track Record	The Coca-Cola Company has engaged with Ceres for more than a decade on a wide range of sustainability initiatives, from sustainability reporting and goals to water policies and approach to other environmental, social, and governance issues. In that time, Ceres has helped convene diverse stakeholders to guide and influence Coca-Cola's sustainability strategies and disclosures, and elevated the Company's sustainability leadership to their broad coalition of investors and NGOs (Reference Link).
Investment	The tool is free to use, but the responses that need to be developed as part of an action plan have associated costs.
References	https://www.ceres.org/resources/tools/ceres-aqua-gauge-comprehensive-assessment-tool-evaluating-corporate-management
Notes	It provides a framework and methodology for companies to engage with institutional investors on water risk and opportunity management.
Business Benefits	Sustainability reporting and disclosure mechanism

1.7 Water Evaluation and Planning Tool – TOOL

Description	A user-friendly software tool that takes an integrated approach to water resources planning. Water Evaluation and Planning Tool (WEAP) places demand-side issues such as water use patterns, equipment efficiencies, re-use strategies, costs, and water allocation schemes on an equal footing with supply-side topics such as stream flow, groundwater resources, reservoirs, and water transfers. WEAP is also distinguished by its integrated approach to simulating both the natural (e.g., evapotranspiration demands, runoff, baseflow) and engineered components (e.g., reservoirs, groundwater pumping) of water systems. This allows the planner access to a more comprehensive view of the broad range of factors that must be considered in managing water resources for present and future use. The result is an effective tool for examining alternative water development and management options. WEAP is developed by the Stockholm Environment Institute's U.S. Center.

Users (geography and industry)	
Track Record	1. The District of Peachland, Canada used WEAP software to better manage its water supply from Peachland Creek, Trepanier Creek, and Ponderosa Wells. It integrates the basin level results from the Water Supply & Demand project at the sub-basin level as input for data for the WEAP model. Once the WEAP model was created, Peachland began using it to create an operational plan, drought management plan, and a sensitivity analysis. This model allowed the District to include uncertain parameters such as climate change into their modeling, and subsequently into their planning process. The District of Peachland's WEAP model could be integrated into WEAP basin level model, providing more details and expanded information about the Peachland Creek sub-basin (Reference Link). 2. Water Planning Tools to Support Water Governance project - ARA-Centro, Waterschap Hunze and Aa's, and UNESCO-IHE collaborated in Mozambique to plan for water availability and the required number of reservoirs needed to make the envisioned economic developments possible. In this pilot project two water planning tools, SWAT and WEAP, were introduced to refine and demonstrate a pilot area in the ARA-Centro. Water planning tools were used to demonstrate how these tools can support water governance related to flood warnings, water allocation, planning of new infrastructure (reservoirs), and water quality. In this way, the water planning tools will demonstrate that better governance based on permits, fees, and cost recovery is possible (Reference Link). 3. The WEAP model was set-up for the Sebou basin in Morocco based on five subcatchments to evaluate the impact of green water management measures on water demand and supply and a benefit-cost analysis. Green water management addresses sustainable water resource utilisation in a catchment, or a river basin, at source. It aims to optimise the partitioning between green and blue water to generate benefits both for upstream land users and downstream consumers. Green water management is targeted at increasing productive transpiration, reducing soil surface evaporation, controlling runoff, reducing flood risk, encouraging infiltration, and groundwater recharge (Reference Link).
Investment	WEAP downloads are only available to those who have joined the WEAP Forum and license can be obtained based on the category of the user. There are more than 30,000 members of the WEAP forum. Detailed information is not openly available without joining the forum. Low – licensing fee ranges from free to $3000 used based on type of user.
References	https://www.weap21.org/
Notes	It is a tool for hydrological modelling based on GIS data and enables policy-makers and stakeholders to consider how management plans will affect cities, industries and farms, as well as long-neglected interests such as wildlife habitat and vulnerable communities.
Business Benefits	Resource Mapping and Optimization

1.8 WBCSD Global Water Tool – TOOL

Description	The Global Water Tool™ (GWT) is a free, publicly available resource for identifying corporate water risks and opportunities that provides easy access to, and analysis of, critical data. It includes a workbook (data input, inventory by site, key reporting indicators, metrics calculations), a mapping function to plot sites with datasets, and a Google Earth interface for spatial viewing. It helps companies build long-term water management strategies that minimize risk and build long-term resilience. Users can map their locations and water use data against water, sanitation, population, and biodiversity datasets, as well as stress indicators on a country and watershed basis, and in turn assess risks related to their global operations, supply chains, new projects, and prioritize action. India specific tools were developed in coordination with CII Triveni and WRI. Benefits include: • Understand water use/needs of operations in relation to local externalities to make informed decisions. • Perform a first level screening through maps or charts capturing key water performance and risk indicators of water consumption, efficiency, and intensity. These metrics can then be used for communication with internal and external stakeholders and reporting under corporate disclosure initiatives like the Global Reporting Initiative, CDP Water, Bloomberg and Dow Jones Sustainability Index.
Users (geography and industry)	Cement, Oil and Gas, Beverage
Track Record	BASF, DSM, DuPont, EDF, GDF Suez,Italcementi, Pepsico and Shel
Investment	The tool is free to use, but the responses that need to be developed as part of an action plan have associated costs.
References	https://www.wbcsd.org/Programs/Food-Land-Water/Water/Resources/Global-Water-Tool
Business Benefits	Risk mapping

1.9 – TOOL

Description	The Water Footprint Assessment provides a sound foundation of quantitative analysis, which can be used to develop a corporate water strategy and become a water steward. A company can use the Water Footprint Assessment to compare its direct and indirect water footprint and the sustainability of its various water footprint components to help prioritize response strategies and set water footprint reduction targets, which become part of the company's corporate water strategy. A Water Footprint Assessment includes two components: the production assessment and the geographic assessment. The production assessment enriches the dialogue between companies, their suppliers, and customers by quantifying the water footprint of operations and the supply chain and identifying where hotspots exist in the value chain. A hotspot is where the water footprint is unsustainable or can be reduced or avoided altogether. Once hotspots are identified, the geographic assessment can be used to understand how

	water is allocated between different uses in a catchment or river basin. The assessment can inform collective action by helping companies explore their water footprint and opportunities to reduce it. It supports civil society engagement in river basin dialogues by building an understanding of the issues and it assists government by providing a comprehensive picture of water use within the basin. The Global Water Footprint Assessment Standard lays out the internationally accepted methodology for conducting a Water Footprint Assessment.
Users (geography and industry)	US, France, Spain, Pakistan, China, Korea, etc. Several users: Nestle, L'Oreal, Made Blue, Unilever, LimnoTech, Dole etc.
Track Record	1. The Tata Group partnered with IFC and technical partner Water Footprint Network (WFN) to develop a corporate water strategy for 12 industrial facilities using the Water Footprint Assessment methodology. The aim was to develop an integrated water sustainability framework and create a common language on corporate water stewardship among internal stakeholders ranging from senior management to facility staff. The tool provides detailed analysis of the amount of water consumed and polluted, and highlights improvement action areas that cannot be identified through the use of traditional water use statistics and discharge permits (Reference Link). 2. SABMiller undertook its first water footprint exercise at its subsidiary, SAB Ltd. in South Africa, the brewer of Castle and other brands of beer. South Africa was selected because the country faces substantial water-related challenges. SABMiller conducted a second water footprint, examining the beer value chain in the Czech Republic (Reference Link). 3. UK Environment Agency and the Water Footprint Network (WFN) undertook a collaborative project on the Water Footprint Assessment (WFA) of the South East Region, North East Thames Area (SENET), now Hertforshire and North London Area, to elaborate the current status of water resources in the SENET area and to provide insights into how water resource management could be improved (Reference Link).
Investment	The tool is free to use, but the responses that need to be developed as part of an action plan have associated costs.
References	http://waterfootprint.org/en/water-footprint/corporate-water-stewardship/
Notes	Widely used by FMCG companies where manufacturing is directly owned or controlled by corporate
Business Benefits	Resource mapping and optimization

1.10 Global Organic Textile Standard (GOTS) – GUIDELINE

Description	The Global Organic Textile Standard (GOTS) is a voluntary, certified standard that covers all aspects of the production of organic natural fibers including textile processing, manufacturing, packaging, labeling, exportation, importation, and distribution. Only textile products that contain a minimum of 70% organic fibers can become GOTS certified. All chemical inputs such as dyestuffs and auxiliaries used must meet certain environmental and toxicological criteria. The choice of accessories is limited in accordance with ecological aspects as well. A functional wastewater treatment plant is mandatory for any wet-processing unit involved and all processors must comply with social criteria. The Global Organic Textile Standard (GOTS) is recognized as the world's leading processing standard for textiles made from organic fibers. Textile processing, manufacturing and trading entities can apply for certification according to the Global Organic Textile Standard.
Users (geography and industry)	Textile industry; the GOTS standard is present in 68 countries around the world (Reference Link).
Track Record	GOTS maintains a public database of all the certified suppliers and product details (Reference Link). The top five countries in terms of the total number of GOTS certified facilities are: India (1,441), Turkey (489), Germany (306), Bangladesh (210), and China (201) (Reference Link).
Investment	The certification cost depends on (number of) location(s), size and type of the entity, and the range of products that are intended to be processed or traded under the scope of certification. As a rough estimation, an entity with one facility can expect annual certification cost in the range of 1200 and 3000 Euro. In addition to the certification cost payable to the certifier, each certified entity must pay a license fee for each calendar year. The license fee is set at 120 Euro for each facility that is inspected for the certified entity, and is collected by the Approved Certifier and transferred to the International Working Group (Reference Link).
References	https://www.global-standard.org/
Business Benefits	Environmental compliance and social impact for stakeholders.

1.11 Oeko-Tex Certifications – GUIDELINE

Description	OEKO-TEX® offers the textile industry several certifications and services to have products tested for harmful substances by independent institutes, and to optimize production conditions and supply chains with regard to sustainability. Below are the certification systems offered by OEKO-TEX®: 1. STANDARD 100 by OEKO-TEX®: testing and certification system for raw, semi-finished, and finished textile products at all processing levels, as well as accessory materials used. 2. STeP by OEKO-TEX®: Sustainable Textile Production (STeP) by OEKO-TEX® is a certification system for brands, retail companies, and manufacturers from the textile chain who want to communicate their achievements regarding sustainable manufacturing processes to the public in a transparent, credible, and clear manner. Certification is possible for production facilities of all processing stages from fibre production, spinning mills, weaving mills, and knitting mills to finishing facilities and manufacturers of ready-made textile items. 3. MADE IN GREEN by OEKO-TEX®: textile label for highlighting consumer products and semi-finished products at all levels of the textile chain that are made from materials tested for harmful substances and that have been manufactured using environmentally friendly processes and under safe and socially responsible working conditions. 4. ECO PASSPORT by OEKO-TEX®: certification system for chemicals, colourants, and auxiliaries used to manufacture textiles. A three-stage verification process analyses to determine if the chemical products and each individual ingredient meet specific requirements with regard to sustainability, safety, and compliance with statutory regulations. 5. DETOX TO ZERO by OEKO-TEX®: enables manufacturers in the textile chain to assess the status of their chemical management systems and the quality of their wastewater and sludge, and to document through independent verification. The result of DETOX TO ZERO by OEKO-TEX® is a status report which can confirm compliance with the Detox campaign from Greenpeace.
Users (geography and industry)	Worldwide textile industry
Track Record	OEKO TEX maintains online directory of the certified products, companies and brands (Reference Link). Gore Fabrics has been working with the OEKO-TEX® Standard 100 since 1996 and adopted OEKO-TEX® 100 as a product safety standard, which requires all of our materials to be approved (Reference Link). US apparel business JC Penney has become the first retailer in the U.S. to introduce the Made in Green by Oeko-Tex traceable textile label (Reference Link). Trident Limited, one of the world's largest vertically integrated home textile players, has been certified for the Sustainable Textile Production (STeP), permitting it to use the OEKO-TEX® "MADE IN GREEN" label on its products (Reference Link).
Investment	The financial cost of certification according to OEKO-TEX® Standard 100 consists of a license fee and laboratory costs. The precise costs for testing of harmful substances depends on the tests involved for each product in question. A preliminary estimate of these costs can be obtained from the OEKO-TEX® Institute that has been commissioned to carry out the test. The overall cost/year may vary from as little as € 1500.00 (simple case) to several thousand Euros for complex and difficult certifications where a high number of tests are necessary. Financial outlays can be reduced by using source materials that have already been certified to avoid duplicate tests. (Reference Link)
References	https://www.oeko-tex.com/en/business/certifications_and_services/certifications_and_services.xhtml
Business Benefits	Environmental compliance and resource optimization

1.12 ISO 14001:2015 Environmental Management System – GUIDELINE

Description	ISO 14001:2015 specifies the requirements for an environmental management system that organizations can use to enhance environmental performance. This helps an organization achieve the intended outcomes of its environmental management system, which provide value for the environment, the organization itself, and interested parties. Consistent with the organization's environmental policy, the intended outcomes of an environmental management system include: • enhancement of environmental performance • fulfilment of compliance obligations • achievement of environmental objectives
Users (geography and industry)	It can be used by any organization regardless of its activity or sector
Track Record	Lindström Group Management System, Europe's leading textile service company, is run according to ISO 9001:2015 and 14001:2015 (Reference Link)
Investment	Medium: the cost of ISO 14001 certification varies depending upon the nature, size, and initial status of environmental protection activities. The cost of certification depends upon three factors: consultancy charges, execution cost of EMS, and auditing and certification charges. Leaving aside the execution cost, which varies widely from less than INR 100000 to over INR 1000000 depending upon the initial status of compliance to regulatory laws and other environmental protection activities, the consultancy charges and certifying charges put together a range between INR 250000 to INR 900000 depending upon the size and nature of enterprise (Reference link). This is an estimated cost from 2001.
References	https://www.iso.org/standard/60857.html
Notes	It can be covered under Higg Index FEM section "EMS"
Business Benefits	Environmental Compliance, Resource Optimization, and Sustainability Reporting

1.13 Global Recycle Standard – GUIDELINE

Description	The Global Recycle Standard (GRS) is an international, voluntary, full product standard that sets requirements for third-party certification of recycled content, chain of custody, social and environmental practices, and chemical restrictions. The GRS is intended to meet the need of companies looking to verify the recycled content of their products (both finished and intermediate products) and to verify responsible social, environmental, and chemical practices in the production of these products. The objectives of the GRS are to define requirements to ensure accurate content claims, good working conditions, and minimize harmful environmental and chemical impacts. This standard applies to all companies that manufacture or trade GRS products. The standard covers processing, manufacturing, packaging, labeling, trading, and distribution of all products made with a minimum of 20% recycled material. The standard is intended for companies that sell and/or produce products with recycled content; hence it targets both brands and manufacturers. If brands and retailers want to have their products certified to the GRS, they need to advise their suppliers of the production and certification requirements. If the producer is outsourcing the production of the end product partially or completely, all units involved must also comply with the GRS in order for the product to be certified.
Users (geography and industry)	The GRS was developed with the textile industry in mind; however, it may be applied to products from any industry. It applies to any product made from recycled materials, including natural fibres (e.g. recycled cotton or recycled wool), synthetic materials (e.g. recycled polyester, recycled polyamide/other recycled polymer), and other products such as recycled paper, recycled glass, etc.
Track Record	Many suppliers in India, Pakistan, Bangladesh, Turkey China, Spain, japan, Germany, Italy, and Portugal have GRS certified suppliers like Arvind, Geetanjli Woollens, and Pratibha Full list of countries and suppliers can be found here
Investment	Fees are determined by the individual certification body rather than by GRS. There is no additional fee for the use of the labels.
References	https://textileexchange.org/wp-content/uploads/2016/06/Global-Recycled-Standard-v3.pdf http://www.ecolabelindex.com/ecolabel/global-recycle-standard http://www.made-by.org/consultancy/standards/grs/
Business Benefits	Environmental compliance and social impact for stakeholders

1.14 Water Risk Monetizer – TOOL

Description	The Water Risk Monetizer is an easy-to-use tool designed to help businesses quantify in monetary terms water risks related to availability and quality. Launched in 2014, the Water Risk Monetizer was developed by Ecolab, Trucost (part of S&P Dow Jones Indices), and Microsoft. Through this collaboration, the tool leverages industry insights, advanced analytics, and Azure Cloud technology to help business leaders easily access information to better understand the impacts of water scarcity. By assessing the impact of declining water quantity and quality on operations, the Water Risk Monetizer provides actionable information to help companies turn water risks into business strategies that enable growth. The Water Risk Monetizer can help businesses: • Understand the full value of water to an operation • Make the case for proactive water management strategies by utilizing risk-adjusted costs to demonstrate potential risk-based return on investment, compared to conventional modeling using only market water costs, water-related risks, and the impact of water scarcity to their business • Identify locations of greatest risk based on quantity and quality risks and growth projections • Prioritize water conservation and reuse investments based on site-specific water risks • Support development of a successful corporate water strategy The Water Risk Monetizer can be used to help businesses better understand water risks and the potential cost implications of water scarcity at a facility. The data provides valuable information to help assess different business models, determine how water costs or scarcity may affect growth plans. and help inform business decisions.
Users (geography and industry)	Broad
Track Record	Leveraging Ecolab's Water Risk Monetizer tool, Microsoft was able to model the full value of water to its business and use risk-adjusted prices to reinforce the business case for water stewardship. Microsoft was able to save more than $140,000 in water costs per year, while also avoiding 58.3 million gallons of potable water use per year (Reference Link).
Investment	
References	https://ceowatermandate.org/resources/water-risk-monetizer-2017/
Notes	Tool for investors to assess shadow price for water
Business Benefits	Resource mapping and optimization, risk mapping

1.15 WASH Sustainability Index Tool – TOOL

Description	The Sustainability Index Tool is a framework to assess the likely sustainability of water, sanitation, or hygiene interventions after they have been implemented. The check considers four main factors that are known to have an impact on sustainability: institutional arrangements, management practices, financial conditions, and technical operations and support. Although the tool was developed globally, it is also necessary to customize indicators – and the associated questions – to specific intervention and country contexts. For example, in the Dominican Republic, the wording of some indicators was modified to match the components of different interventions. It is developed by the USAID-Rotary International H2O Collaboration.
Users (geography and industry)	Broad
Track Record	Dominican Republic: Sustainability Index of WASH Activities Ghana: Sustainability Index of WASH Activities & Partnership Evaluation Philippines: Sustainability Index of WASH Activities & Alliance Evaluation
Investment	Free online excel based tool
References	http://washplus.org/rotary-usaid.html
Business Benefits	Sustainability reporting and disclosure mechanism

1.16 Alliance for Water Stewardship – GUIDELINE

Description	AWS International Water Stewardship Standard (AWS Standard) is a globally applicable framework for major water users to understand their water use and impacts, and to work collaboratively and transparently for sustainable water management within a catchment context. The Standard is intended to drive social, environmental, and economic benefits at the scale of a catchment. It achieves this by engaging water-using sites in understanding and addressing shared catchment water challenges, as well as site water risks and opportunities. It asks water-using sites to address these challenges in a way that progressively moves them to best practice in terms of four values: sustainable water balance, good water quality, healthy important water-related areas (sites and values), and good water governance.
Users (geography and industry)	http://a4ws.org/membership/members/
Track Record	NestléWaters completed the certification of all five of its factories in California. The company's factory in Cabazon, California was the first facility in North America to achieve an AWS Gold certification. Cabazon's AWS Gold certification is reflective of the facility meeting of advanced-level criteria, including a consensus of stakeholders affirming the positive contributions that the Cabazon factory made on water balance and the quality of the catchment (Reference Link). Ecolab's manufacturing plant in Taicang, China, is the first site in the world to be independently certified under the Alliance for Water Stewardship's global standard for water stewardship. Ecolab partnered with the World Wildlife Fund to field test and implement the framework at its Taicang manufacturing plant, which is located in a water-sensitive area in the Taihu basin of the Yangtze region (Reference Link).
Investment	Independent certification bodies - cost not available online
References	http://a4ws.org/about/
Business Benefits	Community stewardship, environmental compliance, and social impact for stakeholders.

1.17 CEO Water Mandate Disclosure Guidelines – GUIDELINE

Description	The CEO Water Mandate's Corporate Water Disclosure Guidelines offer a common approach to business reporting on water-related issues. They put forward metrics and approaches that allow companies to communicate meaningfully with stakeholders about water management practices, and that can begin to harmonize practice. The Guidelines also define which water-related topics to report. These Guidelines are intended to drive convergence and harmonization with respect to how companies report their water management practices while helping to minimize reporting burdens, thus allowing companies to allocate more time and resources to actively managing water. Companies provide several types of water-related information: • Company Water Profile: company's relationship with water resources, offering a snapshot of water performance, risks, impacts, and response strategies that nontechnical audiences can easily understand. • Defining What to Report: description of the process by which a company determines which water-related content to include in its report. The company assesses 1) the significance of water-related topics and associated business risks, opportunities, and impacts, and 2) the influence that those topics may have on stakeholders' assessments and decisions. • Detailed Disclosure: finally, the company provides detailed metrics and qualitative information related to its water management, as well as to the specific water management programs and projects it implements. The Detailed Disclosure pillar is divided into sections and subsections that illustrate the types of water-related information to report. These are further subdivided into categories ranging from Context to External Engagement.
Users (geography and industry)	
Track Record	
Investment	
References	https://ceowatermandate.org/disclosure/ https://ceowatermandate.org/files/Disclosure2014ES.pdf
Notes	The Guidelines cover all steps of the water stewardship journey
Business Benefits	Sustainability reporting and disclosure mechanism

Value Chain for the following:

2.1 Water Calculation Tool for the Wet Processing Sector – TOOL

Description	DNV GL and UN Industrial Development Organization have jointly developed a self-assessment tool to assist textile companies in evaluating the water footprint in manufacturing processes. This will help them make more informed decisions about how to manage water consumption in their supply chains. The Global Network for Resource Efficient and Cleaner Production (RECPnet) facilitates the use of the tool, guiding companies on its use and how to interpret results. Input requires providing background information about: • Business: company size production, annual production, raw material (fibre type), product, relevant manufacturing processes, water source, and treatment • Water data: process specific data of water consumption and quality based on batch or continuous processing, depending on the availability of data (estimation, process control, measured data) • Chemicals and discharge: provide information on used chemicals and amount and quality of discharged wastewater The resulting report provides an overview of water consumption and compares it with regional available indicators of best practice.
Users (geography and industry)	Textile industry
Track Record	Not available
Investment	The tool is free to use, but the responses that need to be developed as part of an action plan have associated costs.
References	https://watercalculator.dnvgl.com/ https://www.just-style.com/news/new-tool-to-help-textile-industry-cut-water-consumption_id131526.aspx
Business Benefits	Resource optimization

2.2 bluesign® System – GUIDELINE

Description	The bluesign® system reduces environmental impact across the entire textile supply chain. With its holistic approach, the Input Stream Management provides an efficient solution for chemical suppliers, textile and accessories manufacturers, as well as fashion brands. The bluesign® criteria define the requirements for inputs, production sites, and products. They enable textile companies to boost their competitiveness by responsible and sustainable industry solutions. The bluesign® system helps to eliminate harmful substances from the very beginning thereby minimizing environmental risks and impact and improving sustainability. The bluesign® system is based on input-stream management. Chemicals are assigned to one of three categories: blue – safe to use; gray – special handling required; and black – forbidden. Water is one of the five principles of the system.
Users (geography and industry)	Adidas, ASICS Corporation, Super Natural, Salomon S.A.S., Anubha (Reference Link)
Track Record	bluesign® system partners include chemical suppliers such as BASF SE, Huntsman Textile Effects and Asahi Glass Co. Ltd., manufacturers such as Kolon Fashion, Tübas and Youngone and brands such as adidas, lululemon athletica, NIKE and Patagonia (Reference Link)
Investment	There is no fixed fee; the costs are based on the complexity of the factory. If the factory is vertically integrated and uses many different chemical components in various processes, it takes more work and effort to conduct a screening. For the first screening there is a onetime fee. If the factory decides to become a bluesign® system partner, there is a yearly fee. However, as a bluesign® system partner, the company has access to the bluesign® bluefinder and re-screenings are included in the yearly fee. The same cost model applies to all factories. The one-time screening fee and the yearly fee for the system partnership depends on the complexity of production. To estimate the cost, an initial questionnaire is sent to the customer to assess the situation. Important factors are the number and complexity of different process steps and the number of chemical products in use.
References	https://www.bluesign.com/industry/bluesign-system/principles.html https://www.patagonia.com/bluesign.html
Business Benefits	Environmental compliance and resource optimization

2.3 BVE3 Environmental Emission Evaluator – TOOL

Description	BV Ecube is a tool developed by Bureau Veritas to measure chemical utilizations within supply chains. Ecube aims to transform the textile industry from a reactive to proactive approach in chemical input management and is designed to help identify area of improvement in chemical usage and discharge. The BVE3 web platform allows factories to monitor, benchmark, and improve the supply chain continuously. It also allows companies to perform self-evaluations and establish improvement action plans that control the use of toxic chemicals within supply chains and proactively demonstrate compliance.
Users (geography and industry)	Textile industry
Track Record	H&M has used the BVE3 measurement and monitoring tool since 2016. It helps suppliers assess their performance and proactively improve their chemical usage and discharge performance. H&M started a pilot project at 29 suppliers in China, Bangladesh, Indonesia, India, Pakistan, and Turkey to test the online version of this tool (Reference Link).
Investment	No info on investment found
References	https://staging.e3.bvonesource.com/cd/cpdHome
Notes	There is no record of any other company using this tool apart from H&M
Business Benefits	Resource optimization and sustainability reporting

ANNEX 1: ADDITIONAL RESOURCES

- Alliance for Water Stewardship: https://a4ws.org/
- CEO Water Mandate: https://ceowatermandate.org/
- Clean By Design: https://www.nrdc.org/resources/green-textile-redux-clean-designs-10-best-practices-offer-even-greater-pollution-reduction
- Gap Inc. Water Stewardship: https://www.gapincsustainability.com/environment/creating-solutions-women-water
- Pacific Institute Corporate Water Stewardship: https://pacinst.org/corporate-water-stewardship/
- Women and Water Alliance: https://www.globalwaters.org/Women-Water-Alliance
- Women and Water Alliance ISC Factsheet: https://www.globalwaters.org/resources/assets/women-water-isc-fact-sheet
- WWF Water Stewardship: https://wwf.panda.org/our_work/water/water_management/
- WWF Corporate Water Stewardship: https://www.worldwildlife.org/initiatives/corporate-water-stewardship

- WWF, 2019. Transforming the textile sector's approach to water. https://wwf.panda.org/our_work/water/?352012/Transforming-the-textile-sectors-approach-to-water

- WWF, 2018. Water Stewardship Revisited: Shifting the narrative from risk to value creation. https://wwf.panda.org/our_work/water/?333310/Water-Stewardship-Revisited

- WWF, 2013. Water Stewardship for Industries. The need for a Paradigm Shift in India. http://www.indiaenvironmentportal.org.in/content/372557/water-stewardship-for-industries-the-need-for-a-paradigm-shift-in-india/