InTex India

UN environment programme



CLUSTER PROFILING REPORT

Developed under the framework of the InTex India project

SURAT

With the kind financial contribution of

Ministry of Environment and Gender Equality of Denmark

National Implementing Partner

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Enabling Change for Impact

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Disclaimer

This report has been prepared to support knowledge sharing, policy dialogue, and informed decision-making on sustainability and circularity in the Surat textile cluster. The findings, analysis, and recommendations are based on secondary research, information available at the time of publication, and stakeholder consultations and expert inputs.

While every effort has been made to ensure the accuracy of the information presented, the authors and contributing organisations do not guarantee its completeness or absolute accuracy. Data, policies, and market conditions may change over time and should be interpreted in the context of the publication date.

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About the UNEP InTex Programme and Textile Initiative

This report has been developed as part of the United Nations Environment Programme (UNEP) InTex Programme, which focuses on advancing circularity in the textile value chain through life cycle approaches and circular business models.

The InTex (Innovative Business Practices and Economic Models in the Textile Value Chain) Programme, part of the UNEP Textile Initiative, works with governments and SMEs in countries where textiles are a key economic driver, encouraging a shift from a linear take, make and dispose process to a more sustainable, circular model. The programme does this by supporting national-level policy changes that enable a shift towards circularity. It also helps companies understand the impact of the resources they are using, spurring them to optimize production processes, reduce environmental harm, and change the way they do business.

In India, the geographic focus of the InTex Programme are the textile clusters of Surat and Karur (along with adjoining clusters including Salem, Dindigul, Perundurai) for technical assistance and capacity building on lifecycle approaches.

This Surat Cluster Profiling Report has been developed under the framework of the InTex Programme to support evidence-based decision-making, identify opportunities for sustainability and circularity, and inform future interventions in the cluster.

The authors would like to gratefully acknowledge the financial support of the Government of Denmark, whose contribution has enabled the implementation of the InTex Programme and the development of this report.

Executive Summary

The Surat textile cluster in Gujarat is one of India's largest and most dynamic textile hubs, renowned for its integrated value chain spanning synthetic fibre, weaving, processing, and garment manufacturing. The cluster is a global leader in man-made fibre (MMF) textiles, particularly polyester fabrics, serving both domestic and international markets while driving innovation, scale, and value addition.

Economic Significance and Global Market Presence

Surat, Gujarat, is one of India's most industrially intensive cities, supported by strong connectivity and a diversified base including textiles, diamonds, and petrochemicals. The Hazira industrial belt strengthens the ecosystem through proximity to major global companies and port access.

The city accounts for nearly 60% of India's man-made fabric production, making it the country's leading MMF textile hub. With an annual turnover of about ₹68,000 crore, employment for around 1.4 million workers1, and a vast MSME-driven value chain spanning weaving to finished products, Infrastructure & Sustainability Practices. Surat plays a critical role in both domestic wholesale markets; the cluster also exports to the Middle East, Africa, and Asia, underscoring its economic pivotal role.

The cluster has developed a strong common environmental infrastructure, including multiple CETPs and ZLD facilities that treat wastewater from textile processing units before discharge. Medium and large units also operate in-house ETPs to ensure pre-treatment and regulatory compliance.

Infrastructure & Sustainability Practices

- Industrial infrastructure: Well-established industrial estates such as Palsana, Sachin, and Pandesara provide shared infrastructure for textile manufacturing and processing.
- Water resources: Water is sourced from river supply, treated wastewater from Surat Municipal Corporation (SMC) sewage treatment plants, groundwater, and recycled effluents.
- Environmental infrastructure: Multiple Common Effluent Treatment Plants (CETPs), Zero Liquid Discharge (ZLD) facilities, and in-house Effluent Treatment Plants (ETPs) support wastewater treatment, reuse, and regulatory compliance.
- Energy infrastructure: Reliable power is supplied through the state electricity grid, complemented by common boiler systems in industrial estates.
- Sustainability practices: The cluster has begun adopting recycled fibres, low-water dyeing technologies, digital printing, and biodegradable packaging to improve resource efficiency.

Strengthening waste segregation, textile waste recovery, and formalized recycling systems presents a significant opportunity to advance circularity across the value chain.

Despite infrastructure improvements, the cluster faces major environmental challenges, including water pollution, coal-based energy use, air emissions, chemical sludge disposal, and weak solid waste management, reflecting significant circularity gaps. Adoption of global sustainability standards like OEKO-TEX, GOTS, GRS, and ZDHC remains limited to export-oriented units due to high costs, complex compliance requirements, and traceability constraints among MSMEs.

Social conditions across the cluster are improving. However, opportunities remain to strengthen fair wages, occupational health and safety, and broader social protections, particularly across MSMEs. From waste management perspective, key gaps persist in post-consumer textile

collection, fiber-to-fiber recycling, reverse logistics, and end-of-life material recovery, highlighting the need for stronger value chain collaboration, enabling infrastructure, and supportive policy interventions.

.Policy Landscape and Circularity Readiness

Surat benefits from strong policy support under the Gujarat Textile Policy 2024 and related state **The Viksit Gujarat Industrial Policy 2026** provides a strong enabling framework for sustainable industrial development by supporting wastewater recycling, Zero Liquid Discharge (ZLD) systems, cleaner production technologies, common environmental infrastructure, and resource-efficient manufacturing. The policy also promotes renewable energy, green industrial estates, and circular resource management, creating opportunities for textile clusters such as Surat to accelerate their transition towards low-carbon and circular production systems.

Complementing the state's broader industrial policy, the **Gujarat Textile Policy 2024** provides targeted support across the textile value chain to enhance competitiveness, technology adoption, and sustainable manufacturing. The policy offers incentives for capital investment, technology acquisition, energy and water conservation measures, quality certification, renewable energy use, and employment generation. By encouraging modernization, resource-efficient production, and value addition, the policy creates an enabling environment for textile clusters such as Surat to strengthen their global competitiveness while advancing their transition towards more sustainable and circular production systems.

The **Economic Master Plan for the Surat Economic Region (SER)**, developed under NITI Aayog's Growth Hub (G-HUB) initiative, presents a long-term roadmap to transform the region into a globally competitive economic hub by 2047. The plan identifies textiles and apparel as one of the region's key growth drivers and outlines interventions to promote high-value manufacturing, technology adoption, logistics, skills development, sustainability, and quality of life. By integrating infrastructure development with economic diversification and environmental sustainability, the Master Plan provides a strategic framework to enhance the competitiveness and resilience of the Surat textile cluster while supporting its transition towards resource-efficient and circular industrial growth.

With this strong policy backing, the cluster is well-positioned to accelerate the adoption of sustainable and circular practices. While initial steps have been taken, broader systemic interventions and stronger stakeholder collaboration are essential to reduce environmental impacts and enhance competitiveness in sustainability-driven markets.

Recommendations and Potential Areas for Intervention

Surat does not need to start its sustainability transition from scratch. The cluster already has significant manufacturing capabilities, environmental infrastructure, recycling activity, technical institutions and policy support. The priority is to connect and scale these existing foundations to address the key challenges identified across energy, water, materials, resilience and market competitiveness.

The next phase should focus on lowering the resource and carbon intensity of production through energy efficiency, renewable electricity and industrial-heat transition, alongside greater water reuse, resource recovery and safer chemical management. In parallel, Surat can move from predominantly downcycling towards a fibre-to-fibre circular system, strengthening collection, segregation, reverse logistics and polyester recycling.

These environmental improvements need to be supported by stronger social and climate resilience, including MSME preparedness, worker health and safety, skills and welfare. Better sustainability data can provide the connective layer across these efforts. Cluster-level LCA, supported by reliable LCI data, traceability and preparedness for Digital Product Passports, can help enterprises measure impacts, substantiate claims and respond to evolving market requirements.

Realising this opportunity requires coordinated cluster action, bringing together government, industry associations, CETPs, technical institutions and enterprises. Progress should be assessed by measurable improvements in resource efficiency, emissions, water reuse, circularity, resilience, worker welfare and market readiness, rather than scheme uptake alone.

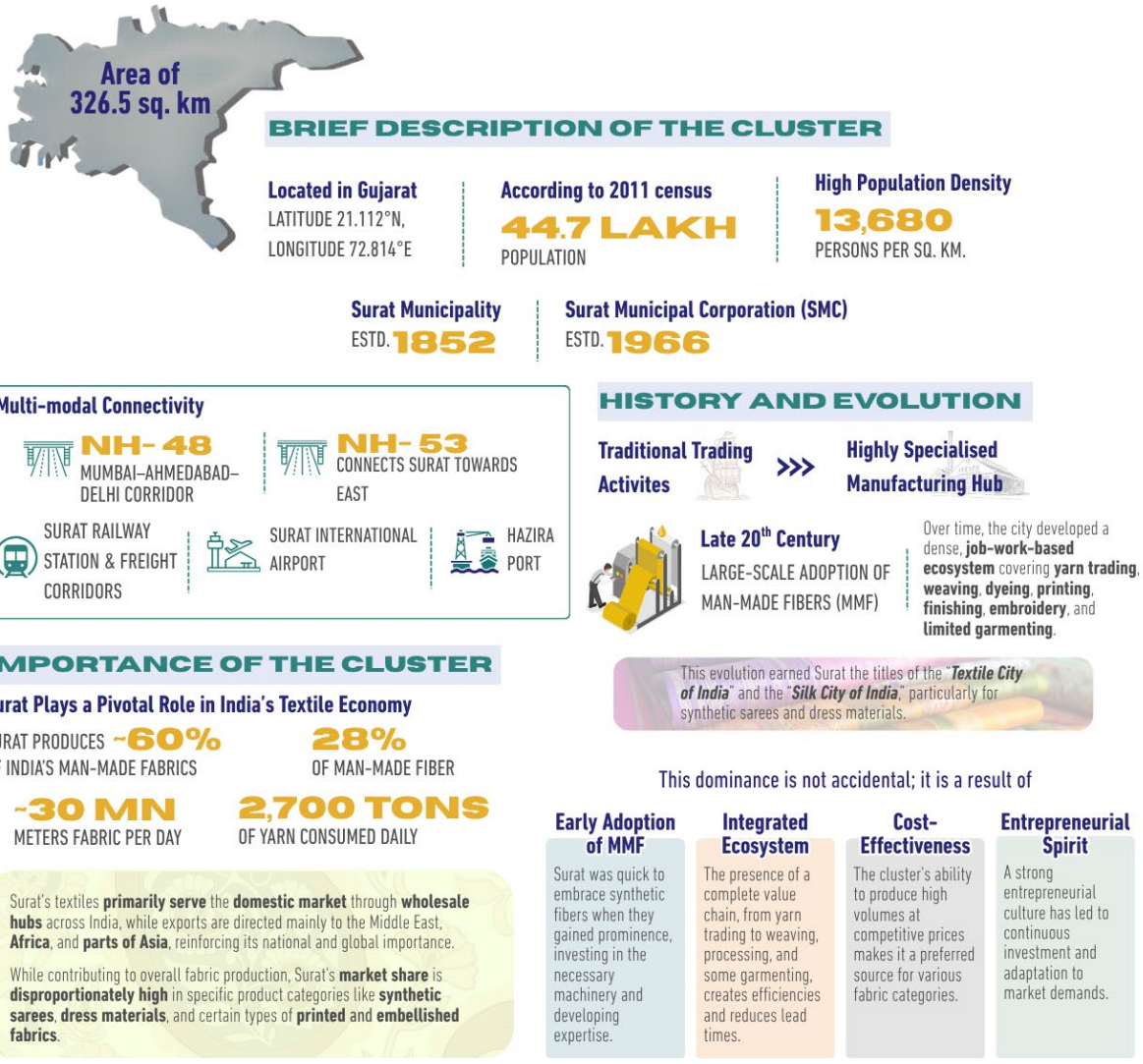
The strategic opportunity is therefore to make sustainability a driver of productivity, resilience and international competitiveness, positioning Surat as a resource-efficient, circular and globally competitive textile hub.

1. Introduction

This cluster profile document has been developed as part of UNEP's InTex Programme in India (project implementation phase: from December 2023 to September 2027) and aims to support circularity in the textile sector in India through life cycle approaches and circular business models. The programme has identified the clusters of Surat and Karur providing technical assistance, training and capacity building support for undertaking life cycle assessments and adopting measures to identify and address critical environmental hotspots during the production processes.

This document provides an overview of the textile industry in Surat, outlines the significance of Surat's textile cluster, provides an understanding of the current sustainability practices, highlights the need for circularity, and proposes the way forward for promoting sustainability and circularity in the cluster. The information presented in this report is based on secondary data and stakeholder interviews (based on questionnaires developed). This report also draws upon an earlier UNEP initiative to prepare a roadmap for developing a circular textile cluster in Surat.

1.1 Cluster Overview



1.2 Economic Profile

Economic Profile – Surat Textile Cluster

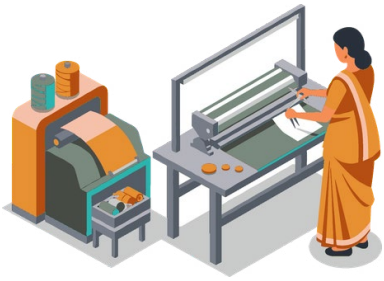
Surat's economy is one of the most industrially intensive and export-oriented urban economies in India, anchored primarily by textiles and diamonds, and supported by petrochemicals, chemicals, and ancillary manufacturing. The city's economic strength lies in its highly specialized, MSME-driven industrial ecosystem, strong domestic trade networks, and increasing integration with global value chains.

While textiles and diamonds are dominant, Surat's industrial portfolio extends to other significant sectors, contributing to its economic resilience and growth. Some of these include:

- **Chemical and Petrochemical Industries**: The Hazira industrial belt, located near Surat, is a major hub for chemical, petrochemical, and natural gas industries. Its strategic location, access to port facilities, and proximity to gas fields make it ideal for these capital-intensive industries.
- **Major Players in Hazira**: This region hosts world-renowned industrial giants, including:
  - ONGC (Oil and Natural Gas Corporation): A leading Indian public sector undertaking engaged in crude oil and natural gas exploration and production.
  - Reliance Industries Limited (RIL): One of India's largest conglomerates, with significant operations in petrochemicals, refining, and textiles (through Reliance Textiles).
  - AM/NS India: A diversified conglomerate with interests in steel, energy, infrastructure, and services, including a major refinery and power plant in Hazira.
  - Shell: A global energy company with operations in liquefied natural gas (LNG) and chemicals.
- **Ancillary Industries**: These major industries foster a robust ecosystem of ancillary units that provide support services, raw materials, and components, further strengthening Surat's industrial base.

Scale and Economic Contribution of the Textile Sector

Surat is India's largest man-made fibre (MMF) textile hub and one of the country's most significant centres for synthetic fabric manufacturing and processing. The textile sector forms the backbone of the city's economy, supported by an extensive network of power looms, processing houses, embroidery units, and ancillary industries. It generates large-scale employment and contributes significantly to both domestic markets and exports, reinforcing Surat's position as a key driver of India's textile industry and an important node in global textile value chains.



KEY ECONOMIC INDICATORS (TEXTILES)

India's Largest Man-Made Fabric Hub
SURAT PRODUCES **~60%**
OF INDIA'S MAN-MADE FABRICS

Economic Contribution
~₹800 BN
ANNUAL FABRIC SALES VALUE

Employment Impact
~1.5 MN
DIRECT JOBS

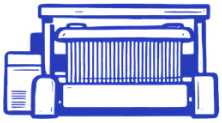
Production Scale
~30 MN
METERS FABRIC PER DAY
14,600 MN
METERS ANNUALLY

Industrial Capacity
6 LAKH+
LOOMS
2,700 TONS
YARN CONSUMPTION PER DAY

Growth Trajectory
5–7%
ANNUAL GROWTH RATE

KEY TEXTILE INDUSTRY STATISTICS

Weaving Backbone



25,000
WEAVING UNITS
7,28,000
TOTAL LOOMS

- **6,35,000** POWER LOOMS
- **64,000** WATERJET LOOMS
- **22,000** RAPIER LOOMS
- **5,000** JACQUARD LOOMS
- **2,000** AIR-JET LOOMS

Processing & Value Addition Assets

- **480** PROCESS HOUSES
- **1,200** WARP KNITTING MACHINES
- **120,000** EMBROIDERY MACHINES
- **3,500** CIRCULAR KNITTING MACHINES

Markets and Trade Ecosystem

185 TEXTILE MARKETS
58,600 TEXTILE SHOPS

ENTERPRISE SIZE COMPOSITION

Micro Enterprises
- Predominant in the weaving and initial processing sectors
- Often operate with a small number of looms (e.g., 4-10 power looms)
- Employ a handful of workers

Small & Medium Enterprises (SMEs)
- Engaged more significantly in dyeing, printing, and finishing, as well as larger weaving operations and garment manufacturing (very few)

Large Enterprises
- Typically integrated textile mills that encompass spinning, weaving, processing, and sometimes even garmenting under one roof

This diverse categorization allows for:
1. Highly specialized division of labor
2. Different segments of the value chain are handled by units best suited for that scale of operation

The interdependence among these units is a defining characteristic of the Surat textile cluster

GEOGRAPHICAL DISTRIBUTION

Palsana
Located on the outskirts of Surat, Palsana is a rapidly developing industrial zone known for its weaving and processing units.

Sachin GIDC (Gujarat Industrial Development Corporation)
Sachin GIDC is one of the oldest and most established industrial estates in Surat, housing a large number of textile units, including weaving, dyeing, printing, and finishing facilities.

Pandesara
Another prominent GIDC estate, it is a major hub for textile processing, particularly dyeing and printing.

Kadodara
Situated on the National Highway, Kadodara is an important textile cluster, particularly known for its weaving and yarn trading activities. Its strategic location provides excellent connectivity for raw material sourcing and finished goods distribution.

Udhana
Historically one of the earliest industrial areas in Surat, Udhana continues to be a significant textile cluster. It hosts a mix of weaving, and processing units, along with a strong presence of textile machinery suppliers and ancillary service providers.

EMPLOYMENT AND WORKFORCE

Employment Numbers

TEXTILE INDUSTRY DIRECTLY EMPLOYS **1.5 MN**

This figure includes those engaged in **weaving**, **dyeing**, **printing**, **finishing**, **embroidery**, **garmenting**, and **associated support services**.

This makes the textile sector one of the largest employers in the region, contributing significantly to socio-economic development.*

Average Workforce

MSMEs
10-50
EMPLOYEES

Micro Weaving Units
5-10
EMPLOYEES

Larger Processing Houses (SMEs)
50-100
EMPLOYEES

Gender Composition

Ownership
The **ownership** and **management** of textile enterprises in Surat are **predominantly male**.

Workforce
Females workforce higher in **labor-intensive** and **skill-based segments** like embroidery, tailoring, and quality checking.



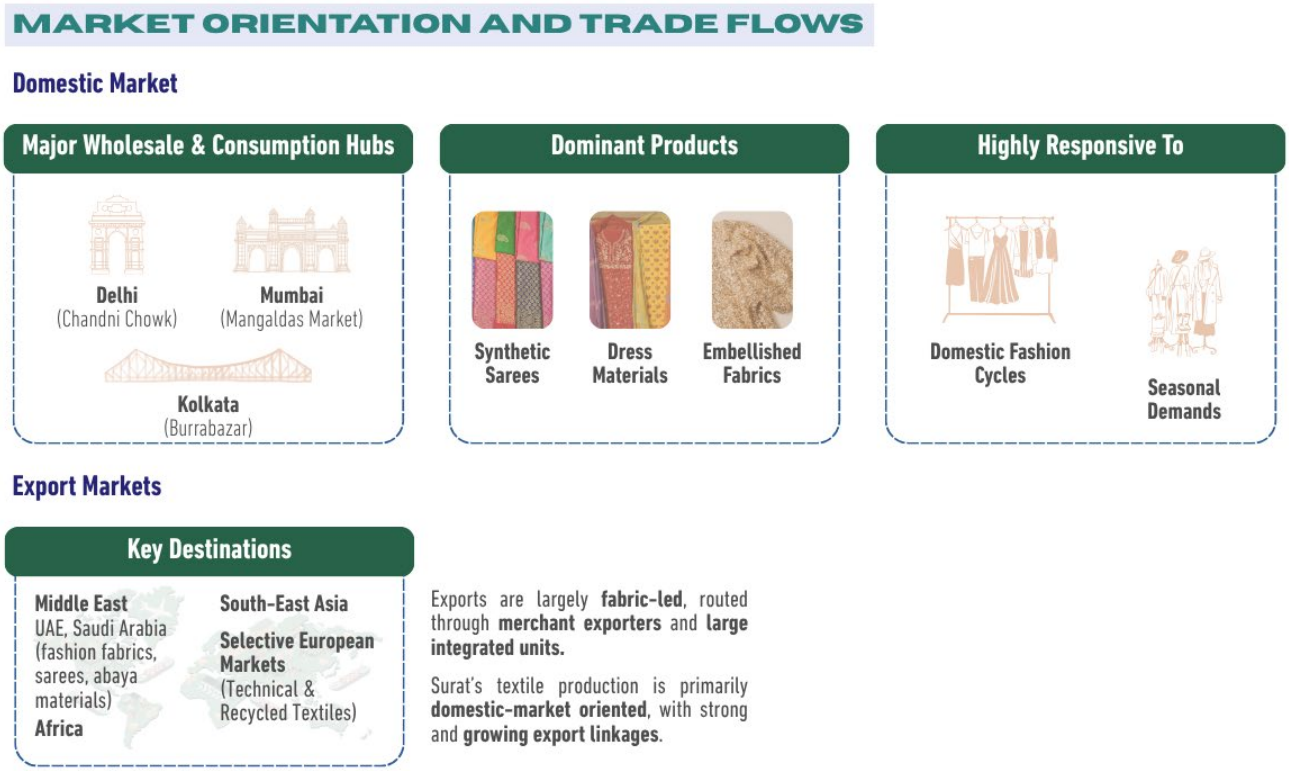
Skilled vs Unskilled Labour

Skilled Labour
Design, **Dyeing Formulation**, **Color Matching**, **Digital Printing Operation**, **Quality Control**, **Machinery Maintenance**, and **Finishing Processes**

Unskilled Labour
Predominantly in **weaving** (operating power looms, loading/unloading yarn), **basic processing** (material handling, fabric folding), and other **manual tasks**. Many **migrant workers** from various parts of India fill these positions.

The availability of a large, adaptable, and increasingly skilled workforce is a key competitive advantage for the Surat textile cluster, enabling it to handle diverse production demands and maintain cost-effectiveness.

*https://www.financialexpress.com/business/industry-why-surat-textile-industry-is-unhappy-with-gst-rate 798194/#:~:text=Surat's%20textile%20industry%20employs%20about,fabrics%2C%20sarees%20and%20dress%20materials.



1.3 Stakeholder Mapping

The Surat textile cluster thrives due to the active participation and collaboration of a diverse range of stakeholders, including industry associations, government bodies, financial institutions, and academic/research organizations.

Industry Associations	Government Departments	Academic and Research Instituitons	Financial Institution
The Southern Gujarat Chamber of Commerce and Industry (SGCCI): Established in 1940, SGCCI is one of Gujarat's oldest and most influential business chambers. With over 14,000 direct members and and network of more than 155 + associations[1].	**Gujarat Industrial Development Corporation (GIDC):** A state-level agency responsible for developing industrial estates and infrastructure across Gujarat. GIDC has played a pivotal role in establishing and maintaining the industrial zones in Surat (e.g., Sachin GIDC, Pandesara), providing land, roads, water, and power infrastructure to textile units.	**The Man-Made Textiles Research Association (MANTRA)**: A major research and industry body supporting the man-made fiber sector in Surat.	Major Financial Institutions in Surat Small Industries Development Bank of India (SIDBI) State Bank of India (SBI) Bank of Baroda Punjab National Bank (PNB) Canara Bank Union Bank of India HDFC Bank ICICI Bank

[1]https://sgcci.in/

Industry Associations	Government Departments	Academic and Research Instituitons
South Gujarat Textile Processors Association (SGTPA): SGTPA represents approximately 400[2] textile processing units in and around Surat. The association focuses on addressing the collective concerns of its members, including policy matters, environmental regulations, and technological advancements.	**Department of Industries, Government of Gujarat:** Works at the state level to promote industrial growth, attract investments, and implement industrial policies that support the textile sector.	**Sardar Vallabhbhai National Institute of Technology (SVNIT):** An Institute of National Importance offering undergraduate to doctoral programs in engineering, technology, and sciences.
Federation of Surat Textile Traders Association (FOSTTA): FOSTTA represents over 65,000[3] textile trading shops across 185 markets in Surat. It plays a pivotal role in addressing industry challenges and liaising with government bodies on behalf of traders.	**District Industries Centre (DIC), Surat:** Provides support to new and existing industries by facilitating registrations, incentives, approvals, and guidance on government schemes at the district level.	**Veer Narmad South Gujarat University (VNSGU):** A state university providing a wide range of programs in arts, science, commerce, management, and law..
Surat Art Silk Cloth Manufacturers Association (SASCMA): Represents art silk cloth manufacturers and is a significant industry body in the city.	**Gujarat Pollution Control Board (GPCB) – Surat Regional Office:** Monitors and regulates industrial and environmental pollution in the district; ensures compliance with environmental laws.	**P. P. Savani University:** Offers diverse programs including engineering, architecture, nursing, and physiotherapy.
Federation of Gujarat Weavers Association (FOGWA): A prominent association for weavers in Gujarat, with significant activity in Surat.	**Surat City Municipal Corporation (SMC):** Responsible for urban governance, including water supply, waste management, sanitation, road infrastructure, and public health services within city limits.	**Sarvajanik College of Engineering & Technology (SCET):** Engineering college under Sarvajanik University, offering undergraduate and postgraduate programs in various engineering disciplines.

[2] https://www.sgtpa.com/
[3]https://www.newsclick.in/GST-Textile-Raised-Upset-Surat-Traders-Protest

2. Overview of Textile Landscape

The Surat textile cluster is one of India's largest textile manufacturing hubs, comprising over 6 lakh power looms, more than 450 processing houses, over 40,000 wholesale outlets, and more than 75,000 textile market shops. Consuming around 2,700 tonnes of yarn and producing approximately 30 million metres of fabric each day, Surat is the backbone of the country's man-made textile industry, accounting for nearly 60% of India's man-made fabric production and providing employment to over 1.4 million people across the textile value chain.

2.1 Production Profile

BACKWARD LINKAGES

Raw material sourcing (e.g., cotton, polyester, dyes, chemicals)

The foundation of Surat's textile industry lies in its efficient sourcing of raw materials, primarily man-made fibers, which are then processed into various fabrics.

Polyester
The most dominant fiber used in Surat, primarily in the form of Polyester Filament Yarn (PFY) and Polyester Staple Fiber (PSF).

Nylon
Used for specific applications requiring high strength, elasticity, and abrasion resistance, such as hosiery, sportswear, and industrial fabrics.

Viscose
It is used in dress materials, fashion fabrics, and blends.

Recycled Polyester (rPET)
Uptake has increased post-2022 due to buyer push for circularity, with companies sourcing from local players using PET bottle flakes.

Cotton
While Surat specializes in man-made fabrics, cotton is also used, particularly in blends with synthetic fibers, or for specific product categories like home textiles and traditional wear.

Dyes and Chemicals
Essential for the processing segment (dyeing, printing, finishing). These include various types of dyes (disperse, reactive, acid dyes), auxiliaries, sizing chemicals, and finishing agents.

FORWARD LINKAGES

Buyers, Exporters, Retail Chains, and Global brands

Surat's textile products reach consumers through a complex network of market linkages and trade flows, both within India and globally.

Domestic Brands

Surat's fabrics and processed textiles are widely used by leading Indian apparel and textile brands.

Wholesale Markets
Surat itself has **massive wholesale textile markets** (e.g., Surat Textile Market, Ring Road Market) where buyers from across India procure fabrics in bulk.

Domestic Players
Numerous **regional** and **national brands**, as well as **unbranded wholesale markets across India** (e.g., Delhi's Chandni Chowk, Mumbai's Mangaldas Market, Kolkata's Burrabazar), are major consumers of Surat's textile products, especially sarees, dress materials, and home textiles.

Distributors & Agents
A network of **distributors** and **agents facilitates** the **reach** of Surat's products to **smaller towns** and **cities**.

Direct Sales to Garmet Manufacturers
Many fabric manufacturers **directly supply to garmenting units across India**.

International Trade

Middle East
A strong and traditional market for Surat's textiles, especially for **fashion fabrics**, **abayas**, and **dress materials**, **driven by cultural preferences and demand from the Indian diaspora**.

The **diverse buyer base**, both **domestic and international**, underscores the **versatility and competitiveness of Surat's textile** offerings, reflecting its **ability to cater to varied market demands** and **quality expectations**.

Buyer Types

- Domestic apparel brands
- Wholesalers and distributors
- International buyers and sourcing agents
- Limited global brand sourcing (export-oriented units)

KEY ACTIVITIES

Weaving
Power looms, waterjet looms, rapier looms, air-jet looms, jacquard looms

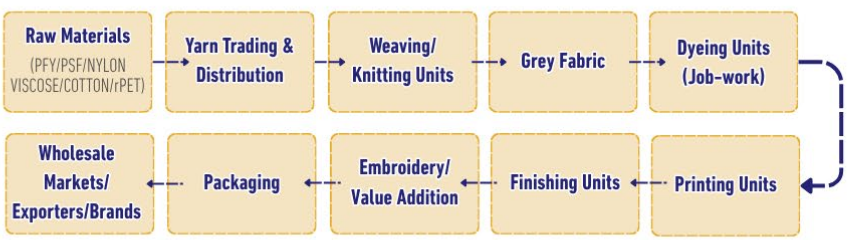
Dyeing
Jet Flow Dyeing, Softina machine treatment

Printing
Flatbed, Rotary, and Digital Printing

Finishing
Calendaring, Mercerization, Heat Setting

Embroidery and Limited Garmenting

SUPPLY CHAIN STRUCTURE



PRIMARY PRODUCT CATEGORY

Surat's textile industry offers a diverse portfolio of products, catering to various market segments and consumer preferences, both domestically and internationally. Surat is the undisputed "***Saree Capital of India***." The city is known for its intricate embroidery, print designs, and value additions on sarees, catering to different price points and occasions.

Sarees

It produces an enormous variety of sarees, ranging from traditional designs to contemporary styles, in various fabrics like georgette, chiffon, crepe, silk blends, and synthetic blends.

Dress Materials

A significant product category, comprising unstitched fabric sets for salwar suits, kurtis, and other traditional or contemporary Indian wear.

Home Textiles

This segment includes a range of products for household use.

- **Bed Linen**: Bed sheets, duvet covers, pillowcases
- **Curtains**: Various fabrics and designs for window coverings
- **Other Decor Items**: Cushion Covers, Table Linens etc.
- **Upholstery Fabrics**: For Furniture
- **Towels and Bath Linens**: It is still a growing segment

Technical Textiles

An emerging and high-growth segment, technical textiles are engineered for specific functional properties rather than aesthetic appeal. Surat's expertise in synthetic fibers positions it well for this sector. Examples include:

- **Geotextiles**: For civil engineering applications (e.g., road construction, erosion control).
- **Medical Textiles**: Surgical gowns, drapes, bandages, implants.
- **Protective Textiles**: For industrial safety wear, fire-retardant clothing.
- **Automotive Textiles**: Seat covers, carpets, airbags.
- **Sportswear & Activewear**: Fabrics with moisture-wicking, breathable, or stretch properties.
- **Agrotextiles**: Shade nets, crop covers.

INDUSTRIAL INFRASTRUCTURE

Surat's textile industry is not confined to a single area but is strategically dispersed across several well-developed industrial clusters, each specializing in different stages of the textile value chain. These clusters benefit from planned infrastructure, connectivity, and a concentration of skilled labor.

Palsana

Located on the outskirts of Surat, Palsana is a rapidly developing industrial zone known for its weaving and processing units.

Kadodara

Situated on the National Highway, Kadodara is an important textile cluster, particularly known for its weaving and yarn trading activities. Its strategic location provides excellent connectivity for raw material sourcing and finished goods distribution.

Pandesara

Another prominent GIDC estate, it is a major hub for textile processing, particularly dyeing and printing.

Sachin GIDC (Gujarat Industrial Development Corporation)

Sachin GIDC is one of the oldest and most established industrial estates in Surat, housing a large number of textile units, including weaving, dyeing, printing, and finishing facilities.

Udhana

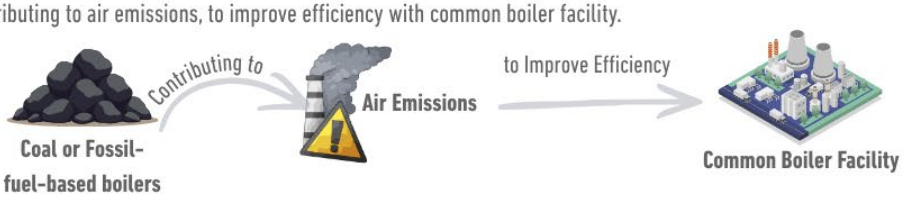
Historically one of the earliest industrial areas in Surat, Udhana continues to be a significant textile cluster. It hosts a mix of weaving, and processing units, along with a strong presence of textile machinery suppliers and ancillary service providers.

Power and Water Supply

The textile cluster's operations are energy- and water-intensive, particularly in dyeing and finishing.

Power Supply

Industrial estates are connected to the state electricity grid. However, due to high thermal energy demand, many units rely on Coal or Fossil-fuel-based boilers contributing to air emissions, to improve efficiency with common boiler facility.



Steam House, Sachin Cluster: Established in 2014, Steam House operates India's first common boiler facility in the Sachin industrial area. The centralized boiler supplies steam to multiple textile units via overhead pipelines, achieving fuel efficiencies of 80–85% compared to 65–70% in individual boilers. This system reduces operational costs, minimizes air pollution, and simplifies regulatory compliance.

Water Supply Infrastructure

The Surat textile cluster relies on a combination of **surface water**, **groundwater, treated sewage water, and recycled industrial effluent** to meet its substantial water demand, particularly from dyeing, printing, and finishing activities.

Surface Water Supply

Freshwater is primarily sourced from the Tapi River, which serves as the main surface water source for Surat's industrial and municipal needs. Water is supplied through infrastructure managed by the Surat Municipal Corporation (SMC) to designated industrial zones

Groundwater Extraction

In areas where surface water supply is insufficient or intermittent, textile units supplement their water requirements through borewells and groundwater abstraction, subject to regulatory permissions. Groundwater remains an important secondary source, particularly for smaller units.

Treated Sewage Water Supply

The Surat Municipal Corporation operates tertiary sewage treatment plants (STPs) that treat municipal wastewater for industrial reuse.

Treated sewage water is supplied

40 MLD **Pandesara GIDC**

35 MLD **Sachin GIDC**

This treated water is used for industrial processes such as **dyeing**, **washing**, and **cooling**, reducing dependence on freshwater sources

Recycled Water from CETPs

Several Common Effluent Treatment Plants (CETPs) within the cluster recycle a portion of treated industrial effluent for reuse by member units.

50 MLD of treated effluent recycled by **Palsana Enviro Protection Ltd. (PEPL)** for industrial reuse.

This recycled water is increasingly used for non-critical process applications, contributing to water conservation.

Internal Water Storage & Distribution

Industrial estates such as **Sachin**, **Pandesara**, and **Palsana** are equipped with **internal pipelines**, **storage tanks**, and **distribution networks** that facilitate the **supply of freshwater**, **treated sewage water**, and **recycled effluent** to **individual units**.

ENVIRONMENT INFRASTRCUTURE

Common Effluent Treatment Plants, Effluent Treatment Plants, Solid Waste Management

Common Facilities

Surat Municipal Corporation STP Tertiary Treatment

Sewage water is treated and is used for Industrial application. It is sent to Pandesara (40 MLD) and Sachin (35 MLD) Industrial Estate.

Palsana Enviro Protection Ltd. (PEPL)

Situated near Kadodara, PEPL is one of Asia's largest textile-focused CETPs. It treats 150 million liters per day (MLD) of effluent and recycles 50 MLD for reuse in member units. Innovatively, PEPL has implemented a solar sludge drying system to convert waste into fuel and has installed a 2.5 MW windmill for captive energy needs.

Hojiwala Industrial Estate CETP

Located in the Sachin-Palsana corridor, this 20 MLD CETP serves waterjet loom-based textile units. Developed by Hojiwala Infrastructure Ltd.

Pandesara Infrastructure Ltd. (PIL)

Serving the Pandesara industrial area, this CETP has a capacity of 100 MLD and utilizes Sequencing Batch Reactor (SBR) technology. It treats effluents from approximately 110 textile processing units and 12 chemical industries.

Sachin Infra Environment Ltd. (SIEL)

Catering to the Sachin industrial cluster, this CETP is designed to handle significant volumes of wastewater from various textile units, ensuring compliance with environmental standards.

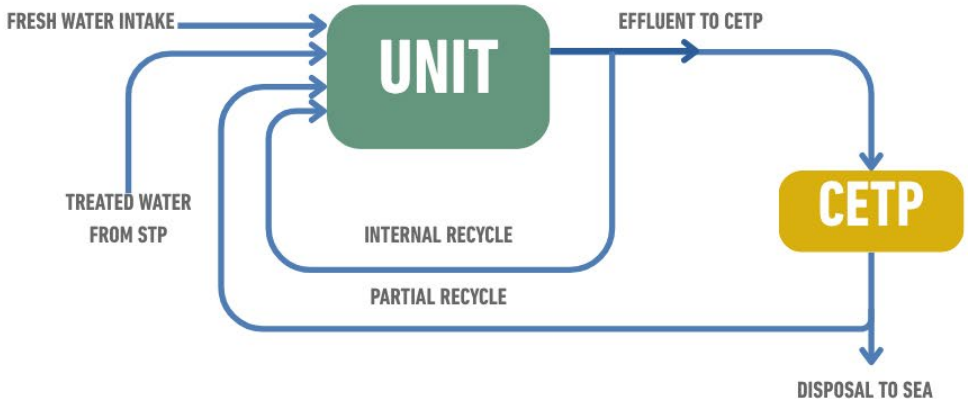
Key CETPs In the Cluster

Table 1: List of CETPs in Surat

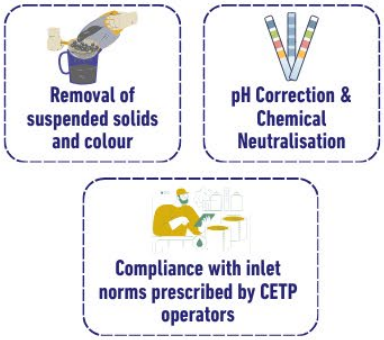
Sr. No	Name of CETP	Built Capacity (MLD)	Majority Members from
1	Pandesara Infrastructure Ltd.	100	Processing Units
2	Sachin Enviro Infra Ltd	50	Processing Units
3	Globe Enviro Care Ltd.	1	Chemical Units
4	Palsana Enviro Protection Ltd	150	Processing Units
5	Kejriwal Integrated Textile Park Ltd	1.25	Weaving Units
6	Gujarat Eco textile park Pvt ltd	60	Processing Units
7	Fairdeal Textile Parks Pvt. Ltd	3.75	Weaving Units
8	New Palsana Industrial Co. Op. Society Ltd.	45	Processing Units
9	Hojiwala Industrial Estate	10	Weaving Units
10	Mangrol Enviro Protect LLP	1	Weaving Units

Effluent Treatment Plants (ETPs)

In addition to shared infrastructure, medium and large textile processing units operate in-house Effluent Treatment Plants (ETPs) as a standard practice. These ETPs primarily serve as pre-treatment systems before wastewater is discharged to CETPs.



Existing ETP practices include



ETPs improve overall treatment efficiency by reducing pollutant load on CETPs and ensuring regulatory compliance. Further, the Common Effluent Treatment Plant (CETP) system is equipped with fine screening, equalization, physico-chemical treatment, clarification, and advanced biological treatment processes. After biological treatment, the treated effluent is discharged into local creeks, eventually reaching the Arabian Sea through the Gulf of Khambhat. Among the key CETPs, the Hojiwala Industrial Estate CETP operates on a Zero Liquid Discharge (ZLD) model with a capacity of 20 MLD. Palsana Enviro Protection Ltd. (PEPL) recycles partly 50 MLD of treated effluent, while the GETP CETP is currently piloting an effluent recycling system.

Solid Waste & Hazardous Waste Management

Solid waste generated within the Surat textile cluster includes textile waste, chemical sludge, and general industrial waste.



Largely managed through a well-established informal recycling system, locally referred to as the ***chindi*** market. This system enables the collection and reuse of fabric waste, which is downcycled into products such as wiping cloths and low-grade fibres. While widespread and functional, this system remains largely informal and lacks systematic tracking or high-value recycling pathways.



In Surat's textile cluster primarily arises from dyeing, printing, and finishing operations, including spent dyes and chemicals, sludge from in-house ETPs and CETPs, and expired or unused chemical inputs. Existing practice mandates that effluent is treated through ETPs and CETPs, resulting in the generation of chemical sludge.This sludge is classified as hazardous waste and is disposed of at authorized hazardous waste treatment, storage, and disposal facilities (TSDFs) as per Gujarat Pollution Control Board (GPCB) regulations. General solid waste and packaging materials are managed through municipal systems and authorised waste collection agencies.

3. Environmental Landscape

3.1 Common Environmental Challenges

The textile industry has a significant environmental footprint, and Surat's cluster, with its intensive processing activities, is no exception. Addressing these concerns is paramount for its long-term viability and social license to operate.

Concerns Specific to Surat's Textile Cluster:

Water Pollution from Dyeing Units: This remains arguably the most critical environmental concern for Surat. Despite the presence of CETPs, managing the sheer volume and diverse chemical load from thousands of units remains a challenge.

High Energy Consumption: Textile processing in Surat, especially the dyeing, printing, and finishing segments, is highly energy-intensive. Heating large volumes of water for dyeing, running powerful machinery, and drying fabrics consume substantial amounts of electricity and thermal energy. Much of this thermal energy is generated from coal-fired boilers, contributing significantly to greenhouse gas emissions and local air pollution.

Air Pollution: Emissions from industrial activities in Surat are a considerable concern. Boilers in processing houses, often fueled by coal or furnace oil, release particulate matter (PM2.5, PM10), sulfur dioxide (SO2), and nitrogen oxides (NOx), contributing to smog, acid rain, and respiratory issues for the densely populated city. Volatile Organic Compounds (VOCs) from printing and finishing processes, especially from screen printing operations, also contribute to air pollution.

Chemical Waste: The chemical sludge generated from ETPs and CETPs, along with unused or expired chemicals, poses a severe threat as a growing land constraint near Surat.

Solid Waste: Beyond liquid and gaseous emissions, the textile industry in Surat generates significant solid waste, including fabric scraps (Chindi), yarn waste, packaging materials, and general industrial refuse. Discussions with industry stakeholders revealed that units don't have an idea on the destination of their textile waste, with no formal linkages established with recyclers for pre-consumer textile waste, highlighting a significant untapped opportunity for circularity within the cluster.

3.2 Certifications and Standards

Certifications play a vital role in demonstrating commitment to sustainability and gaining market access, particularly for Surat's export-oriented units. However, adopting these certifications comes with its own set of challenges for the predominantly MSME-driven cluster.

Common Certifications Relevant to Surat:

While primarily export-oriented units in Surat pursue these, their importance is growing for the entire cluster:

- OEKO-TEX Standard 100
- Global Organic Textile Standard (GOTS)
- Global Recycled Standard (GRS)
- ZDHC (Zero Discharge of Hazardous Chemicals) Programme

Challenges in Adopting Certifications for Surat's Industries:

- **High Costs for MSMEs**: Obtaining and maintaining international certifications is prohibitively expensive for the vast majority of Micro, Small, and Medium Enterprises (MSMEs) in Surat. These costs include audit fees, extensive laboratory testing, and the necessary investments in process upgrades and infrastructure to meet certification standards, often impacting thin profit margins.

- **Complex Processes & Documentation**: The certification process is often complex, requiring detailed documentation, adherence to stringent environmental and social criteria, and regular, rigorous audits. Smaller units in Surat often lack the administrative capacity, technical expertise, and dedicated personnel to navigate these intricate requirements effectively.

- **Buyer-Driven Nature for Exports**: For many units in Surat, certifications are primarily adopted when explicitly demanded by their export buyers, rather than being an intrinsic, proactive initiative for sustainability across the entire cluster. This suggests a market pull for certified products, but a weaker internal drive for universal adoption, especially for products destined for the domestic market.

- **Fragmentation of the Cluster**: The highly fragmented nature of Surat's textile industry, with thousands of small units operating independently, makes it challenging to implement cluster-wide certification initiatives or ensure consistent compliance across the entire value chain.

- **Lack of Awareness and Incentive**: While awareness is growing, some smaller units may still lack a full understanding of the long-term benefits of certifications (e.g., enhanced market access, better brand image, improved efficiency) beyond immediate buyer requirements. Lack of sufficient government incentives to cover certification costs also remains a barrier.

- **Supply Chain Traceability**: Ensuring compliance and traceability across the entire supply chain, from raw material suppliers to finished product manufacturers, particularly in a fragmented cluster like Surat with multiple job-work arrangements, can be very difficult.



4. Social Landscape

Social sustainability is crucial for ensuring fair labor practices, worker well-being, and community development within the Surat textile cluster, which relies heavily on a large and often migrant workforce.

- **Efforts to Improve Working Conditions**: There is a growing focus among Surat's textile enterprises, particularly the larger and more organized ones, on providing a safer, more hygienic, and comfortable working environment. This includes improving ventilation, lighting, reducing noise levels, and considering aspects in factories. Industry associations like SGCCI also play a role in promoting these standards.
- **Addressing Migrant Worker Issues**: A significant portion of Surat's textile workforce comprises migrant laborers from various parts of India. Efforts are needed to ensure proper registration, provide access to dignified housing (often through industrial housing projects), healthcare facilities, and protect them from exploitation. NGOs and local government bodies in Surat often collaborate to address these welfare issues and facilitate their integration.



Credit: Tanushree Mitra via Unsplash

5. Current Sustainability and Circularity Practices

5.1 Raw Materials Transition

Surat's textile cluster continues to be predominantly dependent on man-made fibres (MMF), particularly polyester, which forms the backbone of its weaving, processing, and finishing ecosystem. At present, virgin polyester remains the dominant raw material, reflecting the cluster's cost-sensitive production structure and export orientation.

Limited but selective use of recycled polyester (rPET) is observed among a small number of larger and export-oriented units. These units procure recycled polyester yarn primarily for compliance with specific buyer requirements rather than as a cluster-wide sustainability transition. The usage of organic cotton or other natural fibres remains minimal and is largely confined to niche blended fabrics or pilot-scale production, rather than mainstream manufacturing.

Research institutions and technical bodies such as MANTRA are engaged in laboratory-level research on alternative fibres; however, commercial adoption of bio-based or new-age fibres is not yet prevalent within the cluster.

5.2 Design and Innovation Practices Supporting Circularity

Design and innovation are crucial for embedding sustainability and circularity from the very beginning of the product lifecycle in Surat's textile cluster.

Emphasis on Sustainable Design Practices:

- Design for Recyclability: Surat cluster majorly designs products with single-fiber compositions such as polyester or nylon which facilitate easy end-of-life recycling.

- Design for Low Impact: Surat industries are trying to incorporate materials and processes that minimize environmental footprint, such as using low-water dyes, less energy-intensive finishes, or fibers such as rPET or viscose with lower carbon footprint, is gaining importance in Surat's design considerations.

5.3 Development of Sustainable and Innovative Textiles:

- **Utilizing 'Chindi' (Textile Waste)**: The informal "Chindi" (textile waste) market in Surat is a traditional form of circularity, where fabric scraps are collected. While often downcycled into lower-value products like industrial rags, wiping cloths, or shoddy yarn, there's a significant opportunity for innovation in Surat. Designers and entrepreneurs are exploring creative upcycling of 'Chindi' into higher-value products such as fashion accessories, home décor items (e.g., patchwork quilts, rugs), or even incorporating them as embellishments in new garments. This not only reduces waste but also creates unique, craft-based products.

- **Digital Design and Prototyping**: The adoption of digital printing technologies in Surat has significantly impacted design. It enables rapid prototyping and short-run production, reducing material waste from large print runs and allowing for quick adaptation to fashion trends with minimal environmental impact. CAD/CAM systems are also aiding in optimized fabric utilization, reducing cutting waste.

5.4 Waste Management & Circularity

Effective waste management and a move towards a truly circular economy are critical for Surat, given the sheer volume and diversity of its textile waste.

Recycling of Textile Waste into Yarn:

- **Formalizing the 'Chindi' Economy**: The informal sector in Surat has long dealt with "Chindi" (pre-consumer and some post-consumer textile waste) by sorting and selling it for downcycling into rags, mops, or low-grade fibers. The challenge and opportunity lie in formalizing and upgrading this existing ecosystem. This would involve establishing organized collection centers, mechanized sorting, and investing in advanced technologies for high-quality fiber-to-fiber mechanical or chemical recycling.

- **Investment in Recycling Infrastructure**: For Surat to achieve true circularity for its polyester and blended textile waste, there is a strong need for dedicated, large-scale, and technologically advanced textile recycling facilities. These facilities would need capabilities for both mechanical recycling (for certain types of waste) and chemical recycling (for complex blends and polyester, enabling recovery of virgin-like polymers).

- **Collaboration for Post-Consumer Waste**: Collecting and processing post-consumer textile waste (used garments) from a scattered consumer base is a more complex challenge. This would require collaboration between local authorities, industry associations, and potential reverse logistics providers in Surat to create an efficient collection and sorting system.

5.5 Use of Biodegradable Packaging Materials:

- A gradual but necessary shift in Surat is the transition from conventional plastic packaging to more eco-friendly alternatives. This includes using recycled paper, biodegradable films, or reusable industrial bags for transporting and packaging textile products within and outside the cluster, thereby reducing plastic waste generation.

- Reducing overall packaging material usage through optimized packing methods.

5.6 Institutional and Industry-Led Sustainability Actions

Industry associations in Surat, in collaboration with technical institutions, regularly conduct:

- Awareness workshops on energy efficiency, waste reduction, and compliance

- Training programs related to process optimisation and resource efficiency

These initiatives contribute to incremental improvements in operational sustainability but do not yet translate into systemic circular economy adoption at the cluster level.

These are the some common initiatives :

- Emissions Trading Scheme (ETS)[4] - The Surat Emissions Trading Scheme (ETS) is a cap-and-trade system in Surat, Gujarat, India, designed to reduce particulate matter emissions. It allows industries to buy and sell emission permits, incentivizing them to reduce pollution and stay below a set cap. The Surat ETS is the world's first market-based system specifically focused on trading particulate matter emissions.

- RISE Surat[5] – The project is launched by WRI India, aims to help Surat's textile sector transition to a low-carbon economy. It focuses on equipping at least 50 Micro, Small, and Medium Enterprises (MSMEs) and 500 workers with the necessary knowledge, skills, and tools for decarbonization. The project's goals include raising awareness about climate impacts, promoting sustainable practices, and providing access to financing for low-carbon transitions.



[4]Surat Clean Air Market
[5]WRI India

6. Circularity Readiness Assessment

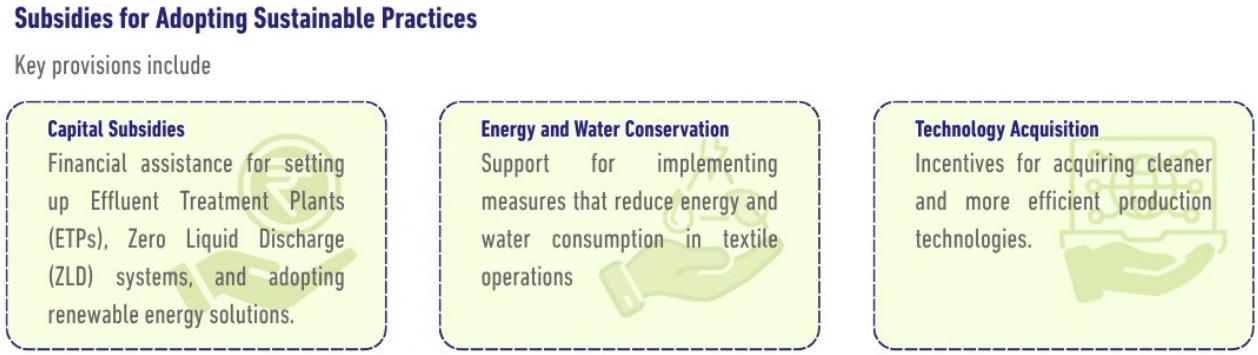
As seen above, the Surat cluster is an important contributor to the Indian textile industry in terms of production, employment, and exports. Further, the cluster has been steadily making efforts to adopt more sustainable practices especially related to emissions trading and wastewater management, and there is an increasing interest to invest in more circular and sustainable practices. Given below is a SWOT analysis of the cluster for adopting circular and sustainable practices.



7. Policy and Institutional Landscape

Government policies and schemes play a crucial role in shaping the growth trajectory and competitiveness of the Surat textile cluster.

The **Gujarat Textile Policy 2024** offers substantial incentives to promote environmental sustainability within the textile sector.



State Government Policies

Scheme/Policy	Key Features	Link
Scheme of Assistance for Common Environmental, Industries and Mine Department, Government of Gujarat	▪ Assistance up to 40% of eligible fixed capital investment in the Project upto Rs. 50Cr for setting of common environmental infrastructure facilities. ▪ 35% or maximum Rs2 Cr, if solid fuel used and 50% of the cost maximum Rs.2Cr, if cleaner fuels used for Common Boiler Project by SPV constituted by minimum 10 MSME's.	https://ifp.gujarat.gov.in/
Scheme of Assistance for Environmental Protection Measures, Industries and Mine Department, Government of Gujarat	▪ Upto 35% of the cost of plant and machinery, maximum Rs. 35lacs for MSME for implementation of cleaner production technology. ▪ Upto 25% of the cost of plant and machinery, maximum Rs. 35lacs for MSME for environmental management project using Clean, Efficient and Innovative Pollution Control Equipment. ▪ Upto 75% for environmental audits with a ceiling of Rs.50,000/Audit. ▪ Upto 25% or Rs.5lacs, whichever is less, for installation of Continuous Stack Emissions Monitoring System (CSEMS). ▪ Upto 50% or Rs.2.5lacs, whichever is less, for industrial building with green rating. ▪ Upto 50% or Rs. 10 lacs, whichever is less, for setting up of Environment Management System and Laboratory. ▪ Upto 35% or Rs. 35lacs, whichever is less, for purchase of new equipment for health and safety compliances. ▪ Upto 50% or Rs. 75lacs, whichever is less, for capital investment for at least 50% waste water recovery unit.	https://ifp.gujarat.gov.in

Scheme/Policy	Key Features	Link
Scheme of Assistance for Industrial Infrastructure, Industries and Mine Department, Government of Gujarat	▪ Upto 80% or Rs. 25 crores, whichever is less, for development of common infrastructure facilities, link infrastructure facilities, dormitory facilities for workers.	https://ifp.gujarat.gov.in
Scheme of Enhancement of Technical Competence and Manpower, Industries and Mine Department, Government of Gujarat	▪ Upto Rs. 10 crores during the operative period of 5 years for capital and operating expenses of Anchor Institute. ▪ Upto 50% of project cost or Rs. 2 crore, for setting up of Specialized Skill Development Centres at Industry. ▪ Upto Rs. 1 crore for setting up of Skill Upgradation Centres at GIDC estates/Industrial Parks/SEZs etc. ▪ Upto Rs. 10,000 course fee for trainee sponsored by an MSME for Skill Development. ▪ Upto Rs. 15,000 per candidate for training courses with maximum duration of 6months. ▪ Upto Rs. 1,00,000 for awareness programme, seminar support with prior approval.	https://ifp.gujarat.gov.in

8. Recommendations and Conclusion

Recommendations

The Surat textile cluster has significant potential to evolve into a leading sustainable and circular textile manufacturing hub. It already has important foundations, including common environmental infrastructure, emerging resource-efficiency practices, industry-led sustainability initiatives, recycling activity and supportive state and national government policies. At the same time, recent developments have highlighted the cluster's exposure to energy, climate and workforce-related disruptions. The priority is therefore to move from fragmented sustainability initiatives towards coordinated, life-cycle-based action that also strengthens the cluster's resilience and long-term competitiveness.

Drive renewable, energy-efficient and low-carbon production

Reducing energy and resource consumption should remain a priority, particularly given the high thermal-energy demand of dyeing, printing and finishing. MSMEs should be supported to adopt lean manufacturing, GPCB-recommended Best Available Technologies (BATs), energy-efficient equipment and Industry 4.0 solutions such as IoT, automation and AI for process optimisation.

Given recent fuel and energy-price volatility, the focus should extend beyond renewable electricity to industrial heat efficiency and decarbonisation. Pilot heat pumps, electric boilers, thermal storage and Heat-as-a-Service models for suitable lower-temperature processes can help reduce fuel dependence and upfront investment barriers. Waste-heat recovery should also be promoted to reduce thermal-energy demand[6].

[6]Vasudha Foundation (2026). Electrification of Textile Heat. July 2026

Renewable electricity should form a parallel pillar of the cluster's energy transition. NITI Aayog's 2026 Roadmap for Green Transition of MSMEs estimates that meeting 50% of Surat textile's electricity demand through renewable energy would require approximately 631 MW of solar capacity, with an estimated 1.3 million tonnes of CO_2 reduction potential[7]. Aggregated rooftop and ground-mounted solar, RESCO models and Green Open Access can help MSMEs overcome upfront investment and scale constraints.

The transition is also relevant from an energy-security perspective. Vasudha Foundation finds that Surat's textile processing sector is highly dependent on coal, lignite and gas-based process heat, exposing units to fuel availability and price volatility[8]. Electrification of suitable process-heat applications, supported by reliable renewable power procurement, can reduce this dependence while improving energy-cost predictability and operational resilience.

Pilot heat pumps, electric boilers, thermal storage and Heat-as-a-Service models for suitable lower-temperature processes, together with waste-heat recovery, can help reduce fuel dependence and upfront investment barriers.

This transition can build on existing cluster initiatives, including the Surat Emissions Trading Scheme[9] for market-based air-pollution management and similar such initiatives for MSME capacity building, resource-efficiency measures, low-carbon technologies, alternative fuels and access to finance.

Strengthen water and chemical management

Water pollution remains one of the significant environmental concerns for Surat's textile-processing sector, despite an established network of CETPs, ZLD facilities and in-house ETPs. The focus should therefore move beyond creating additional treatment infrastructure towards improving the performance, reuse and resource utilisation of existing systems.

Gujarat's treated wastewater reuse policy[10] established a trajectory towards 70% reuse by 2025 and 100% by 2030. With the 2025 milestone now passed, the gap between policy ambition and actual reuse performance warrants renewed attention. SMC's planning already provides for expanded tertiary-treated wastewater supply to industrial areas, building on existing supplies to textile clusters including Pandesara and Sachin. Closing the remaining gap, particularly by expanding reliable tertiary-treated wastewater supply to industrial units that continue to depend on borewells and private tankers, should be treated as a fundable and trackable cluster priority. SMC, GIDC and industry associations should jointly monitor progress against the state's wastewater-reuse targets.

Alongside water management, greater attention should be given to green chemistry through the adoption of safer, non-toxic and biodegradable chemicals, improved chemical handling and process optimisation. Technical institutions such as MANTRA can support industries in identifying safer alternatives and improving chemical-management practices.

[7]NITI Aayog. (2026). Roadmap for Green Transition of MSMEs
[8]Vasudha Foundation. (2026). Energy Security and Stability: Rethinking Fuel Dependence
[9]Emissions Market Accelerator. (2026). Evidence from India
[10]Surat Municipal Corporation. (2019). Action Plan: Reuse & Recycle of Treated Wastewater

Build a fibre-to-fibre circular textile system

Surat's existing informal textile-waste ecosystem, particularly around Chindi, provides an important foundation for circularity. However, much of this activity remains focused on sorting and downcycling, while formal systems for collection, aggregation, reverse logistics and fibre-to-fibre recycling remain limited.

For polyester, this should include mechanical and chemical recycling, with chemical recycling offering potential for blended, contaminated or otherwise difficult-to-recycle streams by recovering polymer or chemical building blocks for new polyester production.

The wider region is already seeing investment in this space, with Filatex India planning a ₹300 crore textile-to-textile polyester recycling plant in Gujarat[11], with a proposed capacity of 26,750 tonnes per annum. Surat should strengthen the upstream waste ecosystem to supply such capacity with suitable textile waste, helping shift from downcycling towards closed-loop material recovery and reduced dependence on virgin polyester.

Strengthen social and climate resilience

Sustainability efforts should also strengthen the cluster's ability to manage climate risks, workforce challenges and operational disruptions.

- Climate and business continuity: A 2026 WRI India assessment of 310 MSMEs across Surat, Chennai and Coimbatore found that only 13% had a formal business-continuity plan and 21% had access to emergency funds, highlighting gaps in MSME preparedness and financial resilience[12]. Cluster institutions should support climate-risk assessment, business-continuity planning, insurance awareness and access to emergency finance.

- Worker health and safety: Heat exposure is a significant concern in Surat's textile-processing units. WRI's assessment of Surat MSMEs recorded indoor temperatures of up to 40°C and humidity of up to 99%, with workers reporting heat-related discomfort[13]. Measures such as ventilation, insulation, heat shielding and appropriate cooling should therefore be integrated into occupational health and safety programmes.

- Inclusive workforce transition: Greater attention should also be given to worker welfare, skills development and women's participation. Recent labour-law reforms provide an opportunity to broaden the workforce.

Strengthen sustainability performance, traceability and market access

Sustainability requirements are increasingly shaping market access, while certification, testing and documentation remain challenging for MSMEs. The cluster should strengthen shared technical support for LCA, testing, certification and digital traceability, enabling enterprises to move from buyer-driven compliance towards measurable and demonstrable sustainability performance.

Life Cycle Assessment (LCA) and reliable data can provide the foundation for this transition. LCA can help enterprises identify environmental hotspots and prioritise improvements, while UNEP's InTex programme is supporting the development of a Life Cycle Inventory (LCI) database with robust, country-specific data to support informed decision-making. Building on this foundation, a cluster-level LCA programme can provide MSMEs with shared tools, data protocols and technical assistance to progressively measure and benchmark resource and environmental performance.

[11]The Hindu. (2026). "Filatex India to invest ₹300 crore in polyester textile recycling plant in Gujarat."
[12]WRI India (2026). Resilience of Micro, Small and Medium Enterprises to Climate Risks: A Vulnerability Assessment in the Manufacturing Sectors of Gujarat and Tamil Nadu
[13]WRI India (2025). Addressing Humid Heat Inside Surat's Textile MSMEs

The cluster should simultaneously strengthen traceability and preparedness for Digital Product Passport (DPP) requirements. Establishing systems to track materials, recycled content, processes and environmental performance can help MSMEs substantiate sustainability claims and improve readiness for evolving international market requirements.

These capabilities can also help Surat capture emerging international market opportunities. The PM MITRA Park at Vansi provides a platform for higher-value production and market linkages, while the India-EU FTA, concluded in January 2026[14] and awaiting entry into force, creates an opportunity to strengthen capabilities in sustainable, traceable and compliance-ready textiles.

The objective should be to make LCA, data and traceability practical business tools, rather than additional compliance requirements, helping enterprises improve performance while strengthening competitiveness in domestic and international markets.

Strengthen institutional coordination and policy implementation

Surat already benefits from state support for cleaner production, resource conservation, technology adoption, environmental infrastructure, skills and industrial development. The priority should be to improve awareness, coordination and access to these mechanisms under the Viksit Gujarat Industrial Policy 2026 and relevant sector-specific schemes.

Cluster sustainability planning should align with the Surat Economic Region's long-term development vision, including NITI Aayog's focus on textile value-chain development, MSME participation, global value chains, new-age skills and low-carbon manufacturing[15].

SMC, GPCB, industry associations, CETPs and technical institutions should coordinate a common cluster sustainability agenda, with industry associations facilitating MSME access to technical support and government incentives.

Conclusion

The Surat textile cluster has a strong foundation for sustainable and circular growth, supported by its integrated value chain, manufacturing capabilities, environmental infrastructure, emerging recycling activity, technical institutions and supportive policy environment. However, persistent challenges in energy and emissions, water and chemicals, textile waste, MSME capacity, worker welfare and market requirements require a more coordinated approach.

The Surat textile cluster is at an important point in its sustainability transition. Its scale, integrated fibre-to-fashion value chain, entrepreneurial ecosystem and strong manufacturing base provide a substantial foundation for sustainable and circular growth. At the same time, persistent challenges related to water pollution, energy intensity, emissions, chemical and textile waste, limited recycling, MSME capacity and evolving market requirements demonstrate that further action is needed.

Recent developments have sharpened this picture. Energy and fuel-price volatility, climate-related disruptions and workforce shortages have demonstrated that the cluster's competitiveness is increasingly exposed not only to conventional environmental challenges, but also to energy security, climate risk and workforce resilience.

[14]Government of Gujarat, Industries and Mines Department. (2026). Viksit Gujarat Industrial Policy 2026
[15]NITI Aayog. (2024). Economic Master Plan for Surat Economic Region: Economic Master Plan to Develop Surat City-Region as a Growth Hub by 2047

The cluster does not need to begin its sustainability journey from scratch. Important building blocks are already present, including common environmental infrastructure, emissions-reduction initiatives, resource-efficiency practices, emerging recycled-material use, an established textile-waste ecosystem, technical institutions and supportive policy mechanisms. The key challenge is to connect, strengthen and scale these initiatives across the wider value chain.

A stronger life-cycle approach can provide the common framework for doing so by identifying where the largest environmental impacts and resource hotspots occur, prioritising interventions, measuring improvements and creating greater transparency across the value chain. Circularity can then extend this approach beyond production efficiency towards material recovery, recycled inputs, circular design and new business opportunities.

Sustainability should therefore increasingly be understood not only as an environmental responsibility, but as a competitiveness and resilience strategy in its own right. Lower resource consumption, reduced dependence on fossil fuels and virgin materials, improved water and waste management, stronger worker welfare, better business-continuity capacity and reliable sustainability data can help enterprises manage risk, respond to changing market expectations and strengthen their long-term competitiveness.

The opportunity for Surat is therefore to move from individual sustainability initiatives to a connected, life-cycle-based and resilience-aware circular textile cluster. With coordinated action by industry, government, technical institutions and other stakeholders, Surat can strengthen its position as a globally competitive textile hub while demonstrating a scalable model for sustainable and resilient industrial development in India.

InTex India

UN environment programme



For additional details about the project visit our website here or contact us: emg@ceeindia.org, unep-textiles@un.org

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