Module 04 – Needs and Potentials in India

1 Introduction to Circular Economy (CE)

2 CE in the context of textiles

3 CE policies and enablers for textiles

4 Need and Potentials in India

5 Developing Policy Instruments

6 Best Practice Examples

7 Repository of Toolkits

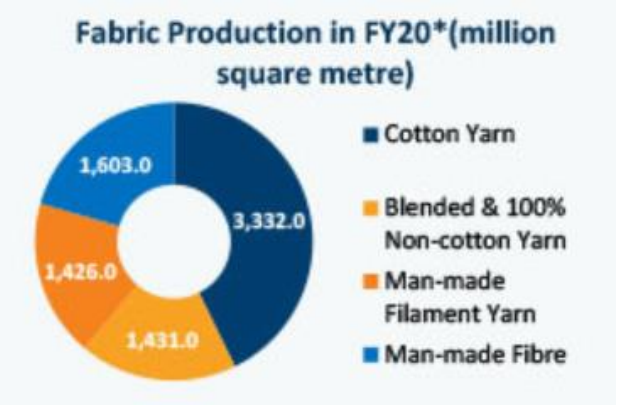


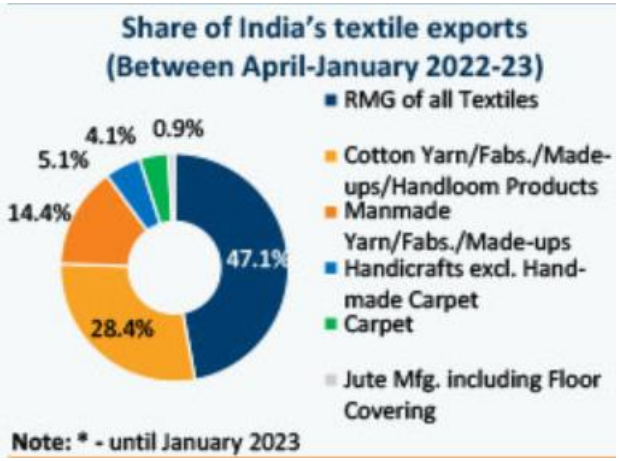
Objective: This chapter will start of with **facts and figures about the textile industry in India**, followed by the outlining of **national policies, strategies and action plans** in regards to waste management. The module ends with an **exercise of analyzing and identifying gaps and needs** in the Indian regulatory framework.

Module 04 – 4.1 Facts and Figures about the Indian Textile Sector

- India is the second-largest producer and exporter of textiles and garments.
- Projections suggest that India's textiles and apparel market will continue growing in the coming years.
- One of India's main products is cotton, making India the largest producer of cotton in the world.
- Cotton production in India is projected to reach 7.2 million tonnes by 2030, driven by increasing demand from consumers.
- India's textile and apparel exports (including handicrafts) stood at US$ 44.4 billion in FY22, a 41% increase year over year. Exports of ready made garments including cotton accessories stood at US$ 6.19 billion in FY22.
- India enjoys a comparative advantage in terms of skilled manpower and in cost of production, relative to major textile producers.







Source: IBEF (2023): https://www.ibef.org/industry/textiles

Module 04 – 4.1 Facts and Figures about the Indian Textile Sector

- In June 2022, it was stated by the Minister of Textiles, Commerce and Industry, Consumer Affairs & Food and Public Distribution that the Indian government wants to establish 75 textile hubs in the country.
- Production-linked Incentive (PLI) Scheme is in place for man-made fibre and technical textiles over a five-year period.
- In June 2023, Government has approved R&D projects worth US$ 7.4 million in textile sector.
- Huge funds in schemes such as US$ 109.99 million for Amended Technology Upgradation Fund Scheme (ATUFS) have been released by the Government in the union budget of 2023-24 to encourage more private equity investments and provide employment.



© cegoh / pixabay

Sources:
IBEF (2023): https://www.ibef.org/industry/textiles;
Picvisa (2023): https://picvisa.com/en/waste-management-industrial-post-industrial-waste/

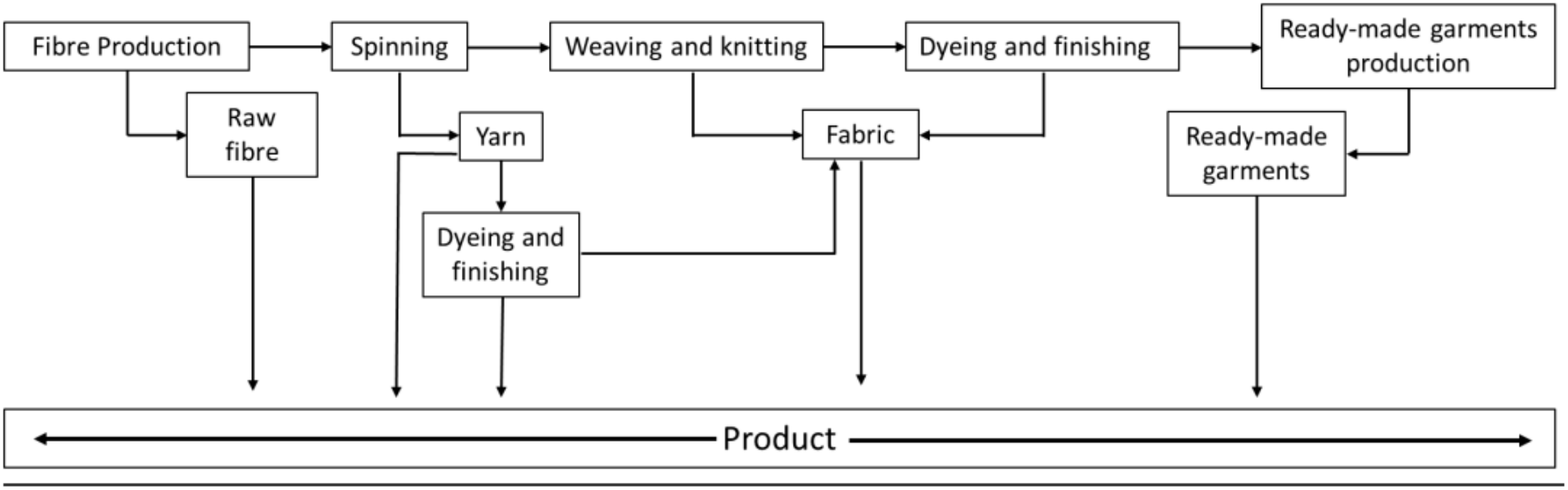
Important challenges faced by the Indian Textile industry

- Highly fragmented industry
- Lack of Technological advancement
- Lack of product diversification in alignment with the global demand
- Lack of price Competitiveness
- High competition from other Emerging Markets
- Infrastructure Bottlenecks
- Differential Taxation System

Source: CRB (2022): https://c4rb.org/wp-content/uploads/2022/04/Circular_Apparel_Status_Paper_140422.pdf/

Textile Production in India

- India is one of the few countries in the world to have all the components of the textile manufacturing value chain, from fiber production to ready-made garments.
- The different stages of textile manufacturing include fiber production, spinning, weaving and knitting, dyeing and finishing, and ready-made garment production.



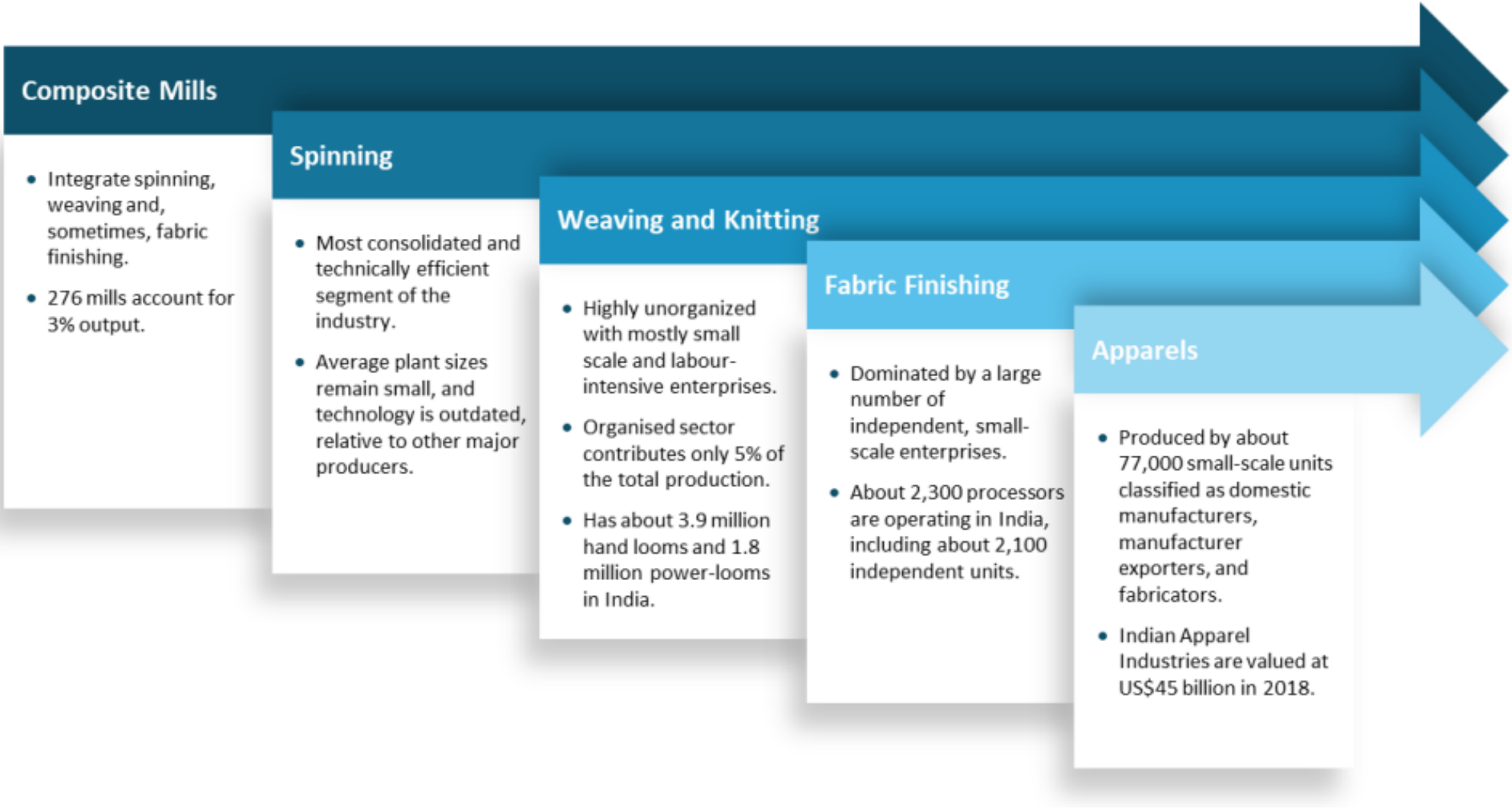
Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf

Textile Production in India

- Fibre production: The total production of textile fiber in India in 2021 was 2.4 million tons, cotton being the most widely produced one. Man-made cellulosic fibers have also been adopted in the industry.
- Spinning: As of 2022, India has about 3400 textile mills with a capacity which is the second largest spinning capacity in the world.
- Weaving and knitting: The production has gradually shifted to power looms over the years. In 2022, about 58% of cloth production is done using power looms.
- Dyeing and finishing: Most of the finishing processes in India are done independently or as a part of a compost mill that uses automated large bath or continuous processing at the rate of about 20,000 m of cloth per day.
- Ready-made garment production: This involves cutting, shaping and stitching the garments to create the final ready-made garment. About 45 million people are employed by India's ready-made garment industry, which makes it the largest employment provider for all the sectors. As of 2016, India has eight major manufacturing clusters for ready-made garment production: Gujarat, Maharashtra, the National Capital Region (NCR), Uttar Pradesh, West Bengal, Tamil Nadu, Madhya Pradesh and Rajasthan. Cotton garments currently lead in market share, at 65% (Kalhan, 2008).

Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf

Textile Production in India



Source: UNIDO (2023): https://hub.unido.org/sites/default/files/publications/Textiles%20SSI%20Report.pdf#page=43&zoom=100,93,609

Textile Production in India - Example of Ludhiana Cluster



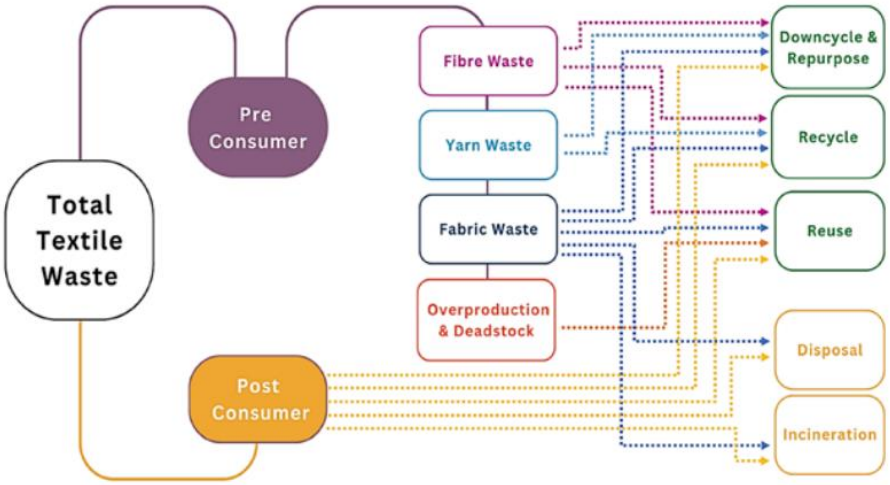
Consists of mainly dyeing, spinning, knitting, printing and finishing units.

- BCI cotton as well as recycled fiber and yarn is used in accordance with the requirements of the buyers. Price of recycled and virgin yarns are the same.
- Organic and certified chemicals are used in a few units as required by buyers. Organic chemicals are available in the market although at a higher cost.
- Dyeing units are incurring higher costs/ more consumption of dyes due to the zero tolerance to color deviation of the brands.
- Water consumption is high and there is heavy reliance on ground water for operations.
- Flow meters to ensure optimum use of water in machines are not widely used.
- There is potential to use recycled water for processes.
- Major energy source is grid electricity. There is interest in installation of solar energy units but support is required for investments.

Source: Outcomes and Findings of the EU-REI Enabling Indian SMEs for Sustainable and Circular Textiles Project

Module 04 – 4.1 Facts and Figures about the Indian Textile Sector

- Studies have shown that wet processing units, the most water- and energy-intensive processes following fabric production, contribute to high resource consumption and low process efficiencies.
- Neither a national quality benchmarking system nor data were found for variables such as the quantity and quality of chemicals and auxiliaries used, water consumption per kg of fabric, etc.
- Typically, cutting waste is sold as “mixed waste” and is divided hierarchically at its source into small, medium, and large pieces.
- In apparel industries, cutting waste is collected from production facilities and transported to India’s main recycling and downcycling plants that manufacture recycled fibre.
- Small-cut waste is shredded into fibres and blended with virgin fibres to produce recycled clothing. Pre- and post-consumer wastes are not sorted or pre-processed, resulting in higher virgin resource demand.



- Circularity is still in early stages of development. Lack of infrastructure and technology are two major challenges limiting the progression of circularity. Consumer awareness and linear habits are also posing threads to circular innovation.

Source: GIZ (2023): https://www.ceeindia.org/pdf_files/Baseline%20Assessment%20Report%20(Digital%20Version).pdf

Textile Wastes

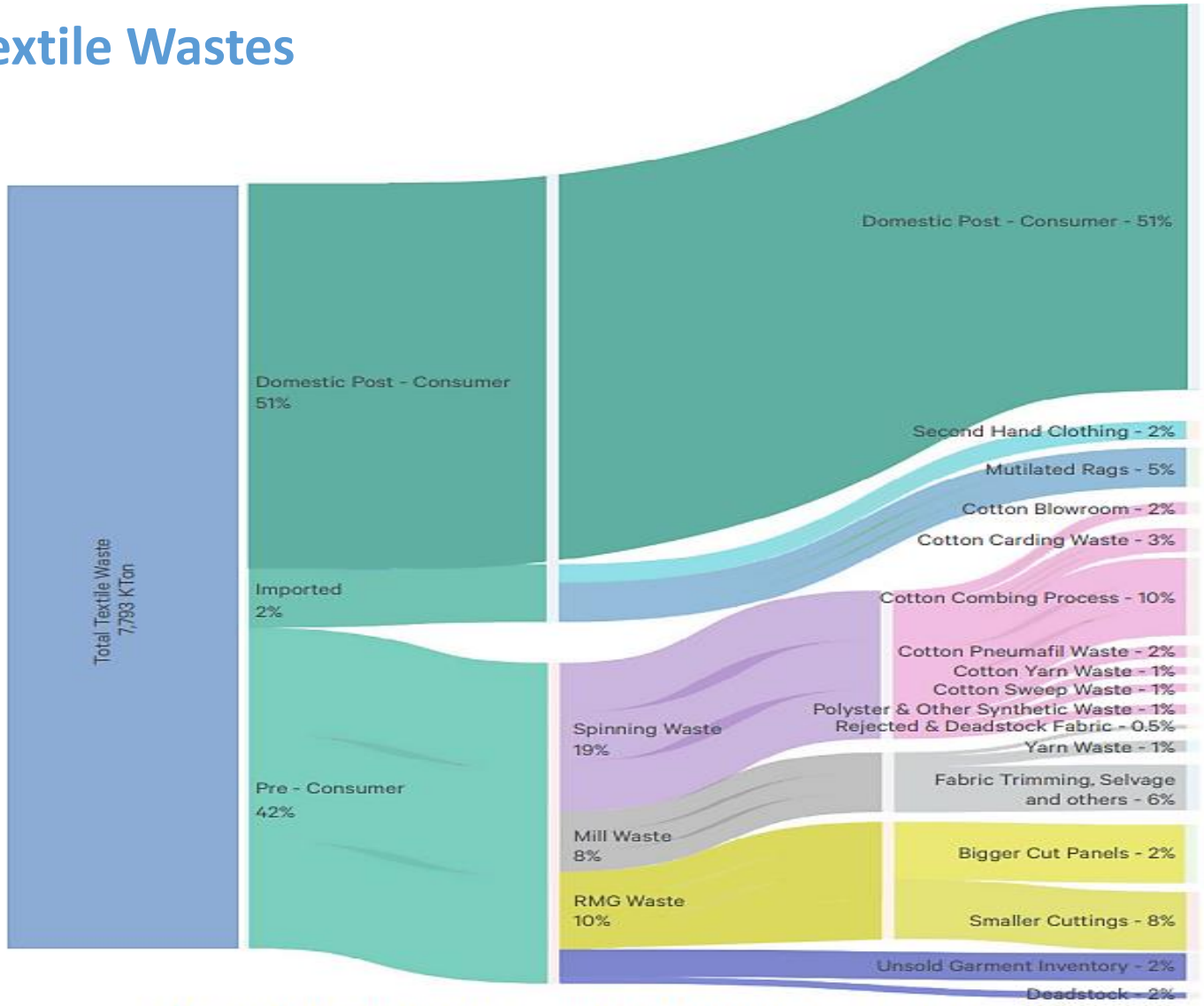


Illustration 10: Total quantity of textile waste in India and quantities by waste streams and types

Note:
1. The values represented above are measured in KiloTon (KTon)
2. Base value for % is total waste (7793ktons)
3. All The figures have been rounded off to the nearest whole number

Cotton solids, natural and man-made fibre blends, and printed textiles constitute a major portion of total waste generated in the process.

Production wastes

Source: FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Textile Wastes

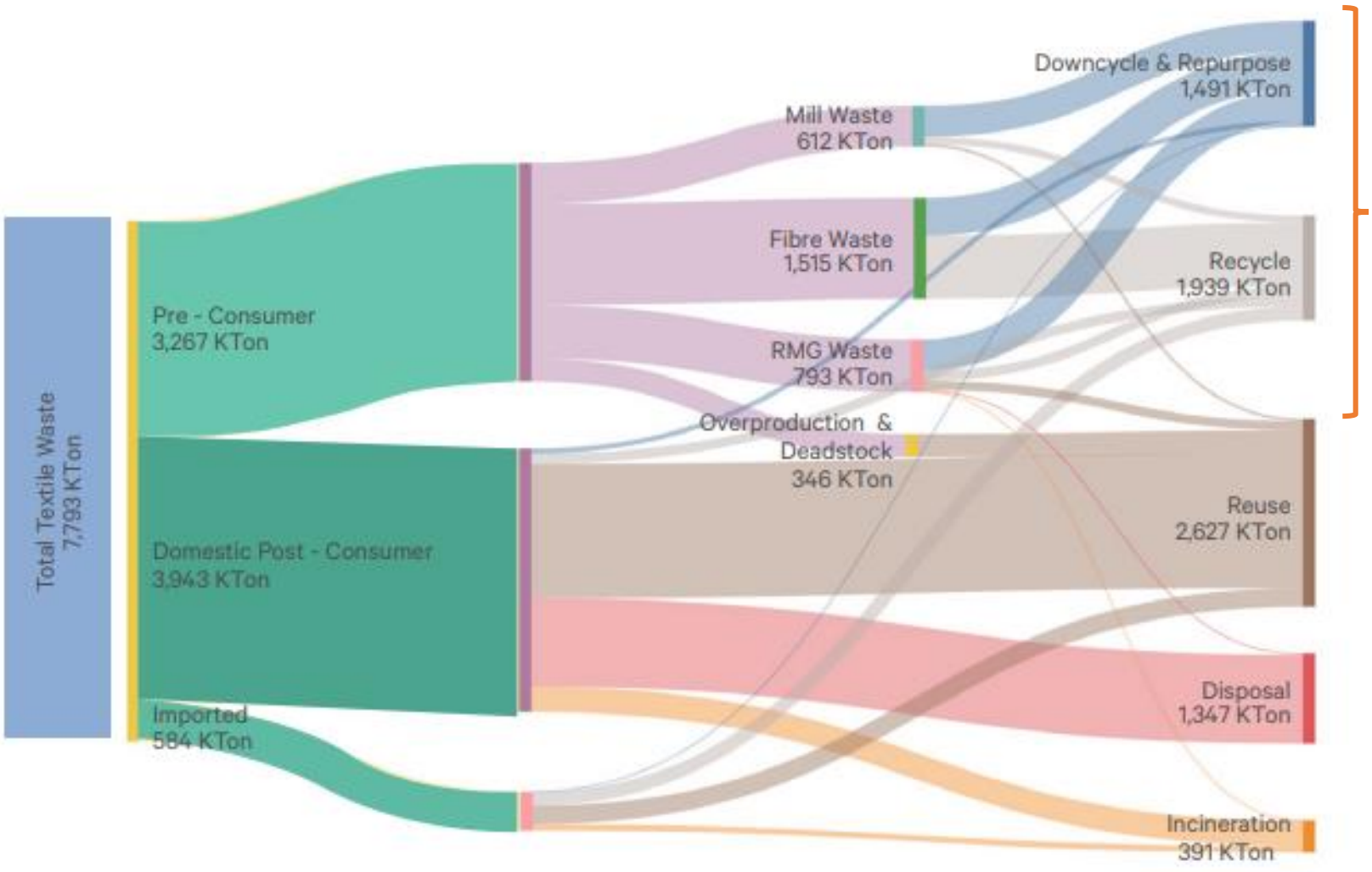


Illustration 11: End-use of textile waste in India

Source: FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Background Information

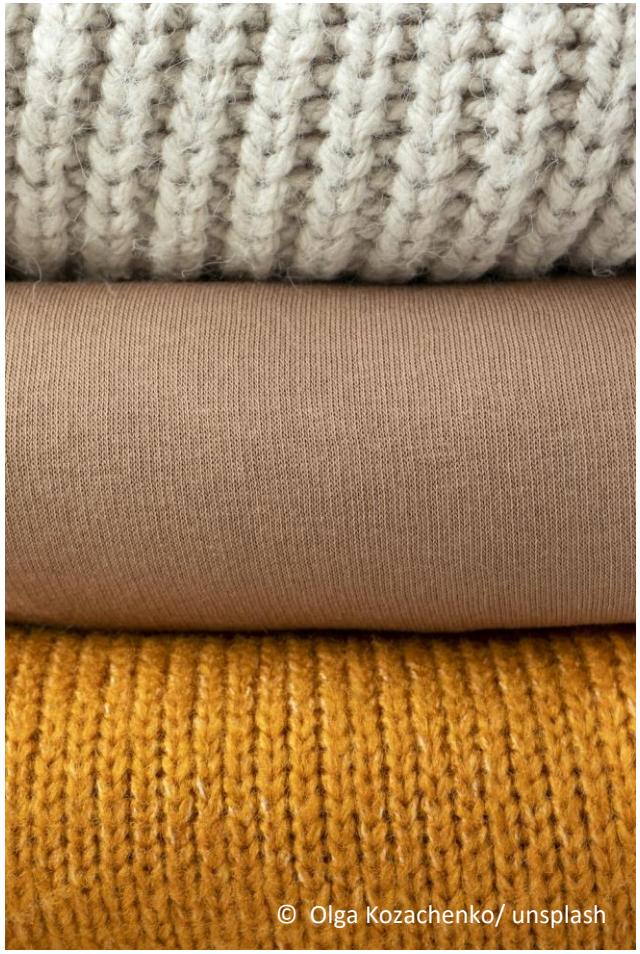
- A large part of textile sector-specific policy development has occurred in the past decade.
- Indian Government has been focusing on the integration of sustainability in order to diminish its adverse environmental impacts and to comply with the related guidelines.
- The focus has been mainly on increasing the value of local products, reducing waste and other environmental impacts created by both production and consumption.
- The government also launched Project SU.RE. – Sustainable Resolution in 2019. It is a commitment by India's apparel industry to establish a sustainable pathway for the fashion industry. This project has supported the sector achieve Sustainable Development Goals (SDGs) and long-term environmental, social, and corporate governance goals.



Sources:
SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf
InvestIndia (2021): https://www.investindia.gov.in/siru/india-goes-green-textile-industry#:~:text=They%20are%20committing%20to%20plastic,Equity%2C%20Environment%2C%20and%20Economics.

Background Information

- Some companies are also setting sustainability and circularity in their value chain, sourcing raw supplies, production, supply chain, and waste recycling.
- To remodel from linear to circular operations, they are concentrating both on pre-and post-consumer waste.
- Research and academics are helping to foster circular textile technologies, discovering new textile materials, and guiding the next generation of textile professionals.
- Besides innovation programs and centers, educational workforce development programs, including certificate and diploma programs on fundamentals of sustainability, fashion sustainability, ESG, circularity, etc. are being put into practice.

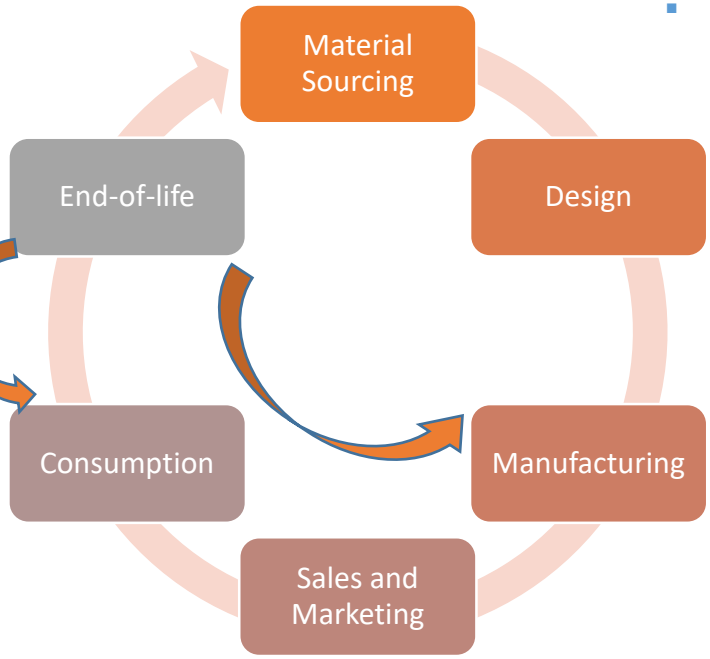


Sources:
SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf
GIZ (2023): https://www.ceeindia.org/pdf_files/Baseline%20Assessment%20Report%20(Digital%20Version).pdf
InvestIndia (2021): https://www.investindia.gov.in/siru/india-goes-green-textile-industry#:~:text=They%20are%20committing%20to%20plastic,Equity%2C%20Environment%2C%20and%20Economics.

Module 04 – 4.2 Sustainability and Circularity Efforts

- Initiatives have been taken to focus on input materials and generate a sustainable ecosystem from farm to fabric by adopting the **Regenerative Organic Farming** practice.
  - Companies are committing to plastic recycling for packaging as they are substituting virgin polyester with recycled LDPE. Disposed PET bottles are turned into flakes that are finely turned into a thread in several deniers and cut for spinning into yarn
  - Innovation Center for Natural Fiber

- The industry is also seeing the creation of eco-friendly textiles to process waste material into a fiber.
  - NGOs, brands and charitable organizations collect post-consumer wastes via donation campaigns and take-back programs.



- Fashion Innovation and Sustainable Design for Circularity (Postgraduate Diploma Program developed by NIFT in collaboration with UNEP)

- Buyer demands have started to influence Indian companies to raise production and product standards towards a more sustainable way.
- Significant acitivity in rental of clothing (although limited to luxury wear)

- Government schemes, such as Mega Investment Textiles Park (MITRA) and the Production Linked Incentive (PLI) Scheme enable the financial affordable adaptation to sustainable manufacturing practices in clusters, on a larger scale.
- Both solar energy and biomass usage have been applied to green the power mix.

Sources:
SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf
GIZ (2023): https://www.ceeindia.org/pdf_files/Baseline%20Assessment%20Report%20(Digital%20Version).pdf
InvestIndia (2021): https://www.investindia.gov.in/siru/india-goes-green-textile-industry#:~:text=They%20are%20committing%20to%20plastic,Equity%2C%20Environment%2C%20and%20Economics.

State of circular innovations along the value chain



Sourcing

- Natural and regenerative fibres as key focus are of innovation in India (but still at early stages)
- Biosynthetics relatively unexplored (rather emerging as new are of raw material innovation)



Manufacturing

- Innovations to reduce water usage and priority on green chemistry
- More frequent use of natural dyes and pigments
- Increasing focus on digital printing as sustainable alternative to traditional water-heavy dyeing processes
- Cut-make-trim and other innovative technologies such as zero-waste manufacturing and additive manufacturing are still emerging
- To date, focus on mass customisation such as digital design and e-commerce solutions.

Source: FashionForGood (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/20201019_State-of-Circular-Innovations-in-the-Indian-Fashion-and-Textile-Industries-Final.pdf

State of circular innovations along the value chain



Retail and Use

- New circular business models like rental, rework, repair and re-commerce focused on extending the lifespan of clothes emerging
- Significant acitivity in rental of clothing (although limited to luxury wear)
- Digital solutions (virtual reality and augmented reality), increasing efficiencies and customer experience, emerging



End-of-Life

- Dominated by mechanical recycling
- Chemical recycling and automated sorting technologies still not very developed
- Mature innovations in area of non-textile to textile recycling (PET into polyester fibres)
- 59% of textile waste in India finds way back into textile industry through reuse and recycling (only fraction of this used in high-end global supply chains due to quality and visibility challenges)
- 19% is downcycled, 5% is incinerated and 17% ends up in a landfill

Sources:
FashionForGood (2020): https://www.oneplanetnetwork.org/sites/default/files/from-crm/20201019_State-of-Circular-Innovations-in-the-Indian-Fashion-and-Textile-Industries-Final.pdf;
FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Technological trends in the Indian textile sector

- **Raw Materials:**
  India as one of the largest producers and exporters of cotton yarn. With challenges like water scarcity sustainable fibre alternative (hemp, agricultural waste and banana fibre) provide exciting solutions for the textile industry: Nanotechnology for more energy-efficiency, water resistancy and low-maintenance in sourcing and production
- **Wet and dry processing:**
  - Focus on innovation landscape to reduce and eliminate the need for water in wet processing. Role of 3D design and printing is growing, but still in a developmental stage in India. Other focus areas for processing are plasma, ultrasonic and foam, spray and supercritical CO2 dyeing as well as cationic and enzymatic pre-treatment and finishes.
  - Plant based dyes and pifments as well as microbial pigments as alternatives
- **Cut-Make-Trim:**

  Innovative technologies for zero-waste manufacturing and additive manufacturing exist but are yet to find mass adoption. Examples of additive manufacturing are flocking, spraying, 3D printing and 3D knitting. Also the use of Big Data and AI as a means to embark on zero-waste manufacturing are gaining attention in India but are still at very early stages.

Sources:
Fogla (2022): How Is Technology and Innovation Helping The Indian Textile Industry? (jumaccans.com)
Citiindia (2021): https://citiindia.org/img-uploads/2021/Textile-Times-Nov-Dec-2021.pdf;
Pells (2023): From forests to catwalks - How Nordic countries became a hub for a new textile revolution? | UPM.COM
FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Technological trends in the Indian textile sector

- **Retails and use:**

  Use if augmented and virtual reality by retailers to improve online shopping experiences (3D Tyron technology to try on products virtually), still a niche, but the sector is growing slowly; Digitization to make production cycle more transparent and traceable

- **End-of-use:**

  Automated sorting technology can enhance the speed and scale of recycling, but also here it would have an impact on local employment and should go hand in hand with upskilling and training interventions, chemical recycling technologies could use existing mechanical recycling supply chains for reaching faster implementation.

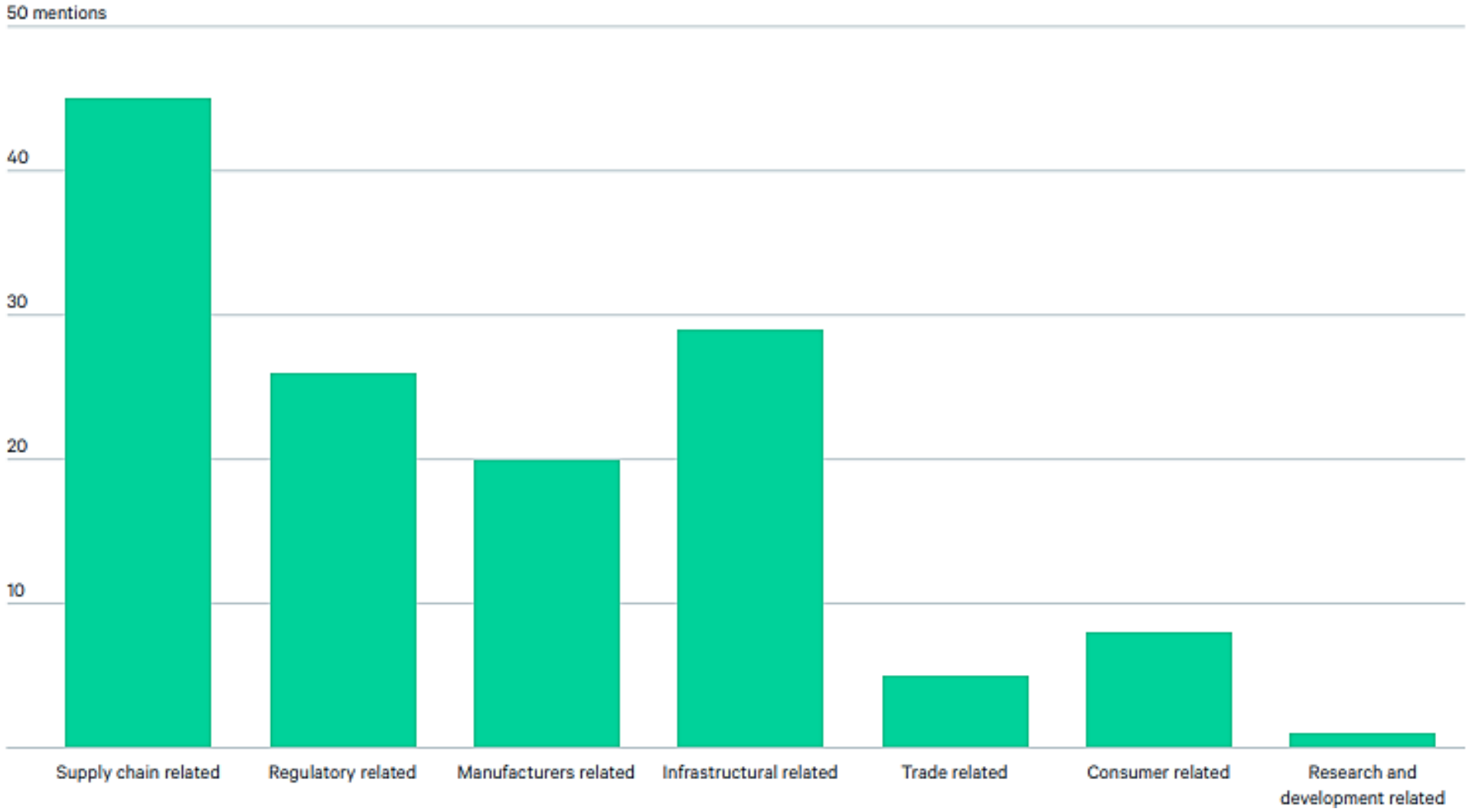
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FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Technological trends – way forwards

- Investments and testbeds are required to improve processing technology for alternative low-footprint natural fibres, such as the spinnability and compatibility with the current equipment & infrastructure.
- A significant part of the industry is unorganised, with several small dye houses that are unable or unwilling to invest in sustainable solutions. Larger players' adoption would hopefully bring in economies of scale and trickle down this effect to India's unorganised sector.
- Sludge treatment and water purification needs to go hand in hand with replacing chemical-based dyes, ensuring that where the industry does not change its input, its output is reduced in toxicity. Policy intervention alongside innovation would enable this.
- Additive manufacturing and 3D printing are a huge opportunity in India especially in footwear and garments, an infusion of funding and large scale adoption can help bring economies of scale in these processes. At the same time garment workers should be upskilled so that they are not adversely affected by growing automation.

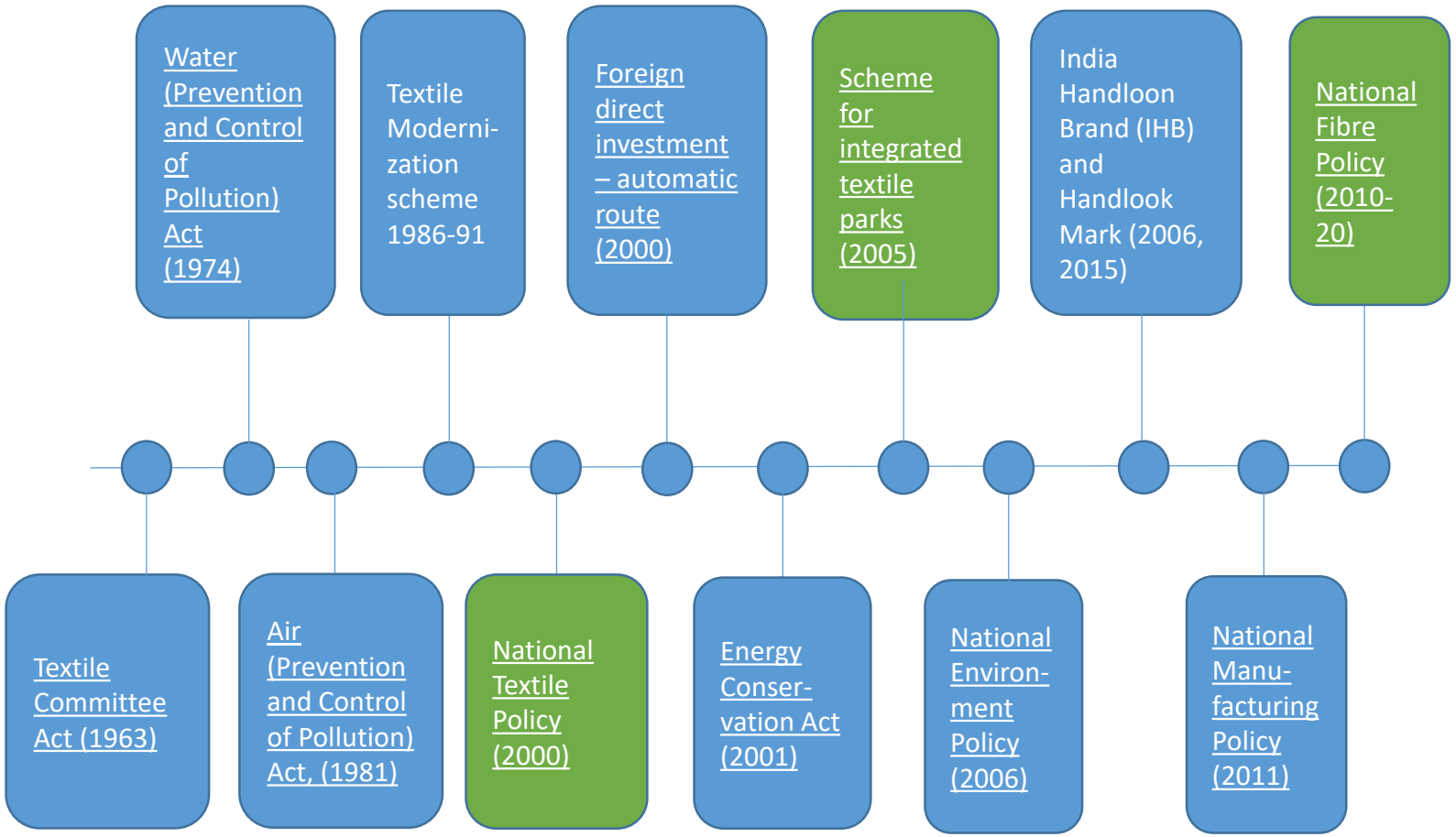
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Citiindia (2021): https://citiindia.org/img-uploads/2021/Textile-Times-Nov-Dec-2021.pdf;
Pells (2023): From forests to catwalks - How Nordic countries became a hub for a new textile revolution? | UPM.COM
FashionForGood (2022): https://citiindia.org/pdf-uploads/resources/Sorting-for-Circularity-Wealth-in-Waste.pdf

Challenges Identified



Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf

Most relevant policies and programs for the Indian Textile Industry (1963 – 2011)

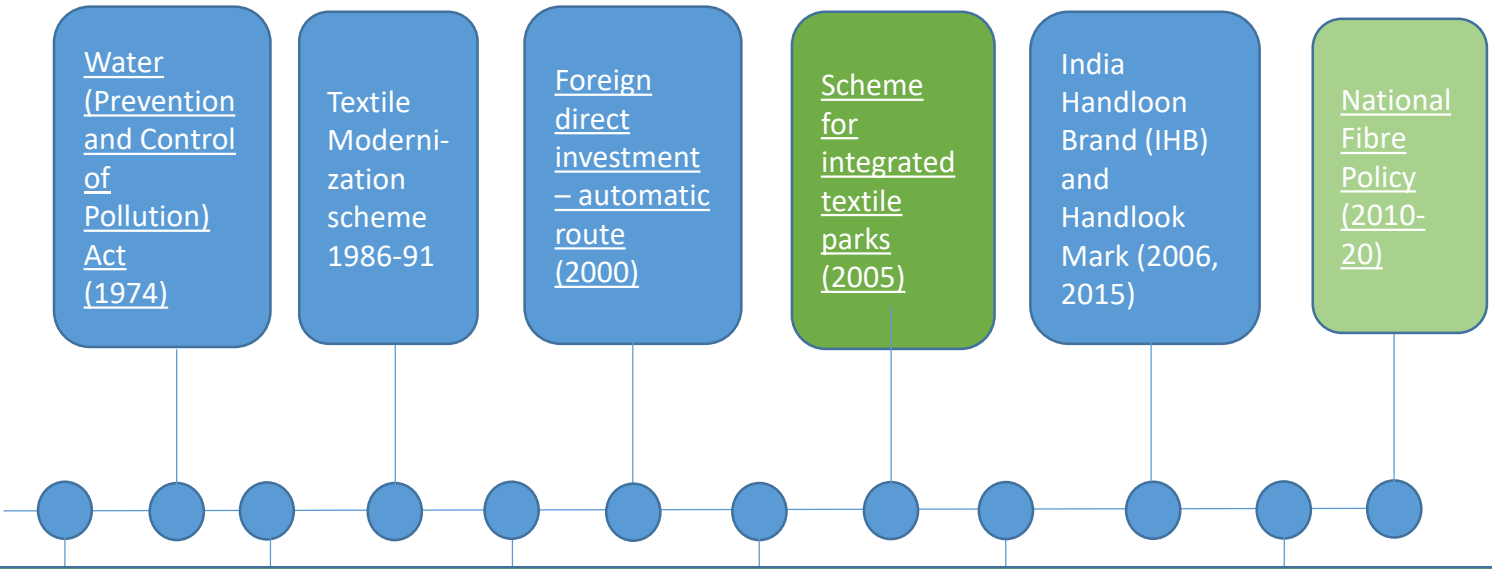


Most relevant policies and programs for the Indian Textile Industry (1963 – 2011)

The National Textile Policy 2000 aimed to propel the industry forward by adapting to global changes, aiming for high-quality production at competitive prices, fostering employment, and contributing to the nation's economic growth. It strived to preserve traditional weaving skills while promoting advancements in manufacturing aligned with environmental standards. This policy sought collaboration among various stakeholders, including state governments, financial institutions, entrepreneurs, farmers, and NGOs, to achieve its goals.

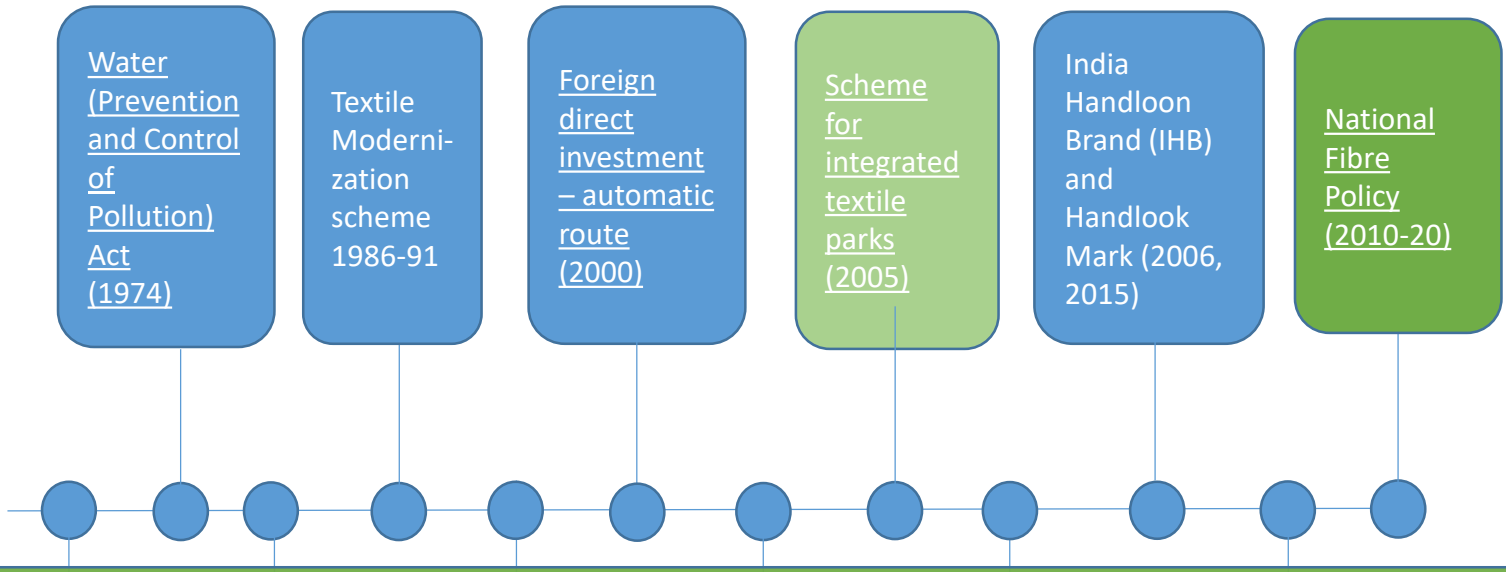
- Textile Committee Act (1963)
- Air (Prevention and Control of Pollution) Act, (1981)
- National Textile Policy (2000)
- Energy Conser-vation Act (2001)
- National Environ-ment Policy (2006)
- National Manu-facturing Policy (2011)

Most relevant policies and programs for the Indian Textile Industry (1963 – 2011)



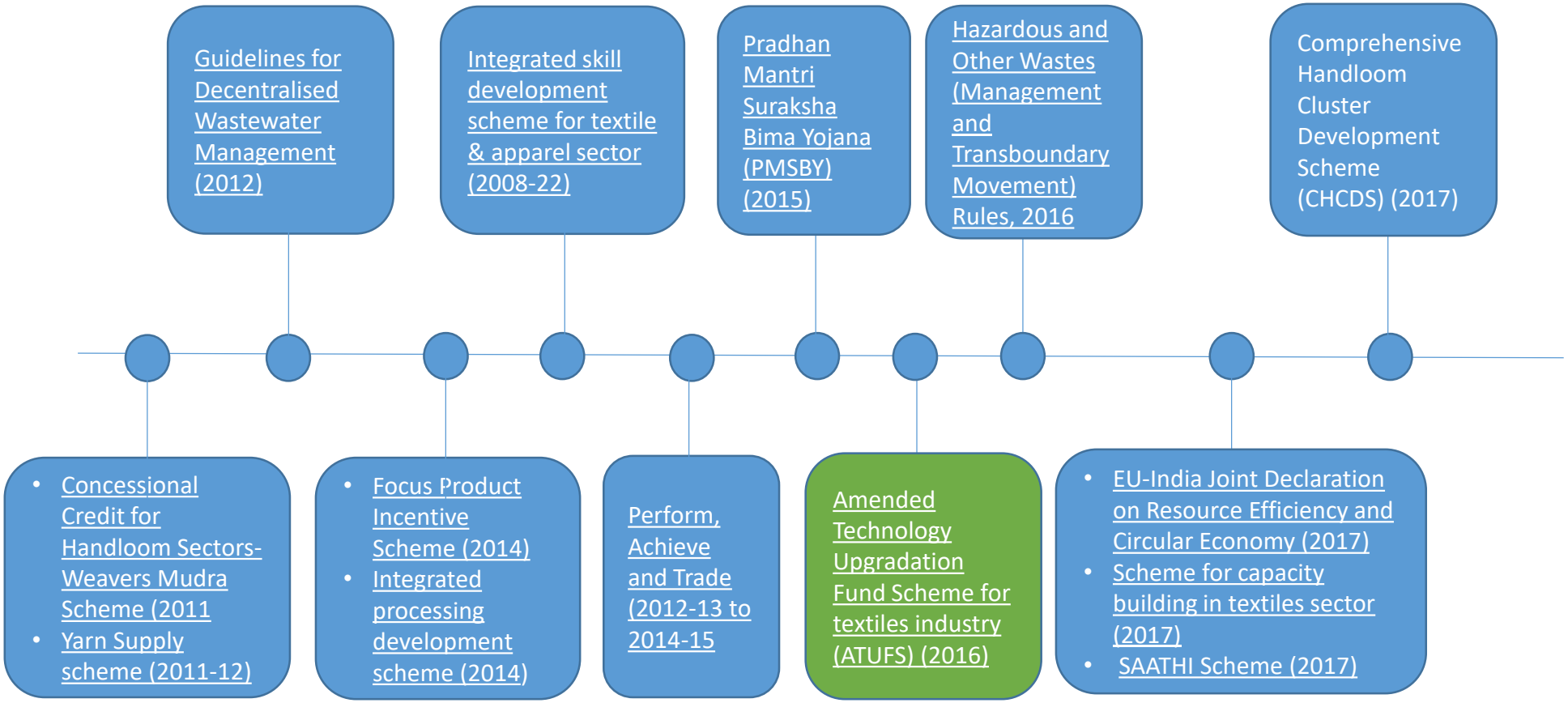
The Scheme for Integrated Textile Parks (SITP) initiated in the 11th Five Year Plan aimed to resolve infrastructure limitations in the Indian textile industry by creating top-tier textile parks, encouraging compliance with global environmental and social standards. The scheme, continuing in the 11th Plan, targeted strategic growth centers, facilitating investment, employment generation, and increased textile production through the approval of ten Textiles Park projects initially. Detailed guidelines and assistance, available on the Ministry of Textiles' website, emphasized the scheme's focus on infrastructure, professional agency engagement for project execution, and flexible components tailored to local needs within each Integrated Textile Park.

Most relevant policies and programs for the Indian Textile Industry (1963 – 2011)



The National Fibre Policy 2010-20, designed by India's Ministry of Textiles, aimed to fortify the country's fibre economy and enhance competitiveness in the textile industry. It focused on equitable promotion of all fibers, technological upgrades, and institutional support to foster growth while addressing infrastructure challenges and human capital development. To execute the policy's measures, a substantial budget of INR 32,000 crore was allocated under the Technology Upgradation Fund Scheme, incorporating fiscal (duty structure rationalization) and non-fiscal (market development, R&D support) measures. Despite these efforts, challenges such as global competitiveness, limited market players, anti-dumping duties, and tax discrepancies persisted in the fiber industry.

Most relevant policies and programs for the Indian Textile Industry (2011 – 2017)



Most relevant policies and programs for the Indian Textile Industry (2011 – 2017)

The Ministry of Textiles introduced the **Amended Technology Upgradation Fund Scheme (ATUFS 2016-22)** aligning with initiatives like "Make in India" and "Zero Defect and Zero Effect." It aimed to offer capital subsidies for technology-intensive segments in textiles, promoting exports and reducing imports. Notably, it excluded the spinning sector. To address this, a new scheme was proposed to replace ATUFS, incentivizing machinery manufacturers. While these schemes facilitated modernization and expansion, delays in fund disbursement emerged as a significant challenge, prompting the need for improvements in implementation timelines.

- Concessional Credit for Handloom Sectors-Weavers Mudra Scheme (2011
- Yarn Supply scheme (2011-12)

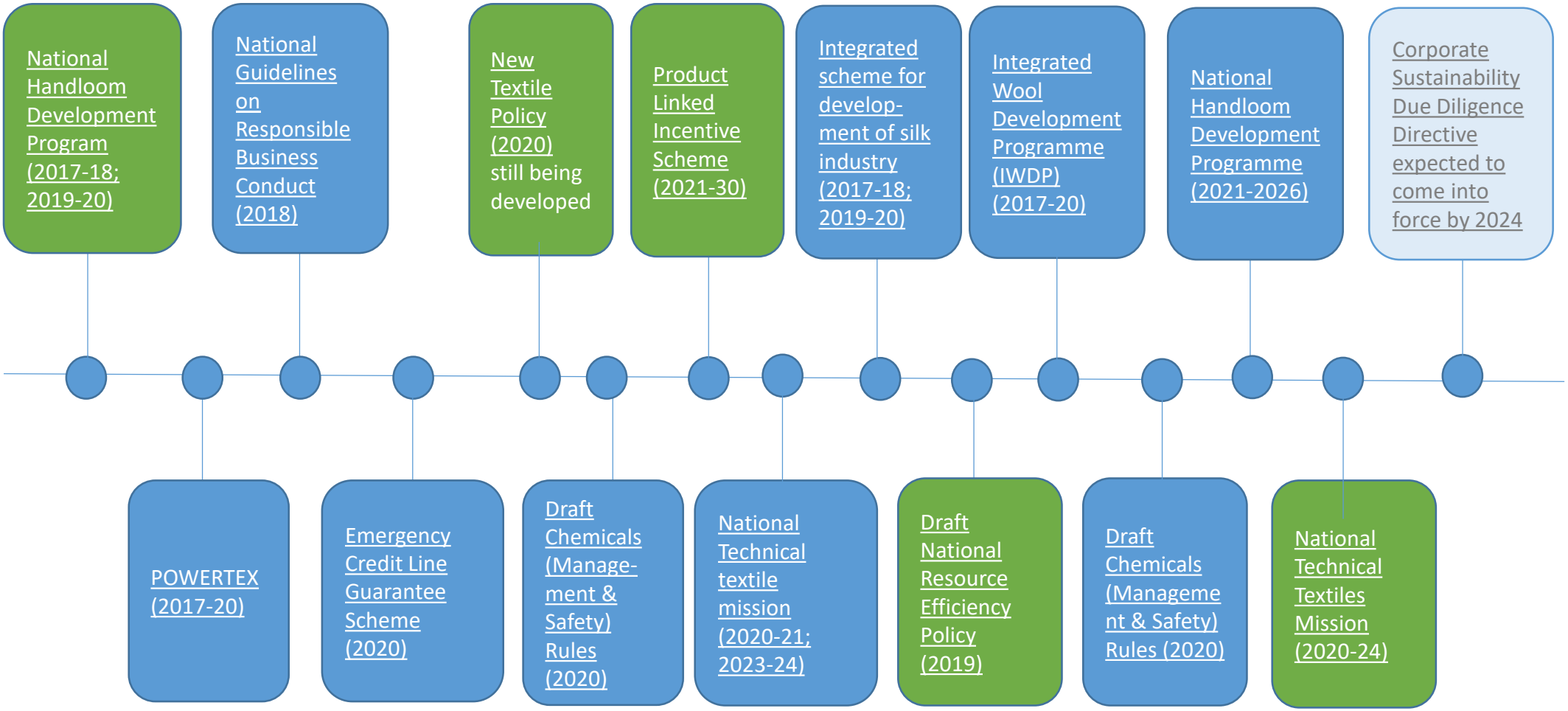
- Focus Product Incentive Scheme (2014)
- Integrated processing development scheme (2014)

Perform, Achieve and Trade (2012-13 to 2014-15

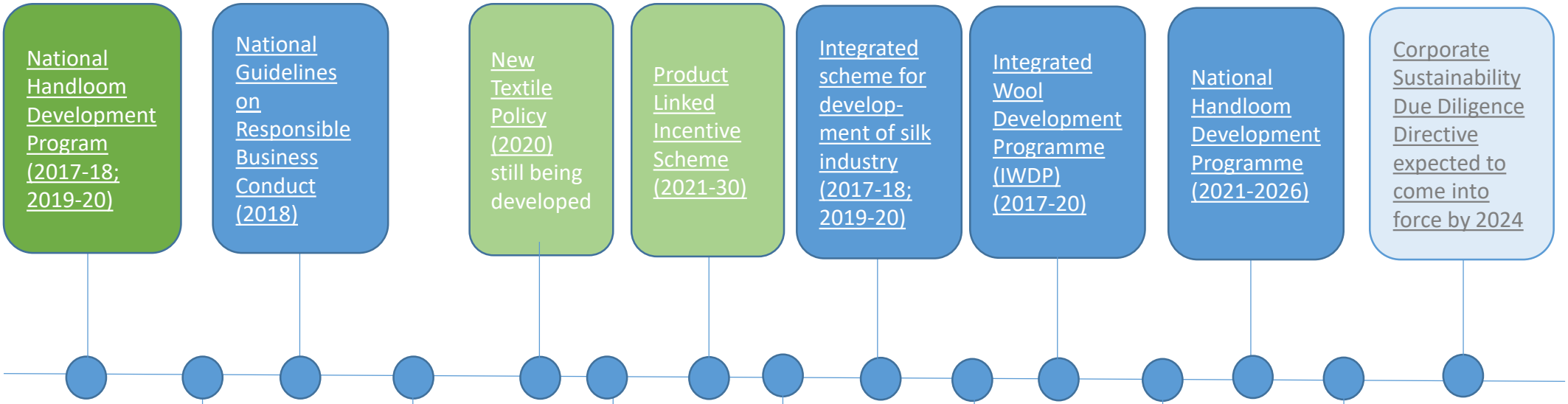
Amended Technology Upgradation Fund Scheme for textiles industry (ATUFS) (2016)

- EU-India Joint Declaration on Resource Efficiency and Circular Economy (2017)
- Scheme for capacity building in textiles sector (2017)
- SAATHI Scheme (2017)

Most relevant policies and programs for the Indian Textile Industry (2017 – today)



Most relevant policies and programs for the Indian Textile Industry (2017 – today)



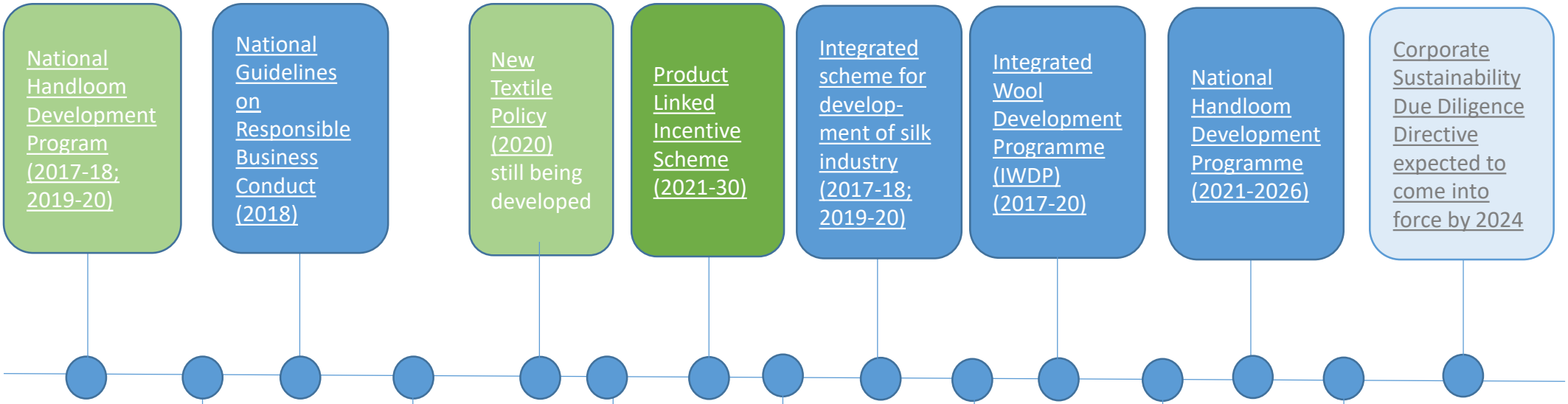
The National Handloom Development Programme (NHDP) from FY 2021-22 to FY 2025-26 aims to support the handloom sector, engaging 3.5 million people, notably empowering 2.5 million female weavers. It offers resources like raw materials, design inputs, technology upgrades, concessional credit, and marketing aid through exhibitions. NHDP aims to create infrastructure such as Urban Haats and Mega Handloom Clusters, benefiting both cooperative and non-cooperative weavers, including self-help groups, for holistic development and welfare.

Most relevant policies and programs for the Indian Textile Industry (2017 – today)

- National Handloom Development Program (2017-18; 2019-20)
- National Guidelines on Responsible Business Conduct (2018)
- New Textile Policy (2020) still being developed
- Product Linked Incentive Scheme (2021-30)
- Integrated scheme for develop-ment of silk industry (2017-18; 2019-20)
- Integrated Wool Development Programme (IWDP) (2017-20)
- National Handloom Development Programme (2021-2026)
- Corporate Sustainability Due Diligence Directive expected to come into force by 2024

The Ministry of Textiles is in the process of developing a **New Textile Policy**, currently in its draft stage. This policy aims to emphasize enhancing export performance and fostering improved employment opportunities. Extensive consultations are underway with diverse stakeholders, including associations, industry bodies, State Governments, and representatives from subsectors like Cotton, Silk, Jute, Wool, Handloom, Handicrafts, and Powerloom, as part of formulating this comprehensive policy.

Most relevant policies and programs for the Indian Textile Industry (2017 – today)



The Production-Linked Incentive (PLI) Scheme for Textiles – focuses on manmade fiber (MMF) apparel, MMF fabrics, and products of technical textiles to enhance India's manufacturing capabilities and exports. India's PLI Scheme for Textiles has selected 64 eligible investors, including seven foreign enterprises, for incentives spanning five years. Gujarat leads in proposed projects, while Madhya Pradesh attracts the largest investment. A second round is expected in 2023, focusing on small and medium-sized businesses.

Most relevant policies and programs for the Indian Textile Industry (2017 – today)

The **National Resource Efficiency Policy (NREP)** of 2019 aims to mainstream resource efficiency across all sectors by fostering collaborations, policy development, and efficient implementation, guided by principles like reducing primary resource consumption, waste minimization, and creating employment opportunities. It seeks to implement resource efficiency across biotic and abiotic resources, sectors, and life cycle stages, offering benefits like cost savings, reduced environmental impact, and support for sustainable consumption patterns. While the policy prioritizes sectors like textiles, packaging, and plastics, there's a crucial need to mandate a shift toward circular processes in the textile and apparel sector, despite existing environmental standards.

- POWERTEX (2017-20)
- Emergency Credit Line Guarantee Scheme (2020)
- Draft Chemicals (Manage-ment & Safety) Rules (2020)
- National Technical textile mission (2020-21; 2023-24)
- Draft National Resource Efficiency Policy (2019)
- Draft Chemicals (Management & Safety) Rules (2020)
- National Technical Textiles Mission (2020-24)

Most relevant policies and programs for the Indian Textile Industry (2017 – today)

The National Technical Textiles Mission (NTTM), initiated in March 2020 with a budget of INR 1480 crore over four years, aims to position India as a global leader in technical textiles. Its components focus on R&D, market development, export promotion, education, and skill development. It aims to boost domestic market levels, enhance exports, and create skilled manpower resources while promoting innovation, incubation centers, and indigenous machinery for technical textiles. With projects focused on specialty fibers and geotextiles, NTTM aims to cultivate a skilled workforce and promote biodegradable materials for sectors like agriculture, infrastructure, and medicine. Pilot projects for geotextile skilling have been launched under NTTM, emphasizing collaboration with academic institutions for specialized training.

- POWERTEX (2017-20)
- Emergency Credit Line Guarantee Scheme (2020)
- Draft Chemicals (Manage-ment & Safety) Rules (2020)
- National Technical textile mission (2020-21; 2023-24)
- Draft National Resource Efficiency Policy (2019)
- Draft Chemicals (Management & Safety) Rules (2020)
- National Technical Textiles Mission (2020-24)

EcoMark Label

ECOMARK

Background:

- Introduced in 1991, the Eco-mark stands as one of India's initial voluntary labeling initiatives geared towards recognizing eco-friendly products.
- Spearheaded by the Ministry of Environment and Forests at that time, this scheme is currently overseen by the Bureau of Indian Standards (BIS).
- It outlines environmentally friendly products as those crafted, utilized, or disposed of in a manner that substantially mitigates their environmental footprint. The criteria encompass a cradle-to-grave perspective, encompassing raw material extraction, production, and disposal methods.
- Manufacturers of prodcuts apply for testing and certification of products which fall under the notified categories in terms of their compliance with published environmental criteria in the prescribed from.

Products covered:

- Soaps, detergents, paints, paper, plastics, cosmetics, **textiles**, batteries, wood substitutes, food items, electrical and electronics, packaging materials, leather, etc.

Source: Rana & Chopra (2020): https://ssrana.in/articles/eco-mark-scheme-bis/

Most Recent Developments

- **Foreign Direct Investment (FDI) Policy (Ongoing)** : India has a liberal and transparent FDI policy that allows 100% FDI in the textile sector under the automatic route. From 2017 to 2022, the textile sector attracted US $ 1522.23 million (equals approximately 1444.37 million Euro) in FDI, indicating its attractiveness to foreign investors.
- **Production Linked Incentive (PLI) Scheme for Textiles (2020)**: The PLI scheme, launched in 2020, with an approved outlay of Rs. 10,683 crore (approximately 1141045.80 Euro), promotes the production of Man-Made Fibre (MMF) Apparel, MMF Fabrics, and Technical Textile products. It aims to make the textile sector more competitive and sustainable.
- **National Technical Textiles Mission (NTTM) (2020):** In 2020, the government allocated Rs. 1,480 crore (approximately 11415.86 Euro) for the NTTM, focusing on promoting and developing the technical textiles sector in India. This mission recognizes the potential of technical textiles in various applications.
- **Mega Investment Textiles Parks (MITRA) (2021):** This scheme will build a world-class infrastructure with plug-and-play facilities to let global champions in exportation. This project will tender India a hotspot for national and international divers seeking to enter the realm of textiles and garments.

Sources:
Ministry of Textiles (2022): https://pib.gov.in/PressReleasePage.aspx?PRID=1885410
Cabinet of India (2021): https://www.pib.gov.in/PressReleasePage.aspx?PRID=1753118
Ministry of Textiles (2020): https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1601536
Ministry of Textiles (2021): https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1694058

Most Recent Developments

- **Silk Samagra-2 Scheme (2021)**: Implemented from 2021-22 to 2025-26, this scheme is dedicated to the development of the sericulture industry, which is crucial for silk production in India.
- **New Bureau of Indian Standards (BIS) Circulars - Mandatory Compliance for Protective and Geotextile Products in India (2023):** To further enhance consumer protection and standardize manufacturing practices, the BIS has issued new circulars specifically targeting protective and geotextile products. These circulars outline mandatory compliance requirements that textile companies must adhere to by the 10th of October 2023.
- **New Textile policy (still being drafted):** The policy will focus on enhancing export performance and generating more employment opportunities in the textile sector. It is being developed through consultations with various industry associations, stakeholders, and state governments, representing subsectors such as Cotton, Silk, Jute Wool, Handloom, Handicrafts, Power loom, and more.

Sources:
Ministry of Textiles (2022): https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1883509
Ministry of Textiles (2023): https://pib.gov.in/PressReleasePage.aspx?PRID=1915526
Ministry of Textiles (2021): https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=1697401

Wrap-up Indian policy landscape

- **Commitments to transitioning to CE need to be mainstreamed in national and local policy contexts**
  - **Current policies** focus on individual areas and themes, are **fragmented, lack a systemic approach**.
  - **Lack of support** on market access , technology adoption, and inadequate financial support **hindering scaling up**
  - Few policies and schemes exist to help promote lean manufacturing –bringing down costs, facilitate funding mechanisms, and increasing demand for MSME products and services through public procurement.
    - But only a handful of policies target resource efficiency and circular economy
    - Focus on the downstream EoL management activities
- **Key overarching policy initiatives to foster circular economy and resource efficiency in India**
  - Strategy on Resource Efficiency by the National Institution for Transforming India (NITI)
  - Establishment of the inter-departmental group to ensure implementation and mainstreaming of the agenda in allied Ministries
  - Establishment of the Resource Efficiency Cell by the MoEFCC (Ministry of Environment, Forest and Climate Change of India)
  - Draft National Resource Efficiency Policy of India
  - A Joint Declaration that established the India-EU Resource Efficiency and Circular Economy Partnership

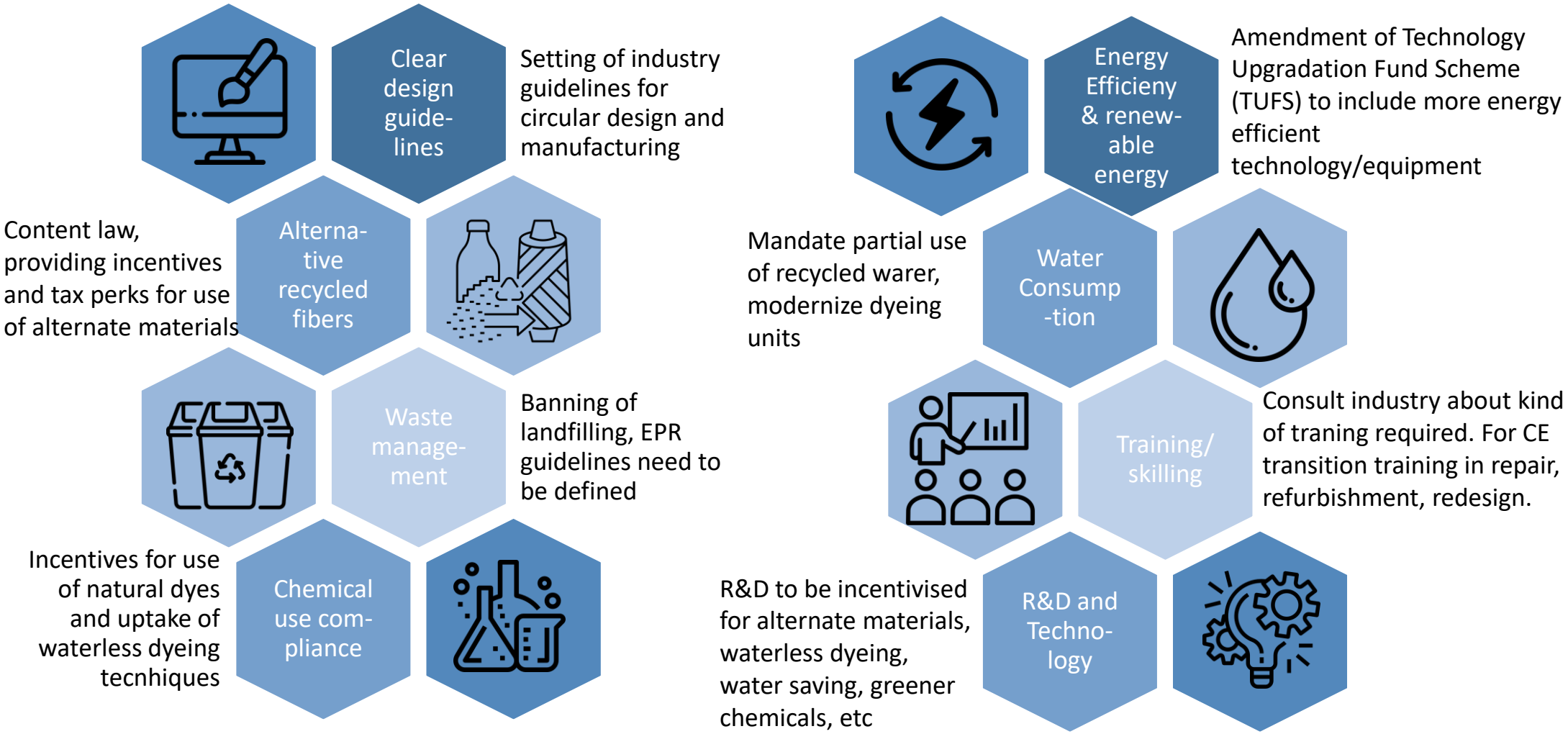
Source: adelphi (2021)

Wrap-up Indian policy landscape

- **Way forward:**
  - **Capacity Enhancement and Fibre Production:** Policies to boost human-made fibre-production
  - **Fertilizer Use:** Policies to regulate balanced fertilizer use and subsidies for raw material production
  - **Bargaining Power:** Strengthening manufacturers bargaining power against Wester customer impositions**;** Emphasis on quality certification and branding for trust in sustainable product
  - **Additional Policy Areas:** Industry guidelines for sustainable manufacturing; incentives for alternate materials with clear labelling and quality norms; Clear guidelines for labelling and use of raw materials and chemicals; Task force for eco-design and sustainable manufacturing guidelines; Implementation of EPR regulations
  - **Specific Regulatory Changes:** Implementing regulations to reduce waste, ban hazardous chemicals, and adopt waterless dyeing; Enforcing wastewater effluent standards for textile industries; Promoting transparency and traceability for efficient recycling and building trust
  - **Energy Prioritization and Reliability**: Prioritizing stable renewable energy sources over conventional ones; Decentralizing power supply for textile parks to reduce costs and enhance reliability

Source: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf

Policy intervention priorities and ideas



Sources: CRB (2022): https://www.oneplanetnetwork.org/sites/default/files/from-crm/Circular_Apparel_Status_Paper_140422.pdf

Module 04 – 4.4 Needs & Potentials in the Indian textile sector





Better tracking/collaboration/ trust

Structure: Industry is highly fragmented with 90% of the textile units in India being MSMEs , poor traceability due to informality and decentralized nature of sector

Fibers used: Mix of fibers: Cotton most dominant one with growing trends towards synthetic fibers (e.g. polyester), mostly virgin material over recycled material



Financially accessible innovations



Design standards, producer responsibility

Design: Clothes are mainly not designed to be recycled, so that technical problems arise at end-of-life stage

Regulatory framework: The framework lacks sectorial standardization and clarity on requirements for uniform implementation of certain codes for sustainable manufacturing



Evaluate & strengthen governmental schemes



Trainings and workshops about CSR, waste minimization and resource efficiency

Awareness: Lack of training and education about sustainability and sustainable economy among society but also employees, among consumers still price, quaility and style are dominant motives for purchasing a product

Infrastructure: There is uneven growth and accessibility to technological innovations due to high excise duty for machinery and little knowledge among small factories.



Development of mega textile park for new technologies, AI and IT systems

Sources: SEI (2023): https://www.sei.org/wp-content/uploads/2023/05/sustainable-garment-manufacturing-india-sei2023.033.pdf

Typical barriers for implementation of CE and RE –

Which one are most prominent ones in the Indian context, which ones should be added?

Regulatory barriers

- Policies that encourage recycling, incineration or disposal rather than other circular strategies such as reuse and repair
- Lack of tax or other fiscal instruments (e.g. CO_2 tax), lack of resource taxation
- Lack of incentives for circularity investments
- Legislation being waste and not product focused (no extended producer responsibility)
- Unclear compliance rules on circularity, lack of standards/certification for circular products
- Lack of defined circularity indicators
- Lack of concrete targets and conflicting targets

Financial barriers

- Risk of not achieving cost-effective repair, reuse or refurbishment,
- High costs associated with take-back of products and high labor costs for dismantling and separation of material fractions
- Declining sales of new products due to increased sales of repaired, refurbished and reconditioned products
- High capital or pre-financing demand, e.g. for leasing models

Sources: Circular Economy Initiative Deutschland (2020):
https://static1.squarespace.com/static/5b52037e4611a0606973bc79/t/6437a399eee7ce0e050a5a6b/1681368086463/AG+GM_Gesamtbericht+EN_DOI_Stand+12.04.23_NEW

Typical barriers for implementation of CE and RE –

Which one are most prominent ones in the Indian context, which ones should be added?

Organisational barriers

- Hesistant corporate culture and predominant linear thinking
- Lack of support from top management
- Lack of internal strategic positioning of circular business models (sales of new vs. Used goods)
- Lack of willingness to cooperate in the value chain (also due to high fragmentation)
- Unclear internal responsibilities
- Uncertainty about circularity legislations

Consumption-related barriers

- Lack of consumer awareness and interest in circularity and longevity
- Misunderstandings about refurbishments, reuse, servicising, etc.
- Rigidity of consumer behaviour (linear thinking patterns)
- Lack of consumer information and education
- Expecations for low prices
- Mishandling of products by customers

Sources: Circular Economy Initiative Deutschland (2020):
https://static1.squarespace.com/static/5b52037e4611a0606973bc79/t/6437a399eee7ce0e050a5a6b/1681368086463/AG+GM_Gesamtbericht+EN_DOI_Stand+12.04.23_NEW

Typical barriers for implementation of CE and RE –

Which one are most prominent ones in the Indian context, which ones should be added?

Value-chain barriers

- Component manufacturers and other non-OEMs can only establish circular business models to a limited extent due to their value chain position
- Lack of trust and exchange of information
- Lack of market incentives (high-quality materials not competitive in price)
- Lack of networks and supply chains for dismantled products and components and recycled materials (reverse logistics)
- Low quality of recycled material flows

Technical barriers

- Lack of design tools for CE and circular products
- Lack of data availability (material, composition, ingredients, products life cycle)
- Lack of digital tools
- Lack of treatment and recycling infrastructure
- Lack of standards and design requirements (non-toxic ingredients, material substitution, design for repair/remanufacturing/recycling)

Sources: Circular Economy Initiative Deutschland (2020):
https://static1.squarespace.com/static/5b52037e4611a0606973bc79/t/6437a399eee7ce0e050a5a6b/1681368086463/AG+GM_Gesamtbericht+EN_DOI_Stand+12.04.23_NEW

EU REI Approach - Textiles

- **Textile Sector Involvement**: Spans the entire value chain, from raw materials to post-consumption management.
- **Challenges Addressed**: High land, water, and resource use; energy consumption; hazardous chemical use; waste generation.
- **Importance**: Critical for India's economic development and employment generation.
- **Transformation Need**: Rapid shift towards sustainability and circularity to mitigate environmental and socio-economic impacts.



Direct (~45 million) & Indirect employment for millions of people (including a large number of women & rural population)

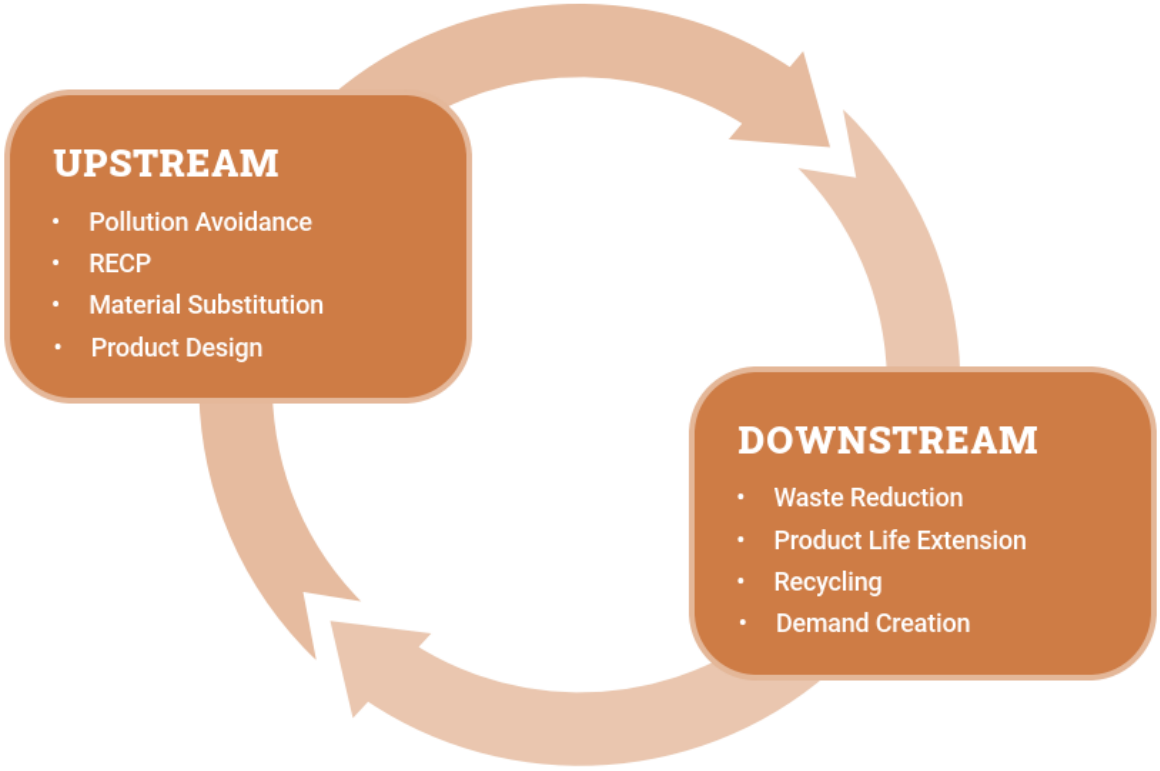


Contribution to India's GDP in terms of percentage share of industrial output was around 7% during the last three years (as of Dec 2022)

Sources: EU REI (2023): https://www.eu-rei.com/wp-content/uploads/2023/10/Brochure_EU-REI-Textiles.pdf

EU REI Approach - Textiles

- Micro, Small and Medium Enterprises (MSMEs) are an integral and dominant part of the Indian textile sector and have a critical role to play in mainstreaming circularity and sustainability in the sector.
- In order to enable sustainable transformation, there is an imperative need to undertake capacity building on sustainable and circular business models and practices, provide support for technology adoption, scale up innovations, promote traceability across the value chain, and raise awareness.

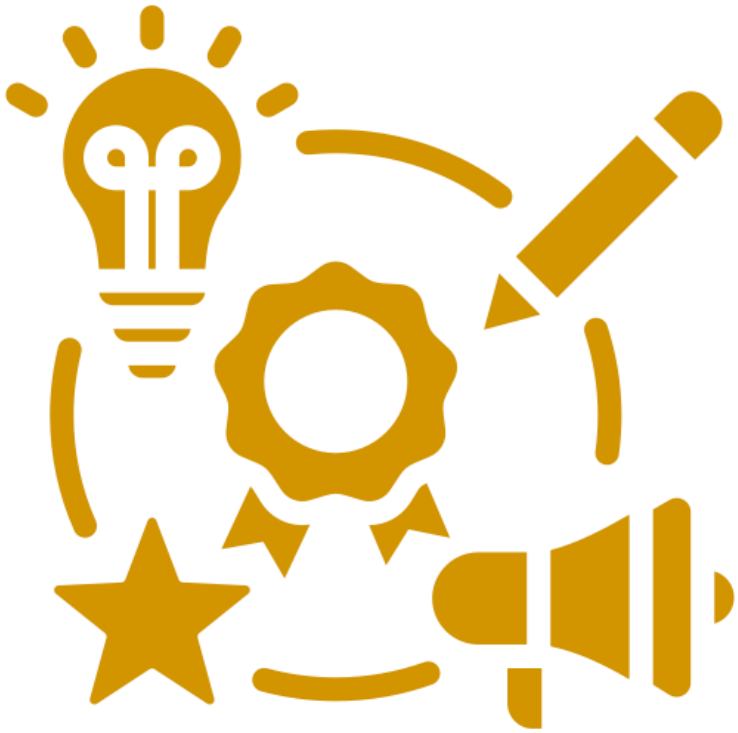


MSMEs can **integrate CE across value chain**

Sources: EU REI (2023): https://www.eu-rei.com/wp-content/uploads/2023/10/Brochure_EU-REI-Textiles.pdf

Measures planned along different parts of the textile value chain

- **Awareness Generation and Capacity Building**
  - Application of circular and resource efficient practices including on water use, energy use, materials and improved sludge management
  - Development of Information, Education and Communication (IEC) materials to promote incorporation of RE and CE practices in MSMEs on selected topics to enable behavior change
  - Supporting knowledge sharing on current best practices in industry, innovation and technology use; and collation of a repository of illustrative practices and solutions



Sources: EU REI (2023): https://www.eu-rei.com/wp-content/uploads/2023/10/Brochure_EU-REI-Textiles.pdf

Measures planned along different parts of the textile value chain



- **Needs Assessment across the Textile Value Chain**
  - Development of the outline of the 'Baseline' and the 'Endline' reports for a selected cluster
  - Development of a cluster level 'Needs Assessment Report' drawing inputs from the baseline and desired endline and emphasizing on critical issues (such as water, energy and materials) identified through stakeholder consultations and rapid appraisals at selected industries. The Needs Assessment Report will contain a high level operational plan to move towards the desired endline

Sources: EU REI (2023): https://www.eu-rei.com/wp-content/uploads/2023/10/Brochure_EU-REI-Textiles.pdf

Measures planned along different parts of the textile value chain

- **'How to' Guide at the Cluster Level**
  - Development of a 'How-to Guide' and a Self-evaluation kit for MSMEs to support transition towards a sustainable and circular textile cluster, with emphasis on water use, energy use, materials and improved sludge management
  - Piloting of the 'How-to Guide' in partnership with a selected cluster, and with institutional actors, including development of implementation plans



Sources: EU REI (2023): https://www.eu-rei.com/wp-content/uploads/2023/10/Brochure_EU-REI-Textiles.pdf