Reverse Resources

Pakistan's Circular Textile Opportunity in the Digital Era

Policy Brief

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NTU
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SMEP

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Programmes and studies

Programme	**Sustainable Manufacturing and Environmental Pollution (SMEP)**
Funded by	UK Foreign, Commonwealth and Development Office (FCDO)
Implemented by	SMEP is implemented in partnership with UN Trade and Development (UNCTAD) who provide technical assistance. FCDO appointed a Project Management Agent (PMA) to manage programme delivery. The PMA comprises a consortium partnership between Pegasys and SouthSouthNorth (SSN).
Focus	SMEP aims to address the environmental and human health impacts of the manufacturing sector in sub-Saharan Africa and South Asia, through funding several pilot and research projects in the target regions, which are designed to generate evidence for feasible pollution mitigation solutions. One such sub-grant / pilot project (lead by Reverse Resources in Pakistan) aims to reduce the excessive consumption of raw materials, water, and energy while addressing the poor management of liquid effluents and solid textile waste. It specifically explores the challenges of international second-hand clothing trade, seeking to prevent textiles from becoming waste in countries that lack recovery capacity.

Programme	**FINIX: multi-disciplinary Sustainable Textile Systems project**

Funded by	Academy of Finland
Implemented by	Aalto University (finix.aalto.fi)
Focus	FINIX produces multi-disciplinary scientific research focused on co-creating resource-wise textile business models that promote global sustainable development. The project drives breakthroughs in developing new sustainable fibers from recycled materials and creating state-of-the-art information systems for tracing textile data throughout their entire lifecycle. By analyzing policies and sustainability impacts, it provides the foundational knowledge necessary to support a large-scale transition toward a global circular textile system.

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Executive Summary

Pakistan is one of the frontrunners among textile-producing countries with recycling infrastructure and market mechanisms already functioning at scale — including textile-to-textile (T2T) recycling in addition to downcycling. This operational foundation positions Pakistan uniquely to capitalise on the global transition to circular textile systems driven by EU regulations, including the Digital Product Passport (DPP) and Extended Producer Responsibility (EPR).

However, Pakistan faces a narrow window to convert its current arbitrage advantage into a permanent competitive position in EU markets. The mechanisms that make Pakistan's recycling industry cost-competitive today — for example chemical decolorisation that enables color-to-color recycling at scale — are precisely the practices that EU regulations will phase out. Capitalising on the opportunity requires coordination across five institutional functions: data infrastructure, trade alignment, industry formalisation, investment attraction, and international representation.

This brief proposes three concrete policy instruments:

- **Verified recycled content export incentive** — An export support scheme with two levels: a standard tier for exporters with existing recycling certificates, and a stronger tier for those who additionally provide verified digital records of where their recycled material came from — rewarding the data capability that EU buyers will soon require.
- **Waste handler formalisation initiative** — Working capital and integrated market access for informal waste handlers through the full digital chain from off-take contract back to DPP-ready evidence, addressing one of the most critical bottlenecks in the value chain.
- **National textile waste data layer** — Data exchange infrastructure, building on the Estonian X-Road model, that enables real-time reporting across ministries while preserving commercial confidentiality, providing the foundation for export incentives, Producer Responsibility Organisation PRO implementation, and international trade data.

This work forms part of the SMEP project, under the component entitled "Proof-of-concept of tracing Post Consumer Waste", implemented in collaboration with the National Textile University (NTU) in Pakistan and the FINIX project at Aalto University.

1. Recycling Value Chains in Pakistan: Waste Flows Overview

Pakistan's textile industry is a cornerstone of the national economy, contributing around **8.5% to GDP** (Pakistan Textile Council, n.d.), employing a large share of the industrial workforce, and generating the majority of export earnings. Its scale makes it central to both industrial activity and livelihoods. At the same time, this extensive production base generates significant volumes of waste across the value chain. (Reverse Resources et al., 2025)

Pakistan plays a relevant role in global waste streams, processing massive volumes of both domestic and imported waste. Annually, the country generates approximately **887 kilotons of post-industrial (PI) waste and 270 kilotons of local post-consumer (PC) waste**. Furthermore, Pakistan is one of the world's top importers of second-hand clothing, bringing in **809 kilotons of imported textile waste** in 2023 alone. (Reverse Resources et al., 2025)

To process these materials, Pakistan has an estimated **350 to 450 recycling units** nationwide, with 175 to 225 units **concentrated in Faisalabad**. Geographic specialisation has emerged organically: **Karachi handles color-to-color recycling** from imported waste, while **Faisalabad serves as the primary recycling hub and majority is stripped** post-industrial waste. (Reverse Resources et al., 2025)

For post-industrial waste, **decolored recycled fibers account for 85–90%** of total recycled fiber production, while the remaining 10–15% consists of mixed-coloured fibres used for low-value applications (Reverse Resources et al., 2025). The price differential (bleached fibres at $0.80–1.60/kg vs colored at $0.30–0.50/kg) (Reverse Resources et al., 2025) explains the industry's current dependence on chemical decolorisation, which enables integration with virgin cotton in open-end spinning. RR estimates the annual capacity for T2T recycling in 2025 to be between **200,000 and 300,000 tons**, covering both post-industrial and post-consumer waste. The numbers might actually be higher, unofficial sources claim that around 1000000 tons are being recycled annualy.

Despite these established processes, **the waste management sector is largely informal**. The sector faces challenges such as inefficient waste collection, contamination, and limited traceability, intensified by a fragmented value chain where thousands of waste handlers operate through personal relationships with minimal formalised contracts. This informality reflects global patterns rather than country-specific features: linear economies have historically treated waste as a cost to be minimised rather than a resource to be managed, producing relationship-based,

light-regulation trade structures across Asia, Africa, and Latin America.

1.1 Post-Industrial Waste and RR's SMEP Contribution

Pakistan's post-industrial waste stream is highly concentrated, with cotton-based materials making up an estimated 68% of the total textile waste (Reverse Resources et al., 2025). This stream includes high-value spinning waste, weaving waste, and readymade garment waste. Through the SMEP project, RR is actively working to formalise and digitise the value chain. By engaging brands (e.g. Primark, OVS, Reformation, Teddy Group, Amazon and the Very Group) and local actors, RR has successfully profiled over 60 manufacturers, 25 local recyclers, and 8 waste handlers on its digital platform.

Figure 1: Overview of Pakistan's waste flows being digitised in the Reverse Resources' platform

An important observation from this operational work is that recycling in Pakistan has long been functioning economically precisely because much of it operates in informal channels with minimal traceability. This is not unique to Pakistan; similar fibre reuse has sustained garment production for centuries across South Asia, long before it was called "recycling." These systems rarely appear in statistics because visibility has traditionally required certification, and certification is expensive, slow, and limited. The opportunity is not to start from zero, but to make the invisible system visible through data rather than paperwork.

1.2 The Reality of Post-Consumer Waste Flows: Insights from NTU and FINIX

Pakistan occupies a highly specialised position in the global post-consumer textile waste (PCW) sector. Imported PCW primarily enters through Karachi Port, where it undergoes initial sorting (sometimes partially completed in Dubai before arrival). High-grade items are typically re-exported; the remaining volume feeds regional markets for resale, recycling, and wiping cloths, with resale dominating due to high value-retention and incineration accounting for a negligible fraction. (Reverse Resources et al., 2025)

Field research conducted under the FINIX project confirms that this value chain operates largely within the informal sector, dominated by family enterprises with specialised buyers for every item type. Waste handlers report that their market has grown smarter over the years in value extraction, but awareness of how global waste legislation may affect them remains limited. Pakistani regulations are similarly misaligned — often failing to recognise the value of local actors in the global second-hand textile sector. A digital verification system could address these gaps, strengthening the industry's legitimacy, global visibility, and scalability.

1.3 Global Waste Flows and Regulatory Landscape Impact

In response to the climate challenge posed by textile waste, the global regulatory landscape is sustaining the transition towards a circular economy. Europe leads this regulatory change, with two key regulations under the Green Deal framework significantly influencing waste streams: **Extended Producer Responsibility (EPR)** and **Eco-design for Sustainable Products Regulation (ESPR)**.

EPR schemes are increasingly influencing the T2T recycling market, with eco-modulation fees incentivising brands to adopt circular design practices — for instance, bonuses in France for incorporating recycled content into new textiles (Refashion, 2026). The ESPR entered into force in 2024 and mandates that brands selling certain products in Europe must provide a **Digital Product Passport (DPP)** alongside each product significantly increasing the volume of verifiable supply chain data needed to meet ecodesign requirements such as durability and recycled content. The first delegated acts covering batteries, textiles and electronics are expected to mandate compliance as early as 2027.

For Pakistan specifically, these regulations create a major opportunity. While EU obligations are substantial, they also mean that buyers need suppliers who can deliver verified recycled content at scale — and Pakistan already has the infrastructure. The country has established recycling capacity, active brand relationships, and a growing digital verification layer being built under the SMEP project. Countries starting from

scratch on recycling infrastructure would struggle to align with the timeline the DPP requires, but Pakistan can.

1.4 The market reality: existing supply, emerging demand

It is also worth acknowledging upfront what many actors in Pakistan's recycling industry already experience: the constraint on scaling T2T recycling here is **not a lack of industrial capability**. Pakistan's existing 350–450 recycling units process substantial volumes, and the country is a top-3 global exporter of cotton waste (ARISA, 2024). Informal recycling has sustained fibre reuse at price points that formal systems elsewhere struggle to match — a point that becomes more visible once we look beyond certified supply chains to the broader ecosystem of regional textile reuse, where recycled fibres have been quietly integrated into mass-market products across South Asia for decades.

The real bottleneck for scaling T2T is not on the supply side. It is the mismatch between two market realities: Pakistani recyclers are set up for volume production of standard recycled fibres (sold as commodity inputs, including via export of cotton waste), while the market segment that regulations like ESPR and DPP are expected to accelerate — brand-sourced, traceable, verified recycled content with documented provenance — is still in early stages on the demand side globally.

Brand sourcing strategies for recycled content are often fragmented or focused on a narrow set of already premium-priced recycled fabrics, and the prevailing global narrative — that recycling is too expensive to scale or that verified recycled fibres are inherently premium products — hides what is actually available in Pakistan.

This is not a problem Pakistan can solve from the supply side alone. It is, however, a problem that the same digital infrastructure proposed in this brief can directly address. Work is already underway — through Reverse Resources and similar actors — on the demand side, building tools that help brands move from ad-hoc recycled-content sourcing **to structured, data-informed purchasing**: forward commitment agreements, forecasting against actual waste availability, integration with eco-modulation frameworks, and matching brand procurement targets to verified supply pools.

The important point for policy is this: the supply side and the demand side are not sequential challenges, and Pakistan cannot afford to wait for the other end of the cycle to move first. Building the data infrastructure proposed in this brief is what makes Pakistan's supply legible to brands — and **legibility is what unlocks orders** for the traceable, primary-data-verified segment that EU regulations will make mandatory. Countries that invest in this infrastructure early will be the ones brands reach for first

when their sourcing strategies mature. Countries that wait will find that the orders, when they come, go elsewhere.

2. Traceability and Supply Chain Formalisation

2.1 Waste Handlers' Role and Network-Based Formalisation

Building reliable T2T recycling value chains requires formalising the role of waste handlers, who carry the highest capital risks in the value chain and have historically been the least visible actors in textile supply chains. However, the model of formalisation matters as much as formalisation itself. Traditional supply chain compliance mechanisms — third-party audits, on-site inspections, paper-based Transaction Certificates — were designed for a linear world where verification happens at discrete moments in time. They are expensive, slow, easily counterfeitable and poorly suited to the hundreds of small, relationship-based waste handling businesses that Pakistan's recycling sector depends on. Applied rigidly, they would either exclude most of the existing sector or impose costs that the economics of recycled fibres cannot absorb.

Reverse Resources has developed an alternative approach through the **RR Network Certificate**, designed around digital transparency rather than periodic auditing. The certificate is linked to a Code of Conduct co-developed with brands and wider industry stakeholders, but it is based on **self-declaration against that Code** rather than on third-party audit, with one critical difference from conventional self-declaration models: participation in the certificate requires continuous data exchange through the RR platform. A certified waste handler's daily transactions, waste flows, and counterparties are visible to the network. This creates an ongoing feedback loop that replaces point-in-time audit with transaction-level transparency.

The shift is significant. Rather than certifying that a waste handler was compliant on the day an auditor visited, the Network Certificate indicates that the waste handler can be **trusted because they are actively participating in making waste flows transparent**, formalising their business through the act of digital data exchange itself. If a claim is raised against a certified handler, it can be addressed within the network through visible transaction history and peer feedback, rather than through a new audit cycle with its associated costs and delays.

2.2 Traceability and Chain of Custody

The enforcement of emerging regulations requires secure, automated data collection to

guarantee the integrity of claims. RR is currently developing digital infrastructure to integrate seamlessly with DPPs and EPR schemes, enabling **end-to-end traceability** from the collection and sorting of textile waste, through pre-processing and recycling, all the way to the final recycled product.

The platform uses a mass-balance approach operating under the principle that every organisation owns the data they enter and chooses who to share it with. RR digitises the chain of custody by automatically generating a **Reclaimed Material Declaration Form (RMDF)**, where recyclers capture exact origin, material information and waste shipment destinations, reducing the cost and effort required for recycled content standards such as GRS and RCS.

A question emerging across the global circular economy conversation is whether existing certification frameworks such as GRS and RCS — valuable as they have been for establishing baseline credibility in recycled content claims — are by themselves sufficient to serve the next generation of regulatory requirements. The EU's Digital Product Passport assumes continuous, machine-readable data flow across the supply chain, an architecture that certificate-based mass-balance systems were not designed to produce. This is not a criticism of existing standards, which continue to play an important role. It is a recognition that the verification requirements of the emerging regulatory environment — ESPR, DPP, eco-modulation linked to recycled content, CSDDD supply chain due diligence — will require **primary-data and digital infrastructure** that support the certification with a digital verification process, which would help reduce the cost of auditing, significantly increase data accuracy and enable end-to-end traceability for proper digital verification of waste-to-product cycles. The global standards community is already engaged in these discussions, and industry working groups are exploring new recycling certificates built on digital verification principles.

2.3 Beyond Traceability: Market Mechanisms for Circular Economics

Traceability alone will not make T2T recycling economically viable. Even a perfectly transparent supply chain will struggle if feedstock prices remain volatile, demand signals reach recyclers too late, or the price gap between recycled and virgin fibres stays unbridged. The digital infrastructure Pakistan needs must therefore do more than document flows — it must actively shape the market conditions that make recycling commercially sustainable at scale.

Three categories of mechanisms are emerging internationally that any national-scale digital infrastructure should be designed to accommodate:

- **Digital commodity marketplaces** that replace opaque, relationship-based waste trading with structured bidding, forward contracts, and order aggregation — stabilising prices and feedstock availability. Pakistan's recycling sector, which already operates at scale but depends on informal price discovery, stands to benefit particularly from this.
- **Financial instruments** that close the virgin–recycled price gap, modelled on renewable energy certificates: tokens representing verified recycled content that brands or PROs purchase as prepayment, subsidising upstream collection and sorting costs. When linked to traceability data, these also generate the verified evidence brands need to claim recycled content against eco-modulation fee reductions under EPR schemes.
- **Interoperability with emerging data standards** — notably the United Nations Transparency Protocol (UNTP), the EU's Green Deal Data Spaces (developed through initiatives such as SAGE), and the CIRPASS work on DPP data structures. These frameworks define how traceability data is formatted, shared, and verified across borders. Infrastructure built in Pakistan should be designed to plug into them from the outset, avoiding costly duplicate reporting.

Reverse Resources is actively developing capability across all three categories in collaboration with brands, PROs, research institutions, and EU-funded initiatives (e.g. the SAGE project to build **EU Green Deal Data Space,** including a **Textile Cluster**). For Pakistan, the question is not which specific platform will provide each function, but how national infrastructure can be designed to incorporate these mechanisms as they mature — whether developed in-country, through international partnership, or both.

3. Pakistan's Circular Textile Ecosystem: What Exists, What's Emerging, What's Missing

Pakistan's circular textile transition is taking shape through a multi-stakeholder ecosystem bridging government, private sector, academia, and international partnerships — coordinated not through a single authority but through complementary functions distributed across institutions. The **Ministry of Commerce (MoC)** leads trade and export policy, having finalised Pakistan's Textile and Apparel Policy 2025–30, which targets $29.381 billion in exports by 2030 with explicit focus on sustainable manufacturing and circular economy (Business Recorder, 2025). The **Ministry of Climate Change and Environmental Coordination** covers environmental compliance and international climate commitments. **SDPI** serves as the research and policy dialogue backbone, partnering with UNEP on used textile trade. **National Textile University (NTU)** anchors academic and technical standards work. Corporate

frontrunners — including Artistic Milliners, Interloop, Sapphire, TexStyle, Datini Fibres, Masood Textile Mills, and Recover — are exploring circular business models through brand partnerships.

Major international commitments shaping the environment include **GIZ Pakistan's €5.5M circular economy project (2026–2028)** in partnership with MoC; **UNIDO's Resource Efficient Initiative** training 500 factories; UNEP's partnership with SDPI; and the **Net-Zero Textile Cluster** in Faisalabad (announced at COP28). Recent commitments include Dutch company Bedding House establishing a Pakistan sourcing office for textile waste reuse (January 2026) and Octans Digital (Interloop subsidiary) pitching DPP implementation to the PM's Commerce Coordinator (August 2025).

The following table maps capabilities against five essential functions for a circular textile economy, showing where existing strengths, emerging developments, and critical gaps sit across this ecosystem.

Layer	What Exists Today	What is Emerging	What's Still Missing
Physical Infrastructure	350–450 recycling units; Faisalabad cluster (175–225 units); Karachi Export Processing Zone (KEPZ) (266 operating companies, 30,000 jobs (EPZA, 2020); geographic specialisation (Karachi: color-to-color; Faisalabad: decolorisation); 200,000–300,000 tons T2T capacity	Satiana chemical & water compliance pilot (SMEP/FCDO); Net-Zero Textile Cluster Faisalabad; GIZ circular economy project (€5.5M); Dutch Bedding House pilot	Advanced sorting technology (NIR, automation); chemical recycling capacity for blends; cluster-wide effluent treatment; alternative decolorisation technologies
Data Infrastructure	RR platform (60 manufacturers, 25 recyclers, 8 handlers under SMEP); NTU waste industry mapping; GRS/RCS certification; brand offtake partnerships	Octans Digital DPP development (APP, 2025); SECP voluntary ESG disclosure guidelines for listed companies	National-scale coverage; DPP-ready continuous data output; cross-ministry data standardisation
Market Infrastructure	Brand relationships via SMEP; export networks	Brand forward commitments via	Performance-linked premium pricing;

Layer	What Exists Today	What is Emerging	What's Still Missing
	through KEPZ; informal waste handler networks	SMEP; Waste Handler Network Certificate pilot	eco-modulation integration; SME access to verified markets
Financial Infrastructure	Duty-free import of textile machinery not manufactured locally (Board of Investment, n.d.)	Green: [State Bank Green Taxonomy (under Textile Policy 2025–30); international climate finance access; GIZ circular economy project (€5.5M, 2026–2028) in partnership with MoC (GIZ, 2026)	Verified recycled content export incentives; PRO fee structure; carbon credit monetisation
Governance & Standards	GRS/RCS certification; Chemical compliance pilot at Satiana cluster aligned with Zero Discharge of Hazardous Chemicals (ZDHC) standards (NTU, KnowTex & Closed Loop Fashion, 2025), MoC lead coordination; SDPI policy dialogue	Textile Policy 2025–30 (MoC-led, cross-ministerial); National Strategy on Sustainable and Circular Textiles; UNEP/SDPI used textile trade guidelines	Primary-data verification standards; coordinated EU trade representation; PRO operational framework; cross-ministry implementation protocols

Two gaps are particularly significant. First, **primary-data verification capability**: Pakistan has certification infrastructure but lacks the continuous, machine-readable data systems that DPP will require. Second, **cross-ministry implementation protocols**: despite MoC's coordinating role and the cross-ministerial ambitions of the Textile Policy 2025–30, the operational mechanisms for Commerce, Climate Change, SBP, and provincial authorities to actually work together on circular textile implementation do not yet exist. The three policy instruments proposed in Chapter 5 are designed to address both gaps simultaneously.

4. Scaling T2T Recycling in Pakistan: Policy Framework and Recommendations

4.1 The Political Landscape of Waste Management in Pakistan

Pakistan has historically lacked a dedicated national policy for textile waste recycling, with the sector indirectly shaped by a mix of environmental, industrial, and trade policies — the National Environmental Policy, National Climate Change Policy (2021), National Hazardous Waste Management Policy (2022), and trade instruments such as tariffs and import/export regulations.

This is now changing. The **Textile and Apparel Policy 2025–30**, finalised by the Ministry of Commerce in late 2025, includes circular economy and resource efficiency as explicit strategic objectives (Business Recorder, 2025). The National Strategy on Sustainable and Circular Textiles, being developed under this framework, creates the first opportunity for coordinated cross-ministerial action. However, the question of institutional ownership remains open: textile circularity cuts across Commerce (trade and export), Climate Change (environmental compliance), SBP (green finance), and provincial industrial authorities (cluster-level infrastructure). None of these can be implemented alone.

4.2 Three Concrete Policy Instruments

Instrument A: Export Incentive for Verified Recycled Content

What it does: Rewards Pakistani recyclers and exporters whose recycled content can be properly traced back to its source so that Pakistani exports are positioned for the verification requirements EU buyers will soon be asking for.

How it works: Today, a recycler selling recycled cotton fibre abroad can show a GRS or RCS certificate as proof of recycled content. These certificates have served the industry well, but they are issued once a year and don't capture what happens between audits. New EU regulations, particularly the Digital Product Passport, will require something more: ongoing, verifiable evidence that each batch of recycled fibre actually came from where it says it did. This means going beyond annual certification to keeping accurate digital records of every waste pickup, every sorting step, and every shipment.

Pakistan can get ahead of this by offering **two levels of export support**:

- **Level 1 (standard):** Existing incentives continue for exporters with recognised recycling certificates (GRS, RCS, etc.)

- **Level 2 (enhanced):** Stronger incentives — through lower export duties, faster customs clearance, or preferential financing — for exporters who additionally provide verified digital records showing where their recycled material came from and how it was handled along the way.

The enhanced tier acknowledges the existing certification investment exporters have already made, while rewarding those who build the additional data capability that the next generation of EU buyers will demand.

Why now: EU buyers are already starting to ask suppliers about their ability to provide DPP-ready data. Pakistani exporters who can answer "yes" by 2027 will win orders from suppliers in countries that are still saying "we're working on it."

Instrument B: Waste Handler Formalisation Initiative

What it does: Brings Pakistan's informal waste handlers — the businesses that collect, sort, and move textile waste every day — into the formal economy as recognised and capable partners in the recycling value chain, equipped to operate in the increasingly digital global supply chain brands and regulators are moving towards.

How it works: Waste handlers are the backbone of Pakistan's recycling system. They collect waste from factories, sort it, and supply recyclers. Without them, there is no recycled fibre industry. Yet historically they have been almost invisible to policy, operating through personal relationships and informal contracts, excluded from structured government support, and unable to demonstrate the traceable chain of custody that EU regulations will increasingly require.

The initiative would support waste handlers across three complementary dimensions:

- **A recognised digital business identity** — An official unique identification as a verified textile waste handler, recognised by factories, recyclers, brands, and government agencies alike. Rather than requiring a traditional audit, this status is earned by simply participating in the digital supply chain: a handler's day-to-day transactions build the record that establishes their credibility.
- **Integration into a transparent supply chain** — connecting each waste handler's day-to-day transactions to the evidence that brands need for DPP and EPR compliance. In practice, this means that doing business in the normal way automatically generates the traceability records that buyers and regulators are beginning to require.
- **Digital literacy and capacity building** — practical education on how digital tools support their businesses, what traceability requirements mean in everyday terms, and how to participate confidently in the data exchange systems that will

increasingly define which handlers are part of the formal supply chain and which are left behind. This is one of the largest barriers to formalisation in the sector and is rarely addressed directly by existing programs.

Rather than requiring handlers to become fully formal before participating, the initiative treats participation in the traceable supply chain itself as the pathway to formalisation. Handlers don't need to produce paperwork they've never had — their ongoing digital transaction history becomes the record. The training component ensures that limited experience with digital tools is not a barrier to participation.

Why now: As EU buyers start requiring documented supply chains, waste handlers who remain outside the traceable network will be cut out of the higher-value recycled content market. Bringing them into the formal system now preserves the sector's existing strength — its scale and its economic viability — as it transitions.

Instrument C: National Textile Waste Data System

What it does: Creates a shared national system for textile waste reporting that multiple government agencies can draw on for their own purposes — without forcing businesses to submit the same data over and over to different ministries.

How it works: Today, if a textile exporter wanted to demonstrate compliance on waste management, they might need to report separately to the Ministry of Commerce (for export paperwork), the Ministry of Climate Change (for environmental compliance), the State Bank (for green financing eligibility), and brand auditors — often using different formats for the same underlying information.

A national textile waste data system would allow a recycler or exporter to **record their data once** and grant different government agencies or business partners permission to see the parts relevant to them. The company owns its commercial data and controls who sees what. Government agencies get the information they need for their specific functions without creating duplicate reporting burdens.

This model is not theoretical. **Estonia has operated exactly this kind of shared data system (called X-Road) for more than 20 years** across its entire government, from tax filings to healthcare to business registrations. The architecture has been replicated in Finland, Iceland, Ukraine, Namibia, and several other countries. And this is now also what the **Green Deal Dataspace Textile Cluster**[1] is set to achieve. What is proposed here is a focused version of the same logic, applied to textile waste and recycling in Pakistan.

[1] https://www.greendealdata.eu/use-cases/textile-circularity/

Such a system also enables what may be the most powerful mechanism for sector formalisation: **tax-based incentives**. In many countries, VAT rebates or tax deductions are available when waste is sent to formal recycling rather than landfill or informal channels. When a single digital record can simultaneously serve customs, tax, and environmental reporting, it becomes realistic to align these incentives without burying businesses in new paperwork.

Why now: Pakistan's Textile Policy 2025–30 already commits to cross-ministerial work on sustainable and circular textiles. A shared data system is the operational foundation that allows the Ministry of Commerce, Ministry of Climate Change, State Bank, and provincial industrial authorities to coordinate rather than operate in parallel.

5. The Window: Why Pakistan Must Act Now

Any national-scale circular textile program for Pakistan will require close integration across **existing data infrastructure** (built under SMEP/FCDO), **academic and research capacity** (NTU, KnowTex, SDPI), **environmental compliance work** (CLF, WWF-Pakistan, ZDHC), and **policy coordination roles** (Ministry of Commerce, Ministry of Climate Change). Program design that treats these as parallel rather than integrated components risks repeating patterns seen globally — building capacity in locations without reliable connections to market demand, generating outputs that cannot be sustained when project funding ends.

Pakistan can become a hub for global circular textile production, but only if policy coordination moves as rapidly as market requirements. The opportunity is substantial; the timeline is limited; the choice is Pakistan's to make.

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