From Faisalabad to Sustainability:
The Untold Story of Pakistan's Textile Recycling Revolution

by Sven Buchholz – Bonn / Bremen, 11.12.2024

In the sun-soaked courtyard of a textile factory in the Punjab, Pakistan, a manager gestures towards massive bales of cotton and remarks:

> *"This is recycled cotton from Faisalabad. Sure, it's recycled — our customers are happy they're doing something for the environment by using recycled cotton in their products. But no one really looks at how this recycling is done. You should take a closer look — there's a lot that needs fixing... maybe you can help them!"*

This brief exchange became the spark for a deeper investigation — and eventually, the launch of a groundbreaking pilot project aimed at transforming the textile recycling industry in Faisalabad.

Peeking Behind the Curtain of Textile Recycling in Satiana

Faisalabad's Satiana region is home to nearly 100 textile recycling units, all operating in roughly the same manner. The process starts with sorting pre-consumer (post-industrial) textile waste, which is then cut into small pieces, loosened, and decolorized.

Decolorization with chemicals in tanks

Sun-drying the decolorized scraps

The decolorization process involves submerging fabric scraps into large tanks filled with chemical solutions, moving them from one tank to another over specific time intervals. Once stripped of color, the scraps are sun-dried in expansive yards.
The wastewater, untreated and chemical-laden, flows directly into the environment. Meanwhile, workers handle the soaking and movement of fabrics with little to no protective equipment, exposing them to significant health risks.

The next stage involves blending decolorized scraps based on "recipes" tailored to customer demands. These recipes—guarded trade secrets—determine the quality of the final recycled fiber. As one entrepreneur put it: "If someone shares a recipe with you, you can be sure it's fake and won't work."
After blending, the mix undergoes ultraviolet inspection under blacklight to remove synthetic impurities, which fluoresce under UV rays. Workers extract these fibers by

hand. Finally, the cleaned scraps enter machines equipped with sharp, rotating teeth that shred the material into ever-finer pieces until only recycled cotton fibers remain. These fibers are then baled for sale.

Inspection under blacklight

The opening of the fabric

The process is noisy, dusty, and perilous, with numerous opportunities for workers to suffer injuries—an unfortunate but common occurrence. Fiber quality, measured by attributes like length and color, dictates the market price.

Recycled cotton at the end of the process

A Call for Change: Objectives of the Pilot Project

The initial analysis revealed three key areas ripe for improvement:

1. **Decolorization Process**: Introducing safer chemicals and methods to protect workers and the environment.
2. **Fiber Recovery**: Enhancing the machinery and processes to yield higher-quality fibers while improving worker safety.
3. **Occupational Safety**: Raising awareness and implementing basic health and safety protocols.

This pilot wasn't about scaling solutions immediately but about testing interventions in a real-world context. The goal was to explore improvements while navigating the complex intersection of profit, environmental protection, and worker welfare. Data collection was central to the effort, aiming to understand not just *if* but *how* and *why* certain changes worked.

Testing the Waters: The Experimental Design

The project divided 12 recycling units into three test groups and one control group, each with four companies. Each test group received varying combinations of interventions:

1. **Retrofitting existing machines with upgraded components to enhance efficiency and safety.**
2. **Introducing Standard Operating Procedures (SOPs) to streamline processes and reduce accidents.**
3. **Combining retrofitting with SOPs for a holistic improvement approach.**
   In addition, all groups received basic occupational health and safety (OHS) training. Interventions were carefully monitored to measure their impact on fiber quality, worker safety, and environmental sustainability.

Testing fibre-length

Challenges on the Ground

The project encountered significant hurdles, from delays in retrofitting machines to supply chain disruptions for protective equipment. Differences in input materials also complicated efforts to standardize testing conditions, as companies refused to share their secret "recipes."

Additionally, the rapid adoption of visible improvements by companies outside the pilot disrupted the controlled environment. Positive changes, such as basic machine modifications, were quickly copied by neighboring units, even those in the control group.

But most importantly, with each retrofitting component, recyclers initially faced challenges related to product quality and process inefficiencies during the first few hours or even days. These issues required careful adjustments and fine-tuning of the machinery, tailored to the type of fabric waste and the specific setup of the equipment. Additionally, recyclers experienced financial losses from the lower-quality bales produced during the retrofitting process. Their patience in enduring these temporary setbacks and their motivation to see the project through were critical factors in the success of this pilot initiative.

Early Successes and Lessons Learned

Despite the challenges, the pilot has yielded promising results. Retrofitted machines improved material yield, product quality, and worker safety. Advances in the decolorization process hold the potential to significantly reduce environmental harm,

though these innovations must still undergo cost analysis and large-scale implementation.

The project underscored the importance of flexible planning, close collaboration with all stakeholders, and a willingness to adapt based on real-time insights. As one team member noted, quoting Einstein: "Planning replaces chance with error." Mistakes became opportunities for learning, highlighting the value of iterative experimentation.

The Bigger Picture: Can Pilots Lead to Scale?

While pilots are invaluable for testing concepts, scaling them requires addressing broader structural issues. The close support provided during this pilot—both from local partners and the National Textile University—fostered trust and experimentation. However, such intensive support is rarely feasible during large-scale rollouts, meaning outcomes might differ.
What these pilots can offer, however, is a "proof of concept." By demonstrating the feasibility of changes within real-world constraints, they lay the groundwork for future reforms.

As the final results of this pilot are awaited in March, one thing is clear: this initiative has already sparked critical conversations about sustainability, safety, and innovation in Pakistan's textile recycling industry. Whether it serves as a blueprint for broader change remains to be seen, but its impact is undeniable—a testament to the potential of collaboration and curiosity in tackling global challenges.
For more information and to get invited for the presentation of the final results, contact:

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