

## Influence of Local Inputs on Eco-Innovation and Sustainability in the Congolese Textile Sector

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### ABSTRACT

Agricultural dynamics, particularly in the fields of fashion and tailoring, play a fundamental role in building a sustainable local economy, especially in the textile sector of the Democratic Republic of Congo (DRC). Fletcher (2008), a pioneer in sustainability in fashion, clearly distinguishes between two approaches: sustainable textile products and sustainable textile systems. Both dimensions are especially influential in the Congolese context, where the use of local resources is of strategic importance. Local raw materials such as plant fibers, traditional fabrics, cultural symbols, and identity patterns play an essential role in creating fashion that is rooted in the sociocultural realities of the region. They are both a source of innovation and a means of valorizing Congolese textile heritage. Nzau (2019) emphasizes that these natural resources facilitate the production of components that are adapted to local dress codes, thus strengthening the cultural anchoring of fashion. Nkongolo-Bakenda (2001) argues that the integration of local inputs helps reduce dependence on costly imports while stimulating artisanal innovation and creating jobs. However, this dynamic is not without challenges. The growth of the sector leads to environmental impacts that require better waste management and the adoption of more sustainable production practices. Therefore, promoting eco-innovation becomes essential to ensure a transition to an environmentally responsible Congolese textile industry. Local inputs thus appear as strategic levers to enhance the competitiveness of artisans and garment technicians against international competition, particularly from markets saturated with imported products. The question remains: what will the future of Congo-Kinshasa look like if the valorization and local transformation of raw materials become the drivers of a sustainable and innovative textile sector? This perspective paves the way for a circular economy based on local resources, offering resilience, creativity, and economic sovereignty.

**Keywords:** textile industry, local inputs, eco-innovation

### INTRODUCTION

#### The Textile Industry

The textile industry encompasses all activities related to fabrics, from design and manufacturing to marketing. This sector includes a wide range of professions covering the entire chain of production and transformation of raw materials.

According to Chataignier (2015), this sector plays a key role in the global economy due to its strong capacity for job creation and innovation. However, it is also among the most polluting industries, raising significant challenges in terms of sustainability and environmental responsibility.

Parish (2010) emphasizes that, in the field of fashion design, the textile industry holds a central role. It involves all activities related to the conception, creation, and production of garments from fabrics. Meanwhile, Debbabi (2014) defines pattern making as the art of transforming an idea or sketch into a concrete model or prototype a process closely linked to the quality and diversity of available textile materials, particularly fabrics and fibers.

Thus, the textile industry provides not only fibers, fabrics, linings, threads, and accessories essential for creating innovative garments suited to market demands, but also promotes experimentation with new shapes, volumes, and sewing techniques.

In Kinshasa, this industry has experienced unprecedented growth. It contributes to shaping trends while addressing aesthetic, cultural, and functional needs. Therefore, in the context of fashion design, the textile industry goes beyond supplying raw materials; it serves as a strategic partner in the process of creation, innovation, and enhancement of local and artisanal expertise.

### **Local Inputs**

Gwilt and Rissanen (2011) emphasize that the use of locally sourced raw materials is of particular importance, as it combines innovation, sustainability, and the promotion of cultural heritage. Customs and traditions, integrated into textile practices, become creative reflexes that give rise to an art deeply rooted in local identity.

This approach aligns fully with a sustainability mindset, essential in dressmaking and fashion design, especially to meet current ecological requirements. Local inputs play a vital role in strengthening the local economy. They provide clothing professionals with accessible, reliable, and suitable resources, facilitating the creation of designs that reflect the needs of society.

The maintenance and development of the textile industry largely depend on these resources, which follow a value chain starting from agriculture to transformation and commercialization, including tailoring and sewing workshops.

In this context, Debbabi (2014) notes that natural or agricultural resources from a given region or country are used in textile production processes. These resources are exploited not only in agriculture, industry, and crafts, but also as drivers of sustainable production and as means of promoting local expertise.

To ensure the healthy development of the textile industry in the Democratic Republic of the Congo, agricultural production includes:

- Vegetable Fibers: cotton, flax, jute, and raffia.
- Animal Fibers: wool and silk.
- Hides and Leather.

### **Eco-Innovation**

The textile sector constitutes a significant value chain that contributes substantially to the intensification of the local economy. In this domain, the public does not consume only raw fabric, but primarily the finished product the designed, realized, and adapted model which becomes a tangible good intended for commercial use.

Within textile workshops, two types of products can be distinguished: tangible and intangible. Tangible products refer to finished garments resulting from modeling and manufacturing processes. Intangible products, on the other hand, correspond to services offered by fashion designers and clothing technicians, such as custom design or garment adjustments. This type of service attracts a broad clientele, often seeking personalized creations adapted to their tastes or specific cultural contexts.

To ensure the success of this practice, innovation is essential to attract more clients, with creativity serving as a lever for competitiveness in the apparel market. Such dynamics also promote the development of a social climate conducive to fulfilling fiscal obligations, including the payment of taxes, which allows the state to provide public services such as sanitation while ensuring environmental protection within the textile sector.

Caron and Valette (2018) emphasize that sustainability in this field encompasses the entire garment lifecycle, from design to end-of-life. It requires an ethical, creative, and technical approach at each stage of the process.

## **MATERIALS AND METHODS**

To collect the necessary data for this study, a sample of 50 clothing technicians was selected to allow a representative analysis of practices related to textile eco-innovation. The adopted methodology is based on content analysis, following principles developed by Gérard Dereze and Laurence Bardin. This method enables a thorough examination of the influence of local inputs within an eco-innovation dynamic in the Congolese textile sector. The survey protocol focused on four main questions:

1. Which types of local inputs (fibers, fabrics, dyes, accessories) are currently used in Congolese tailoring workshops, and how frequently?
2. How does the use of local raw materials stimulate innovation (technical, aesthetic, or social) in the textile creation process?
3. How do stakeholders perceive the link between using local inputs and environmental sustainability issues?
4. What economic, technical, or cultural barriers limit the adoption of local inputs in a textile eco-innovation approach?

From a quantitative perspective, this study also explored the relevance of the value chain—from agriculture and livestock to the textile industry, and then to design and production workshops—to sustainably supply the apparel market with local products.

## **RESULTS**

### **Use of Inputs in Tailoring Workshops**

The survey reveals that 68% of clothing technicians use local inputs in garment fabrication. This practice is considered an asset in the market, particularly because of its ability to meet clients' cultural expectations, especially those attached to traditions. Conversely, 32% of respondents report that, although they recognize the value of local materials, their scarcity or irregular availability in the market limits their use. This constraint leads them to rely on imported products to sustain their activity and avoid economic vulnerability.

### **Impact of Local Materials on Textile Innovation**

Results indicate that local raw materials have a significant impact on textile innovation. In fact, 54% of participants believe these materials are more durable, both in terms of strength and ecological sustainability. On the other hand, 46% consider them less performant than industrial textiles, particularly in terms of durability.

This divergence highlights a lack of uniformity in the quality of available local materials, while also reflecting growing awareness of environmental issues. Several artisans report adopting adaptation strategies such as fiber blending or reinforcement of linings to optimize the longevity and quality of fabrics derived from local resources.

### **Perceived Link Between Local Inputs and Sustainability**

The link between local inputs and sustainability is perceived through the individual and collective responsibility of actors in the apparel sector. According to the survey results, 62% of participants believe that the use of local raw materials contributes to sustainability, particularly due to the longevity of the fabrics and their low environmental impact, thereby reducing the risks of pollution and unsanitary conditions.

Additionally, 48% of respondents highlight the need for structured education to better understand and manage the interactions between the use of local inputs and sustainability issues. This observation underscores the need for awareness and training on eco-responsible practices in the textile sector.

### Obstacles to Local Textile Eco-Innovation

Survey results show that 72% of respondents assert that the use of local materials stimulates creativity in garment design. Textures, colors, and the cultural meanings attached to these materials serve as a source of inspiration for original creations, which are particularly valued during fashion shows and artisanal exhibitions. As one respondent expressed: *"The pagne (traditional fabric) forces us to think differently in order to create designs that resonate with our clients and tell a story."*

However, despite this creative potential, several obstacles hinder the growth of local textile eco-innovation. These challenges include:

- Limited availability of raw materials
- Insufficient adapted processing tools
- Lack of technical training on sustainable procedures

These constraints reduce artisans' ability to develop competitive products while respecting sustainability principles.

## DISCUSSION

The analysis of results highlights the central role of local raw materials in building a more sustainable textile industry in Kinshasa. This is the core interest of this study: examining the influence of local inputs on eco-innovation and the evolution of the textile industry in the Democratic Republic of Congo.

The main hypothesis, confirmed by the data, suggests that the concept of the "textile industry" in Kinshasa goes beyond its purely semantic meaning to take on a technical dimension. Some clothing technicians innovate by using recovered fabrics and fibers—particularly from second-hand clothing to create high-quality garments.

The use of these materials is driven both by economic constraints and a strong attachment to local cultural values. However, the uneven quality of local fabrics remains an obstacle to their widespread adoption in certain market segments, particularly those focused on performance or export.

In terms of innovation, local inputs encourage the originality of creations and contribute to the valorization of artisanal expertise. Constraints become drivers of creativity: by relying on materials rooted in Congolese culture, artisans develop hybrid styles that are both eco-friendly and deeply connected to their socio-cultural environment.

Nevertheless, to enable large-scale adoption of sustainable practices, it is essential to further structure the local textile value chain. This includes:

- Investment in the quality of raw materials
- Training of artisans
- Consumer awareness initiatives

### Future Perspectives

To strengthen this dynamic and promote a sustainable transformation of the Congolese textile sector, several action paths are proposed:

- **Improvement of Local Material Quality:** Invest in textile processing infrastructure (spinning, weaving, dyeing) to standardize input quality and expand creative possibilities.

- **Capacity Building for Artisans:** Provide technical training in tailoring, sustainable pattern making, and finishing techniques adapted to the specificities of local fibers.
- **Institutional and Policy Support:** Implement incentive-based public policies, including subsidies, easier access to local and international markets, and protection of textile and artisanal heritage.
- **Consumer Education:** Raise public awareness about the importance of responsible consumption and the added value of products derived from the local economy.
- **International Market Positioning:** Promote Congolese textiles through digital platforms, international fairs, and partnerships with global ethical brands.

## CONCLUSION

This study highlights that local raw materials are a strategic lever for promoting sustainability and innovation within the textile industry in Kinshasa. Despite certain constraints—particularly uneven input quality and recognition in the formal market—their potential as catalysts for ecological, cultural, and economic transformation remains significant.

To consolidate this dynamic, it is essential to actively involve public authorities, professional organizations, and field actors in developing incentive policies. These should aim to strengthen the local textile value chain, support sustainable entrepreneurship, and improve access to processing tools and technical training.

Ultimately, the valorization of local raw materials paves the way for a more resilient, innovative, and culturally rooted Congolese textile industry. By leveraging this strategic resource, Kinshasa has the potential to become a reference hub for textile creation, combining artisanal traditions with contemporary sustainable development requirements.

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