



## A Framework for Evaluating Sustainable Jean Attributes

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*Introduction.* Denim accounts for the world's largest segment of the clothing industry with jeans making up most of the denim usage (Research and Markets, 2017). Prized for its durability and strength, denim is considered one of the most versatile fabrics in fashion. According to recent market research, 6 billion pairs of jeans were made in 2018 (Szmydke-Cacciapalle, 2018). But the production of a single pair has an enormous environmental footprint using an average 2,113 gallons of water, 48 kilowatts of energy, (Levi's Strauss, 2015), and 1.1 pounds of toxic and corrosive chemicals (Candiani Report, 2016). Producing jeans has immense social impacts as well. Besides common workplace chemical hazards used to acquire a variety of finishes, jeans production represents a labor-intensive process with only 2-3 pairs produced per hour. More positively, jeans production generates significant industry profit (\$66.02 billion in 2018) and secures as many as 26 million jobs worldwide (Muthu, 2017).

*Rationale.* More recently, the demand for sustainable denim is growing (Muthu, 2017) and fashion brands are making efforts to improve jeans production by reducing environmental and social footprint of the product. Still, it is estimated that less than 1 billion pairs of jeans have been produced in a more sustainable manner, leaving significant room for further improvements (Szmydke-Cacciapalle, 2018). Very little systematic research has been done to understand the scope, attributes, and volume of sustainable jeans offerings. This project presents a framework for sustainable jeans attributes that could be used for future research.

*Method and Approach.* This study represents the first systematic review of sustainable jeans offerings. To avoid sustainability compartmentalization (Jestratijevic & Rudd, 2018), the integrative Triple Bottom Line (TBL) approach was applied to analyze the offerings and evaluate product sustainability (Elkington, 1998). To aggregate a description of what product-related attributes contribute to the environmental, social and economic sustainability, the research focus was exclusively placed on website content search and analysis (Stansfield et al., 2016). Python programming language libraries were used to develop a web scrapper and yielded an initial sample of 142 official websites of international brands that advertised *sustainable jeans* products (Mitchell, 2018). After exclusion of websites that contained mainly non-English content, and ones that failed to provide no or minimal information about why their jeans are sustainable, the final sample for the systematic review included sixty websites/brands (n=60). Secondly, each brand's website was manually browsed multiple times to iteratively explore the content. A Microsoft Excel worksheet was used to compile relevant data and keep records with descriptions of the techniques used for searching (date searched, pathways followed, search terms etc.) Qualitative analytical method-thematic content clustering (Braun & Clarke, 2006) was utilized to identify the scope, and central themes of sustainable jeans offerings. Finally, based on research findings, an integrative framework for sustainable jeans attributes was proposed, providing a coherent agenda for future improvements while addressing current limitations.

*Results.* Sustainable jeans have been offered mainly by American (n=31), and European (n= 20) retail brands, while a minor number of brands originate from Canada (n=2), India (n=2), Australia (n=2), Turkey (n=2), and Japan (n=1). Sustainable jeans prices range from \$29 at minimum (mass market retailers H&M, Gap etc.) up to \$1000 in the case of premium and luxury brands (*Stella McCartney, Nobody Denim*). A wide range of descriptions and attributes has been used by retailers to promote their products as sustainable. Some brands describe the sustainability of their jeans through quantifying their superior performance to competing products in an environmental life cycle assessment (*Levi's, E.L.V., Kings of Indigo, M.I.H.*). Others communicate their efforts to ensure traceable materials (*Redew, Theory*), ethical and an accountable supply chain (*Closed, Warp-Weft*), transparent product pricing (*Everlane*). Some brands emphasized a focus on zero-waste design (E.L.V), meticulous attention to material selection (*Stella McCartney, Kings of Indigo, Nobody, Kuyichi*), improved chemical treatments and natural dyeing methods (*Acne, Nudie, Free People, Good Society*), and logistics optimization (*Yoga*). A few brands described that they contribute to sustainable development through collaborations (*Sustainable Apparel Association, Fair Wear Foundation*), recycling efforts (*Blue jeans go Green*), or product rentals (*Mudd, Gianni*). For most brands (63%, n=38), sustainable products claim an exclusively environmental scope with little more than a single product attribute improvement (e.g. carbon reduction, water, and energy efficiency, waste reduction, and recycled content). Some brands (12%, n=7) investigated (*Nudie Jeans, Mudd Jeans, NoNasties, Outland, Kings of Indigo, Outerknown, Frank & Oak*) evidently adhered to more comprehensive, integrative TBL standards. Nevertheless, 25% of brands (n=15) use extensive verbiage to self-declare sustainable product value showing no factual evidence to support product sustainability. Strong evidence to support sustainable product attributes was commonly provided through business certifications (*B-corporation, BSCI*), product certifications (*Cradle 2 Cradle, Fair Trade*), material certification (*Global Organic Textile Standards-GOTS; Global Recycled Standard-GRS*), or legitimate product testing (*Blue Sign, Standard 100 by OEKO TEX*). Improvements also were visible through a business model (e.g. *Warp & Weft* family owned and vertically integrated business, *Korra* -artisanal business, and *Mott & Bow* hand-tailored goods); socio-economic attributes (e.g. *Nudie*-labor costs and product true cost estimates); measurable impact assessments (e.g. *Mudd Jeans* -396 gallons of water compared to an industry standard of 2,113 gallons per pair of jeans) or tangible product characteristics (e.g. *Warp & Weft*-lightweight jeans: 7-15 oz; *NoNasties*-100% biodegradable jeans, *Agolde*-100% recyclable jeans).

*Implications for retailers.* An integrative framework for the sustainable jeans attributes was proposed to map best peer practices. While some retailers have already made evident sustainability achievements, the results revealed practical obstacles that still prevent standardized, product related assessments. There was an evident lack of consensus about which product attributes are mandatory for sustainable product classification, and which ones are voluntary. Consequently, for different retailers' sustainability has very different meanings. Only 12% of brands investigated provided enough evidence to show how they apply an integrative TBL approach to jointly consider all sustainability pillars in order to determine benefits in some areas, or potential trade-offs in other areas. Unless consensus is reached and the essential

prerequisites for sustainable jeans products are harmonized industry wide, some brands will continue to mislead consumers by falsely promoting “sustainable” choice. Thus, it is timely to ensure that sustainability claims are neither deceptive nor misleading but are compliant with the governing laws and are premised on justifiable and widely-accepted sustainability metrics.

*Implications for consumers.* Consumers are often hampered to purchase improved jeans products as they do not have adequate knowledge to distinguish legitimate and brand-declared certifications (Brach et al., 2018) or to understand other quantitative and technical impact assessments. A wide range of product pricings in the same product category and ambiguous sustainability claims are further accentuating the confusion. Since consumers mainly rely on official brand websites to find information about desired products (Verhagen et al., 2010), this study urges retailers to address confusions by publishing accurate information, which would help facilitate decision making, but also ensure brand credibility and create a competitive advantage.

### References

- Brach, S., Walsh, G., & Shaw, D. (2018). Sustainable consumption and third-party certification labels: Consumers’ perceptions and reactions. *European Management Journal*, 36(2), 254-265.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101.
- Candiani Sustainability Report. (2016). Candiani denim. Retrieved March 31, 2020 from <https://www.candianidenim.it/download/Sustainability%20Report.pdf>.
- Elkington, J. (1998). Partnerships from cannibals with forks: The triple bottom line of 21st-century business. *Environmental Quality Management*, 8(1), 37-51.
- Jestratijevic, I., & Rudd, N. A (2018). Six Forms of Sustainable Fashion. *Trends in Textile & Fashion Design*, 2(4). DOI: 10.32474/LTTFD.2018.02.000145
- Levi’s Strauss. (2015). The life cycle of a jean. Retrieved March 30, 2020 from <https://levistrauss.com/wp-content/uploads/2015/03/Full-LCA-Results-Deck-FINAL.pdf>.
- Mitchell, R. (2018). *Web scraping with Python: Collecting more data from the modern web*. O’Reilly Media, Inc.
- Muthu, S. (2017). *Sustainability in Denim*. Woodhead Publishing.

- Research and Markets. (2017, December 13). Global Denim Market 2017-2023 by Product, Segment, Consumer Type, and Distribution Channel. Retrieved April 7, 2020 from <https://www.globenewswire.com/news-release/2017/12/13/1261138/0/en/Global-Denim-Market-2017-2023-by-Product-Segment-Consumer-Type-and-Distribution-Channel.html>
- Stansfield, C., Dickson, K., & Bangpan, M. (2016). Exploring issues in the conduct of website searching and other online sources for systematic reviews: how can we be systematic? *Systematic reviews*, 5(1), 191.
- Szmydke-Cacciapalle, P. (2018). *Making Jeans Green: Linking Sustainability, Business and Fashion*. Routledge.
- Verhagen, T., Boter, J., & Adelaar, T. (2010). The effect of product type on consumer preferences for website content elements: An empirical study. *Journal of Computer-Mediated Communication*, 16(1), 139-170.