ASSESSMENT AND CLASSIFICATION OF FABRIC OFF-CUTS GENERATED BY TAILORING AND GARMENT ENTERPRISES FOR CRAFT AND TOY PRODUCTION IN RIVERS STATE, NIGERIA

Samuel, Ngozi
Prof. Regina Azunwena
Dr. Sonye Comfort
Department of Home Economics, Hospitality and Tourism, Faculty of Vocational and Technical Education, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, Rivers State, Nigeria

Abstract
Textile production and garment construction generate substantial quantities of fabric remnants, popularly known as fabric off-cuts, which are frequently discarded as waste in tailoring shops, fashion houses, and garment enterprises. This study assessed and classified fabric off-cuts generated by tailoring and garment enterprises in Rivers State, Nigeria, with a view to determining their suitability for craft and toy production. The study adopted a descriptive survey design. A sample of 415 respondents, comprising secondary school leavers drawn from six Local Government Areas across the three senatorial districts of Rivers State, was selected using a multistage sampling procedure involving stratified, purposive, and simple random sampling techniques. Data were collected using a researcher-developed Fabric Off-cuts Identification Checklist (FOIC), which was validated by experts in Clothing and Textiles, Home Economics, and Entrepreneurship Education, and analysed using frequencies and percentages. The findings revealed that twelve of the fifteen types of fabric off-cuts assessed were suitable for craft and toy production, with cotton (95.9%), Ankara/African print (93.7%), felt (92.0%), and denim (88.0%) off-cuts recording the highest levels of acceptance. Chiffon, organza, and silk off-cuts were classified as unsuitable due to their delicate textures and poor durability under repeated handling. The study concludes that tailoring and garment enterprises generate a wide range of fabric off-cuts that constitute viable raw materials for craft-based enterprises. It recommends the establishment of structured collection systems between garment enterprises and craft/vocational training centres to formalise the supply of suitable off-cuts for skill acquisition and small-scale production.

Keywords: fabric off-cuts, textile waste, craft production, toy making, classification, sustainability

Introduction

The global textile and garment industry generates enormous volumes of waste at every stage of production, from fabric manufacturing through to garment construction. A significant proportion of this waste consists of leftover fabric pieces, commonly termed fabric off-cuts, which accumulate in tailoring shops, fashion houses, garment factories, and clothing alteration centres. Rising concern over the environmental consequences of indiscriminate textile waste disposal has intensified interest in reuse, recycling, and upcycling strategies that shift production and consumption away from the traditional "take-make-dispose" model toward a circular economy grounded in resource efficiency and environmental responsibility. Transforming discarded materials into useful products has similarly been recognised as an effective strategy that unites environmental sustainability with experiential learning and vocational skill development (UNESCO, 2020).

Nigeria's tailoring and fashion sector, though a major contributor to employment and local economic activity, generates considerable volumes of fabric remnants that are routinely discarded without productive use. In many urban centres, including those within Rivers State, these materials are disposed of through open dumping or burning, contributing to environmental pollution, blocked drainage systems, and pressure on already inadequate waste management infrastructure. Onyele (2022) estimated that Nigeria generates approximately 32 million tonnes of solid waste annually, much of it poorly managed; fabric off-cuts, though only one component of this stream, represent an abundant and durable resource that has received comparatively little systematic attention.

Fabric off-cuts vary considerably in colour, texture, size, thickness, and fibre composition depending on the textile from which they originate. While garment producers commonly regard them as production waste, off-cuts can be assembled, stitched, padded, folded, braided, embroidered, and combined with other low-cost materials to create a wide range of functional and decorative products. Materials once regarded purely as waste can, through appropriate design and selection, be converted into products of genuine economic and social value while reducing environmental burden (McDonough & Braungart, 2022). Their affordability, flexibility, durability, and aesthetic diversity make certain categories of off-cuts particularly well suited to craft-based vocational activities such as toy production, an application with direct relevance to youth skill acquisition and entrepreneurship in resource-constrained settings.

Despite this potential, systematic evidence on which specific categories of fabric off-cuts generated by tailoring and garment enterprises are actually suitable for craft or toy production remains limited in the Nigerian context. Craft trainers, curriculum developers, and vocational centres require an empirically grounded classification of off-cut types by suitability, since not all fabric remnants possess the durability, safety, and workability required for products that will be handled repeatedly, such as toys and craft items. This study therefore assessed and classified the types of fabric off-cuts generated by tailoring and garment enterprises in Rivers State, Nigeria, according to their suitability for craft and toy production, in order to provide an evidence base for craft trainers, entrepreneurs, and vocational programme designers.

Objectives of the Study

The study was guided by the following specific objectives. The study sought to:

1. identify the types of fabric off-cuts generated by tailoring and garment enterprises in Rivers State that are available for craft and toy production;
2. determine which of the identified fabric off-cut types are considered suitable for craft and toy production based on user assessment;
3. classify the identified fabric off-cuts into suitable and unsuitable categories using a defined decision criterion.

Textile Waste and the Circular Economy

The transition from a linear "take-make-dispose" model of textile production toward circular economy principles has been widely promoted as a response to the environmental costs of textile waste (UNESCO, 2020). Within this framework, fabric off-cuts are increasingly reframed not as waste requiring disposal but as an underused raw material stream. McDonough and Braungart (2022) argued that design innovation can convert materials traditionally regarded as waste into products of economic and social value, a proposition that underpins the growing interest in waste-to-wealth vocational initiatives in developing economies, where limited access to conventional raw materials constrains small-scale enterprise.

This reframing is more than a matter of environmental rhetoric; it reflects a genuine change in how discarded materials are valued once appropriate processing and design are applied. Reusing textile remnants reduces the volume of material requiring disposal, lessens pressure on already constrained waste management infrastructure, and conserves the water, energy, dyes, and raw fibre that would otherwise be consumed in producing equivalent quantities of new fabric. In settings such as Rivers State, where fabric off-cuts generated by tailoring shops and garment enterprises are frequently disposed of through open dumping or burning, converting even a portion of this stream into productive use directly reduces an existing source of environmental pollution rather than merely avoiding a hypothetical future one.

The circular economy framing also carries a specifically educational and developmental dimension relevant to craft-based skill training. The Resource Utilization Theory, propounded by Faniran (2011), holds that the effectiveness of any educational or training programme depends less on the sheer availability of resources than on how efficiently, creatively, and strategically those resources are identified, organised, and deployed toward defined learning or production objectives. The theory explicitly supports the substitution of costly or scarce materials with locally available alternatives, particularly in resource-constrained educational settings, as a means of sustaining training without dependence on expensive imported inputs. Applied to textile waste, this principle positions fabric off-cuts not merely as an environmentally responsible choice but as a strategically sound one: a raw material stream that is abundant, low-cost or free, continuously replenished by ongoing garment production, and therefore capable of sustaining craft-based training and micro-enterprise over the long term without the capital constraints that limit access to commercially purchased textiles.

Taken together, the environmental and resource-utilisation arguments converge on a single practical implication for craft and vocational education: textile waste streams generated by local tailoring and garment sectors are not incidental byproducts to be managed away, but a resource base whose systematic assessment and productive use directly advances circular economy goals while lowering the barriers to entry for craft-based entrepreneurship.

Fabric Off-cuts as a Craft Resource

Several studies have examined the practical use of textile remnants in craft and educational contexts, generally supporting the proposition that appropriately selected off-cuts can substitute for costlier commercial materials in vocational training. Textile remnants suitable for craft use are typically evaluated against criteria such as availability, durability, texture, ease of manipulation, safety, and aesthetic appeal — criteria consistent with those applied in expert validation of fabric selection instruments for skill-based production (Borg & Gall, 2003).

However, not all textile types are equally suited to products subject to repeated handling and stress, such as toys, since delicate or loosely woven fabrics are prone to fraying, tearing, and reduced durability under such conditions.

This distinction between generic reusability and functional suitability is critical, and is where the Resource Utilization Theory again offers useful guidance. Faniran (2011) emphasised that different resources possess varying inherent characteristics, and that efficient utilisation depends on matching a resource's specific properties — in the case of fabric, its texture, strength, thickness, elasticity, and durability — to the demands of the intended application, rather than treating all available material as interchangeable. Not every category of fabric off-cut satisfies this match equally well: firmer, closely woven fabrics such as cotton, denim, and felt generally hold stitching, resist fraying, and tolerate stuffing and repeated handling, whereas fine or loosely woven fabrics such as chiffon, organza, and silk are prized for drape and softness in garment applications but are correspondingly ill-suited to products that must withstand sustained physical stress. Selecting fabric off-cuts for craft production therefore requires the same kind of criterion-based assessment applied to any instructional or production resource, availability, cost, durability, safety, and fitness for purpose, rather than an assumption that any discarded textile is automatically usable.

The practical implication for craft and toy-making enterprises is that the economic and environmental advantages of using fabric off-cuts as raw material, low or zero cost, ready availability, and reduced waste, can only be fully realised where off-cuts are first systematically classified by suitability. An enterprise or training programme that indiscriminately accepts all available off-cuts risks producing items with poor durability, weak stitching retention, or inconsistent quality, undermining both the marketability of the finished product and learners' confidence in the craft itself. Conversely, a structured classification of off-cut types by suitability, of the kind this study undertakes, allows craft trainers, entrepreneurs, and curriculum developers to source and specify materials with the same rigour typically applied to commercially purchased fabric, while still capturing the cost and sustainability benefits that make off-cuts an attractive resource in the first place.

Methodology

The study adopted a descriptive survey design, appropriate for systematically identifying and classifying existing conditions, in this case, the types and perceived suitability of fabric off-cuts available for craft and toy production, without manipulation of variables. The study was conducted in Rivers State, Nigeria, an oil-producing state in the South-South geopolitical zone with its capital at Port Harcourt. The state comprises twenty-three Local Government Areas across three senatorial districts (Rivers East, Rivers West, and Rivers South-East) and is characterised by rapid urbanisation, an active tailoring and garment sector, and a growing emphasis on vocational and entrepreneurship education for young people.

The population comprised 18,640 secondary school leavers enrolled in government-approved skill acquisition and vocational training centres across six selected Local Government Areas, Obio/Akpor and Ikwerre (Rivers East); Ogba/Egbema/Ndoni and Ahoada East (Rivers West); and Khana and Tai (Rivers South-East). A sample of 415 respondents was determined using Cochran's (1977) formula for large populations, adjusted with the finite population correction formula, plus a 10% allowance for attrition. Participants were selected through a multistage procedure: senatorial districts were purposively included for geographic spread; two Local Government Areas were randomly selected per district by balloting; vocational and craft training centres were purposively selected; and individual participants were drawn proportionately and then randomly from each centre. Data were collected using the researcher-developed Fabric Off-cuts Identification Checklist (FOIC), covering fifteen categories of fabric remnants commonly generated by tailoring shops, fashion houses, garment industries, and textile markets in Rivers State, including cotton, Ankara (African print), denim, felt, fleece, polyester, satin, wool, lace, velvet, canvas, corduroy, chiffon, organza, and silk off-cuts. The checklist required respondents to indicate whether each off-cut type was suitable for craft/toy production, judged against availability, durability, safety, texture, ease of manipulation, and aesthetic appeal. Responses were analysed using frequency counts and simple percentages. A decision criterion was applied whereby an off-cut type identified as suitable by 50% or more of respondents was classified as suitable, while those below 50% were classified as unsuitable.

Results

Table 1 presents the frequency and percentage distribution of respondent assessments of the fifteen fabric off-cut types evaluated.

Table 1: Frequency and Percentage Distribution of Respondents on the Suitability of Fabric Off-cuts for Craft and Toy Production (N = 415)

S/N	Type of Fabric Off-cut	Frequency (f)	Percentage (%)	Decision
1	Cotton fabric off-cuts	398	95.9	Suitable
2	Ankara (African print) off-cuts	389	93.7	Suitable
3	Felt fabric off-cuts	382	92.0	Suitable
4	Denim (jeans) off-cuts	365	88.0	Suitable
5	Polyester fabric off-cuts	356	85.8	Suitable
6	Fleece fabric off-cuts	341	82.2	Suitable
7	Canvas fabric off-cuts	332	80.0	Suitable
8	Satin fabric off-cuts	309	74.5	Suitable
9	Velvet fabric off-cuts	296	71.3	Suitable
10	Wool fabric off-cuts	284	68.4	Suitable
11	Lace fabric off-cuts	261	62.9	Suitable
12	Corduroy fabric off-cuts	247	59.5	Suitable
13	Silk fabric off-cuts	194	46.7	Not Suitable
14	Chiffon fabric off-cuts	176	42.4	Not Suitable
15	Organza fabric off-cuts	169	40.7	Not Suitable

Decision criterion: off-cuts identified as suitable by 50% or more of respondents were classified as suitable; those below 50% were classified as not suitable.

Twelve of the fifteen off-cut categories assessed were classified as suitable for craft and toy production. Cotton off-cuts recorded the highest acceptance (95.9%), followed by Ankara/African print (93.7%), felt (92.0%), and denim (88.0%) off-cuts. Polyester, fleece, canvas, satin, velvet, wool, lace, and corduroy off-cuts were also classified as suitable, with acceptance ranging from 59.5% to 85.8%. Chiffon, organza, and silk off-cuts were classified as not suitable, each falling below the 50% threshold.

Discussion

The findings indicate that tailoring and garment enterprises in Rivers State generate a wide range of fabric off-cut types, the majority of which are considered suitable raw material for craft and toy production. The strong preference for cotton, Ankara, felt, and denim off-cuts is consistent with their known physical properties: these fabrics are relatively firm, hold stitching well, resist fraying, and can withstand the repeated handling and stuffing involved in toy production, aligning with the general proposition that appropriately selected textile remnants can substitute for costlier commercial materials in vocational and craft training (Borg & Gall, 2003). Ankara's popularity may additionally reflect its cultural resonance and visual appeal within the Nigerian context, both valuable attributes for products intended for eventual sale.

By contrast, chiffon, organza, and silk off-cuts were judged unsuitable, most plausibly because their delicate, loosely woven, or slippery texture makes them difficult to cut, stitch, and stuff without fraying or losing shape, properties that reduce their durability under the repeated handling toys and craft items typically undergo. This distinction is instructive for craft trainers and curriculum designers: rather than treating "fabric off-cuts" as a single undifferentiated resource, training programmes should specify which categories of remnant are appropriate for which class of product, since durability and safety requirements differ markedly between decorative and functional applications.

Practically, these findings suggest that a structured off-cut sourcing and grading system, in which tailoring and garment enterprises segregate remnants by fabric type before disposal, could substantially improve the reliability and quality of raw material supply available to craft and vocational training centres, converting a waste-management liability into a low-cost input for youth-focused skill acquisition and micro-enterprise.

Conclusion

The study concludes that tailoring and garment enterprises in Rivers State generate diverse types of fabric off-cuts, with twelve of the fifteen types assessed demonstrating suitability for craft and toy production. Cotton, Ankara/African print, felt, and denim recorded the highest levels of acceptance, while delicate fabrics such as chiffon, organza, and silk were considered unsuitable due to their texture and limited durability under repeated handling. These findings establish an empirical basis for the systematic identification, selection, and utilisation of suitable fabric off-cuts as alternative raw materials for craft-based vocational training, skill acquisition, and small-scale enterprise development. The establishment of structured collection systems between garment enterprises and craft/vocational training centres could further ensure a consistent supply of suitable off-cuts for productive reuse.

7. Recommendations

Based on the findings, it is recommended that:

1. Tailoring and garment enterprises be encouraged, through simple sensitisation and incentive schemes, to segregate fabric off-cuts by type rather than discarding them as mixed waste.
2. Vocational and craft training centres establish structured collection arrangements with garment enterprises to secure a reliable supply of suitable off-cuts (cotton, Ankara, felt, denim, and related durable fabrics).
3. Craft and toy-making curricula explicitly specify suitable fabric categories, using classifications such as those established in this study, rather than treating fabric off-cuts as an undifferentiated resource.
4. Further research examine the physical and safety properties (e.g., colourfastness, tensile strength, flammability) of the suitable off-cut categories identified, to support formal quality standards for craft and toy products made from recycled textiles.

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