**Journal of the Society for Human Ecologists in Nigeria (JSHE)**
*An Annual Publication of the Society for Human Ecologists in Nigeria (SHEN)*
Vol. 7 No. 1, 2026 | pp. 31–40 | ISSN: 3026-9083 (Print)

DOI: https://doi.org/10.68064/jshe.2026.m710z934

# Production and Acceptability of Footwear Made from Municipal Fabric Scraps for Sustainable Footwear Development in Makurdi, Benue State, Nigeria

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## Abstract

Municipal fabric scraps generated from tailoring, garment production and other clothing-related activities are often discarded despite their potential for reuse in value-added textile products. This study assessed the use of municipal fabric scraps for footwear production, with three specific objectives focusing on the production process, acceptability of the footwear and its perceived contribution to sustainable footwear production as. The study adopted a Research and Development (R&D) design. Fabric scraps were sourced from tailoring and garment-making activities in North Bank, Makurdi, Benue State, and were sorted according to their physical condition, size, texture and suitability for footwear production. Four footwear designs were produced using cemented construction, involving pattern development, cutting, preparation of upper components, assembly, shaping, adhesive application, sole attachment and finishing. Data were collected using the Footwear Acceptability and Sustainability Evaluation Form (FASEF)**,** comprising two sections: acceptability and perceived contribution to sustainable footwear production. The instrument was validated by three experts in Family and Consumer Science/Clothing and Textiles and yielded a reliability coefficient of **0.82**. A four-point rating scale of Strongly Agree, Agree, Disagree and Strongly Disagree was used, with a criterion mean of 2.50. Data were analyzed using mean and standard deviation. The findings showed that the footwear produced from municipal fabric scraps was generally acceptable to the judges. High mean scores were recorded for liking of the footwear (M = 3.53), enjoyment of wearing it (M = 3.53), satisfaction (M = 3.47), proper fit (M = 3.53), comfort while walking (M = 3.53), softness (M = 3.53), ease of movement (M = 3.53), attractive design characteristics and perceived durability. The judges also agreed that they would consider purchasing the footwear (M = 3.53), recommend it to others (M = 3.40), and pay for it based on its features (M = 3.47). Regarding sustainability, the highest mean score was recorded for reduced reliance on conventional materials (M = 3.80), while responsible resource use, sustainability and prevention of fabric waste from landfills each received favorable ratings. The study concludes that municipal fabric scraps can be transformed into functional and aesthetically acceptable footwear while providing a practical avenue for sustainable textile waste utilization. The study recommends greater use of fabric scraps in footwear production and the incorporation of fabric-scrap product development into Clothing and Textiles training programmes.

**Keywords:** Municipal Fabric Scraps, Footwear Production, conventional materials, Sustainability, garment production

## Introduction

Municipal fabric scraps are discarded pieces of textile materials generated from households, tailoring shops, garment production and other clothing-related activities within communities and

they include cotton, polyester, denim and blended fabrics that remain after cutting, sewing, alteration or other textile processes. These fabric scraps may no longer be suitable for their original purpose, but many still have material value and can be converted into other useful products. In Nigeria, the generation and disposal of fabric scraps have become concerns for sustainable textile waste management. According **to** Bashorun et al. (2025**)** substantial generation of fabric scraps among fashion designers in South-West Nigeria and identified opportunities for their reuse and value creation. Scrap fabrics from dressmakers and tailors could be utilized to produce household items, showing that materials commonly treated as waste can be redirected into productive use and the productive reuse of these scraps provides a means of extending the useful life of textile materials while reducing the quantity requiring disposal (Amaefule & Nwike 2025).

The productive reuse of fabric scraps involves recovering discarded textile materials and using them as inputs for the development of new products rather than sending them directly to disposal sites. This practice is consistent with the principles of resource conservation and circular production, in which materials are kept in use for as long as possible through reuse, adaptation and recycling. There lies a lot of potential in the use of discarded garments and tailor waste fabrics for the development of functional products, showing that textile waste can be redirected into productive applications (Odums et al., 2024). The use of fabric scraps in the production of patchwork articles and emphasized the role of practical skills in converting textile remnants into useful products therefore providing both a waste-management option and an opportunity for product development, particularly where the materials can be adapted to products with practical and aesthetic value (Arinze et al., 2022)

Footwear refers to products designed to cover and protect the feet while also providing comfort and serving aesthetic and functional purposes. The production of footwear from fabric scraps provides an opportunity to apply textile-reuse practices to a product that requires both functional performance and visual appeal. The suitability of fabric scraps for this purpose depends on how the materials are selected, prepared and incorporated into the footwear. Lawal and Odums (2015) showed the importance of material properties such as thickness, strength and moisture absorption when materials are considered for footwear applications. In the context of fabric-scrap footwear, appropriate material selection and construction are therefore necessary to produce footwear that can provide acceptable fit, comfort, appearance and durability. This makes footwear production a useful area for examining whether discarded textile materials can be transformed into products that users are willing to accept and use.

The acceptability of footwear is influenced by functional, physical and aesthetic characteristics, including fit, comfort, appearance, durability, material quality and the user's willingness to use or purchase the product. Fit determines how well the footwear conforms to the foot, while comfort relates to ease of movement and the absence of discomfort during use. Aesthetic characteristics such as colour, style, neatness and overall appearance can influence users' preference for a footwear product, while durability relates to the ability of the product and its materials to withstand regular use. Purchase intention provides an indication of whether users consider the product desirable enough to buy, while willingness to recommend reflects their overall evaluation of the product. These characteristics are particularly relevant when footwear is produced from recovered fabric materials because the environmental value of the material does not compensate for poor fit, discomfort, unattractive appearance or inadequate durability. Thus, assessing these characteristics provides a basis for determining the acceptability of footwear produced from municipal fabric scraps.

The sustainability relevance of fabric-scrap footwear lies in its potential to reduce the quantity of textile materials discarded after garment production and to lessen the demand for conventional materials used in footwear. The use of available scraps for footwear components can also encourage

responsible resource use and provide a practical application for materials that have limited value in their original form. In this study, sustainability is considered through the perceived contribution of the produced footwear to reducing environmental waste, reducing reliance on conventional materials, preventing fabric scraps from entering landfills and encouraging responsible resource use.

Fabric scraps from garment production and tailoring are often discarded despite their potential for reuse. Studies have shown that these scraps can be converted into useful products (Arinze et al., 2022; Odums et al., 2024; Amaefule & Nwike, 2025) but limited attention has been given to their use in footwear production and to the acceptability of footwear made from these materials. There is also limited evidence on how such footwear is perceived in relation to sustainability and waste reduction. This study therefore focused on producing footwear from municipal fabric scraps, assessing its acceptability, and examining its perceived contribution to sustainability and waste reduction.

### Objectives of the Study

The main objective of the study is to assess the use of municipal fabric scraps for footwear production. The specific objectives were to:

1. Produce footwear from municipal fabric scraps.
2. Evaluate the acceptability of the footwear produced from municipal fabric scraps.
3. Assess the perceived contribution of municipal fabric scraps to sustainable foot wear production

## MATERIALS AND METHOD

### Research Design

The study adopted a Research and Development (R&D) design. The design was appropriate because the study involved the development of footwear from municipal fabric scraps, followed by evaluation of the produced footwear.

### Materials

The materials used for the production of the footwear included municipal fabric scraps, already-made soles, synthetic gum, Marko (cellulose board), thick supporter/lining, fancy pins, gum brush, sandpaper, punch, sewing machine, hammer, thread, pincers, scissors and cutters

### Sourcing of Fabric Scraps

Municipal fabric scraps used for the production of the footwear were sourced from tailoring and garment-making activities in North Bank, Makurdi, Benue State**.** The collected scraps consisted of assorted patterned and colored textile remnants of different sizes and surface designs. The materials were sorted and selected according to their physical condition, size, texture and suitability for incorporation into footwear components. The fabric scraps that were considered suitable were prepared for production, while damaged or unsuitable pieces were excluded.

### Production of footwears

The footwear was produced using cemented construction, a recognized footwear construction method in which the upper is fixed or lasted to the sole using adhesive (International Organization for Standardization [ISO], 2025). The production sequence was adapted from established small-

scale footwear manufacturing procedures described by United Nations Industrial Development Organization and international Labor Organization with modifications to accommodate the use of municipal fabric scraps as upper materials. The production was done as follows;

**Pattern Development**

Patterns for the footwear components were drafted according to the selected footwear designs. The patterns were used as templates for determining the required shapes and dimensions of the fabric components. The prepared patterns were positioned on the selected fabric scraps, taking into consideration the available sizes and shapes of the materials. The fabric was then cut accurately along the pattern outlines to obtain the required footwear components.

**Preparation of Footwear Components**

The cut fabric components were prepared for assembly with the supporting footwear materials. The Marko (cellulose board), thick supporter/lining and other required materials were cut and prepared according to the footwear design. The components were arranged to ensure proper alignment before assembly. The cut fabric pieces were assembled to form the footwear upper. The sewing machine, thread and other specified tools were used where required to join and secure the fabric components. The assembled upper was checked for proper alignment, neatness and conformity with the intended design.

**Attachment of the Upper to the Sole**

The completed footwear upper was positioned on the prepared sole and secured using the appropriate adhesive and supporting materials. Pressure was applied where necessary to ensure proper bonding between the components.

**Finishing**

The completed footwear was examined and finished by trimming excess materials, checking the edges and correcting visible construction irregularities. The finished footwear was then prepared for evaluation by the panel of judges.

**Instrument for Data Collection**

The instrument used for data collection was the Footwear Acceptability and Sustainability Evaluation Form (FASEF). It was developed by the researchers to obtain panel judges' assessments of the footwear produced from municipal fabric scraps. The form was divided into two sections A and B. Section A assessed the acceptability of the produced footwear based on general acceptability, comfort, aesthetics/design, perceived durability and purchase intention while Section B assessed the judges' perceptions of the contribution of the footwear produced from municipal fabric scraps to sustainability and waste reduction, including reduction in reliance on conventional materials, reduction of environmental waste, responsible resource use and prevention of fabric waste from entering landfills. The items were generated on a four-point rating scale **of** Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1)**,** with a criterion mean of 2.50 used for decision-making.

The researchers personally administered the Footwear Acceptability and Sustainability Evaluation Form (FASEF) to the panel of 15 judges who were consumers of such products. The evaluation forms were presented to the judges alongside the footwear produced from municipal fabric scraps. The judges examined the produced footwear and independently rated the items based on the

statements contained in the two sections of the instrument. The completed forms were collected immediately after the evaluation and used for the analysis. This approach allowed the judges to assess the actual footwear rather than relying on descriptions or photographs alone.

## Validation and Reliability of the Instrument

The Footwear Acceptability and Sustainability Evaluation Form (FASEF) was subjected **to** face and content validation by three experts in Family and Consumer Science/Clothing and Textiles. The experts examined the items for clarity, relevance, adequacy and appropriateness in relation to the objectives of the study. Their observations and suggestions were used to revise the instrument before its administration.

The reliability of the FASEF was established through a pilot test using respondents who were not included in the main study. The responses obtained from the pilot administration were analyzed to determine the internal consistency of the instrument. The reliability coefficient obtained was **0.82**, indicating that the instrument was sufficiently reliable for the study.

## Method of Data Analysis

Data collected from the panel of judges were analyzed using mean and standard deviation. The mean scores were used to determine the judges' level of agreement or disagreement with each statement on the evaluation form. A criterion mean of 2.50 was used for decision-making. Items with mean scores of 2.50 and above were interpreted as Agree, while items with mean scores below 2.50 were interpreted as Disagree**.** Standard deviation was used to determine the extent of variation in the judges' responses.

## Results and Discussion

Picture 1 & 2 shows that the footwear produced from municipal fabric scraps was generally acceptable to the judges. The judges agreed that they liked the footwear (M = 3.53), would enjoy wearing it (M = 3.53), and were satisfied with it (M = 3.47). The comfort-related items also recorded high mean scores, with agreement that the footwear fitted the feet properly (M = 3.53), was comfortable while walking (M = 3.53), felt soft (M = 3.53), and allowed easy movement (M = 3.53). The judges disagreed that the footwear caused discomfort (M = 2.00). The aesthetic attributes were also favorably rated. The judges agreed that the footwear had likeable colors (M = 3.53), a modern appearance (M = 3.53), a pleasing design (M = 3.53), an attractive style (M = 3.40), and a neat appearance (M = 3.47). Similarly, the footwear was perceived as sturdy (M = 3.53), resistant to wear and tear (M = 3.53), and long-lasting (M = 3.47). Purchase intention was also positive, as the judges agreed that they would consider buying the footwear (M = 3.53), recommend it to others (M = 3.40), and be willing to pay for it based on its features (M = 3.47).



**Plate 2:** Multi-coloured Patterned Fabric



**Table 1: Mean and Standard Deviation of Judges' Responses on the Acceptability of Footwear Produced from Municipal Fabric Scraps.**

All the items met the minimum mean score for acceptability.

| S/N | Items | Mean | SD | Remark |
|---|---|---|---|---|
| | **General Acceptability** | | | |
| 1 | Like the footwear. | 3.53 | 0.52 | Agree |
| 2 | Enjoy wearing the footwear. | 3.53 | 0.52 | Agree |
| 3 | Satisfaction with the footwear. | 3.47 | 0.52 | Agree |
| | **Comfort** | | | |
| 4 | Fits my feet properly. | 3.53 | 0.52 | Agree |
| 5 | Comfortability when walking. | 3.53 | 0.52 | Agree |
| 6 | Softness on the feet. | 3.53 | 0.52 | Agree |
| 7 | Ease of movement. | 3.53 | 0.52 | Agree |
| 8 | Discomforting | 2.00 | 0.63 | Disagree |
| | **Design Aesthetics** | | | |
| 9 | The footwear has likeable colors. | 3.53 | 0.52 | Agree |
| 10 | The footwear has a modern appearance. | 3.53 | 0.52 | Agree |
| 11 | The footwear has a pleasing design. | 3.53 | 0.52 | Agree |
| 12 | Attractiveness | 3.40 | 0.51 | Agree |
| 13 | Neat appearance. | 3.47 | 0.52 | Agree |
| | **Perceived Durability** | | | |
| 14 | The footwear is sturdy. | 3.53 | 0.52 | Agree |
| 15 | Resistance to wear and tear. | 3.53 | 0.52 | Agree |
| 16 | Appear long-lasting. | 3.47 | 0.52 | Agree |
| | **Purchase Intention** | | | |
| 17 | Choice in Purchase | 3.53 | 0.52 | Agree |
| 18 | Recommend to others. | 3.40 | 0.51 | Agree |
| 19 | Willingness to pay for this footwear because of its features. | 3.47 | 0.52 | Agree |

**Table 2:** Mean and Standard Deviation of Judges' Responses on the Perceived Contribution of Municipal Fabric Scraps to Sustainable Footwear Production. All 8 items general show the acceptability score of the footwears.

| S/N | Items | Mean | SD | Remark |
|---|---|---|---|---|
| **1** | Using fabric scraps in footwear reduces reliance on conventional materials. | 3.80 | 0.41 | Agree |
| **2** | Using fabric scraps in footwear is sustainable | 3.67 | 0.65 | Agree |
| **3** | Minimize ecological footprint of footwear. | 3.47 | 0.74 | Agree |
| **4** | Reduction of environmental waste. | 3.53 | 0.74 | Agree |
| **5** | Support in environmental protection. | 3.53 | 0.74 | Agree |
| **6** | Encourage sustainable consumption. | 3.47 | 0.74 | Agree |
| **7** | Footwear made from recycled materials demonstrates responsible resource use. | 3.67 | 0.65 | Agree |
| **8** | Minimize the fabric wastes ending up in landfills. | 3.67 | 0.65 | Agree |

## Discussion

Pictures 1 and 2**,** show that municipal fabric scraps were successfully transformed into different footwear designs, with variations in color, pattern and visual arrangement. The finding demonstrates that discarded fabric materials can be adapted into functional products while retaining their aesthetic qualities. This agrees with Odums et al. (2024) who demonstrated the conversion of tailor waste fabrics and discarded garments into ecological bricks and a functional lampshade, showing that textile waste can be redirected into useful and aesthetically relevant products. The present finding extends this application to footwear, showing that fabric scraps can also serve as materials for wearable products with different design expressions.

Table 1 show that the footwear produced from municipal fabric scraps was generally acceptable to the judges. The favorable ratings for liking, satisfaction, fit, ease of walking, softness, movement, appearance, durability and purchase intention indicate that the use of fabric scraps did not prevent the products from meeting important expectations of footwear. The positive assessment of the aesthetic attributes also suggests that the color and pattern characteristics of the recovered fabrics were successfully incorporated into the footwear designs. This finding is consistent with Abdulkadir et al. (2023), who reported high acceptability for quilt bedspreads produced from textile scraps, indicating that products developed from discarded textile materials can receive favorable user evaluations. The finding also agrees with Akinyotu and Alao (2025), who found that recycled waste fabrics could be used to produce useful articles and that recycling fabric waste was perceived as a means of recovering economic value and reducing fabric wastage and environmental pollution. The present study extends this evidence to footwear, where the recovered fabrics were not only used to create different designs but were also favorably evaluated for comfort, aesthetics, perceived durability and purchase intention. The positive responses are further supported by recent research on fabric-scrap management in Nigeria.

Braide et al. (2025) found that fashion designers were already repurposing fabric scraps into jackets, patch garments and accessories, although substantial potential for further value creation remained untapped. This supports the present finding that fabric scraps can be redirected into products with functional and aesthetic value. Okeke (2025) reported that upcycling, reuse and recycling strategies can improve resource efficiency and reduce fabric waste in Nigeria. The favorable purchase-intention responses in the present study are also important because they suggest that the judges did not view the use of fabric scraps as incompatible with desirable footwear characteristics.

The findings in Table 2 show that the judges perceived the use of municipal fabric scraps in footwear production as contributing positively to sustainable footwear production. The highest mean was recorded for the statement that using fabric scraps reduces reliance on conventional materials (M = 3.80), followed by responsible resource use (M = 3.67), contribution to sustainability (M = 3.67), and prevention of fabric waste from entering landfills (M = 3.67). The judges also agreed that the practice reduces environmental waste (M = 3.53), supports environmental protection (M = 3.53), encourages sustainable consumption (M = 3.47), and minimizes the ecological footprint of footwear (M = 3.47). The consistent agreement across the items suggests that the judges associated the conversion of fabric scraps into footwear with more responsible use of textile materials.

The finding agrees with Braide et al. (2025), who found that fabric scraps generated by fashion designers in South-West Nigeria had considerable potential for reuse and value creation, although a substantial proportion of this potential remained untapped. Their study reported that some designers already repurposed scraps into jackets, patch garments and accessories, supporting the view that textile remnants can remain useful resources rather than being treated solely as waste. The finding is also consistent with Okeke (2025), who reported that reuse, repair, recycling and upcycling of

textiles can help reduce fabric waste, conserve resources and create economic opportunities in Nigeria. The present study provides a product-level example of this approach by demonstrating the use of municipal fabric scraps in footwear production. Alves et al. (2024) demonstrated that waste generated from the footwear and textile industries could be transformed into new recycled materials, reducing dependence on virgin raw materials. Their work provides further support for the principle that waste materials can be redirected into useful applications rather than disposed of. The present study extends this principle to the direct production of footwear from municipal fabric scraps.

## Conclusion and Recommendations

The study concludes that municipal fabric scraps can be successfully transformed into functional and aesthetically appealing footwear. The footwear produced from the scraps was generally acceptable to the judges in terms of comfort, aesthetics, perceived durability and purchase intention. The judges also perceived the use of municipal fabric scraps as contributing to sustainable footwear production, particularly through reduced reliance on conventional materials, responsible resource use and reduction of textile waste. The findings demonstrate the potential of fabric scraps as a useful material for footwear development and as an alternative approach to managing textile waste. Based on the findings of the study recommends that:

1. Footwear producers and entrepreneurs should explore the use of municipal fabric scraps as raw materials for footwear production to create value from materials that would otherwise be discarded.
2. Clothing and Textiles practitioners should incorporate fabric-scrap footwear production into practical training and skill-development programs to promote creativity, resourcefulness and sustainable product development.
3. Tailors and garment producers should sort and preserve usable fabric scraps rather than disposing of them indiscriminately, making the materials available for reuse in footwear and other value-added products.

## REFERENCES

Abdulkadir, S. O., Adeniran, I. B., & Titilope, F. I. (2023). Acceptability of quilt bedspread made from textile scrap for wealth creation. *Achievers Journal of Scientific Research, 5*(2), 177–185.

Akinyotu, O. E., & Alao, D. F. (2025). Acceptability of recycled waste fabrics for production of articles for teenagers. *International Journal for Research Trends in Social Science & Humanities, 3*(1), 214–224.

Alves, D. I., Carvalho, Ó., Fernandes, N. A. T. C., Cosentino, L. T., Paula Junior, A. C., Fangueiro, R., & Ferreira, D. P. (2024). Upcycling of industrial footwear waste into nonwoven fibrous structures with thermal and acoustic insulation properties. *Journal of Environmental Management, 363*, 121363. https://doi.org/10.1016/j.jenvman.2024.121363

Amaefule, G., & Nwike, U. (2025). Practices, disposal, and utilization of scrap fabrics from dressmakers/tailors for household items and environmental sustainability in Nsukka LGA of Enugu State. *International Journal of Home Economics, Hospitality and Allied Research, 4*(2), 182–194. https://doi.org/10.57012/ijhhr.v4n2.012

Arinze, A. U., Chidolue, I. B., & Onuchukwu, R. N. (2022). Utilization of fabric scraps skill

needed by Home Economics students for in production of patch-work articles in Colleges of Education in Anambra State. *Journal of Home Economics Research, 29*(2), 171–179.

Bashorun, O. E., Badiru, I. O., Oyewole, M. F., Adebisi, T. T., Braide, O. O., & Lawal, A. O. (2025). Potentials of fabric scraps management for value creation among fashion designers in South West Nigeria. *African Journal of Science, Technology, Innovation and Development, 17*(6), 823–833. https://doi.org/10.1080/20421338.2025.254024

International Labour Office, & United Nations Industrial Development Organisation. (1982). *Small-scale manufacture of footwear* (Technical Memorandum No. 2). International Labour Office. https://doi.org/10.13140/RG.2.2.18674.45766

International Organization for Standardization. (2025). *Footwear—Vocabulary* (ISO Standard No. 19952:2025). https://www.iso.org/standard/84291.html

Lawal, A. S., & Odums, C. P. (2015). Tanning of different animal skins/hides and study of their properties for textile application. *Current Journal of Applied Science and Technology, 5*(6), 588–594. https://doi.org/10.9734/BJAST/2015/12938

Odums, C. P., Sombo, S. S., & Aize, D. E. (2024). Evaluation of physical properties of ecological bricks made from tailor waste fabrics, discarded garments and the prototype lampshade produced. *International Journal of Food Science, Tourism & Home Economics, 8*(5), 32–44. https://doi.org/427251-39265-0852

Okeke, N. K. (2025). An investigation of how the circular economy's upcycling, repair, reuse and recycling strategies might increase resource efficiency and reduce fabric waste generation in Nigeria. *Journal of Design Studio, 7*(1), 107–124. https://doi.org/10.46474/jds.1596272