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Eco-friendly banana/Cotton union fabric: Its preferences and potentiality

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Abstract
Banana fibre is potential eco-friendly Agro-waste fibre which can be efficiently and effectively utilized for economic advantage and better quality of life. Four jackets were designed and constructed to understand its potentiality for rural employment through garment making and preference studies. It was found that 92% respondents preferred decorated jackets, over all look of jacket ‘C’ was scored first. Respondents had given choice for top garment of banana/cotton union fabric and they thought garment of banana/cotton union fabric will be most suitable for occasional wear.

Keywords: Banana fibre, Agrowaste, biodegradable, apparel designing

1. Introduction
With technical advancement, the production of synthetic fibres reached to such an extent that their disposal becomes increasingly difficult, more over manufacturing and processing of synthetic fibre is creating heavy environmental pollution. Global market is focusing on eco-friendly sustainable textile which is environment and human friendly and brings a better quality of life. Customers of 21st Century are also safety and health conscious. Therefore, eco-friendly fibres and fabrics are gradually gaining importance. Banana is abundantly grown in Bihar and produces huge post harvest waste. Due to ignorance this post harvest waste is thrown away. Instead if the utilization of banana trunk is carried out for extracting textile fibre, it would convert a huge agro waste to an economic advantage and reduce environmental pollution as well as generate employment. The long, lusturous fibres are obtained from the banana trunk (Pseudostem). These fibres can be utilized for making value added handicraft products and designing apparel which will have great demand in home and abroad as well. Because eco-friendly movement is now global trend, conscious people are preferring to consume biodegradable, eco-friendly and skin friendly textile. The use of banana fibre for textile as eco-friendly material is new for Bihar (Sarkar et al., 2009) [5].

So, this study was undertaken with the aim to prepare banana/cotton union fabric, designing jacket out of banana/cotton union fabric and to know the respondents opinion regarding design, suitability of fibre for garment and wearing preferences.

Materials and Methodology
Banana fibre was acquired from Krishi Vigyan Kendra, Hajipur (Vaishali), Bihar.

1. Treatment of fibres: The collected fibres were treated with 20% acetic acid at 90o-95 oC for 30 minute for enhancement in softness, strength and shining (Mishra, 1999) [1]. After that they were rinsed and sun dried for weaving in the handloom.

2. Weaving banana/cotton union fabric: The fibres were tied by weaver’s Knot to each other for making continuous length of yarns and wind in a shuttle bobbin. Plain weave banana/cotton union fabric was woven on two harness handloom using cotton yarn in warp and banana yarn in weft.

3. Designing and preparing jackets: Four (Teenager’s) jackets were designed out of banana/cotton union fabric with different constructional techniques and decorative designs. According to designs, fabric was cut, stitched and ornamented.
4. **Collecting data:** A structured interview schedule was formed and data were collected through personal interview method from 80 randomly selected respondents comprising girl students and lady staff of RAU, Pusa and Dholi campus. The jackets were shown to the respondents for getting reliable responses.

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5. **Statistical analysis:** Data were analysed by employing the following statistical techniques:
   1. Percentage distribution.
   2. **Rank scoring:** To assess over all look of jackets scoring was done by giving 4, 3, 2 & 1 weights for excellent, very good, good and fair respectively.

   **Rank weighted average:** It was calculated by the following formula.

   
   \[
   \text{Rank weighted average} = \frac{\sum (\text{No. of respondents in each rank} \times \text{Rank no.})}{\text{Total No. of respondents in all ranks}}
   \]

   The findings of Table 1 revealed that 90% respondents preferred natural colour of banana fibre because fine banana fibre looked like natural Tasar silk. Moreover 55% respondents preferred ornamented jackets of banana fibre with different techniques. 45% respondents preferred simple design.

   **Table 2:** Distribution of respondents’ preference for overall looks of the jackets. N-80

<table>
<thead>
<tr>
<th>Items</th>
<th>Excellent</th>
<th>Very good</th>
<th>Good</th>
<th>Fair</th>
<th>Total score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>f</td>
<td>f</td>
<td>f</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>12</td>
<td>48</td>
<td>16</td>
<td>48</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>16</td>
<td>36</td>
<td>168</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>C</td>
<td>30</td>
<td>120</td>
<td>20</td>
<td>60</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>D</td>
<td>16</td>
<td>64</td>
<td>24</td>
<td>72</td>
<td>30</td>
<td>60</td>
</tr>
</tbody>
</table>

   It was observed from Table 2 that rank score of overall looks of jacket ‘C’ was highest and jacket ‘A’ was given least preference by the respondents. On quilted jacket (C) small wooden beads and handmade braided banana fibre buttons on front opening gave a novel look and ecofriendly appeal, may be due to its unique design, respondents preferred it most.

   **Table 3:** Distribution of respondents’ preference for the suitability of banana fibre garment. N-80

<table>
<thead>
<tr>
<th>Garments</th>
<th>No. of respondents assigning ranks</th>
<th>Rank weighted average</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
<td>III</td>
</tr>
<tr>
<td>Top garments (jacket, yoke of kurta, shirt etc.)</td>
<td>74</td>
<td>92.5</td>
<td>4</td>
</tr>
<tr>
<td>Short skirt</td>
<td>4</td>
<td>5.0</td>
<td>36</td>
</tr>
<tr>
<td>Trouser</td>
<td>-</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Long skirt</td>
<td>-</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Salwar kurta</td>
<td>-</td>
<td>-</td>
<td>24</td>
</tr>
</tbody>
</table>

   Respondents assigned rank for suitability of banana fibre for different garments in Table 3. Based on the result, it could be interpreted that majority of the respondents (92.5%) assigned 1st rank to top garment suitable for banana/cotton fibre. Rank weighted average showed that top garment, short skirt, salwar kurta, long skirt and trouser as a order of preference. Banana/cotton union fabric is less soft as compared to pure cotton fabric. Therefore, this fabric is most suitable for top garment.
Table 4: Distribution of respondents’ opinion regarding wearing frequency of banana/cotton fibre garment. N=80

<table>
<thead>
<tr>
<th>Garments</th>
<th>No. of respondents assigning ranks</th>
<th>Rank weighted average</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top garments (jacket, yoke of kurta, shirt etc.)</td>
<td>f</td>
<td>%</td>
<td>f</td>
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<td>Long skirt</td>
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<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Salwar kurta</td>
<td>-</td>
<td>-</td>
<td>24</td>
</tr>
</tbody>
</table>

A cursory look at the Table 4 revealed that the respondents thought banana/cotton union fabric is most suitable for occasional wear because they have a natural luster, more over frequent care and maintenance problem would not be there, so they ranked occasional wear as first. Whereas 75% respondents thought it is not suitable for daily wear, they are costlier and may not be comfortable for daily wear. We could see that rank weighted average showed that occasional wear, cultural festival, party dress, social function and daily wear as a order of preference.

**Conclusion**

From the above findings it could be concluded that most of the respondents preferred natural coloured fibre and decorated jacket. Quilted jacket ‘C’ was scored high by the respondents. Overwhelming response of banana fibre apparel. Respondents had given preference for top garment of banana/cotton union fabric and given choice for occasional wear.

**Recommendation**

Banana fibre is a potential fibre and will prove boon for rural people of Bihar if they take up processing of banana fibre for craft and garment making as income generation without throwing these precious fibre as waste. Banana fibre garments and other products demarcated for aristocracy and sold in high price in domestic market as well as in international market. Therefore, this renewable and biodegradable fibre can open up a new avenue for income generation of rural people and to reduce labour migration from Bihar, which also reduces the environmental pollution.

**References**

3. www.vibrantgujarat.com
4. www.agricultureinformation.com