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Digital revival of traditional Indian floor painting designs for textile applications: A pathway to empowering women through entrepreneurship

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Abstract

India, a land of cultural diversity has a rich artistic heritage including traditional floor paintings created by women on auspicious occasions and festivals using natural pigments at home entrances and religious places. These temporary artworks passed down through generations, reflect regional identities. However, urbanization and changing lifestyles have led to their gradual decline, with limited documentation further threatening their survival. This study explores the adaptation of Indian floor painting motifs for textile surface enrichment through digital technology. Ten traditional Indian floor paintings of different states namely *Aipan*, *Alpona*, *Chita*, *Chittara*, *Gond*, *Kollam*, *Mandana*, *Muggulu*, *Onapukallam* and *Rangavalli* were analyzed for motif selection. Five hundred motifs were collected and refined digitally using Adobe Photoshop to enhance intricacy and adaptability. Through systematic design development in CorelDRAW 2021, one hundred innovative designs were created by combining two to four selected motifs. Ten selected designs i.e. one from each painting based on expert evaluation underwent digital simulation, exploring five placements and colourways each. Expert assessments determined the most preferred placement and colourway for textile application. Integrating traditional Indian floor painting designs into textiles offers a sustainable approach to preserve endangered art forms while promoting India's cultural heritage. This adaptation enhances the visibility of folk floor arts globally and creates opportunities for women entrepreneurship by empowering women practicing this craft to establish small-scale enterprises. Additionally, extension programs and capacity-building initiatives can utilize these designs to train artisans and promote socio-economic development, supporting cultural tourism and community participation.

Keywords: Digital technology, Indian floor paintings, women empowerment, CAD, motif adaptation, textile

1. Introduction

India is a vibrant nation with a rich cultural heritage reflected in its arts and crafts. These artistic expressions have captivated people globally, serving as a crucial part of cultural identity. Indian paintings, including folk art, chronicle the country's history and traditions. Floor paintings, in particular, hold religious and cultural significance, depicting mythological scenes and daily life (Jaswal, 2020) ^[10]. Traditional floor paintings are created by women during auspicious occasions using natural colours and free-hand techniques, passed down through generations serving both decorative and spiritual purposes across India (Dutta, 2016) ^[8]. As one of the earliest artistic expressions, floor designs date back to prehistoric times, evolving from cave paintings to modern-day traditions. Many motifs found in ancient pottery and Indus Valley sites (2500-500 BC) are still seen in contemporary floor paintings (Bhatnagar, 2019; Sariya, 2022) ^[4, 14]. Traditional methods of designing were labor-intensive, necessitating modernization to remain competitive. The incorporation of digital technology ensures

efficiency while preserving artistic heritage. Computer Aided Designing (CAD) enables designers to visualize their creative concepts in a finished form without the need to produce physical samples. The integration of CAD with textile designing combines artistic creativity with technological precision, allowing designers to craft fabrics that are both visually appealing and technically sound. This advancement enhances design quality, boosts efficiency and significantly reduces the time between design conception and market launch (Srivastava and Vaishnav, 2015; Pant, 2020) ^[17, 20].

Textile design draws inspiration from traditional arts, adapting motifs into contemporary forms. Folk paintings and floor designs can be integrated into textiles to create innovative and culturally rich designs. The traditional floor paintings of different Indian states symbolize the unity in diversity of Indian culture. However, these art forms are gradually declining due to urbanization, changing lifestyles and lack of proper documentation. Integrating these intricate motifs into textiles offers a sustainable way to preserve and

promote these endangered art forms in a contemporary context. The adaptation of floor painting designs onto textiles not only preserves India's artistic legacy but also enhances its visibility across regional and global markets. This approach creates opportunities for women entrepreneurship by enabling women who practice this art to establish small-scale enterprises, where they can apply these designs onto fabric to develop various textile products using different surface embellishment techniques such as painting, printing and embroidery, thereby fostering economic empowerment.

Furthermore, extension programs and capacity-building initiatives can use these findings to train artisans, students and rural women under social welfare schemes. The tourism sector and educational institutions can leverage these designs to represent India's rich artistic traditions, promoting cultural tourism and heritage conservation. This initiative encourages community participation, supports socio-economic development and provides innovative design solutions for textile designers.

2. Methodology

2.1 Locale of the Study: The study was conducted in the Department of Apparel and Textile Science, I.C. College of Community Science, CCS Haryana Agricultural University, Hisar, focusing on adaptation of traditional Indian floor painting motifs for textile surface embellishment.

2.2 Selection of Respondents: Thirty experts, including faculty members and postgraduate students from the department, were purposively selected based on their subject expertise and availability. The respondents provided preferences for motif selection, design development, design placements and colourways.

2.3 Collection and Selection of Traditional Indian Floor Painting Motifs: Motifs from ten different traditional Indian floor paintings including *Aipan*, *Alpona*, *Chittara*, *Chita/Jhoti/Muruja*, *Gond Painting*, *Kollam*, *Mandana*, *Muggulu*, *Onapukallam* and *Rangavalli* were collected through secondary sources. Five hundred motifs (50 per

painting) were screened by the researcher and advisory committee for suitability for textile design. The motifs were refined using Adobe Photoshop and evaluated by experts on a five-point rating scale. Based on the calculated weighted mean scores, the top five motifs from each painting were selected for design development.

2.4 Development and Selection of Designs: Fifty selected motifs were simulated into 100 innovative textile designs (10 per painting) using CorelDRAW 2021. The experts evaluated the designs on a five-point rating scale and the top preferred design from each painting was selected for layout preparation.

2.5 Creation and Selection of Design Placements: The ten selected designs were arranged on fabric outline (88 × 36 inches) in five different placements per design using CorelDRAW 2021. Fifty placements were assessed by experts. Based on preferences and weighted mean scores, the top placement for each design was selected.





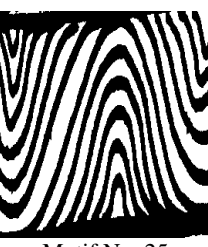
2.6 Simulation and Selection of Colourways: Each selected placement was simulated in five colourways using CorelDRAW 2021, employing 5 different colour schemes namely analogous, complementary, split complementary, monochromatic, triad and tetrad. Experts evaluated the fifty colourways and weighted mean scores were calculated based on expert preferences.






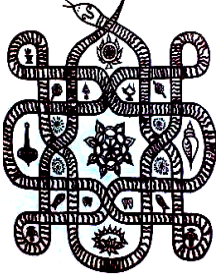

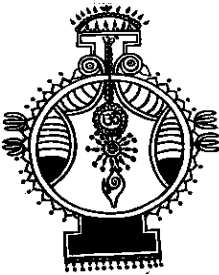
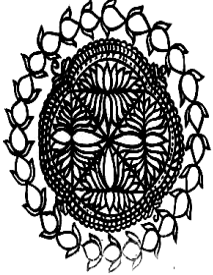











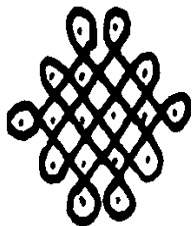
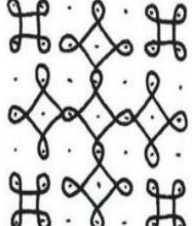
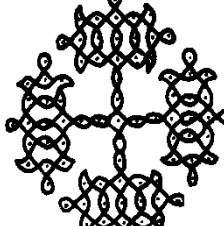
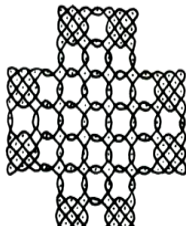
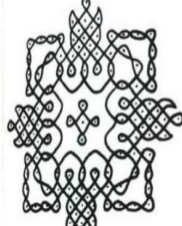
3. Results and Discussion

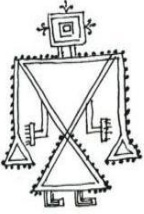
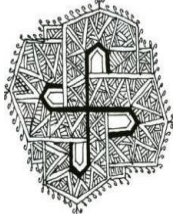









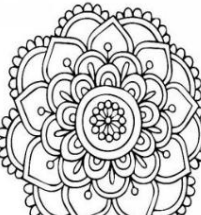


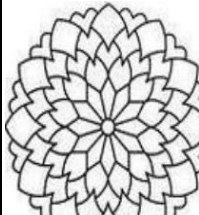
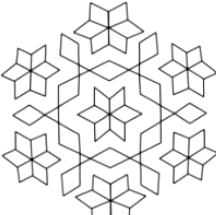

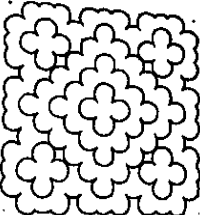
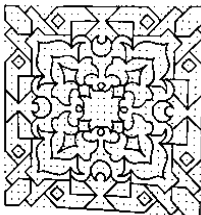
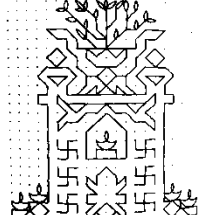
3.1 Selection of Traditional Indian Floor Painting Motifs: Table 1 presents the selected motifs along with their respective WMS values. The higher the WMS, the greater the preference of the expert panel for the motif.

3.1.1 Aipan Motifs: The five selected motifs from *Aipan* art exhibited WMS ranging from 4.00 to 4.23. Among these, motif number 22 obtained the highest WMS (4.23), reflecting its intricate design and cultural significance. The consistent preference for these motifs indicates their aesthetic appeal and suitability for textile applications.

Table 1: Selected Traditional Indian Floor Painting Motifs (N=30)

1. <i>Aipan</i> (Uttarakhand)				
				
Motif No. 2 WMS 4.16	Motif No. 6 WMS 4.00	Motif No. 15 WMS 4.10	Motif No. 22 WMS 4.23	Motif No. 25 WMS 4.10
2. <i>Alpona</i> (West Bengal and Assam)				

				
Motif No. 11 WMS 4.23	Motif No. 16 WMS 3.93	Motif No. 17 WMS 4.36	Motif No. 29 WMS 4.16	Motif No. 6 WMS 4.00
3. Chita (Orissa)				
				
Motif No. 10 WMS 4.03	Motif No. 13 WMS 4.30	Motif No. 15 WMS 4.36	Motif No. 23 WMS 4.16	Motif No. 30 WMS 4.23
4. Chittara (Karnataka)				
				
Motif No. 17 WMS 4.40	Motif No. 33 WMS 4.03	Motif No. 35 WMS 4.36	Motif No. 39 WMS 4.16	Motif No. 41 WMS 3.94
5. Gond (Madhya Pradesh)				
				
Motif No. 2 WMS 4.60	Motif No. 27 WMS 4.50	Motif No. 28 WMS 4.40	Motif No. 31 WMS 4.63	Motif No. 39 WMS 4.23
6. Kollam (Tamil Nadu)				
				
Motif No. 21 WMS 4.16	Motif No. 2 WMS 4.23	Motif No. 2 WMS 4.36	Motif No. 2 WMS 4.00	Motif No. 2 WMS 3.94
7. Mandana (Rajasthan)				

				
Motif No. 11 WMS 4.13	Motif No. 20 WMS 4.20	Motif No. 33 WMS 3.97	Motif No. 34 WMS 4.50	Motif No. 50 WMS 4.17
8. Muggulu (Andhra Pradesh and Telangana)				
				
Motif No. 3 WMS 4.36	Motif No. 17 WMS 4.10	Motif No. 20 WMS 4.03	Motif No. 26 WMS 4.40	Motif No. 32 WMS 4.50
9. Onapukallam (Kerala)				
				
Motif No. 19 WMS 4.00	Motif No. 20 WMS 4.36	Motif No. 24 WMS 4.10	Motif No. 31 WMS 4.03	Motif No. 32 WMS 4.30
10. Rangavalli (Maharashtra)				
				
Motif No. 35 WMS 3.93	Motif No. 43 WMS 3.80	Motif No. 47 WMS 4.03	Motif No. 49 WMS 4.10	Motif No. 50 WMS 4.46

3.1.2 Alpona Motifs: Alpona motifs were highly appreciated by the experts, with motif number 17 securing the highest WMS (4.36), followed by motif number 11 (4.23). The motifs of this painting are characterized by floral, fish and geometric patterns, making them ideal for textile embellishments.

3.1.3 Chita Motifs: These were well received, with motif number 15 scoring the highest WMS of 4.36. The designs of this category predominantly feature simple yet elegant patterns with religious and cultural significance, making them suitable for surface ornamentation.

3.1.4 Chittara Motifs: Motif number 17 from Chittara art obtained the highest WMS (4.40), followed closely by motif number 35 (4.36). The motifs in this category were characterized by linear patterns and traditional symbolism, making them versatile for adaptation on textiles.

3.1.5 Gond Motifs: emerged as the most preferred category, with the highest WMS scores ranging from 4.23 to 4.63. Motif number 31 received the highest WMS (4.63), showcasing its intricate detailing and aesthetic appeal. The popularity of Gond motifs highlights the potential of tribal art in contemporary textile designs.

3.1.6 Kollam Motifs: The selected Kollam motifs displayed WMS values between 3.94 and 4.36. Motif number 2 (WMS 4.36) was the most preferred, reflecting the traditional geometric patterns of this art form. However, the slight variation in WMS suggests that experts appreciated the motifs' cultural significance despite their simplicity.

3.1.7 Mandana Motifs: were selected with WMS scores ranging from 3.97 to 4.50. motif number 34 (4.50) was the most preferred, reflecting its intricate nature and compatibility with textile applications.

3.1.8 Muggulu Motifs: secured high preference, with WMS values ranging from 4.03 to 4.50. Motif number 32 (WMS 4.50) emerged as the most popular, reflecting the rich decorative patterns characteristic of this floor painting.

3.1.9 Onapukallam Motifs: were moderately preferred, with WMS ranging between 4.00 and 4.36. Motif number 20 (4.36) was the most appreciated, indicating the appeal of its symmetrical and floral patterns.

3.1.10 Rangavalli Motifs: received varying preferences, with WMS values ranging from 3.80 to 4.46. Motif number 50 (4.46) was the highest ranked, suggesting the preference for its detailed and intricate composition.

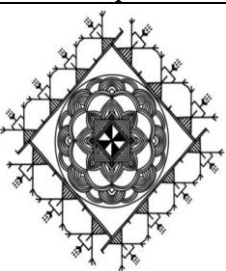

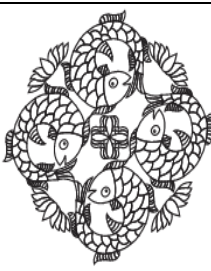
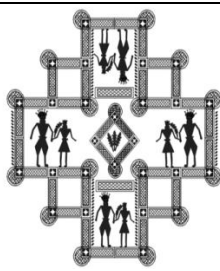

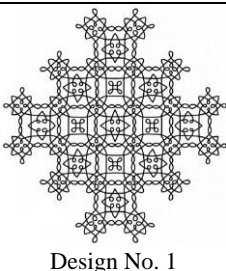
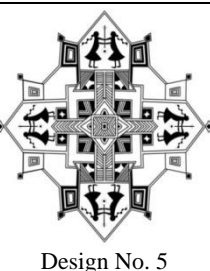


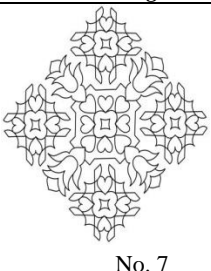
The results indicated that the expert panel exhibited higher preferences for motifs with detailed, symmetrical and culturally significant designs. Among the ten floor art forms, *Gond* motifs were the most highly preferred,

followed by *Muggulu* and *Mandana*. The high preference for *Gond* motifs highlights the growing appreciation of tribal art in contemporary textile applications. Motifs with geometric and floral patterns consistently received higher WMS values, indicating their aesthetic appeal and adaptability for textile embellishments. The findings suggest that traditional motifs not only add aesthetic value but also preserve cultural heritage in textile products.

3.2 Selection of Developed Designs

Table 2 presents the selected developed designs from ten different traditional Indian floor paintings, evaluated based on weighted mean score (WMS) calculated as per the preferences from experts. The highest rated design from each traditional Indian floor painting was selected, representing the aesthetic preferences and suitability of the designs for textile adaptation.

Table 2: Selected developed designs (N=30)

1. Aipan	2. Alpona	3. Chita	4. Chittara	5. Gond
 Design No. 7 WMS 4.15	 Design No. 8 WMS 4.33	 No. 8 WMS 4.26	 No. 8 WMS 3.91	 No. 9 WMS 4.33
6. Kollam	7. Mandana	8. Muggulu	9. Onapukallam	10. Rangavalli
 Design No. 1 WMS 4.16	 Design No. 5 WMS 4.23	 No. 1 WMS 4.21	 Design No. 8 WMS 4.10	 No. 7 WMS 4.06

Among the developed designs from *Aipan* motifs, design number 7 scored a WMS of 4.15, reflecting its high acceptance by experts. Design number 8 from *Alpona* received the highest WMS of 4.33, indicating its strong visual appeal and potential for textile adaptation. Similarly, for *Chita* design number 8 achieved a WMS of 4.26, showcasing its intricate details and cultural significance. Design number 8 from *Chittara* scored 3.91 weighted mean score, indicating moderate preference due to its unique geometric composition. The *Gond* design number 9 received a WMS of 4.33, highlighting its vibrant and detailed artistic style.

Design number 1 from *Kollam* designs was highly rated with a WMS of 4.16. Among the developed *Mandana* designs, design number 5 obtained a WMS of 4.23, reflecting its symmetrical appeal. *Muggulu* Design number 1 achieved a WMS of 4.21, showing experts' preference for its traditional elements. *Onapukallam* design number 8

scored 4.10 WMS, while *Rangavalli* design number 7 obtained 4.06 WMS, both indicating positive reception for their aesthetic and cultural relevance. Overall, the results highlight that the selected motifs hold significant potential for contemporary textile adaptation.

3.3 Selection of Developed Design Placements

Table 3 presents the expert evaluation of selected design placements for ten traditional Indian floor paintings, based on their weighted mean scores (WMS). The design placements were assessed to determine the most aesthetically pleasing and culturally appropriate adaptations for textile products.

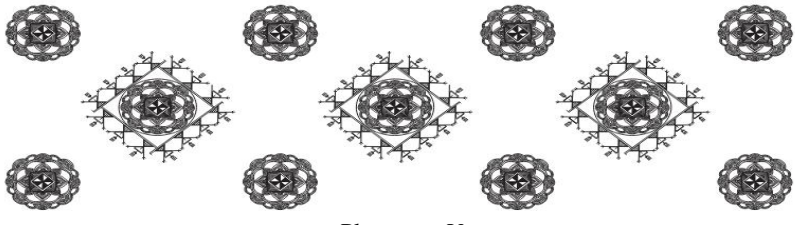
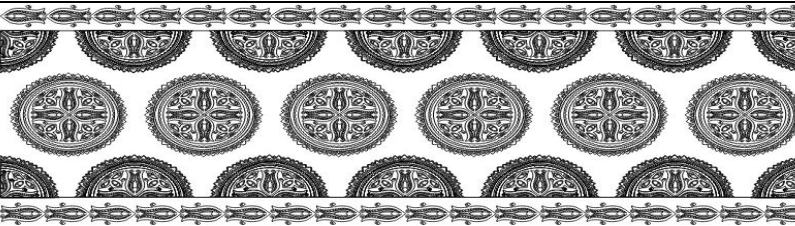
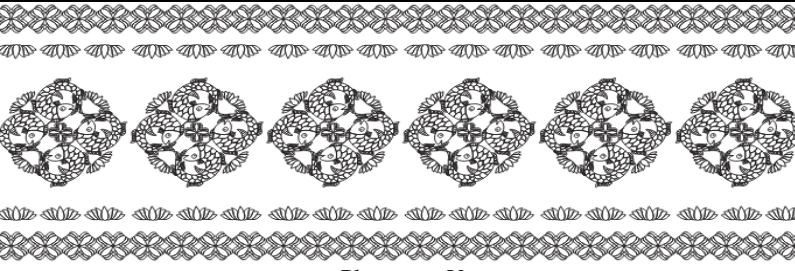
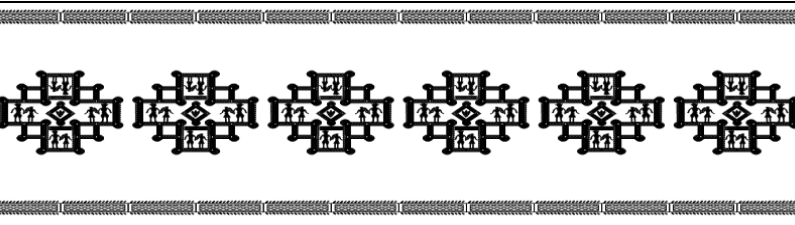
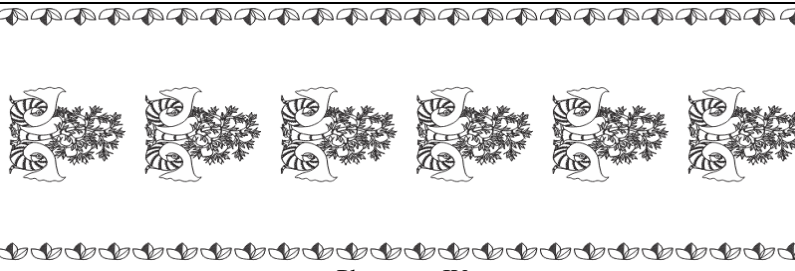
Among all the placements, *Rangavalli* design with placement I received the highest WMS of 4.36, indicating experts' strong preference for its visual appeal and suitability on textile. The *Gond* design at placement IV scored 4.3, reflecting its vibrant and artistic style in that

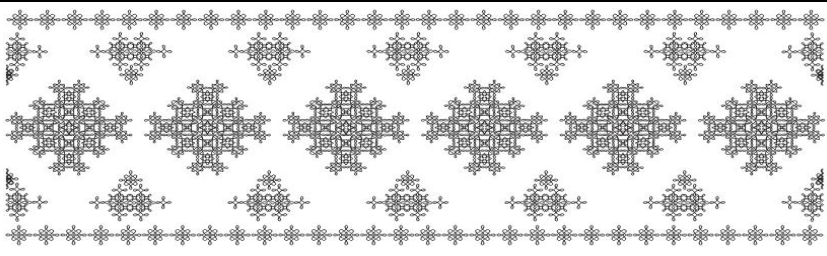
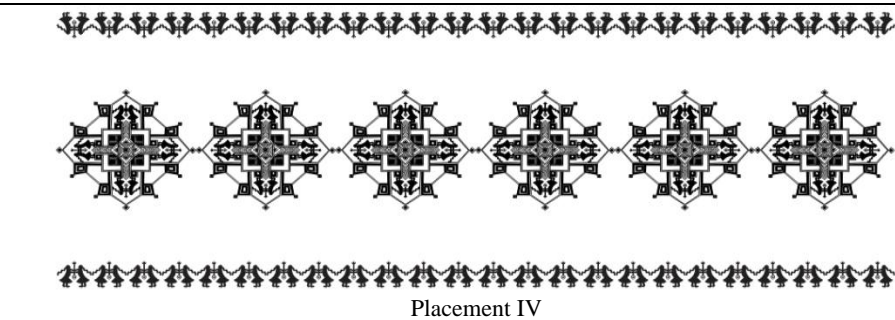
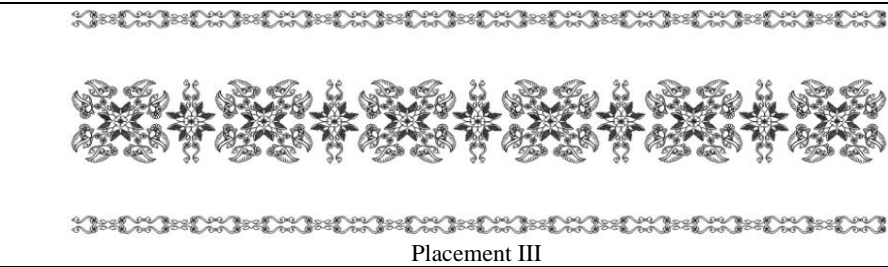
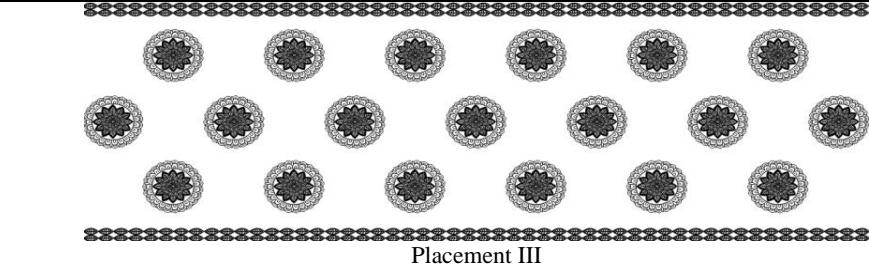
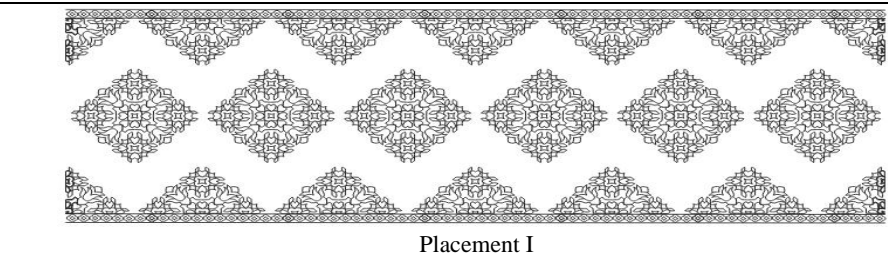
particular arrangement. The *Chita* design with placement V and *Kollam* design with placement II both received 4.2, suggesting that symmetrical and repetitive patterns are widely appreciated for textile design. Similarly, for *Alpona* design placement III scored 4.1, while the *Mandana* design at placement IV received 4.0, indicating favorable responses to these placements for their balanced and traditional appearances. The *Muggulu* design at placement III obtained WMS 4.06, showing experts' preference for its intricate layout.

The *Onapukallam* design with placement III scored WMS

3.94 and the *Aipan* design at placement V received WMS 3.93, both indicating moderate acceptance due to their unique cultural representations. The *Chittara* design at placement II scored the lowest at 3.7, possibly due to its abstract geometric composition, which might require further refinement for textile adaptation. Overall the findings suggest that design placements play a crucial role in enhancing the aesthetic value of textile products. The selected placements offer a contemporary medium for preserving traditional Indian floor painting designs.

Table 3: Selected Design Placements (N=30)

Floor Painting	Placements	WMS
<i>Aipan</i>	 <p style="text-align: center;">Placement V</p>	3.93
<i>Alpona</i>	 <p style="text-align: center;">Placement III</p>	4.1
<i>Chita</i>	 <p style="text-align: center;">Placement V</p>	4.2
<i>Chittara</i>	 <p style="text-align: center;">Placement II</p>	3.7
<i>Gond</i>	 <p style="text-align: center;">Placement IV</p>	4.3

<p><i>Kollam</i></p>	 <p>Placement II</p>	<p>4.2</p>
<p><i>Mandana</i></p>	 <p>Placement IV</p>	<p>4.0</p>
<p><i>Muggulu</i></p>	 <p>Placement III</p>	<p>4.06</p>
<p><i>Onapukallam</i></p>	 <p>Placement III</p>	<p>3.94</p>
<p><i>Rangavalli</i></p>	 <p>Placement I</p>	<p>4.36</p>












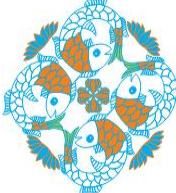


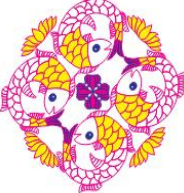
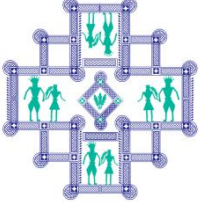
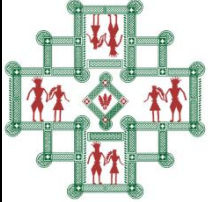
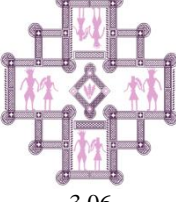
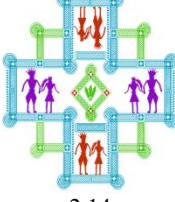
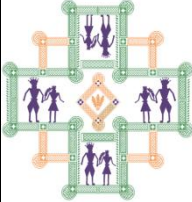





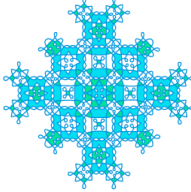
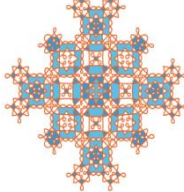
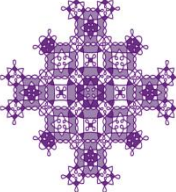
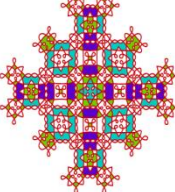
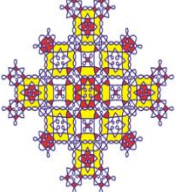





3.4 Selection of Colourways














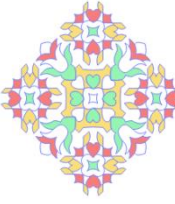
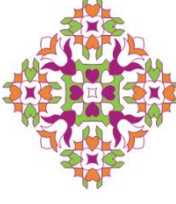
Table 4 represents the preferences of experts regarding five different colourways developed for the selected designs of developed design from motifs of each floor painting. The mean scores indicate the aesthetic appeal and suitability of each colourway for textile application based on expert evaluation.

The findings reveal that colourway III (Monochromatic) was highly preferred for Gond (4.23) and Rangavalli (4.23), highlighting its ability to enhance the intricacy of these designs with subtle variations of a single hue. Colourway I (Analogous) emerged as the most preferred colourway for

Chita (4.53) and Alpona (3.86), emphasizing harmonious colour combinations that maintain the traditional essence of these motifs. Colourway II (Complementary) was preferred most for Onapukallam (4.26), demonstrating the striking contrast that enhances the visual impact of the design. Meanwhile, colourway IV (Tetrad) and colourway V (Triad) received comparatively lower scores across most motifs, indicating that simpler colour schemes were more effective in preserving the cultural aesthetics of the designs. The expert preferences highlight the importance of colour harmony in adapting traditional art forms for contemporary textile applications.

Table 4: Preferences of experts regarding colourways (N=30)

Floor Painting	Colourway I (Analogous)	Colourway II (Complementary)	Colourway III (Monochromatic)	Colourway IV (Tetrad)	Colourway V (Triad)
<i>Aipan</i>	 3.86	 2.56	 3.50	 3.30	 2.76
<i>Alpona</i>	 3.86	 3.32	 3.96	 3.90	 4.16
<i>Chita</i>	 4.53	 1.60	 3.00	 1.93	 1.86
<i>Chittara</i>	 3.46	 2.00	 3.06	 2.14	 2.73
<i>Gond</i>	 2.16	 1.66	 4.23	 2.00	 2.86
<i>Kollam</i>	 2.72	 2.06	 3.70	 2.13	 2.26
<i>Mandana</i>	 3.98	 3.70	 4.13	 2.40	 3.12

Muggulu	 3.12	 3.63	 1.86	 2.23	 2.40
Onapukallam	 2.53	 4.26	 2.96	 3.20	 2.40
Rangavalli	 3.03	 3.46	 4.23	 1.80	 3.70

4. Conclusion

The high weighted mean scores of motifs, developed designs, placements and colourways demonstrate that traditional floor painting designs can be effectively transformed for adaptation on innovative textile products through different techniques of surface embellishment of fabric viz. painting, printing, embroidery and weaving etc. This adaptation not only highlights the aesthetic appeal of traditional art forms but also opens new avenues for women entrepreneurship, extension programs, cultural preservation and social development. The successful integration of traditional motifs into contemporary textile products underscores the potential for sustainable livelihoods while fostering a deeper appreciation of indigenous art forms. These designs hold significant promise for future applications in product lines such as fashion accessories, home textiles and eco-friendly fabrics, further broadening their market potential. Further exploration in this field can contribute to the diversification of textile products and the promotion of cultural heritage through innovative design practices.

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