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DIGITIZATION AND DOCUMENTATION OF TANGALIYA CRAFT: A STUDY OF ITS DESIGN PRACTICES IN SURENDRANAGAR, GUJARAT

Shohrat Saiyed [1], Dr. Reena Bhatia [2]

[1] Ph.D Scholar, Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, India
[2] Assistant Professor, Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara, India

Corresponding Author
Shohrat Saiyed,
shohratsaiyed28@gmail.com

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ABSTRACT

Tangaliya, a 700-year-old handloom textile weaving tradition upheld by the Dangasia community of Surendranagar represents a vibrant cultural heritage of Gujarat. The textile intricately woven and adorned with unique dana, created through warp binding technique. This technique is visible only in Tangaliya textile craft. This textile serves as lower garments for the women of the Bharwad community. It is traditionally woven on a hand-operated throw shuttle pit loom. Due to the limited width of the loom, it is woven in two halves and after weaving two continuous half lengths, it is separated and hand-stitched from the center. "Desi Oon" i.e. regional sheep wool is used as raw material which was historically provided by the Bharwad (the user community). Tangaliya were traditionally woven in the villages of Surendranagar district, Gujarat.

The study focused on covering the design process followed by the weavers and converting the traditional motifs into Computer-Aided Design (CAD). The data was collected through field visits through interviews and observation. The understanding of design development from the weavers' perspective was gained and documented. The layouts of traditional tangaliya layouts were prepared in CAD and explored in different colourways.

Keywords: Handloom, Tangaliya, Warp Binding Technique, CAD, Layout Designing

1. INTRODUCTION

Traditional handwoven textile craft is an extensive and time-consuming process that demands dedication and precision. The craftsmen, who create these textiles possess immense patience and high skills. Their knowledge is passed down through generations, as they work meticulously to preserve the authenticity and cultural significance of each piece. From preparing the yarn to weaving intricate patterns, every step requires focused craftsmanship and a deep understanding of traditional methods.

Gujarat has a rich legacy of traditional handwoven textiles, reflecting the region's vibrant culture and craftsmanship. From the centuries and even today, the artisans have sustained cultural heritage of weaving such as *Dhabla*, *Tangaliya*,

Patola, *Mashru*, *Kimkhab*, and *Ashavali*, each known for unique techniques, motifs, and symbolic significance. These textiles are deeply rooted in social customs, religious practices, and regional identity and often created using locally sourced materials like cotton, silk, and wool. The handlooms of Gujarat not only reflect the intricate craftsmanship and aesthetic innovation but also represent intangible cultural heritage passed down through oral tradition and practice.

Tangaliya is a unique and ancient handwoven textile craft practiced by the Dangasia community in the Surendranagar district of Gujarat, India. It is a handwoven textile, used as a draped lower garment by women of the Bharwad community of the region. This centuries old tradition, carries a fascinating narrative. According to legend, members of the Dangasia community, formerly part of the Vankar (Weavers) community weaving *Dhabla*, started *Tangaliya* weaving after a forbidden marriage between a Bharwad boy and a weaver girl. Despite familial opposition, the boy integrated into the girl's family and adopted their traditional weaving techniques, leading to the creation of *Tangaliya* by the people known as "Dangasia community."

Tangaliya is woven with "*Desi Oon*" i.e. regional sheep wool is used as raw material which was historically provided by the Bharwad (the nomadic community of shepherds in the Saurashtra region of Gujarat). The motifs on *Tangaliya* are created using a unique warp-binding technique with additional weft threads in colours that contrast with the black or maroon warp. These weft threads are skillfully hand-twisted around counted warp threads to form raised beads known as *dana*. These raised *dana* dots add a tactile quality to the surface, resembling Braille and give *Tangaliya* its distinctive character. The motifs, often inspired by nature, daily life and religious themes, include simple shapes such as dots, circles, squares and triangles, as well as more elaborate arrangements in geometric configurations like flowers, peacocks, temples and trees.

2. METHODOLOGY

This study employed a qualitative research approach to investigate the traditional design practices of *Tangaliya* weavers and explore the potential for the digitization of traditional designs. The methodology involved several key stages: Field visits were conducted in Surendranagar, Gujarat, specifically focusing on Dedadara village, master weavers, were identified and approached. In-depth interviews were conducted with these master weavers to gather insights into their traditional loom setups, design development processes and motif construction techniques. Direct observation of the weaving process was employed to gain a firsthand understanding of the intricate craftsmanship involved. Traditional and contemporary *Tangaliya* samples were documented, noting details like design elements, structural construction, base colors and extra thread techniques. New designs created by the younger generation of weavers, were also recorded. Traditional *Tangaliya* motifs and its layout, from the samples, were meticulously studied and recreated digitally using Adobe Photoshop version 2019. A grid-based approach was utilized, to generate these motifs using Computer-Aided Design (CAD). The traditional layouts for borders and motif placements were developed in CAD based on the analyzed samples. Furthermore, various colorways were explored for these digitized traditional layouts.

3. RESULTS AND DISCUSSIONS

Tangaliya were woven in the villages of Surendranagar district, Gujarat. Two master weavers were approached in Dedadara village. This village was 17 kilometers away from Surendranagar city. The major activity of the village was agriculture; a few households were engaged in the Patola pre weaving activity and two houses were involved in *Tangaliya* weaving.

Babubhai Rathod and his brother Mohan Bhai Rathod, were weaving this traditional handloom textile in the village using a fly-shuttle pit loom. They had their looms installed in each house, as their businesses were handled separately. They both had one traditional fly shuttle pit loom with a narrow reed width and one frame loom in their houses. Their entire families were involved in the same occupation.

3.1. DOCUMENTATION OF DESIGN PRACTICES

3.1.1. LOOM ANALYSIS

The *Tangaliya* was woven on hand-operated fly shuttle pit loom (Fig.1). The textile was earlier woven on a throw shuttle pit loom. The shuttle operating system was replaced with fly-shuttle mechanism on the traditional pit loom.

Figure 1: Mohan bhai Rathod weaving on traditional *Tangaliya* loom

Figure 2 : Warp peg

Loom had two shafts for the plain weave and two pedals. Width of the reed was limited to 27 inches. There was no warp beam attached to the loom. The warps were tied to the pole at a distance. (Fig, 2)

Shed formation: There was no special attachment given to the loom for developing patterns. The wooden plank or pattern rod was inserted at the back side of shafts. These planks were inserted to make a shed to pick the warps for warp binding to form *dana*.

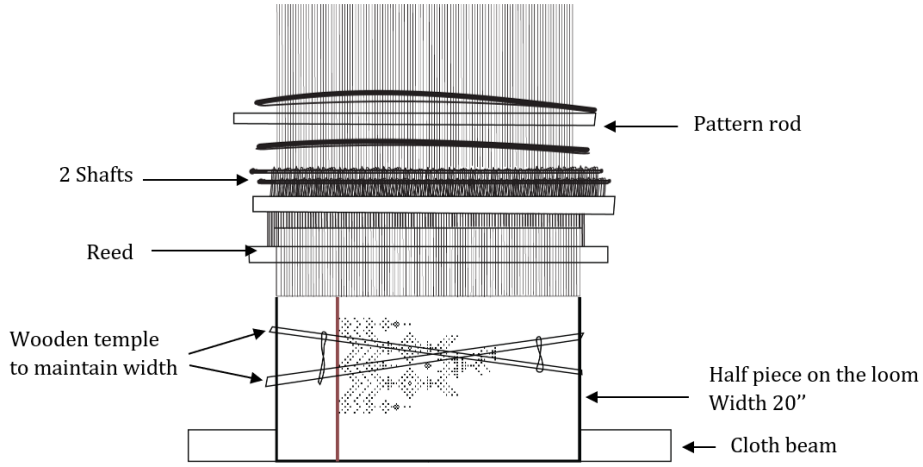

Figure 3 *: Tangaliya* on loom

Tangaliya was woven in two parts where the border was positioned on a single side on the loom (Fig.3). The two halves were woven into continuous lengths (Fig.4) and after removing from the loom, the two separate parts were and hand-stitched from the centre with a needle and thread. The two side borders remained on two edges of the textile (Fig.5). The dimensions of the single part was 20'' in width and 100'' in length. And ready width was 40'' after hand-stitched from the centre.

Weavers were also possessing upgraded frame loom in their house holds to weave larger width fabrics. The sarees with *Tangaliya* motifs were woven on frame looms. This frame loom had two shafts and two peddles. Fly shuttle mechanism was found on the loom. There was a warp beam attached to the loom. The shed formation method to add '*dana'* was similar to the traditional loom.

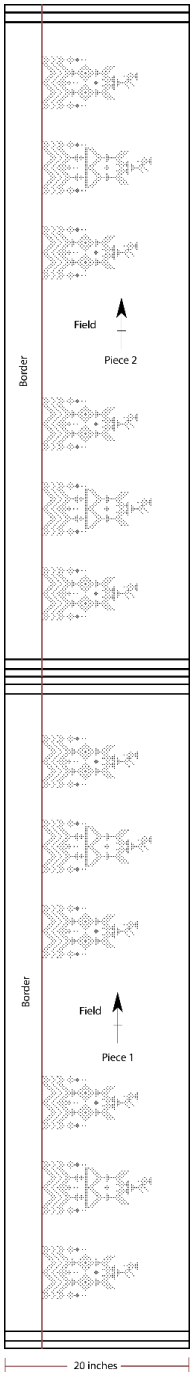

Figure 4: Layout planning for the loom

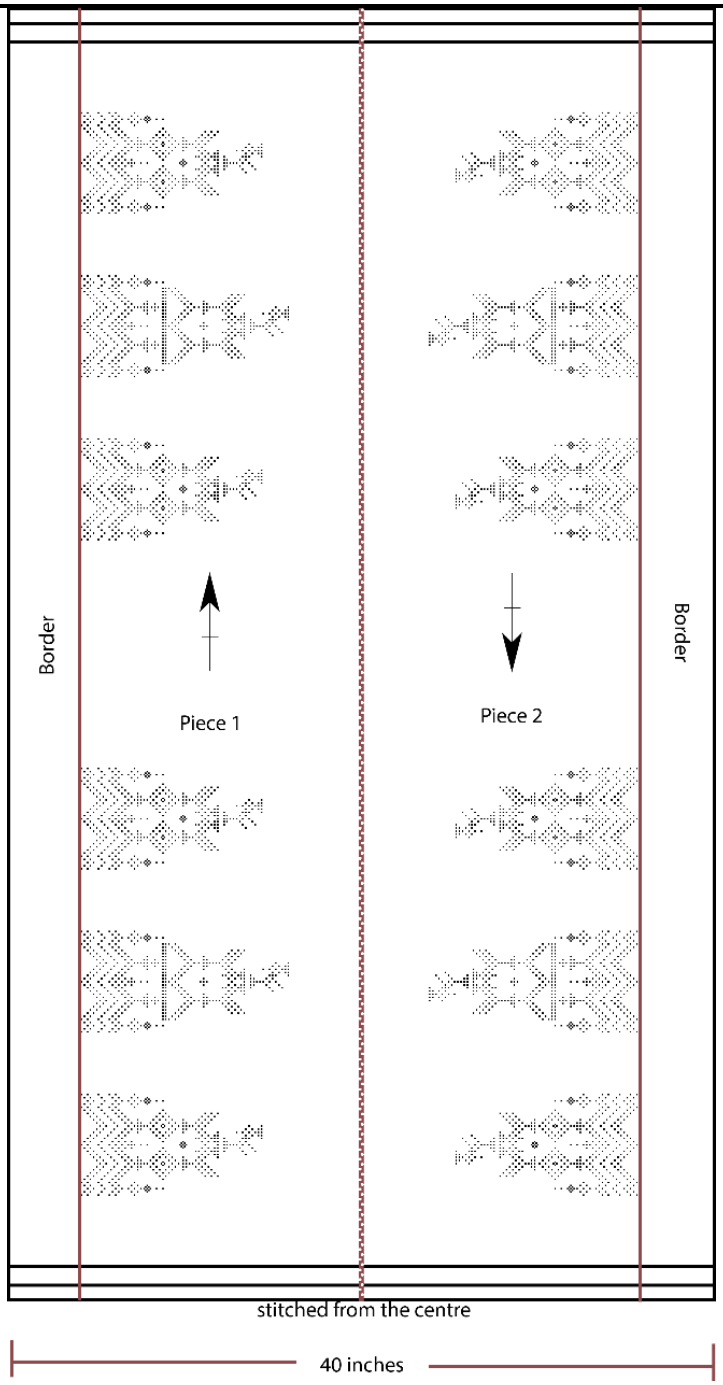

Figure 5 : Hand-stitched from the center after removing from the loom

3.1.2. DESIGN DEVELOPMENT

- Ground weave was plain weave with one up/one down lifting order.
- The designs were created using extra weft insertion. And the wooden plank was lifted each time to bind extra wefts on the warps with fingers. These planks are also known as 'Pattern rods' (Fig.3), which are used in handlooms for extra weft patterning.
- The tiny dots created by following warp binding was known as '*Dana'.* They were inserted on different spaces together formed a single motif unit. These *dana* were created on the ground weave itself by picking up the warp yarns manually (Fig.6).

Figure 6 : *Dana* making

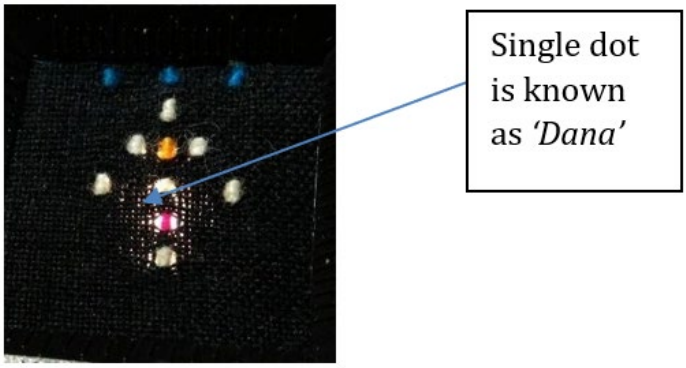

Figure 7 : *Dana* formation

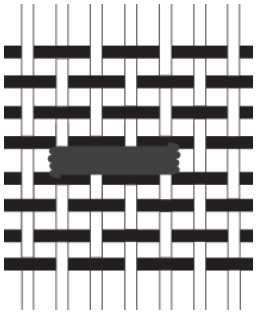

Figure 8 : Schematic Diagram of *Dana*

If, 4 sets of warp yarns were picked up manually for *dana* making. Extra wefts of colourful cotton yarns were bonded on these warps and pulled towards the already woven fabric. 4 wefts were inserted after one horizontal sequence of *dana*. These numbers might differ as 2, 4, 6 according to the change in raw material or change in yarn count or as per the product's design and design requirements. The number of warps taken to form *dana* remains constant for the entire piece.

During the researcher's interaction with craftsman, it was observed that the craftsman's approach to crafting textile designs was distinct in that they did not depend on graphical representations. Instead, the weavers themselves undertook the creative process, conceptualizing and envisioning designs for traditional weaving applications, motif

development and colour selection. Conversely, when tasked with contemporary or customized designs, clients played an active role by providing the design concepts, which the craftsmen then skillfully translated into the final textile creations.

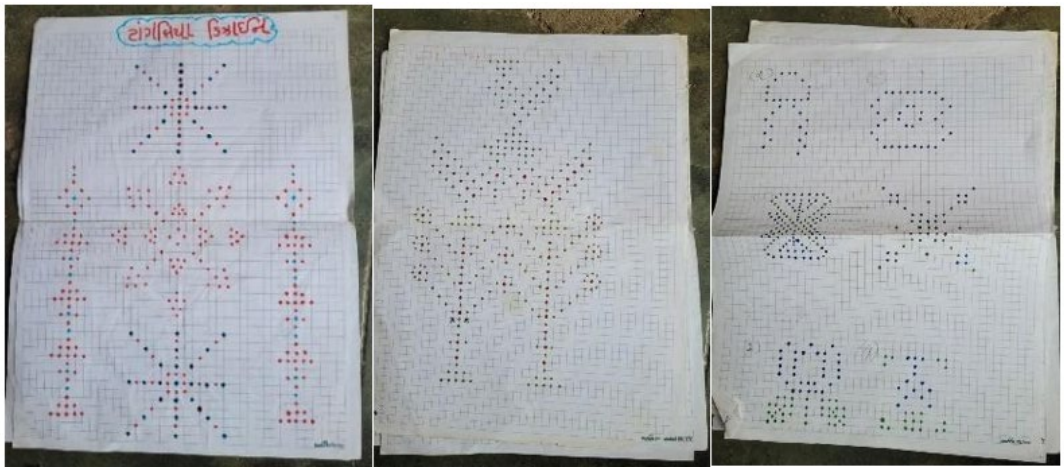

Figure 9 : New design recorded on graph paper from the collection of youngest *Tangaliya* weaver, Manisha Rathod, Dedadara Village, Surendranagar.

The designs were created on A4 size graphs paper with colour pencils and pens by Baldev bhai's daughter and Mohan bhai's granddaughter, Manisha (Fig.9). By observing the new created designs, the researchers identified that the younger generation was keenly inclined toward exploring creativity and advancing the development of new designs and motifs.

Figure 10 : *'Ramraj' Tangaliya*'

The traditional *Tangaliya* samples were observed and analysed by the researcher. These samples were with *Tangaliya* weaver Babu Bhai. In Figure 10, the first image was a 150 year old sample available with the weaver and woven by his great grandfather. The centre and last images were the traditional designs which are now woven with the acrylic yarns. The sample was studied carefully with design details and structure of construction. Understanding the craftsperson's design practice was crucial for developing motifs using digital tools.

As *Tangaliya* were used as draped lower garment, the motifs were off grain throughout the textile. The motifs were *mor, mor nu ghar, sasla nu ghar etc.* The base were usually black. Wherein warps were black with maroon border. And wefts were either black or black and maroon, using interlocking technique.

3.2. COMPUTER AIDED DESIGNING OF *TANGALIYA*

3.2.1. MOTIF DEVELOPMENT IN CAD

Traditional sample was carefully studied and the motifs of the traditional *Ramraj Tangaliya* was designed in CAD.

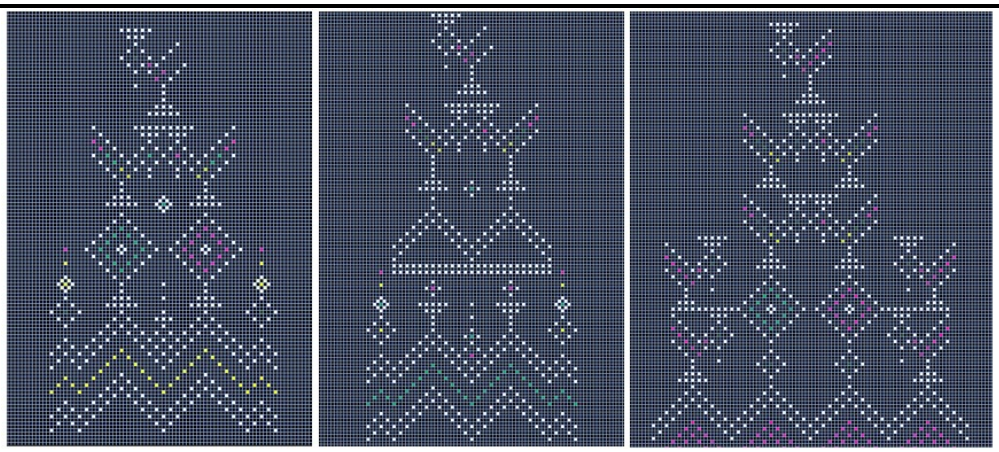

Figure 11: Reconstruction of Grid based *Ramraj Tangaliya* motif development using Adobe Photoshop

The designs were created in grids. Photoshop version 2019 was used to develop these designs. The grid was set and the motifs were developed on the black background using pencil tool to create dotted motifs of *Tangaliya*.

3.2.2. LAYOUT DEVELOPMENT OF TRADITIONAL *TANGALIYA*

The Layout was developed following the traditional sample for borders and motifs placements (Fig.12). The colourways were also developed for the traditional layouts (Fig.13)

Figure 12 : Traditional *Ramraj Tangaliya* in CAD

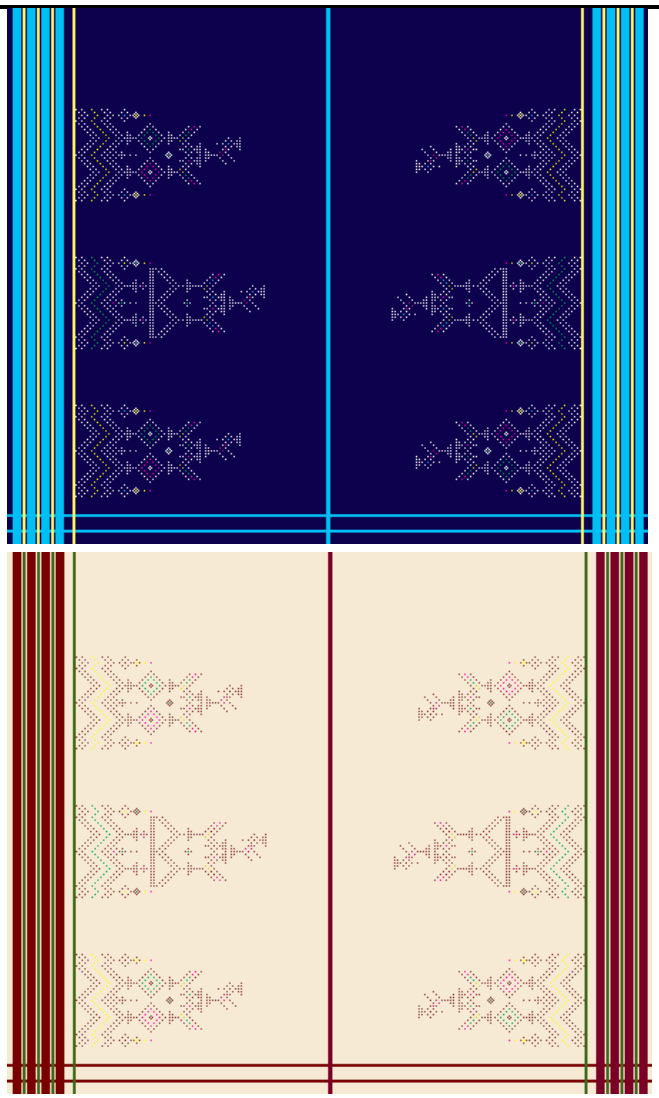

Figure 13 : Colourways of traditional *Ramraj Tangaliya* in CAD

4. CONCLUSION

The *Tangaliya* weavers were practicing traditional methods of handweaving, which could be documented to recreate traditional *Tangaliya* using application software.

Documentation of traditional textile motifs and layouts in digital format thus, ensured that old-age techniques are not lost to time and will survive in digital archives. By digitizing the methods, motifs, materials and meanings behind these crafts, a valuable resource was created for future generations.

CONFLICT OF INTERESTS

None.

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