WEAVING COMPUTERIZED *NEGI* MOTIFS IN TRADITIONAL LAKKUNDI SAREES

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SEPTEMBER, 2003

WEAVING COMPUTERIZED *NEGI* MOTIFS IN TRADITIONAL LAKKUNDI SAREES

Thesis submitted to the
University of Agricultural Sciences, Dharwad
In partial fulfillment of the requirement for the

Degree of

DOCTOR OF PHILOSOPHY

In

TEXTILES AND CLOTHING

By

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CERTIFICATE

This is to certify that the thesis entitled **"WEAVING COMPUTERIZED *NEGI* MOTIFS IN TRADITIONAL LAKKUNDI SAREES"** *. submitted by* **Mrs. JYOTI V. VASTRAD**, *for the degree of* **DOCTOR OF PHILOSOPHY** *in* **TEXTILES AND CLOTHING** *to the University of Agricultural Sciences, Dharwad, is a record of research work carried out by her during the period of her study in this university, under my guidance and supervision and the thesis has not previously formed the basis of any award of any degree, diploma, associateship, fellowship or other similar titles.*

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ACKNOWLEDGEMENT

The task of acknowledging the cooperation offered to me throughout this study by my teachers friends and family members is a magnanimous task. As I feel scanty of words under this decorum I would recall all those gentle people, who directly or indirectly are concerned to my Ph. D studies.

I feel immense pleasure in expressing my deepest sense of gratitude and profound indebtedness to ***Dr. (Mrs.) Shailaja D. Naik****, Professor and Head, Department of Textiles and Clothing, the esteemed Chairman of my Advisory Committee for her persistent encouragement, thought provoking suggestions and prodigious help. I gratefully venerate her inspiring guidance and eager involvement at every stage of this investigation.*

I am grateful to the members of my Advisory Committee, Dr. Geeta Mahale, Senior Scientist, AICRP (CI), Department of Textiles and Clothing, Dr (Mrs.) V. Gaonkar, Professor and Head, Department of Human Development, Dr. (Mrs.) Pushpa Bharati, Associate Professor, Department of Food Science and Nutrition and Dr. Kiresur V. R., Associate Professor (Ag. Econ.) and Nodal Officer (NATP), UAS, Dharwad, for their encouragement and valuable suggestion during the course of research work.

My sincere thanks are due to Sri. M. R. Itagi, Assistant Director, Demonstration cum Technical Service Centre, Central Silk Board, Rayapur, Dharwad for his constructive suggestions and involvement during investigation.

I am indebted to Mr. T. L. Srinivas, Proprietor, Amaragiri Design Centre, Belgaum, and his staff for their timely help in designing. I whole-heartedly acknowledge the help and cooperation rendered by the progressive weavers Sri. Shankarappa Patali of Sureban (Belgaum district) and Shri Shankrappa Karjigi &

his son Mr. Rajesh Karjigi of Shigli (Gadag district), who voluntarily came forward to weave the new designs of research work. I also avail this opportunity to express my sincere regards and thanks to Sri. Deekappa Gulganji (Shigli) and sons, progressive weavers, Sri. A. B. Timmapur, Chairman, Weavers Co-operative Society, Lakkundi and Sri. L. Ukkali (Kapathappa), the only throw shuttle pit-loom weaver (Lakkundi), for their encouragement and co-operation during the study.

I wish to acknowledge the co-operation given by my Department colleagues, Ms. Sunitha S., Mrs. Gouri, Mrs. Sunanda R. K., Mrs. Vanishree R. and students Sanapapamma, Renuka, Shardha, Deepa and Rashmi for their timely help.

My diction is too poor to express my heartfelt gratitude to my beloved parents, Sri. Veerbhadrayya and Smt. Shivaleela, father-in-law – Sri. A. S. Giritammannavar and mother-in-law, Smt. Annapurna, sisters – Sumangala Neeta and Shubha, brother – Naveen, brother-in-law Mr. Rajshekhar, Sister-in-law Mrs. Shashikala and Smt. Kamalvva for their affection and constant encouragement. The love extended by children chinnu, vinay, kartik, sheetal and harsha during my study is unforgettable. I am strongly beholden to my friends, Shakuntala, Sadhana and Chandrakala for their constant help.

I will be failing in my duties if I don't acknowledge the help extended by the University of Agricultural Sciences, Dharwad for granting Study leave cum part time facility for executing the Ph. D programme.

I Thank the Almighty for blessing me with a co-operative and encouraging hubby who, like a shadow of mine constantly supported, motivated and helped me sail through the research period successfully.

(Jyoti V. Vastrad)

Dharwad
September 2003

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Introduction

I. INTRODUCTION

Clothing is the second skin and clothes are an outward expression of how people feel about themselves and the world around them. The two obvious functions of clothing are to provide concealment in the name of modesty and to protect the body against inclement weather and unpleasant contacts. Clothing of course, is an intimate part of an individual, an extension of the bodily self. Adornment later grew as one of the necessities since one's appearance affected not only feelings and behaviour, but also served as a non-verbal symbol, projecting and revealing impression to those with whom one came in contact.

Historical evidences reveal that primitive people did use painting, tattooing, mutilation and variety of ornaments as a part of clothing, along with animal hide, leaves, barks, fur and fabrics to enhance their beauty. Russian archeologists found the traces of two young boys in frozen rock. The leather trousers and shirts that they wore were decorated with beads and fur. Egyptian tombs showed richly embroidered robes from ancient remains. Kings and queens of Europe were very fond of Indian fabrics famous for their exquisite art of interlacement. Creating designs on looms was perhaps the earliest method of decorating the fabric followed by embroidery, dyeing and appliqué work. To decorate fabrics in those days meant producing self

designed fabrics, which now means woven designs. Indian craftsmen were expert in the art of manufacturing fine translucent delicate fabrics. This art of weaving was inherited for manufacture of traditional national costume of India the 'saree'. The intelligent and creative interlacement of ends and picks to weave elaborate and intricate designs in the border, the pallav and the body have created great demand for the saree both in Western and Eastern countries.

The word 'Saree' is believed to be derived from 'sati' or 'shati', a Sanskrit word, which means 'a strip of cloth' or 'pattas of cloth'. From 'shatika' word 'satee' was formed and later it came to be known as 'sadi' in Marathi and 'sadee' in Oriya, Bengali, Bihari and Hindi.

It is difficult to say as to when this feminine made-up, the saree came into existence since the existence of saree is seen in some ancient sculptures of the Sumerian tradition. 'Hiranyadrapi' in Rigveda is an example of a saree, a fine cloth with border as pattas. In Mahabharat, 'minicheri' is nothing but a woven saree interwoven with pearls and glittering border. In Ajantha, there are various specimens of sarees woven with different techniques. The chief characteristic of colour in saree is to produce rhythmic contrasts, which have been displayed in the murals of Ajantha.

Saree is simply a long fairly wide strip of cloth, with a knot here and pleat there, is transformed into graceful drapery lovingly following the feminine figure. The most common way of draping saree is to pleat at the waist and throw one end over the left shoulder. The exact date when the saree was adopted by the Dravidians is not known. Through paintings it is learnt that women of South used to wear saree in the middle of nineteenth century. But in some parts of Southern India, saree was hardly older than a century before which both men and women moved about bare breasted (Joshi, 1984).

Karnataka, one of the Southern States of India is renowned for its exquisitely produced traditional saree of cotton and silk. A large number of villages in Karnataka even today produce sarees and blouse pieces on the handloom. Plain and checked sarees of cotton, rayon and pure silk are produced distinctly and are identified region wise. Prominently notable among them are Ilkal sarees with *tope teni* pallav and *khan* the choli material of Ilkal, Gajendragad and Guledgud. Similar sarees with *patti* pallav of Hubli and Betageri, Silk sarees with contrast borders of Molakalmuru, mulberry silk sarees of Mysore, light weight printed silks of Bangalore and Polycotton sarees of Lakkundi and Shigli are also famous region wise. Very few villages have introduced man made fibres in their handloom industries.

Presently there are two types of looms existing in North Karnataka *viz.,* fly shuttle pit loom and powerlooms without jacquard attachments for designing. Dobby is the only shedding mechanism adopted for producing designs in the borders. Powerlooms came into existence since last three decades (1970s). Of course the output on powerloom is remarkably higher, but even then a greater percent of weavers in Northern Karnataka have not installed powerlooms because of lack of capital, technical services, training and fluctuations in power supply (Shailaja, 1991). On the other hand powerloom weavers have succeeded in producing fashion fabrics with variegated designs, a challenge over the handloom products.

Fashion speaks of three aspects - style, acceptance and change. Change makes the fashion world go round. New styles that are introduced rise to the peak of popularity and then decline into obsolescence. Some styles remain fashionable for longer time, some come back into fashion after a latent period. However, the speed of change is influenced by modern communication, constantly changing system of marketing, purchasing power, consumer behaviour, advances in mass production and seasonal change. With increasing fad for ethnic costumes and its popularity among the dress designers to give an exclusive traditional look, handloom and traditionally

designed products have made a new vista to meet the demands inland and abroad.

Such traditionally woven goods are no longer the choice of the poor alone, but a weakness for the elite in India and abroad. It is heartening to see the illiterate and seldom clothed weaver in remote villages of India working on the loom where this exquisite product is enjoyed by the most sophisticated group of people around the Globe. Lakkundi saree of Karnataka is one among such sarees has demand even in the international market. With warp as cotton and weft as polyester, is identified as the best polycotton sarees most suitable for all seasons and age groups both in rural and urban areas. The use of polyester not only made the sarees light in weight but also has improved the resiliency. Further the care and maintenance practices are made simpler. With harmonious matching of colours in the body, border and pallav, these sarees are identified as the most elegant and thus adopted as casuals as well as party wears. Presently, Lakkundi polycot sarees are produced in more than twenty-five shades with prices ranging from Rs. 275 – 600. Higher range of cost may be due to the value addition through *'kasuti'*-the traditional folk embroidery of Karnataka or the fabric sett.

The favourite pass time hobby for the rural women folk of India is to work with traditional art and prepare antique handicrafts. Their

leisure time was spared in conservation of ethnic crafts. The hand embroidery has its own distinctive characteristic. It is the out come of spontaneous expression of emotions, feelings, aspirations and experiences of the women folk. At the same time lacks the conventional rigidity of a pre conceived or a well thought design. Motifs and colour in embroidery not only expressed the aesthetic value, but also was a tool to communicate the aspirations, hopes, expectations and achievements of a distinctive social set up. Various forms of folk embroidery thus, took birth region wise distinct in style type, hue of thread and background material, motifs, stitchery, fineness and delicacy now recognized as statewise embroideries *viz.,* Appliqué of Orissa, *Chamba Rumal* of Himachal Pradesh, *Chikankari* of Uttar Pradesh, *Kashida* of Kashmir, *Kasuti* of Karnataka, *Kutch* and *kathiawar* of Gujarat, Manipuri embroidery, *Phulkari* of Punjab and so on.

'*Kasuti*' the word derived by combining two vernacular words of Karnataka *viz.,* 'kara' meaning hand and 'suti' is the cotton thread, which in totality explains the handwork in cotton thread. It is intricate embroidery always done by counting the threads. *Kasuti* has resemblance with tattooing and floor decorations that reflected the folk culture of this region. The tradition of decorating the floor is called 'rangoli' a prevailing practice observed till today. The designs for floor

decoration and motifs used in embroidery are almost similar *i.e.*, the geometrical patterns with dots, lines, squares, circles, swastik, lotus, fish, conch shell, creepers, leaves, flowers, animals, birds and anthromorphic figures (Mahale, 1998).

Historical evidences provide an insight into the past culture, tradition, customs, art and ethnicity and do help in preserving them. After the decline of the Gupta Dynasty, the period from 6th to 10th century A.D. was marked as the second Golden Age in India. During this period, the Chalukyas of Badami, Pallavas of Kanchi, Kadambas of Goa and Canara, Hoysalas and Cholas of Vijayanagar and Pandyas of Madurai ruled over Karnataka. These rulers encouraged the cult of Shiva and Vishnu by building temples at Halebidu, Belur, Somanathpur, Aihole, Pattadakal, Hampi, Lakkundi, Lakshmeshwar and Badami of Karnataka. These temples unsurpassed for the refinement of sculptures and richness of their antiquities with delicacy of ornamentation and carving that are considered as heritage centres. It is from these architectural treasures, the women folk drew their inspiration and were largely influenced by the patterns, designs and ornamentations depicted in the carvings. Secondly, the impact of religious revival was so great that the architectural designs of temples and structures in the vicinity of the temples such as gopuram, deepmala, chariots, palanquins; animals like deers, elephants, horses;

birds like swan, parrots and peacock; flowers like lotus, jasmine, champak and marigold found their colorful representation on the embroidered work in *kasuti.*

It is believed that Karnatak *kasuti* has resemblance with the embroideries of Hungary and Spain (Pandit, 1976). The speciality of *kasuti* is that the designs were never traced on the material but instead the work commenced with a tiny backstitch without knotting the thread and continued by counting the threads. This embroidery comprised of four types of stitches *viz., gavanti, murgi, negi* and *menthi.* The motifs embroidered with *gavanti* and *murgi* stitches appeared identical on either sides of the fabric. *Gavanti* produced straight lines whereas *murgi* produced staircase like effects. *Negi* resembled woven motifs and *menthi,* the cross-stitch.

For many years *kasuti* remained only as a passtime or leisure time craft for women to accomplish their own artistic desires. Emerging needs of the urban and the elite for traditional wear further encouraged the commercialization of this folk art thus, engaging majority of women folk in the embroidery work. Earlier *kasuti* was done only on traditional Ilkal saree and cholis. Later it extended to household articles like pillow/cushion covers, table/television covers, draperies, children's blanket; and clothing items like lehengas, baby frocks, caps, salwar kameez, veil or odhani and shawls. Presently

traditional hand stitchery is very elaborate and time consuming. 'Counting threads', the practice of earlier embroidering is gradually becoming extinct, since the present day professional/commercial embroiderers have adopted a simpler mode of working, *i.e.*, use of loosely woven net fabric as a guide to maintain the stitch size and working direction *i.e.*, the small swatch of net is placed over the ground fabric and held in place. The embroidery is actually done on the net cloth picking stitches through ground cloth too. Of the four stitches *gavanti, murgi* and *menthi* are extensively used in embroidery but presently none use *negi* stitch. This may be because the floats in *negi* stitch need to resemble the ground weft. It involves lot of skill, patience, expertise and intricacy. To achieve the embroidery almost parallel to the interlacement of warp-weft it was very difficult by the commercial craftsmen of today. Hence many professionals did not adopt '*negi*' stitch. Moreover there existed greater variation in the stitch length, motif and its placement.

This folk embroidery has played an important role in enhancing surface enrichment of the traditional cotton, silk and polycotton sarees. Similarly, the *kasuti* embroidery on Lakkundi polycotton sarees has enhanced the beauty, elegance and appeal, thus succeeded in capturing the hearts of Indians and foreign travellers. Polycotton sarees of Lakkundi are the treasure of Karnataka; the saree being

unique, woven with special border, pallav and body. Surprisingly these regionally famous sarees marketed all over India as 'Dharwad sarees'. Thus it was felt necessary to document about the production and designing of this historic polycotton sarees with special emphasis on revival and surface enrichment through *kasuti* embroidery.

Hence, the present investigation was taken up with a view to generate information on the history and development of weaving at Lakkundi, the socio-economic status of the weavers involved in the production of traditional sarees and their problems. Further the other features of the study were to develop computerized *negi* motifs, mechanizing the developed motifs in weaving technology to enhance the production rate. The present investigation therefore, was taken up with the following specific objectives:

1. To study the historical background of weaving polycotton sarees.
2. To document the possibility of modifying and computerizing or digitalizing selected *negi kasuti* motifs.
3. To explore the possibilities of weaving Lakkundi sarees with computerized *negi* motifs.
4. To estimate the market potentiality of newly designed sarees.
5. To asses the comparative economics of traditional embroidered and newly woven sarees.

Review of Literature

II. REVIEW OF LITERATURE

The literature of the related researches conducted provides a suitable background for the study undertaken. The review of literature of relevance to the present study is arranged in this chapter under the following sub headings:

2.1 Traditional sarees

2.1.1 Silk sarees

2.1.2 Cotton sarees

2.1.3 Mixed sarees

2.2 Traditional embroideries

2.3 Revival of traditional sarees and embroideries

2.3.1 Revival of traditional sarees

2.3.2 Revival of traditional embroideries

2.4 Demographics of artisans

2.4.1 Demographics of weavers

2.4.2 Demographics of embroiderers

2.5 Problems of artisans

2.5.1 Problems of weavers

2.5.2 Problems of embroiderers

2.6 Computer Aided Designing

2.1 Traditional sarees

India has a rich traditional and cultural heritage, which to a maximum extent has influenced the art and handcraft industries of the country. Weaving supposed to be one of the oldest methods of producing the fabric has developed into the largest industry employing greater percentage of the population and earning a great deal of foreign exchange. Yet, a touch of traditionality is still seen in the newly produced clothing items. Every state of the country is known for its regional traditional textiles. Many research workers have conducted studies on the regionally famous sarees of India, listed here under:

2.1.1 Silk Sarees

Annathomas (1985) conducted a study on 'Banaras textiles' and reported that Banaras brocade is the fabric of dream, a cloth of genuine gold. In olden days very fine and delicate gold and sliver wires were interwoven instead of yarn. The saree ultimately glittered with a metallic sheen. However, the silk yarns used in weaving were purchased from Bangalore, Kashmir and Malda and the tested jari from Surat. The varieties of Banaras textiles were Brocades, Jangala, Tanchoi, Satin border, Banarasi butidar, tassar silk and organza woven with a harmonious combination of plain, satin and twill weaves to create interesting floral, fruit, animal, bird geometrical patterns and

human figures. Colours used were the shades of pink, red, blue, green, yellow and purple.

Bansal and Phadke (1984) in a study on 'Hand woven sarees of Maharashtra' described Maharashtran sarees to be simple, plain and relatively inexpensive ones. The traditionally woven gorgeous saree of Paithani are renowned for their exquisite and antique beauty. *Kuyari, gokarnbal, asavaali, aokruthi, morebogdi, totamaina, asharpi, jiparighari, ajanta* lotus, *humaparinda* and *anarbala* are the motifs commonly found in the saree. Moghul rulers did protect and preserve the traditional crafts. However, religion played an important role in the selection and adoption of motifs, which kept on changing from Shalivahan period to the Moghul period. The sarees were oven in Striking Shades of yellow, pink, purple, blue, red, maroon, orange and black. The length of the saree ranged from 5, 5 ½, 6 to 9 yards while the width from 45" to 49".

'Golden age of Indian Sarees: Baluchar Sarees'- a study conducted by Joshi (1984) revealed that the sarees were woven in Murshidabad district of West Bengal with charaka spun silk yarns either in dark red, blue or some times in combinations of red and blue. The elaborately designed *anchal* covered the entire width and was about 24" x 32" in dimensions. The most favourable season for weaving Baluchar sarees was monsoon.

Ravikumar (1984) observed that Kancheepuram sarees were composed of 100 per cent mulberry silk that was charaka spun the warp being finer than the weft. Use of flexible bamboo reeds in weaving checked the yarn damage. Contrast borders on either sides of the saree were stitched through using three shuttles, two small to interweave borders and one large to weave the saree body.

Jacob (1989) studied the 'Rich, artistic Sarees of Andhar Pradish'. Kotha kota sarees produced in Kotha kota town of Mahabub Nagar district, are the richly woven brocaded sarees with 2 ply silk yarns used in both the directions. The sarees have a pleasing colour in the body with contrast border and pallav. Mythological swan, the *hamsa* with carved tendrils in the border and *gouli*, a stylized single and double-headed eagle in the pallav were uniquely used.

Armoor sarees are the traditional silks of Andhra Pradesh. This saree is woven more commonly by using purple and deep red colours. The border is deep red in colour with a width of 2 ½ to 3 inches carrying geometrical patterns of lozenges worked in gold. Pallav is intricately woven with red warp and gold weft creating a tissue like surface, over which mango motifs are worked with silk yarns. The body of the saree carries small star like flowers as buttas (Jacob 1989).

Pochampalli sarees are one amongst the lightweight silk sarees of Andhra Pradesh (Jacob 1989). The sarees are interwoven with single yarn in both the directions. Tested zari in the border as well as body enriches the saree. The common motifs in use are geometrical patterns, parrots, peacocks, elephants and floral designs with attractive colour combinations.

Kannan (1989) in his article on 'Sonata Sarees' describes that Sonata sarees produced in Karnataka are of mixed type since warp is composed of pure mulberry silk and the weft pure mulberry spun silk. This saree was basically a handloom product but now is economically woven on powerlooms. A weaver who weaves 4 to 5 meters a day on handloom is now able to produce 15 meters a day on powerloom. Use of jacquard and dobby have made it possible to create beautiful designs much similar to Kanjeevaram, Dharmavaram and Kumbhakonam sarees.

Priyadarshini unit of Karnataka Handloom Development Corporation was established during 1975 with the main objective to help the handloom weavers to earn a substantial income. The unit had successfully modernized 10,000 handlooms, providing work for 12,000 wearers all the year round. Manorama sarees specially designed by the weavers service centre, Bangalore under the National Collection Programme represent good taste and culture. Designs woven in this

saree resembled the famous frescoes of the Summer Palace of Tippu Sultan at Srirangapatnam of Karnataka state (Kannan, 1989).

Ramesh and Mukund (1989) described Kancheepuram saree as a fine quality charaka spun silk saree weighing about 400-600 g of which gold zari weighed 30-200 g. The body of the saree was either plain or with stripes of zari or in simple checks most commonly with all over buttas. The pallav was richly woven with incomparable temple designs.

Nadiger *et. al.,* (1995) elaborated the uniqueness of Kancheepuram sarees that lies in weaving the solid border and Mundhani (also called pallav) formed other end of the saree, when worn, drapes over the shoulders. 'Korvai' is an elaborate process of interlocking individual warp yarns with the pallav yarns resembling the border yarns. The pallav often runs upto 48" full of decorative details and finish. The body of the saree was either plain or with simple checks or most commonly with buttas. *Rudraksham, vankis, kanchu, garudhanchu, breck pattu,* diamond and half diamond *pettu, simhasana, ardhasimhasana,* elephants, horses, parrots, peacocks and *gandaberunda* were the motifs used as buttas.

Jacob (1996) in her study on 'Grandeur of Kanchipuram' stated that silk with 16/18 denier is generally used to weave Kanchi sarees

and for which most of the silk was purchased from Karnataka. The saree woven is double colour was its speciality. The motifs used represent a gallery of exotic, exquisite and sturdy designs. Geometrical designs, stylized rings, dots, *rudraksha* beads and other decorative floral and mango pattern of various style and size, peacocks, parrots, elephants, motifs from Ajantha and Ellora temple, creepers, animals, birds, diamond, half diamond, double headed mythological bird formed the integral part of the design. These patterns woven with extra warp and weft were worked into the body of the fabric by means of an indigenous device known as 'Adai' which performed the same function as jacquard. Korvai technique prevailing in Tamilnadu was adopted to join the border to the body. The solid pallav matching the borders in colour produced by doffing the warp yarns and then twisting another set of warp with original warp of the body called the 'petni'.

Krishnamurthy *et. al.,* (1996) conducted a study on 'Kumbhakonam sarees - a blend of tradition and modernity'. The Author mentioned the weaving of Kumbhakonam sarees was a slow process because of intricacies and elaborate designs. Designs in the border and body by extra warp figuring was done using jacquard mounted on a frame loom. The warp comprised of silk yarns of 20/22:2, 20/24:2, 16/18:2 and 28/32:2 ply yarns was woven with 2, 3 and 4 ply untwisted filature silk. Crimson, violet, carrot, green,

arakku and turquoise were the common colours whereas blue brown and mixed colours were woven occasionally on demand. The hallmark of Kumbhakonam sarees were absolute perfection well geometrized, well-defined curved motifs derived from nature and temples. It was noted that *sigappa roja*, white *roja*, button dollar, grape, creep, cross creep, double flower, red rose and diamond rose were a few popularly woven designs.

Rajappan and Vatsala (1998) studied the 'Splendorous silks of Dharmavaram' and indicated that the sarees were woven on pit loom with dobby and jacquard attachment for border, pallav and extra weft designs. Two ply silk yarns of 20/22, 20/24, and 28/32 were used to weave the Dharmavaram sarees with contrast border and pallav were called as 'Kuttu' type whereas, those with self borders and pallav were called as 'Lattu type'. Weaving 'Kuttu' sarees was a slow process because it involved stitching. The motifs and designs for the sarees were adopted from the sculptures of temples at Lepakshi and Tadapatri. Besides, motifs from nature like peacock, deer and flowers were also woven. Lux, parrot, olive green, ram or magenta, peacock blue and mustard were the few fast moving colours.

Sanapapamma and Mahale (2001) conducted a study on 'Silk sarees of Molakalmuru'. Results revealed that 2-ply filature silk was used in the warp and 3-4 ply charaka silk in the weft of the sarees.

The authors record a galaxy of geometrical, temple and intricate designs. Most commonly woven buttas were the mango, peacock, parrot, *hamsa*, lotus, diamond, *rudraksha* beads, banaras, venki and phoenix on both contrast and self bordered sarees.

2.1.2 Cotton Sarees

Bansal and Phadke (1984) in a study on 'Hand woven sarees of Maharashtra' mentioned that the weaving of pure cotton sarees of Ahmednagar were introduced into the city by a rich Kolik of the Bhangria clan soon after the city was founded in the year 1499. The weavers purchased cotton yarn from Bombay, Coimbatore and local markets. Motifs used in the border included *gome, bugdi, veel bugdi, ruiful, kamal, rudrakshi, swastika, kuyari, karvati, lehari, pinjara, nagmani, khawale* and *surya*. The length of the saree varied from 5-9 yards and the width was 45" to 49".

Sholapur sarees consisted of a finer sort of cotton yarns dyed with vegetable dyes Naphthol, vat and reactive dyes. The border of the saree was a replica of the ones woven at Ahmednagar (Bansal and Phadke 1984). Finer quality yarn in addition to natural dyeing increased the price of the saree.

Paul (1994) in a study on 'Dorias of Kota weave: a spell of magic' explains that a fabric is called Doria only when it has duras *i.e.,*

striped Kota dorias were pure cotton sarees of either 100s or 120s. The original doria sarees were called 'masuria' since produced at Mysore (Karnataka). The weavers migrated from Karnataka to Kota in the late 17th and early 18th centuries and the sarees were later called as 'Kota masuria'. Traditional plain doria fabrics were woven on a simple throw shuttle pit loom without any extra attachments. Presently the sarees are woven on both handlooms and powerlooms with jacquard shedding mechanism. Flowers blooming, animals grazing and birds flying are the motifs seen in the wispy sky of doria sarees.

Shailaja (1991) conducted a study on 'Handloom sarees and *khans* of Northern Karnataka'. Gajendragad cotton saree was one of the popular sarees worn by the rural women folk as daily wear. Cotton of 40s was used to weave the saree. Viscous rayon was employed for extra warp figuring in the border. The *'Gadi-dhadi'* border comprised of small flowers (*ruiphool*) created by extra warp figuring was very popular among the rural folk. The pallav 64.00cms in length had four bands of white stripes each 1.5cms wide with *'tope-teni'* effect. White viscous rayon filaments were used to create the bands.

Similar pure mercerized sarees were manufactured in Hubli. Cotton yarns of 50s made the sarees finer than Gajendragad sarees. Viscose rayon filament was used for extra warp designing in the

border whereas, white silk yarns to create bands in *'tope-teni'* pallav. The pallav of Hubli saree had five bands of each 2.00 cm wide. The border was very much similar to that of Gajendragad saree (Shailaja 1991).

Cotton yarn of 50s was used to weave the Ilkal cotton saree on the pit loom (Shailaja 1991). Border was composed of viscose rayon as warp and cotton as weft, whereas the *'tope-teni'* pallav was of pure silk constructed by the laborious process of cutting and interlocking a separate set of silk warp yarns to the original warp. The border with harmoniously placed geometric motif the diamond, was called as *'chikki pharas'*.

Jacob and Bala (1999) studied the 'Changing trends in cotton zari sarees of Andhra Pradesh'. Venkatagiri sarees were one among the finer varieties. These sarees were popular for their purity of cotton content and the rich zari work mainly woven by jamdani technique using extra weft insertions. The saree was composed of finely spun cotton yarns of 100s in the warp and 120s in the weft. The traditional sarees were woven in off white colour with pure zari border. The solid bordered sarees were commonly called *'Kaddi Anchu'*. Border was rarely designed with *batani* or *asharfi* buttas.

The ornamented Gadwal saree was the second masterpiece of Andhra Pradesh textiles adorned with rich and beautiful pallav. (Jacob

and Bala 1999). The sarees were similar to venkatagiri Sarees in fineness with the counts ranging from 80s to 100s. Pallav and border consisted of pure silk and were attached separately to the body by '*Korvai*' technique. Off white Gadwal Sarees with contrast borders are traditionally famous. Common motifs used in the sarees were '*vanki*', '*muthu*', running floral motifs and wavy pallav designs with *muthu* and stylized diamond motifs. This wavy portion was adorned with mango, *muthu* and *rudraksha* motifs in gold zari.

Narayanpet is a regional traditional saree centre in Mehboob Nagar of Andhra Pradesh. Narayanpet sarees resembled the Ilkal sarees of Karnataka. The sarees were woven with finely spun cotton yarns of 80s. The distinct feature of traditional Narayanpet saree was the silk patti border enriched with zari yarn resembling basket weave and a broad pallav known as '*tope-teni*' Pallav (Jacob and Bala 1999).

2.1.3 Mixed sarees

Bansal and Phadke (1984) conducted a survey to study the 'Hand woven sarees of Maharashtra'. Handloom sarees of Poona were quite famous for their quality construction, constant inflow of new designs and reasonable price ranges. Rayon as warp and cotton as weft were inter woven with a typical pallav called the '*ganderi padar*' comprised five stripes - three in dark colour, 1 ¾ to 3 ¾ inches wide and two in white colour 1 to 1 ½ " wide.

Shailaja (1991) in a study on 'Handlooms sarees and khans of Northern Karnataka' noted that the saree manufactured at Gajendragad were of mixed type with viscose rayon as warp and cotton as weft. The red pallav of the saree was of pure rayon with four white coloured rayon bands each 1.75cms wide. The width of the saree was 120cms of which border measured 16cms. The border with bands of wavy feather like designs was called as *'gomi dhadi'*. The sarees at Gajendragad were also woven with silk warp and cotton weft.

In Hubli also similar sarees were woven in rayon warp with cotton weft (Shailaja 1991). The weight of these *'bambar'* (rayon) sarees was reduced remarkably compared to pure cotton sarees of Hubli. However, the motifs in the border and *'tope-teni'* pallav of bambar saree was in par with the cotton sarees of Hubli. Usually the pallav of rayon sarees used to be of pure silk. It was noticed that the pallav of the saree is always woven first, followed by the body. The fly shuttle pit loom employed to weave these sarees, did not have warp beam, instead the warp ends were tied to the bamboo stave in turn the latter tied to the wooden pole posted on the floor. Each time a single saree is woven. After completing each saree, the pallav warp of the next saree is joined to the body warp of the previous saree. Similar sarees woven with silk warp and cotton weft were called *'garbha reshme'*.

2.2 Traditional Embroideries

Urge of man to decorate his clothes marked the origin of embroidery. Embroidery was used in countless ways for varied purposes - to embellish elaborate trousseaux and funerary wrappings, to proclaim the glory of God and majesty of Kings, to add a little colour to the simple home of peasants hence displaying the rich wealth of the country. India records the maximum variety of embroideries traditionally developed by the women folk of peasant families that are identified regionally or state wise. Highlights of studies on traditional embroideries of the country are described here under.

Joshi (1986) expressed that ancient literature and sculptures have the evidences of the antiquity of the folk embroidery *'Kasuti'* of Karnataka. Historically famous temples, palaces and their ruins with fine stonework reveal the architectural excellence of Karnataka. Inspired artisans drew the designs by needle and thread embroidery that was patronized by the rulers of that period. *Kasuti* work was purely a domestic art done by the peasant community during their leisure time. The author observed that *'gavanti, murgi, negi* and *menthi* were the four stitches of *kasuti. Gavanti* is described as double running stitch, used to create simple vertical and diagonal lines. *Murgi* a ladder type stitch looked identical on both sides of the cloth.

Varughese (1986) in a study on 'Towards revival of Dharwad *Kasuti*' noticed that almost all women folk possessed a piece of cotton cloth (almost a meter size) that contained all traditional *kasuti* embroidery motifs. On the contrary, institutions treasured a manual consisting matti cloth *kasuti* samples, which was used as reference for personal use in business transactions. The author described four types of stitches as '*negi*' that produced woven effects, '*gaonti/gavanti*', resembled running and backstitches, '*menthi*' as the cross stitch and '*murgi*' with zig zag lines like a ladder. Cotton and silk threads of green, red, yellow, pink, orange, dark maroon and brown colours were used to embroider on various coloured backgrounds including white crème, black, purple, blue, pink and green.

Grewal (1986) explored '*Phulkari*, folk embroidery from Punjab' and revealed that long and short darning stitches were the two prime stitches used in *phulkari*. The stitches were so compactly done on the surface of the fabric that it gave the impression of woven designs. Other stitches traditionally used were the herringbone, blanket, chain, running and stem. Most commonly used floral motifs were cotton boll, wheat ear, sesame seeds, marigold, jasmine and small buds. Other popular motifs were mango slices, rolling pin, peacock, parrot, snake umbrella, kite, aeroplanes and cyprus tree and jewelry articles.

Grewal (1987) in a write up on '*Chamba rumal*: poetic imagery of *Pahari* miniature' explains that *chamba rumal* the folk embroidery of North-western Himachal Pradesh was traditionally done on two types of cotton fabrics *viz.*, *khaddar* - home made rough quality and *halwan* - mill made fine quality and on tasar silk too. The embroidery was done on off white, red, or indigo backgrounds with brilliant blue, purple, red, pink, crimson, yellow, green, brown, black and grey coloured threads. The stitches included double satin, stem, chain, double running and darning stitches. This embroidery was used to embellish *rumals*, wall hangings, blouses, fans, gauntlets, canopies, caps, cushion covers and dice sets.

Varughese (1987) in a study on 'Revival of *chikankari* embroidery found that the embroidery was solely done on transparent material from the wrong side of the fabric. White material was more commonly embroidered intricately using the same coloured thread. Solid parts of the design were embroidered using herringbone stitch that produced shadow effects on the right. Other stitches traditionally used were back, darning, stem, satin, french knot and buttonhole. Plenty of foliage and floral designs with buds, climbers, stylized mango, rice millets, birds, peacock, gheese, elephant and fishes were seen in the masterpieces of the embroidery work.

Mittal and Paul (1989) elaborated the 'Success story of craftsmanship' involved in gold and silver embroidery of Lucknow. Transfer of design onto the fabric was through tracing or by using graph. Very rarely it was done by free hand drawing. Laid, chain, running, satin, stem and cross-stitches were prominently used to embroider the traced designs. Motifs included the traditional mango, swastik, animal and human figures and geometrical designs created by using lines triangles and circles.

'Variegated embroideries of Rajasthan' a study conducted by Grewal (1990a) revealed that the designs for the embroidery was transferred onto the fabric using carved wooden blocks, dipped in a paste of fuller's earth and gum. The use of perforated paper for tracing the designs was rarely seen. Author described different group of embroideries as '*Mochi bharat*' as chain stitch done using the cobbler's hook needle called the '*Katarin*' or '*Ari*'. '*Heer bharat*' included double satin, herringbone, interlock and buttonhole stitches. Lotus flower was the extensively used motif in addition to flower buttas, stylized parrots, *garuda*, horses and elephants carrying palanquin with two human beings gazing out.

'*Pichhvai*' one of the religious embroideries of Rajasthan was done to embellish the sacred textiles used in temples. *Pichhvai*'s were traditionally used according to the seasons. Velvet and satin used

during winter were called the *'Sarhad'*, whereas cottons used in summer were called the *'Gresham'*. Silk or cotton threads of bright red, green, yellow and orange colour were used on red, purple, blue or white backgrounds. The patchwork with an outline of white cord in addition to gold and silver embroidery were done on the backgrounds. Designs used were pictorial in character depicting themes from *'Bhagad purana'*, *'Ras mandala'*, *'Krishna leela'* and *'Gokul vana'*. Besides the *pichhvai* embroidered articles had heavily ornate borders comprising of floral scapes and scallops (Grewal, 1990b).

'Jain embroidery' was the second religions embroidery (Grewal, 1990b) of Rajasthan. Jain's offer wall hangings, canopies, panels and door carvings as gifts to the shrines. Satin fabric of red, indigo, blue or violet colours were used as base on which embroidery and patchwork of red, yellow, white, green and blue colours were done. Gold and sliver threads were less commonly used. The designs used in the Jain embroidery included themes based on Jain philosophy such as *mandala, adidivapa, dipkala, ashatmangala. 'Mandala'* was the diagrammatic representation of Jain beliefs and concepts and depicted the centre of universe, heaven, various gods and goddesses. *'Adidivapas'* showed Jain cosmology with three worlds worked out in concentric circles and the names of different gods and goddesses inscribed in it. *'Ashatmangala'* contained eight auspicious objects

related to different *'Tirthankaras'*. Pali, Jaipur and Churu of Rajasthan were the main centers of Jain embroidery.

Mahale (1998) in 'Folk embroidery of Karnataka' found out that *Kasuti* was an inherited art practiced regularly for personal and domestic purpose. Sky was the limit for selecting the motifs from nature. Most prevalent motifs used in *Kasuti* were *gindigida, simbi* flower and *bele aasan.* Big buttas *viz., suruligubbi, gandol kamala, godi kamala, panaj,* and *gubbi kamala.* Creepers included *tengin hoovin patti, shank murgi patti, godambi patti* and *kai patti.* Birds and animals like peacock, parrot, sparrow, elephant and squirrel. Plants, flowers and fruits *viz., gindigida,* birds, plants, tulsi, lotus and mango, god, goddesses and other religions motifs-*gopuram,* chariot, palanquin, Hanumanth, Shivaling and Ganapathi.

Gupta and Goel (1999) described the *'Chutki'* work as the traditional embroidery of Aligarh in Uttar Pradesh. Simple slipstitch was used to tack small motifs onto the base fabric. Supporting stitches *viz.,* featherstitch was applied for decoration and ornamentation of the design and stem stitch was used create lines in the design. Main characteristic of *'chutki'* work was a dot and a leaf, which was prepared by folding pieces by hand called as *'patti'*. These designs were named after the arrangements as *'chaddiyan', 'jaldaar',*

suraj', '*haar*' and '*gamla*'. Saree, salwar suits, dupattas, shawls, frocks and gent's kurtas were marvelously enriched using this handwork.

Bains (2001), classified '*Phulkari*' according to the area of fabric embroidered as '*bagh*', '*chope*', '*ghungat bagh*', '*nilak*', '*til patra*', '*salloo*', '*shisdar*' and '*suber*'. There were about 23 types of *phulkaries* and *baghs* named after the designs and motifs embroidered on them. *Phulkari* was done using silk floss - 'the *pat*' on hand spun, hand woven and home dyed cotton khaddar the base material. Bright coloured thread *viz.*, golden yellow, crimson red, green, orange, white, black and sometimes blue were used to embroider geometrical motifs, floral and plants, fruits and vegetables, birds and animal motifs, household motifs like pins, handfuls, combs, brass utensils and other miscellaneous motifs like roads, aeroplanes, kites top, feathers and umbrellas.

2.3 Revival of traditional sarees and embroideries

'Change' an important component is responsible to create variety in any concept of life. Change is any modification brought about in the original or traditional ones, thus making popular and acceptable for a period of time. The traditional textiles were once a fad, are revived either by changing the style or by widening the horizons of their utility. Efforts of researches conducted to revive traditional sarees and embroideries are recorded below

2.3.1 Revival of traditional sarees

Reddy and Jacob (1989) conducted a study on 'polynosic rayon yarns in the weft of traditional Dharmavaram silk sarees'. Three sarees were woven with silk warp and polynosic rayon as weft. The newly produced sarees were evaluated subjectively by a panel of judges and compared with pure Dharmavaram silk sarees for their characteristics like luster, whiteness and overall appearance of the control and laundered sarees after 10 and 20 washes. The results revealed that majority of the consumer's preferred silk-polynosic sarees because of disappearance of artificial luster after laundering. Not much difference existed in the appearance of control and newly designed sarees on laundering, low cost, luster, better hand and feel and over all appearance.

'Dorias of Kota weave: a spell of magic', a study conducted by Paul (1994) revealed that kota sarees were woven into union fabrics of silk and cotton with chequered patterns. Fine silk yarns produced the transparent background while the relatively coarser cotton yarns formed the grid effect. Jacquard and dobby shedding mechanisms were lately employed to produce border designs. The '*Naka*', '*Pagia*' and '*Jala*' system of Banaras were put into action of weaving intricate and beautiful designs in the *aanchal* of the saree.

Tandon (1997) in 'Marketing of Banarasi silk goods' revealed that the diversification by mixing silk with viscose, nylon and cotton yarns was done to enhance the appearance, feel and texture and further to slash down the cost of production of pure silk sarees. Besides sarees, a wide range of products like the zari woven dress material, scarves, stoles, furnishings, wall hangings, cushion covers and tabletops were introduced.

Jacob and Bala (1999) in their study on 'Changing trends in cotton zari sarees of Andhra Pradesh' discussed that good number of colours were introduced in Venkatagiri sarees since 1962 under the supervision of All India Handloom Board, Madras. The pastel shades were introduced to be in par with the taste and demand of the consumers. Zari, which was earlier imported from Paris, was later procured from Surat. Tested zari, plastic zari and powder zari succeeded in replacing the pure zari. In 1960's lots of changes were brought about in the motifs. Film bordered design representing the holes in the cine reel were introduced along with motifs *viz.*, parrot, mango and gold coins. In 1970's changes were made in the body designs by the imitation of *dorias*. Later tissue patterns with zari as weft and pure cotton as warp become famous in 1980's. In additions to *kaddi anchu* some buttas were incorporated in the pallav. However, in the recent decade (1990's) wide range of floral, bird and mango motifs were seen with peacock as the most popular one.

The results of the survey conducted by Jacob and Bala (1999) revealed that mercerized cotton had replaced the pure cotton body of Gadwal sarees. Wide range of colours were introduced with red, dark blue, dark green, magenta, purple, violet, reddish brown, peacock blue, rust, maroon and golden yellow. Use of tested and powdered zari in place of pure zari reduced the cost of the sarees. 'Catch cord' technique replaced the *korvai* technique to weave the contrast borders where single person managed weaving gadwal sarees with contrast border. The onset of 1980's highlighted the rich ornamented pallavs with *batani* buttas and lotus motifs. Semi gadwal sarees were introduced in 1990's with mercerized cotton as weft and pure cotton as warp. Other varieties with silk warp and cotton weft were also available in the market.

Weaving poly cotton sarees was one of the diversifications made in traditional Narayanpet sarees (Jacob and Bala 1999). Black cotton weft was also interwoven with coloured silk yarns to achieve harmonious and double toned effects. Not much diversification in the motifs were developed in the sarees expect for little variations in motifs like peacock, floral border and dorian effects in the body.

Sarkar (2001) conducted a study on '*Baluchari* sarees of West Bengal'. The results revealed that pure tasar *Baluchari* sarees were woven in other textures too, to meet demand of all sets of consumers

and also to popularize the sarees. Half tasar sarees *i.e.,* poly- tasar and pure cotton *Baluchari* sarees were available at most reasonable price ranging from Rs.300 to Rs.800 respectively.

2.3.2 Revival of traditional embroideries

Phulkari embroideries of Punjab traced the designs instead embroidering by counting the threads from the wrong side of the fabric. Designs were transferred onto the fabric using charcoal powder or by block printing on the right side (Grewal, 1986).

Chamba Rumal, which was done traditionally on khaddar and *halwan* is now worked on a variety of fabrics including poplin, linen, silk, organdie and terrycot too. Twisted rayon threads replaced the untwisted silk floss 'pat'. White, cream, sky-blue and lemon yellow were the newly added colours for the background. The author (Grewal, 1987) observed scarce use of chain and darning stitches. This embroidery was also extended to household textiles is on fine screens and room dividers.

Varughese (1987) mentioned that in *Chikankari* embroidery darker shades of threads were used against lighter background of the same hue. For example dark purple embroidery on light purple background. Sometimes even contrast combinations like green or brown threads against white ground were applied. Apart from these

lighter tints of pastel hues like green, blue, pink, purple and yellow and shades of darker hues like black, maroon, blue, purple and dark yellow replaced the traditional white background.

Grewal (1990a) in her study on 'Variegated embroideries of Rajasthan-1' narrated that mill dyed cotton threads had replaced the traditionally used silk floss -*'pat'*. *Heer bharat* was also done on a variety of fabrics including hand spun or mill spun cottons and woolens.

Mahale (1998) observed in her study on 'Folk embroidery of Karnataka', that *negi* stitch was rarely used. The loosely woven viol cloth or net material was used as a media to embroider *Kasuti* onto the ground material. The use of twisted silk, chiffon thread and six ply anchor cotton thread instead of silk floss was another observation made by the author. The embroidery that used to be started and ended with a backstitch is now worked with a knot.

2.4 Demographics of artisans

Artisans are categorized according to their profession *viz.*, carpenter, blacksmith, dyers, weavers, goldsmiths and so on. However, a vast variation in the socio-economic status of artisans of different categories exists that needs to be studied. Listed below are a

few researches conducted that highlight the demographics of the weavers and the embroiderers.

2.4.1 Demographics of weavers

Bansal and Phadke (1984) conducted a survey on 'Hand woven sarees of Maharashtra'. The findings showed that the weavers of Paithani were either Muslims or Brahmins. The muslim weavers called themselves as *momins* while the Brahmins as s*halis* of s*wakulasale* Samaj. Weavers at Ahmednagar, Sholapur and Nagpur belonged to *padmasali, devangkoshthi* and *swakulasale* Samaj spoke Telugu as well as Marathi. Muslim weavers spoke Urdu, Hindi and Marathi. The age of the weavers ranged from 15-65 years. However majority of them were found to be in between 50-60 years of age.

'Molakalmuru: From sermons in stones to stories in silk threads' a study conducted by Ramamurthy (1991) records that weaving profession in Molakalmuru was followed by *padmasalis* and *swakulasalis.* The whole weavers communities in the state claimed to have migrated from Hampi (Karnataka) during Kempegowda's rule. *swakulasalis* seemed to have originated from distant Maharastra and *padmasalis* from the Eastern coastal region of Andhra over to Rayalaseema and in the process percolated into Molakalmuru area to pursue their professional trade.

Jacob (1996) in 'Grandeur of Kanchipuram' explained that the weavers were mostly from *mudaliar* community and weaving was their traditional art. The master weaver was an entrepreneur who owned a number of looms employing weavers on wage contracts and spent long hours in dexterous labour. Most of the weavers were poor with meagre means of subsistence and therefore were forced to take loans from master weavers. The wage weavers were controlled by the master weavers and were exploited both economically and socially.

Mamatha and Shailaja (1997) in a study on 'Socio-economic status of handloom weavers and impact of weaving on their livelihood' concluded that 61.00 per cent of the weavers belonged to middle adulthood (41-60 years). More than 50 per cent of the weavers were illiterates and had medium family size. Majority of the weavers belonged to nuclear type family and middle-income group.

Mishra (1997) in his article on 'Silk Industry of Assam' mentioned that women constituted 80 per cent of weavers in Assam. They were involved in weaving silk products like *mekhla, chaddar,* saree, *riha* and shirting. On an average on one loom, about 24 *mekhlas* or 12 *chaddar* or 6 sarees were woven per month and the weavers earned about Rs. 1200 as piece wages.

Sanapapamma (2000) in her research on 'Silk sarees of Molakalmuru' found that majority of the weavers belonged to middle

age group and medium family size. Nearly one third of the weavers had education up to higher secondary, whereas more than 20 per cent were illiterates. Maximum number of weavers belonged to nuclear family and middle income group.

2.4.2 Demographics of embroiderers

Varughese (1986) found that only rural women were engaged in the needlecraft –'*Kasuti* of Karnataka'. Embroidery was actively done during the leisure hours as a hobby by women folk of all groups right from 15 years to 75 years.

Grewal (1987) pointed out interestingly that women lacking delineation did *Chamba Rumal.* A girl's accomplishment in embroidery influenced her matrimonial negotiations, was one of the reasons for its increased popularity.

Moti Bharat, a filling beadwork of Rajasthani embroidery was exclusively practiced and produced by '*sodah*' women of Jalor district in Rajasthan. Similarly appliqué work of Rajasthani embroidery was once a speciality of the *marwari* community of the State. Later people of other communities did start using appliqué craft for fabric ornamentation (Grewal, 1990a).

Mahale (1998), concluded that majority of *Kasuti* embroiderers were illiterates, belonging to medium family size (5-7 members) and backward caste (42%). More than half of the embroiderers on an average before crossing their 19 years of age became perfect in this needlecraft as a matrimonial qualification. Very few embroiderers employed in the *Kasuti* centers earned Rs. 336.00 per month.

Findings of Gupta and Goel (1999), revealed that maximum number of workers of Rampur (Uttar Pradesh) were between 30-40 years of age. The embroidery *'chutki'* work was mainly done by muslim ladies, majority being illiterates. *'Chutki'* work was the only source of livelihood for the divorcee and widows.

2.5 Problems of artisans

Artisans constitute most creative section of the society. A saying in Kannada *'nekarana hendati bettale'* means that a weaver's wife can seldom afford clothes. The weaver himself producing clothes is not in a condition to afford clothes for his family members. The artisans are the most neglected group of workers. However, the problems encountered by the weavers and embroiderers are summarized below.

2.5.1 Problems of weavers

Rao (1980) analyzed economic aspects of the Gadwal handloom industry in Andhra Pradesh. Results revealed that the industry was

facing problems because of the exorbitant rise in price of zari yarns, which in turn increased the cost of production of sarees. This hike in price consequently decreased the demand for the saree and created problems for the weavers.

Ghosh (1984) in his study on 'Bengal handloom industry' mentioned that Bengal weavers were continuously trying to maintain and upgrade their traditional handloom products. This attempt was in spite of their limitations to obtain superfine quality yarn, poor marketing facilities and weak financial status.

Anitha (1988) conducted a study on problems of handloom weavers in Pochampalli and Vellanki of Andhra Pradesh. The findings of the study revealed that majority of the wage weavers were not facing any problems with the co-operative society or master weavers. However, the weavers were unhappy for not having freedom in selecting the designs.

Rao and Prasad (1989) after analyzing problems of Andhra Pradesh handloom weavers reported that the industry was facing the problems of scarcity of yarn, raw materials and lack of sufficient marketing facilities for their products.

Sundari and Manimekalai (1989) studied the problems of women workers in handloom industry at Vengamedu of Tamil Nadu. It was

reported that low wages, insecurity of job, lack of alternative employment owing to illiteracy, lack of skill, poverty, indebtedness, high cost, erratic supply of inputs like yarn, dyes and chemicals, lack of technical know how, weak co-operative structure, stiff competition between handloom sector and powerful mill as well as powerloom sector were the major problems faced by the weavers community.

Kirsur and Shivaprakash (1991) studied on the Marvellous and poignant story of the silk weavers of Molakalmuru and reported that the weavers were facing the problems of lack of sufficient marketing facilities to their products. Increased labour wages and lack of demand during off-season were the problems faced by the master weavers.

Mamatha and Shailaja (1997) in their study emphasized that 52 per cent of the weavers faced the merchandising problems. Non-profitable labour was the major constraint with the wage weavers working under master weavers and in co-operative societies. Hike in the prices of raw materials and lack of demand for handloom goods was the main problem of the independent weavers. The problems encountered for low productivity were lack of modern tools, techniques and inadequate finance.

The hike in prices of filature, charka silk and zari, inferior quality filature and charka silk, untimely supply and scarcity of zari

were the problems faced by the weavers at Molakalmuru while procuring raw material. The weavers did face the problem of marketing the goods, which was the lack of proper marketing system that made the situation worst infers Sanapapamma (2000) in her study on 'Silk sarees of Molakalmuru'.

2.5.2 Problems of embroiderers

Mahale (1998) highlighted that a large proportion of commercial embroiderers possessed problems of backache and strenuousness to eyes since the embroidery was done by counting threads in the fabric.

Gupta and Goel (1999) found out that the workers of Rampur (Uttar Pradesh) were paid a meagre amount for their wonderful '*Chutki*' embroidery work, which involved lot of labour and elaborate process. Most of the workers earned very low monthly family income and their earnings were insufficient to fulfill their needs.

2.6 Computer Aided Designing

Traditional methods of designing woven textiles have been dependent on the production of sample samples to illustrate the designer's ability to visualize the likely result before large-scale production that requires a couple of days. This hinders the designers from keeping pace with the 'quick response' trends prevailing in the

market. Use of Computer Aided Design (CAD) system in textile industry has created new opportunities for the textile designers. Following are a few studies highlighting the advantages of the Computer Aided Textile Designing.

'Computer aided designing – views from the industry' was studied by Bhat (1985). The author found that computer is very useful for print designs because of the possibility of placing motifs in number of orders by a rotation of 360°. Colour matching of each motif could be individually altered and woven jacquard designs could be developed. Storing created motifs in the library made it possible to reuse the same for future reference.

Patwardhan (1986) in her study on 'Textile designs by colour graphics computer' explained that the colour graphic computer system consisted of a colour graphic terminal with 13" or 19" screen, keyboard, graphic tablet and the programmes were stored on the floppy diskettes. The software consisted of the programmes to draw small patterns on the graphic tablet using the electric pen where, same design is displayed on the monitor. The designer was then free to combine these elements by rotate, scale, copy and transform commands to achieve the proposed design.

Sudershan and Jayachandran (1987) conducted a study on 'Computer aided woven design textiles' and found that whenever an input data like a fabric design is fed to the computer it would be displayed on the Visual Display Unit (VDU). It was possible to produce a design with different colour combinations and preserve as a hard copy. The hard copy reproduced was true in colour as well as resolution aspects. The author concluded that it was possible for the designer to create new designs at low cost through CATD (Computer Aided Textile Designing) and to respond to the fast changing fashions quickly.

The computer aided textile design involved three phases. First was the input of the design. A new design would be created using suitable software and the existing designs by scanning. The second step was to modify the motifs by changing size, hue, value and intensity until the desired effect is displayed on the monitor. The final phase of designing was the output phase. The output was of great help to the textile entrepreneurs since it reduced time, cost and efforts in production of a sample piece. (Supenekar and Phadke, 1991).

Holmes (1992) in a report on 'Changing the design process' pointed out that CAD was the link between design creation, design interpretation, colouration, sample proofing and production. CAD was a tool of design and a product of communication. CAD helped to save

time, hence reduced the costs and provided an opportunity to produce designs punctually to meet the specific needs of the customers. However CAD shall not replace the designer but make the task of designing more rewarding and creative by relieving the burdens and constraints that prevailed with the traditional designing and production processes.

Lokhande *et al.*, (1996) conducted a study on 'Advances in computer applications in textile industry' and pointed out that once a design was input into a system, the possibilities to change or even improve were virtually endless. Recent advances in CAD technology allowed both design and their exact colouration to be transferred directly from the computer to the production of prints at a reasonable cost. The author concluded that the use of such systems could give a greater level of control throughout the design production process, allowing editing at every stage of that process to give a greater accuracy in the translation of design artwork into fabric production.

'Dharmavaram: Role of a designer in silk industry' an article by Kumar and Nerli (2001) explained the advantages of CATD. Introduction of computers for creating designs helped the designers to save time and labour. It almost took 3 to 6 days to finish a design manually on a graph sheet of size 288 square inches, whereas it took just one day to get the finished design-using computer. But master

weavers are still encouraging manual designing as they apprehended that computers may lead to multiple supply of designs which was but difficult in case of manual designing.

Chhajed and Shah (1993) in their write up on 'Computers in textile design' described the advantages of CATD. Speed and simplicity in designing a pattern, repeatability, flexibility, variety and cost were the important advantages of using computers in designing. ATIRA-AAPP packages for computer-aided textile design had three major components - dobby, jacquard and print design. Textile print designing involved four stages *viz.,* design creation, engraving, sampling and printing. CAD played an important role in the first stage itself. Design input was done by scanning an existing piece of artwork or textile sample. Design was created by artists using electronic board (digitizer) and a pen (stylus). Once a design was input, to a system, the possibilities for change/ improvement were virtually endless. A printout of the finalized design was produced on paper using an inkjet printer. Acceptance or rejectance i.e., 'Go/No Go' was done using this sample printout. 'Go' –directed the continuation of the printing process on a large scale whereas 'no go' cancelled the whole process and the process was to be started from input of the design.

Jayachandran and Sundaram (1995) in 'CAD for handloom and Powerloom' explained the possibilities of producing designs for

weaving. It is possible to programme the basic weaves in the computer language and could be stored in the memory. Software developed should have the facility to input the designs and edit by various commands *viz.*, cut, enlarge, reduce, mirror, rotate, paste and super-impose within and between the stored designs. The CAD system should have the provision for simulation, which could be visualized on the monitor as well as taken hard copy. Software TCS-dobby™ and TCS-Jacquard™ were two major softwares that were available for dobby and jacquard designing mentioned by the authors.

Srivastava *et. al.*, (2000) conducted a survey to know the use of 'Computers in Textiles'. Results revealed that out of 30 units surveyed, majority of them belonged to spinning mills followed by processing, weaving and other processing units. The personnel and administration / HRD and accounts were the activities/departments where almost all the units had computer facilities. Fox-pro and clipper were the most preferred platforms for developing software by the participants. Most of the mills need to computerize their activities yet.

Patwardhan (1997) in a review article on 'Computextiles', explained that the five attributes of the system suitable for textile designing were the resolution, colour palette, memory, hard copy capability and the graphic software. The author expressed that creation of yarn, pattern, design and simulation of the fabric were the

essential operations expected of any textile design software. This could be possible with high-resolution computer colour graphics, wherein a designer was free to choose any fabric and design patterns. It was also possible to introduce new colours or change the designs or settings and simulate all types of fabric patterns.

Bains and Bhatti (2001) made an attempt to develop 'Software for Phulkari design' under Microsoft disk operating system (MS-DOS). The basic statements used in MS-DOS were arithmetic operators, DIM, read, for-to, go-to, go subroutine, if-then-else, input, locate, loops, print, read, return and end statements. The software developed provided immediate visualization of the results of any design on the monitor and any detailed alterations could be done in minutes. The simulation involved also provided an additional advantage of checking out the suitability of designs on computer screens for commercial production.

'Designing the dream' by Kapadia (1994) recorded the benefits of CAD and CAM. Author opined that CAD has simplified the process of putting designs into repeats. Few CAD software's even allowed designers to visualize the garments by electronically draping out fits on digitally generated mannequins that didn't exist. CAD also provided an additional advantage of generating imaginary fibers into yarns, yarns into custom weaves and weaves into fabrics and latter into garments without even touching thread to spindle or needle to garment.

Material and Methods

III. MATERIAL AND METHODS

The present investigation on "Weaving computerized *negi* motifs in traditional Lakkundi sarees" is accomplished by using a well-planned methodology, which is presented in the following subheadings:

3.1 Survey

Two separate surveys were carried out to achieve the objectives set for the study. The initial survey was conducted to gather information about the historical background of weaving and demographic conditions of the weavers. The main aim of the second survey was to know the consumer preference for the newly designed polycot sarees woven with computerized *negi kasuti* motifs. However, the details about the survey conducted are narrated here under:

3.1.1 Tools used for the study

Self-structured questionnaire was the tool used to collect data by personal interview method. Questionnaire-1 (Appendix - I) administered to the wage and master weavers consisted of three parts.

The first part assisted to gather information on the demographic conditions of the weavers, the second covered questions pertaining to the historical background, evolution of polycotton sarees decade wise, the prevailing pre-loom, loom and post-loom operations including the merchandising practices, while the last part dealt with problems of the weavers.

The Questionnaire-II (Appendix - II) used to study the consumer preference for newly woven sarees consisted of two parts. The first part encompassed the general information of the respondents and the second dealt about the preferences for the newly designed polycot sarees with woven *kasuti* motifs.

3.1.2 Locale

The weaving of traditional polycotton sarees with contrast border on powerloom though initiated in Lakkundi, a village approximately 85 kms away from Dharwad, the weavers from Shigli another village about 90 kms from Dharwad did adopt this technology of weaving and are now producing a wide range of varieties on commercial scale. Hence, both the villages *viz*, Lakkundi and Shigli of Gadag district were selected for the present study (Fig. 1).

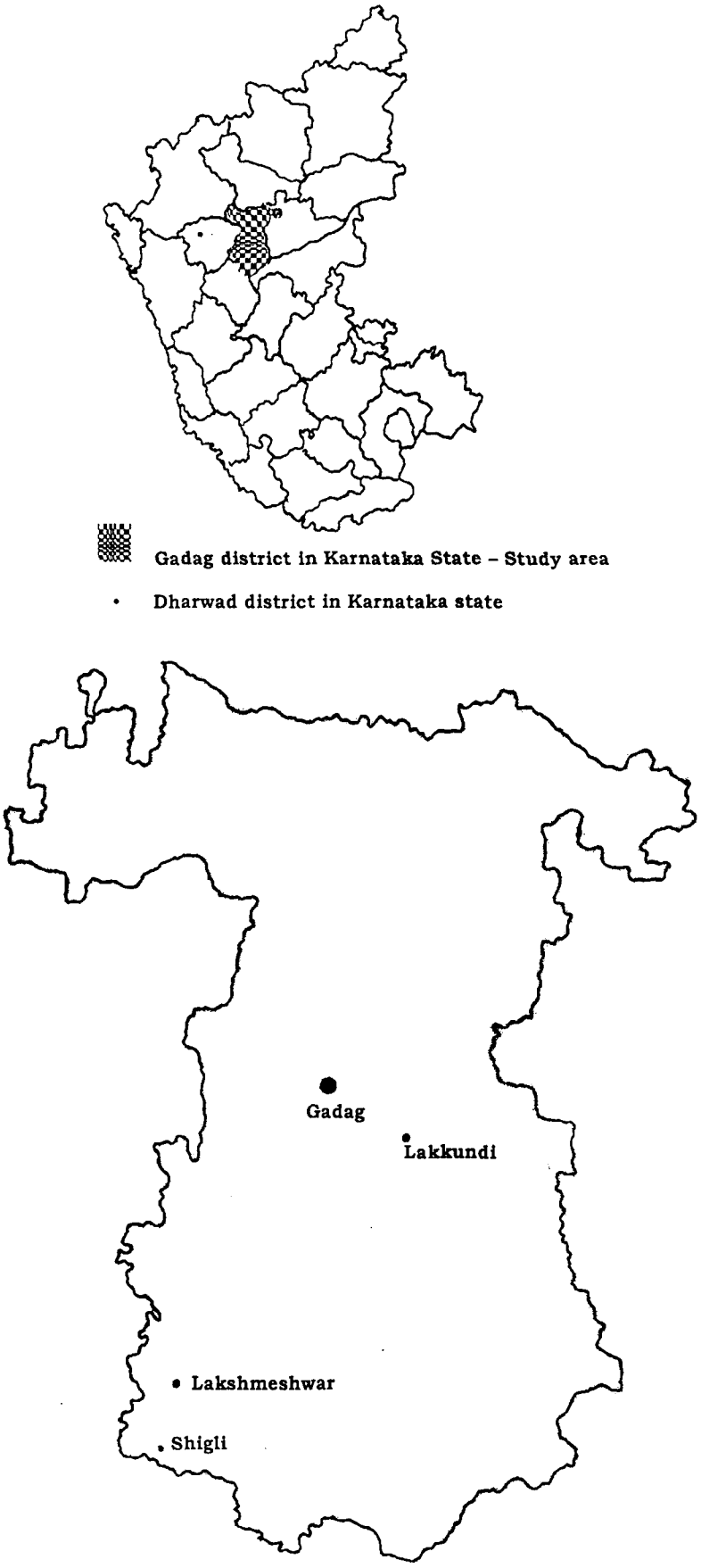


Fig. 1. Locale of study: Lakkundi and Shigli (Gadag district)

Criteria for selection of the villages

- The villages are the pioneers to produce polycotton sarees on powerloom.
- No research has been conducted in this area neither on weaving technology nor on weaving community.

To know the preference for the newly designed polycot sarees, the consumers were randomly selected from Dharwad city and nearby villages. The newly woven sarees with computerized *negi* motifs were displayed along with a *kasuti*-embroidered saree as control for better perception and comparison.

3.1.3 Population and sample selection

In Lakkundi village there are about 200 weavers of which three master weavers and 50 wage weavers were engaged in weaving polycotton sarees on powerloom. On the other hand of the total 500 weavers in Shigli village approximately 15 master weavers and 250 wage weavers were engaged in the manufacture of polycotton sarees. However, for the present study, three master weavers along with 50 wage weavers of Lakkundi (entire populations, purposively) and five master weavers with 75 wage weavers from Shigli (1/3rd of the population, randomly) were selected making a total sample size of

eight master weavers and 125 wage weavers. The master weavers were the sole decision makers for various weaving activities *viz.,* designing, purchasing and merchandising. Hence the data collected from the wage weavers and master weavers was compiled and tabulated separately.

Totally 100 consumers, 50 each from Dharwad city and nearby villages were randomly selected to study the preference for newly designed sarees in comparison with the traditionally hand embroidered sarees.

3.1.4 Pilot study

Pilot study was very essential to pre-test the self-structured questionnaire. The questionnaire-I was administered to ten weavers engaged in weaving polycot sarees and questionnaire-II to five each rural and urban women from Dharwad city and Yettinagudda village, about 10 kms away from Dharwad city. After the pilot study substituting and eliminating the suitable and irrelevant items respectively modified both the questionnaires. However, the samples chosen for pilot study were not included in the final data collection.

3.1.5 Data collection

Master weavers and wage weavers were interviewed at their respective units during their lunch and sufficient time was provided to

each respondent to express his views. The information on history of weaving technology and evolution of polycot sarees from time to time was gathered from the elderly weavers of the respective villages.

The display of newly computerized *negi* designed polycot sarees along with the hand embroidered (*kasuti*) polycot sarees was arranged in the premises of college of Rural Home Science, University of Agricultural Sciences, Dharwad for the convenience of the urban consumers. The consumers were allowed to spend sufficient time to go through the exhibition and were later interviewed randomly to know their preference for the newly designed computerized sarees. A similar display was conducted in the selected rural areas and the research worker interviewed the rural subjects.

3.1.6 Variables included for the study

3.1.6.1 Dependent variables

1. Production of traditional polycotton sarees
2. Consumers preferences for the newly designed sarees

3.1.6.2 Independent Variables

1. Age, education and income of the weavers and the consumers
2. Family type and Family size of weavers
3. Caste / community of weavers

4. Raw material
5. Dwelling area of the respondents
6. Hand embroidered *kasuti* motifs
7. Hand woven *kasuti* motifs

3.1.7 Classification of independent variables

3.1.7.1 Age of the respondents

Based on the age, the master weavers, the wage weavers, and the consumers were classified into three groups using the statistical expression $\bar{X} \pm 0.425$ SD

Sl. No.	Categories	Master weavers	Wage weavers	Consumers
1.	Younger	<41 years	<28 years	<29 years
2.	Middle	41-47 years	28-38 years	29-37 years
3.	Older	>47 years	>38 years	>37 years

3.1.7.2 Education of the respondents

All the master weavers, wage weavers and consumers were grouped based on the education as under.

Sl. No.	Category	Education level
1.	Illiterates	Do not know to read and write
2.	Primary	1-7
3.	Secondary	8-10
4.	Higher secondary	PUC
5.	Degree and above	UG and PG degrees

3.1.7.3 Family type

Family type refers to two-way classification of family as nuclear and joint. The basic grouping of mates and children is called nuclear family and collection of more than one nuclear family on basis of class wood ties and common residence is called joint family. (Dhama and Bhatnagar, 1980). Weavers were classified based on the family type as follows

Sl. No.	Category
1.	Nuclear
2.	Joint

3.1.7.4 Family size

Master weavers and wage weavers were classified into three categories based on the number of family members. This categorization was done on the basis of mean and standard deviation ($\bar{X} \pm 0.425$ SD).

Sl. No.	Categories	Master weavers	Wage weavers
1.	Small	<9 members	< 4 members
2.	Medium	9-12 members	4-7 members
3.	Large	> 12 members	> 7 members

3.1.7.5 Income of the family

The gross family income of the respondents was recorded and the annual income was assessed considering the main income and the subsidiary income.

1. **Main income:** Income, which is earned by weaving polycotton sarees and dress material.

2. **Subsidiary income:** Income earned by the respondents by all sources other than weaving polycotton sarees and dress material *i.e.*, income from agriculture, weaving for co-operative societies like Karnataka Handloom Development Corporation, woollen blanket (*kambli*) weaving and other petty businesses were included under this category. Master weavers, wage weavers and consumers were grouped into three income levels based on their annual income, using $\bar{X} \pm 0.425$ SD.

Sl. No.	Category	Annual income (Rs.)		
		Master weavers	Wage weavers	Consumers
1.	Low income	<90,372	<21,456	<51,664
2.	Middle income	90,372-1,11,228	21,456-31,728	51,664-1,34,016
3.	High income	>1,11,228	>31,728	>1,34,016

3.1.8 Statistical analysis

The data were analyzed by using frequency tables. Percentages were calculated for all the variables. Few results on history recorded the mode values.

Weighted Average Ranking (WAR) was calculated using the formula:

$$WAR = \frac{\sum R_i f_i}{\sum f_i}$$

Where, R_i - ranks given by rural and urban consumers for newly designed sarees

Fi - the frequency

Chi-squire test of significance was used to test the significance between the resemblances of the computerized motifs with hand embroidery motifs as opined by the rural and urban consumers. It was also used to test the significance of the preferences for hand and computerized embroidery motifs among the rural and urban consumers.

Chi square test was used to test the association between variables using the formula:

$$X^2 = \frac{\sum (O_{ij} - E_{ij})^2}{E_{ij}}$$

and the significance was tested at (r-1) (c-1) degrees of freedom

Where,

O_{ij} = observed frequency.

E_{ij} = expected frequency (row total x column total)/ grand total.

c = number of columns

r = number of rows

z test of significance was used to compare the weighted average ranks given for the newly designed sarees by the rural and urban consumers.

$$z = \frac{|\bar{X}_1 - \bar{X}_2|}{\sqrt{S_p^2 (1/n_1 + 1/n_2)}}$$

with significance tested at (n_1+n_2-2) degrees of freedom

where,

$$Sp^2 = \frac{(n_1-1)\, S_1^2 + (n_2-1) S_2^2}{n_1+n_2-2}$$

n_1 = Number of observations in the first group

n_2 = Number of observations in the second group

S_1^2 = Variance of the first group

S_2^2 = Variance of the second group

Sp^2 = Pooled variance of the two groups

X_1 = Mean of the first group

X_2 = Mean of the second group

3.2 Production of polycotton sarees with computerized *negi* motifs

3.2.1 Selection of *kasuti* motifs

All the *kasuti* embroidery motifs formed the total population from which the designs were selected for weaving. Irrespective of the type of stitch used in the motifs, 13 most popularly used *kasuti* motifs were selected for computerizing and weaving.

3.2.2 Digitizing the motifs

The process of transforming hand embroidery motifs to weaving was done digitally using the software 'GC Kala-2000' in addition to the basic 'Paint Shop Pro' software for designing.

GC Kala-2000 developed by the GC's Technologies (formerly Gurubrahma Concerns), Bangalore is the software used at major weaving sector – Belgaum. Hence, software GC Kala-2000 and PSP were used for digitizing the motifs. Epson/ Hewlett Packard printer was used to make hard copies in the form of design plan.

3.2.3 Punching and lacing of jacquard cards

The conventional card-punching unit manually operated was used to punch cards that were laced serially for weaving.

3.2.4 Weaving

Powerloom with dobby shedding mechanism for extra warp figuring and cone technique for contrast borders was used to weave the newly designed sarees. The designs were woven into the saree using handloom jacquard of 120 needles capacity.

The computerized motifs were placed in five different traditional and stylized fashions resulting in production of five newly designed sarees. These sarees were then assessed for consumer acceptance.

3.3 Comparative economics of the traditional and newly designed sarees

The fixed cost, variable cost and the marketing costs of the traditional hand embroidered and the newly designed sarees were calculated for cost comparison. It is observed that almost all the master weavers in the study area purchased second hand powerlooms. Hence the depreciation of the powerlooms was calculated

using the rates of second hand machines by the average number of sarees produced on the loom for the period of 25 years.

3.4 Hypothesis set for the study

- It is not possible to produce hand embroidery motifs into woven figures.
- The computerized woven *negi* motifs do not resemble the hand embroidered motifs.
- The sarees with computerized motifs are less expensive than hand embroidered

Results

IV. RESULTS

The results of present study on "Weaving computerized *negi* motifs in traditional Lakkundi sarees" is analyzed and presented under the following sub headings:

4.1 Historical background

4.1.1 General history

4.1.2 Evolution of looms

4.1.3 Products manufactured

4.1.4 Weavers co-operative societies functioning in Lakkundi and Shigli

4.2 Demographics of weavers

4.2.1 Demographics of wage weavers

4.2.2 Demographics of master weavers

4.3 Raw material

4.3.1 Raw material details

4.3.2 Procurement of raw material

4.3.3 Mode of payment

4.3.4 Frequency of purchasing the raw material

4.4 Weaving Lakkundi polycotton sarees with digitized motifs

4.4.1 Digitizing the *kasuti* motifs

4.4.2 Preparation of jacquard cards

4.1 Historical Background

The historical background included the general history of the villages Lakkundi and Shigli, evolution of looms, products manufactured and the weaver's cooperative societies existing at the villages.

4.1.1 General History

Lakkundi about 12kms to the South-East of Gadag, is a place of antiquarian interest with as many as fifty temples and 29 inscriptions, spread over the period of the later Chalukyas Kalachuries, Seunas and the Hoysalas. Lakkundi has the Pride of capitalship during the period of Hoysalas. Lakkundi was also called as *'Lokkigundi'* derived from two different words of Kannada literature. *'Lokki'* denotes plant of a particular species that was abundantly available in *'Gundi'* a lowland area / place. Lakkundi was also famous as *'Lohakhandpura'*. Haridas (1998), describes the mythology behind it as follows:

While on a pilgrimage king Shibhi the son of Ushina once landed up at Lakkundi on the banks of the river Papanashini. Bhallata a cruel dacoit along with his fellowmen invaded the king. After a tough battle, King Shibhi defeated the thieves and killed

Bhallata. The wealth looted by the thieves was then brought to Lakkundi and was used to build beautiful temples and lakes by the King Shibhi, who ruled over Lakkundi for a short period of time.

King Shibhi was well known for his able administration and generosity. The three Gods Brahma, Vishnu and Maheshwar once landed on the earth in disguised forms of pigeon, hawk and hunter, respectively. Brahma as 'pigeon' escaped from Maheshwar 'the hunter' and fell on the lap of the King Shibhi. Shibhi promised to offer his own flesh to the hunter in place of the pigeon. As promised Shibhi cut a piece of flesh from his thigh and kept it on one pan of *chintala* (weighing pan) with pigeon on the other. The weight did not come up to the level even after Shibhi himself sat in the pan. Shibhi then brought his five queens for sacrifice and sat with them on the *chintala*. Satisfied by the sacrifices made by king Shibhi, the Gods took their forms and showered alloys of gold on King Shibhi. Since then this place of alloys was known as *Lohakunda*.

Lakkundi is a place of complex temples with beautiful architecture. History records the existences of 101 temples of Chalukyan art and 101 steep wells artistically built with small-canopied niches inside the walls of the wells enshrining *lingas*. The place is also known by the famous 'Danachintamani Attimabbe'. She sanctified every niche and corner of the place and was a patronage for

Kannada literature. She was the beloved wife of Nagadeva who was the chieftain and soldier of Chalukyan king Ahramalla and mother of Ahniga Masavadi who ruled Lakkundi for some time. She sheltered the poet 'Ranna'. The Brahma Jinalaya constructed by Attimabbe stands as the testimony of the high rank in the Karnataka architecture and sculpture. Attimabbe's great devotion, generosity, excellence and other virtues are well portrayed in this temple.

The inscriptions of the Kalyana Chalukyan King Irive Bedanga, narrates in two stanzas of *Ajithanatha Purana* the details of the donations and constructions made by Attimabbe. An inscription also mentioned about the then existing *Mulasangha Devange* sect of Jain Saints, whose descendants formed a dominating portion of the weaving community in Karnataka. With an approximate population of 12,000, Lakkundi at present has seven Jain Basdis, ten Shaiva, three Vaishnava, six Veerashaiva temples and a mosque. Other than temples this place is now famous for its jasmine, guava, ber cultivations and of course polycot sarees too.

Shigli about 80 km from Gadag is situated six km away from the historically famous Lakshmeshwar. Lakshmeshwar records the existence of the historically famous temples of Chalukyan art designed by 'Jakanachari' a famous architect of the period. This place once enjoyed celebrating fairs (*jatras*) all the year round. People

offered small sarees for goddesses in temples as a custom. Hence weavers residing at nearby places especially in Shigli, started the production of the small goddess sarees. The village now has developed into a textile production centre. There were about 2000 weavers in the village a decade back. Presently with a total population of 15,000 the village has about 500 weavers.

4.1.2 Evolution of Looms

The type of looms at Lakkundi and Shigli are presented in Table 1. The oldest throw shuttle pit loom was in use since ages even before 1916 at Lakkundi and prior to 1955 at Shigli. Fly shuttle pit looms came into existence during 1975 in Lakkundi and even earlier (1955) at Shigli. Power looms were first introduced at Shigli in 1975. However power loom with 'Cone technique' was adopted in Lakkundi and Shigli during 1988 and 1992 respectively.

Throw Shuttle Pit Loom

The oldest loom known to weave sarees was the throw shuttle pit loom called the *kuni magga* in kannada. This loom basically consisted a pit measuring 3 ½′ x 3 ½′ x 3′ (length x breadth x depth).

Table 1: Evolution of looms at Lakkundi and Shigli (decade wise)

Sl. No.	Type of looms	Lakkundi	Shigli
1.	Throw shuttle pit looms	Before 1916	Before 1955
2.	Fly shuttle pit looms	1975 onwards	1955-1975
3.	Powerlooms	-	1975 onwards
4.	Powerlooms with packages for contrast border	1988 onwards	1992 onwards

The pit has treadles operated by foot. Two pillars on either sides of the pit supported the upper frame of the loom (Plates 1 and 2).

Warp threads from the cloth beam *Kunti*, passed through the read (*halagi*) into the harness (*bejada kolu*). Extra warp yarns in the border were passed through the five dobby slaves (*peti shell*) for creating motifs in the border. The free warp ends were tied in separate sets of 4 - 6 bundles onto a bamboo stave (*chungi kolu*) that acted as the warp beam. A sturdy cord pulled the *chungi kolu* tightly through the main peg (*mini goota*) to the hand peg (*kai goota*) on the right hand side of the weaver. The rayon yarns used for extra weft figuring were taken up from the dobby stave over another bamboo stave (*peti kolu*) that was hung to the roof. The free ends of rayon were wound on an indigenous spool (stick), the tension of which was maintained by hanging sand bags of required weights. The tension of the dobby staves was controlled by weights superimposed through sand filled coconut shells. Similarly harnesses were interconnected on either sides of a single cord, which was passed over a pulley (*chakra gada*) for shed formation. The stave holding the pulleys was tied to the roof.

4.1.3 Products manufactured

The information on the production of variegated textile made-ups at Lakkundi and Shigli (decade wise) presented in Tables 2a and

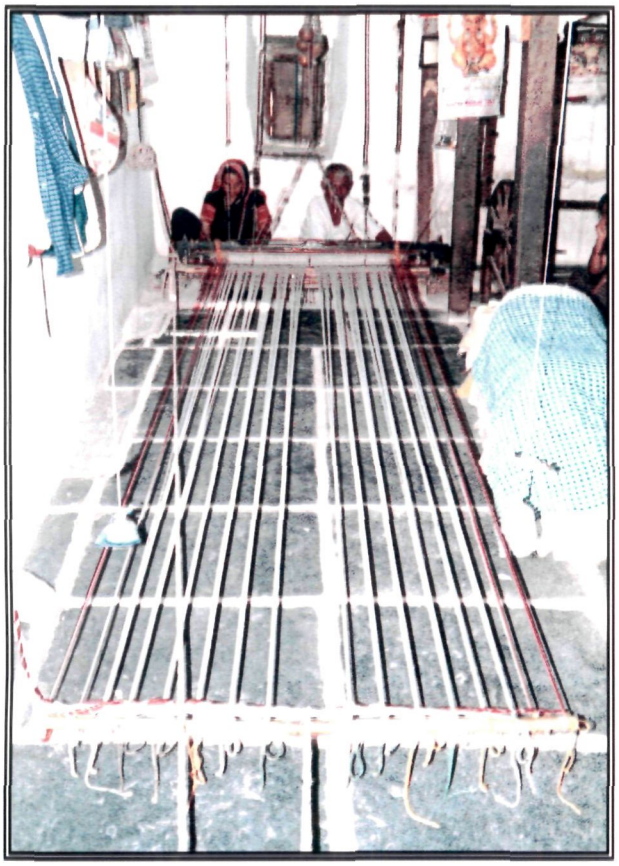


Plate 1 : Throw shuttle pit loom

Plate 2: Throw shuttle pit loom
(Profile view)

Table 2a: Production of variegated textile made-ups at Lakkundi (decade wise)

Sl. No.	Product	Year	Loom employed	Length (mts)	Width		Fibre content					
					Body (inch)	Border (inch)	Body		Border		Pallu	
							Warp	Weft	Warp	Weft	Warp	Weft
1.	*Ambasi Phadiki dhadi panje* (Bordered Lungis)	1916	Throw shuttle pit loom	1.95	34.0	3.50	Unbleached cotton	Unbleached cotton	Dyed cotton	Dyed cotton	-	-
2.	*Ambasi Phadiki dhadi panje* (Bordered Lungis)	1950's	Throw shuttle pit loom	1.95	34.0	3.50	Unbleached cotton	Unbleached cotton	Red rayon	Red rayon	-	-
3.	Mercerized sarees	1975	Fly shuttle pit loom	6.95 to 7.60	35.5	3.25	Cotton	Cotton	Cotton	Cotton	Cotton	Viscose
4.	Bordered lungis	1988	Powerloom with cone technique	1.95	34.0	3.50	Cotton	Cotton	Dyed polyester	Dyed polyester	-	-
5.	Polycotton sarees	1990	Powerloom with cone technique	5.5 to 6.2	39.0	3-4	Dyed cotton yarn	Polyester	Polyester	Polyester	Cotton	Polyester

2b, respectively. The contrast-bordered *lungi* called the *ambasi phadiki dhadi panje* was woven on the throw shuttle pit loom during 1916 and even before (Plate 3). The length of each *lungi* was 1.95 meters and the width 41" with 3½" border on either side. This off-white *lungi* was woven using unbleached cotton yarns in the body and dyed cotton yarns in the border. Red rayon replaced dyed cotton yarns in the border during 1950's. Introduction of fly shuttle pit loom marked the beginning of the production of mercerized sarees during 1975. The saree was either 6.95 meters or 7.60 meters long with a total width of 42" of which 35.5" was the body and 3.25" border on either side. With cotton yarns in the border and body, the pallav of the saree had four bands of white viscose rayon each measuring 1.5cms wide. Power loom with cone technique replaced the throw shuttle pit looms used to weave *dhadi panje* (bordered *lungi*) in the year 1988. This technique was later used to produce polycot sarees. The saree with a length of 5.5mtrs and 6.2mtrs had 39" body and 3-4" border. Warp was of pure cotton with polyester weft. The border was totally of polyester.

Jeerigi pethi datti was a small Goddess saree woven on the throw shuttle pit loom till 1954 at Shigli. The length of the saree was 4.5 meters and the width 37 inches including 2.5" borders on either sides. Rayon was woven as weft to the cotton warp of the saree. The

Table 2b: Production of variegated textile made-ups at Shigli (decade wise)

Sl. No.	Product	Year	Loom employed	Length (mts)	Width		Fibre content					
					Body (inch)	Border (inch)	Body		Border		Pallu	
							Warp	Weft	Warp	Weft	Warp	Weft
1.	*Jeerigi Pethi datti* (Goddess sarees)	1954	Throw shuttle pit loom	4.50	32.0	2.50	Cotton	Rayon	Cotton	Rayon	Cotton	Rayon
2.	Mercerized sarees	1955	Fly shuttle pit loom	6.75 to 7.60	35.5	3.25	Cotton	Cotton	Cotton	Cotton	Cotton	Rayon
3.	Mercerized sarees	1975	Powerloom	6.95 to 7.60	35.5	3.25	Cotton	Cotton	Cotton	Cotton	Cotton	Rayon
4.	Mercerized sarees	1979	Powerloom	6.75 to 7.60	35.5	3.25	Cotton	Cotton	Cotton	Cotton	Cotton	Silk
5.	Polycotton sarees	1992	Powerloom with cone technique	5.5 to 6.20	39.0	3-4	Cotton	Polyester	Polyester	Polyester	Cotton	Polyester

Plate 3 : Contrast bordered *lungi* (A*mbasi phadiki dhadi panje*)

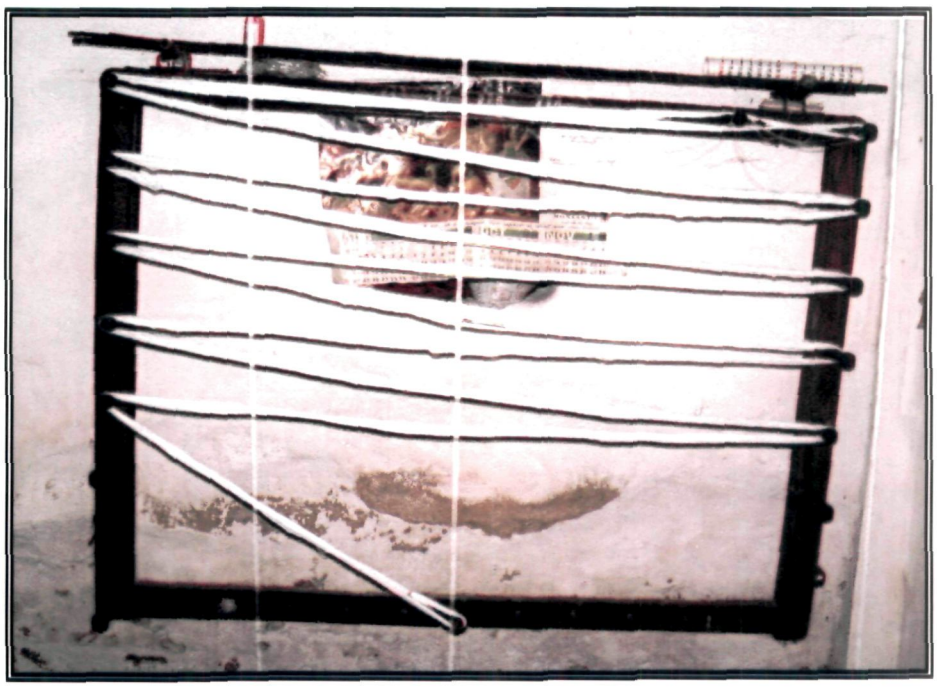


Plate 4 : Warping frame (*Reshmi hari*)

production of mercerized sarees with rayon and silk pallav started on the fly shuttle pit loom in 1955 and then on powerlooms after two decades (1975-1991), almost similar to the ones woven at Lakkundi. Further during 1992, the cone technique for the contrast border was adopted by the weavers at Shigli to weave polycot sarees.

WEAVING TECHNOLOGY

a. Warping

Warping called as *hasuvadu* in kannada is done on the warping frame called the *reshmi hari* (Plate 4). Warping frame constituted of wooden frame with six pegs each on either sides and two pegs on the top and a single at the bottom. This frame is hung on the wall at a convenient height for warping. For warping, 10 - 20 yarn packages (10 for coarse and 20 for fine fabrics) are taken collectively. The yarns from the packages travel through a indigenously made guide (glass bangle tied onto a wooden stave), onto the warping board. The person engaged in warping will collect all the yarns in the left hand and works on the warping frame with the right (Plate 5).

On the frame, the work first starts from the top two pegs between which a lease cross or Portee-cross (*ani hakuvudu*) is used to maintain the order of yarns for easy threading (Plate 6). The yarns next move in a zigzag fashion over the peg moving downwards, till the

Plate 5 : Warping

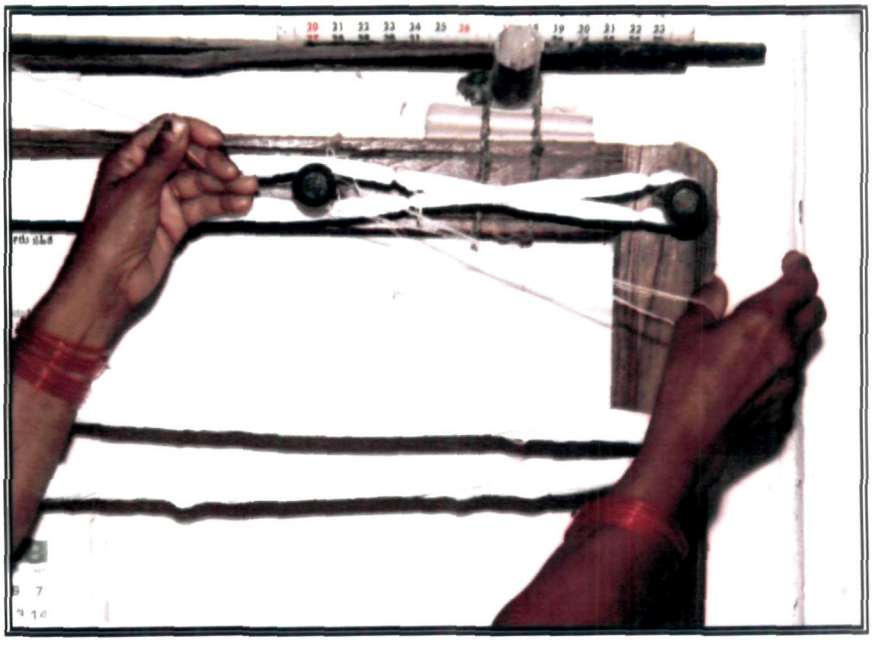


Plate 6 : Portee-cross (*Ani hakuvudu*)

last peg at the bottom from where the yarns after taking a turn start traveling upwards up to the first two pegs on the top. A knot then secures the cross between the top two pegs tightly. The warp is later tied with cords at intervals along its length before taking off the warp from the warping frame.

b. Gaiting the loom

Gadidara katuvadu, in kannada means preparing the loom for weaving. The harnesses, reed and the dobby staves are all tied on into the positions. The lease rods are placed alternately and the starting ends of the warp yarns are brought in front of the loom onto the cloth beam (Plate 7). The surplus warp lengths are conveniently divided into 6 - 8 sections and are tied to the bamboo stave that act as a warp beam.

c. Pirn Winding

This is a process of winding the weft yarn from the bobbins on to the pirn, called *khandaki* in regional language. Pirn winding wheel known as *khandaki suttuva raathi* consisted of a large wooden wheel (similar to the bullock cart wheel) with a handle in the centre to rotate. On the left is the spindle connected to the wheel by a cord or some times cycle chain. The person sits in front of the machine,

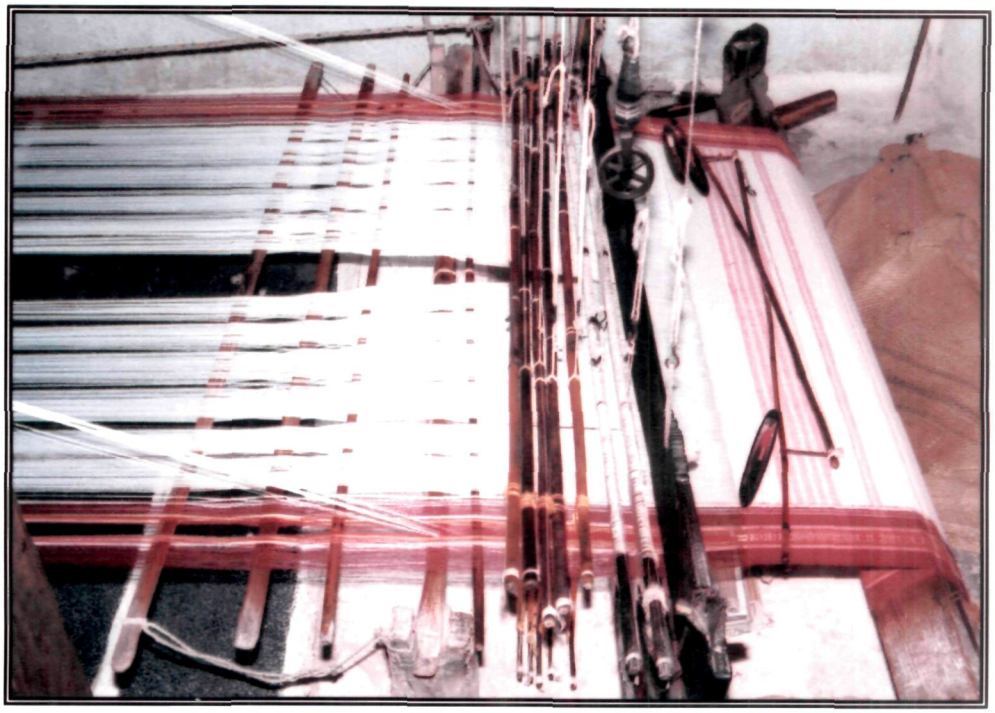


Plate 7 : Loom ready for weaving

Plate 8 : Pirn winding

rotates the handle with right hand clockwise. On operating the wheel, the spindle automatically rotates at a greater speed. The person from left hand draws the yarn from the bobbin placed over the bobbin stand and fills the pirn/spool mounted on the spindle (Plate 8). Sometimes the sorghum stalk 2 ½ -3 inches long with a hole at the end was used as a pirn (Plate 9).

d. Weaving

Neyuvadu in kannada meant weaving of the *ambasi petigi dhadi panje* with contrast borders was accomplished by using three shuttles – one big for the body carrying unbleached cotton yarn and two small for the borders carrying either dyed cotton or red rayon weft. Weaver always needed a helper on his right side, most of the times his wife who used to operate one of the small shuttles in the right border. The weaver throws the big shuttle from the left through the body of the *lungi* wherein it is interlocked with the border weft and in turn thrown from the right to the left (Plate 10). This process continues after every successive beating and lifting. The weaver applies wax to the reed at intervals to avoid warp breakages.

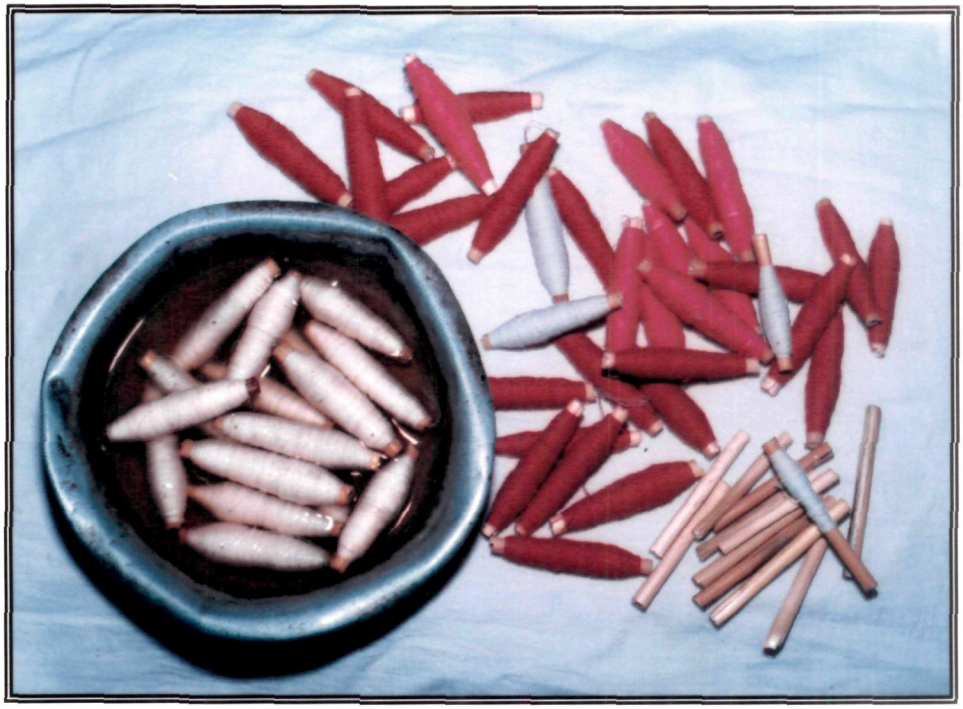


Plate 9 : Indigenous pirns – sorghum stalk

Plate 10 : Weaving contrast bordered *lungi* using three shuttles

e. Taking up and letting off

The bamboo stave carrying the surplus warp ends is loosened and simultaneously the cloth woven is wound onto the cloth beam. This is how the bamboo stave slowly comes closes to the weaver. At a point, the excess lengths of threads are opened and added onto the warp. The new sets of warp are then twisted and joined to the old warp using a weaver's knot. This process is called *kechchuvadu* in kannada. This system of drawing in is easy and less time consuming. The whole set of warp sheet is pulled through the heald eyes and dents at a time, thus completing the warping process in few minutes.

4.1.4 Weavers co-operative societies functioning in Lakkundi and Shigli

Table 3 gives information about the weaver's co-operative societies functioning in Lakkundi and Shigli. Lakkundi Weavers and Producers Co-operative Society was established in the year 1916 with one office and had more than 200 handloom weavers as members.

One Number Weaver's Society at Shigli was established in the year 1967 with handloom weavers as the members. The society had three offices in the village.

Table 3: Weaver's Co-operative societies functioning in Lakkundi and Shigli

Sl. No.	Particulars	Lakkundi	Shigli
1.	Name	Lakkundi Weaver's and Producers Co-operative Society	One Number Weaver's Society
2.	Year of establishment	1916	1967
3.	No. of offices	1	3

The demographic status includes the category wise distribution of weavers according to their age, education, family size, family type, subsidiary occupation, total annual income and caste.

4.2.1 Demographics of wage weavers

a. Age

From the Table 4 it is clear that 52 percent of the wage weavers at Lakkundi belonged to the middle age group followed by older age group (26%) and younger age group (22%). Nearly 41 per cent of the wage weavers at Shigli belonged to the middle age group. On the other hand, 40 per cent and 19 per cent of the wage weavers belonged to the younger and older age groups, respectively.

On the whole 43 per cent of the wage weavers belonged to the middle age group followed by younger (33%) and older (22%) age groups.

b. Education

Distribution of the wage weavers according to their education is given in Table 4. Majority *i.e.*, 64 per cent each of the wage weavers from Lakkundi and Shigli had education up to primary and secondary

Table 4: Demographics of wage weavers

N=125

Sl. No.	Variables	Wage weavers		Total
		Lakkundi (n=50)	Shigli (n=75)	
I.	**Age**			
1.	Younger	11 (22.00)	30 (40.00)	41 (32.80)
2.	Middle	26 (52.00)	31 (41.33)	57 (45.60)
3.	Older	13 (26.00)	14 (18.67)	27 (21.60)
II.	**Education**			
1.	Illiterate	06 (12.00)	-- (0.00)	06 (4.80)
2.	Primary	32 (64.00)	09 (12.00)	41 (32.80)
3.	Secondary	12 (24.00)	48 (64.00)	60 (48.00)
4.	Higher Secondary	-- (0.00)	16 (21.33)	16 (12.80)
5.	Degree and above	- (0.00)	02 (2.67)	2 (1.60)
III.	**Family type**			
1.	Nuclear	22 (44.00)	49 (65.33)	71 (56.80)
2.	Joint	28 (56.00)	26 (34.67)	54 (43.20)

Figures in parentheses indicate percentages

Table 4: (continued)

Sl. No.	Variables	Wage weavers		Total
		Lakkundi (n=50)	Shigli (n=75)	
IV.	**Family size**			
1.	Small	6 (12.00)	17 (22.67)	23 (18.40)
2.	Medium	30 (60.00)	44 (58.67)	74 (59.20)
3.	Large	14 (28.00)	14 (18.67)	28 (22.40)
V.	**Subsidiary occupation**			
1.	Agriculture	4 (16.67)	15 (40.54)	19 (31.15)
2.	Weaving other products			
	a. For KHDC	4 (16.67)	10 (27.08)	14 (22.95)
	b. Kambli	14 (58.33)	-	14 (22.95)
	c. Mercerized sarees	-	12 (32.43)	12 (19.67)
3.	Others (tea stalls, butchers etc)	2 (8.33)	-	2 (3.28)

Figures in parentheses indicate percentages

levels, respectively. Nearly 12 per cent of the wage weavers from Lakkundi were illiterates. On the other hand, nearly 21 per cent of the wage weavers at Shigli had higher secondary education followed by 3 per cent with degree and above.

However irrespective of the locations, majority of the wage weavers had education up to secondary level (48%) followed by primary (32.80%), higher secondary (12.80%), illiterates (4.80%) and degree and above (1.60%).

c. Family type

Findings in the present study revealed that maximum number of wage weavers from Lakkundi (56.00%) belonged to joint family type followed by 44.00 per cent to nuclear. At Shigli majority of them (65.33 %) belonged to nuclear family type while, 34.67 per cent to joint.

However, it is also observed that irrespective of the villages, about 57 per cent of the wage weavers belonged to nuclear family system followed by joint family system (43.2%) (Table 4).

d. Family size

It is imperative from Table 4 that majority of the wage weavers in both the villages i.e. Lakkundi (60.00%) and Shigli (58.67%) belonged to the medium family size having 4-7 family members.

About 28 per cent of them from Lakkundi belonged to large family (>7 members) followed by 12 per cent small family (<4 members) sizes. However, approximately 23 per cent and 19 per cent of the wage weavers of Shigli belonged to small and large family sizes respectively.

In general majority of the wage weavers belonged to medium (59.20%) followed by large (22.40%) and small (18.40%) family sizes.

e. Subsidiary occupation

It is reflected from Table 4 that in Lakkundi 58.33 per cent of the wage weavers derived their additional income by weaving Kamblis (woolen blankets), followed by each 16.67 per cent agriculture and weaving for Karnataka Handloom Development Corporation (KHDC, 16.67%). Around 8.00 per cent of them had other petty businesses like tea stalls and butcher shops. At Shigli, majority (40.54%) of the wage weavers earned subsidiary income through Agriculture, followed by weaving mercerized sarees (32.43%) and weaving for KHDC (27.03%).

Irrespective of the villages, each 22.95 per cent each of wage weavers were involved in weaving for KHDC and *Kambli* (woollen blanket) weaving. However, majority of them earned their subsidiary income through agriculture (31.15%).

f. Total annual income

Regarding the income, majority of the wage weavers (44.00%) at Lakkundi belonged to high-income group with an annual income greater than Rs. 31,728.00 followed by low income group (38.00%) with an annual income lesser than Rs. 21,456. On the contrary, majority of the wage weavers at Shigli belonged to low (56.00%) income followed by middle (22.67%) and high (21.33%) income groups.

In general, of the pooled population, most of the wage weavers (48.80%) belonged to low income followed by high (30.40%) and middle (20.80%) income groups (Table 4).

g. Caste

Table 4 revealed that majority (46.00%) of the wage weavers at Lakkundi were Hindu *kuruhinshetty* (grocery merchants), followed by *kurubas* (shepherds, 40.00%), *panchamsalis* (*lingayats*, 10.00%) and *kallals* (butchers, 4.00%). On the other hand, at Shigli majority (37.33%) of the wage weavers belonged to *naamdevas* (weavers/dyers), followed by *kuruhinshetty* (30.67%), *devangas* (weavers, 24.00%) and 2.67 per cent each to the *panchamasalis*, *ganigars* (oil extractors) and Muslim category.

Table 4: (continued)

Sl. No.	Variables	Wage weavers		Total
		Lakkundi (n=50)	Shigli (n=75)	
VI.	**Total annual income**			
1.	Low income	19 (38.00)	42 (56.00)	61 (48.80)
2.	Middle income	9 (18.00)	17 (22.67)	26 (20.80)
3.	High income	22 (44.00)	16 (21.33)	38 (30.40)
VII.	**Caste**			
A.	**Hindus**			
1.	Kallals (Butchers)	2 (4.00)	--	2 (1.60)
2.	Kurubas (Shepherds)	20 (40.00)	--	20 (16.00)
3.	Kuruhinshettis (Grocery merchants)	23 (46.00)	23 (30.67)	46 (36.80)
4.	Panchamsalis (Lingayats)	5 (10.00)	2 (2.67)	7 (5.60)
5.	Naamdevas (Weavers/dyers)	--	28 (37.33)	28 (22.40)
6.	Devangas (Weavers)	--	18 (24.00)	18 (14.40)
7.	Ganigers (Oil merchants)	--	2 (2.67)	2 (1.60)
B.	**Muslims**	--	2 (2.67)	2 (1.60)

Figures in parenthesis indicate percentages

Irrespective of the places, 36.80 per cent of the wage weavers were of *kuruhinashetty*, followed by *naamdevas* (22.40%) and *kurubas* (16.00%).

4.2.2 Demographics of Master weavers

a. Age

It is clear from Table 5 that majority of the Master weavers at Lakkundi were older (66.67%) falling in the age group of more than 47 years, followed by middle (33.33%). At Shigli, 60.00 per cent of them were younger (< 41 years) and 20 per cent each fell in the middle (41-47 years) and old age (>47 years) groups. Irrespective of the villages, each 37.50 per cent of master weavers belonged to young and old age groups whereas, 25 per cent to middle.

b. Education

With respect to the education cent per cent of the master weavers of Lakkundi and 60 per cent of the master weavers at Shigli were educated upto primary level, whereas 20 per cent each belonged to illiterate and secondary education groups.

In general, of the pooled population, majority (75.00%) of the master weavers had primary education, followed by 12.50 per cent each to the secondary and illiterate groups.

Table 5: Demographics of master weavers

(N=8)

Sl. No.	Variables	Lakkundi (n=3)	Shigli (n=5)	Total
I.	**Age**			
a.	Younger	--	3	3
		(0.00)	(60.00)	(37.50)
b.	Middle	1	1	2
		(33.33)	(20.00)	(25.00)
c.	Older	2	1	3
		(66.67)	(20.00)	(37.50)
II.	**Education**			
a.	Illiterate	--	1	1
		(0.00)	(20.00)	(12.50)
b.	Primary	3	3	6
		(100.00)	(60.00)	(75.00)
c.	Secondary	--	1	1
		(0.00)	(20.00)	(12.50
III.	**Family type**			
a.	Nuclear	--	2	2
			(40.00)	(25.00)
b.	Joint	3	3	6
		(100.00)	(60.00)	(75.00)
IV.	**Family size**			
a.	Small	1	2	3
		(33.33)	(40.00)	(37.50)
b.	Medium	2	2	4
		(66.67)	(40.00)	(50.00)
c.	Large	--	1	1
		(0.00)	(20.00)	(12.50)

Figures in parenthesis indicate percentages

Table 5: (Continued)

Sl. No.	Variables	Lakkundi (n=3)	Shigli (n=5)	Total
V.	**Total annual income**			
a.	Low	2 (66.67)	1 (20.00)	3 (37.50)
b.	Middle	1 (33.33)	2 (40.00)	3 (37.50)
c.	High	-- (0.00)	2 (40.00)	2 (25.00)
VI.	**Caste**			
a.	Devanga	-- (0.00)	2 (40.00)	2 (25.00)
b.	Namadevas	-- (0.00	2 (40.00)	2 (25.00)
c.	Kuruhinshetty	3 (100.00)	1 (20.00)	4 (50.00)
VII	**Looms owned**			
a.	< 14 looms	-- (0.00)	2 (40.00)	2 (25.00)
b.	14-17 looms	3 (100.00)	1 (20.00)	4 (50.00)
c.	>17 looms	-- (0.00)	2 (40.00)	2 (25.00)

Figures in parentheses indicate percentages

c. Family type

Cent per cent of the master weavers at Lakkundi fell in the joint family group, whereas, at Shigli majority of them (60.00%) belonged to joint family and 40.00 per cent to nuclear family type.

On the whole, 75.00 per cent of the master weavers belonged to joint family followed by 25.00 per cent to nuclear (Table 5).

d. Family size

Regarding family size, majority of the master weavers at Lakkundi belonged to medium family size whereas, each 40.00 per cent of master weavers to small and medium family sizes in Shigli.

Irrespective of the villages, it is apparent from Table 5 that 50 per cent of master weavers belonged to medium followed by small (37.50%) and large (12.50%) family sizes.

e. Total annual income

Majority of the master weavers (66.67%) at Lakkundi belonged to the low income category followed by 33.33 per cent to the middle. On the contrary, at Shigli only 20.00 per cent of them belonged to low and 40.00 per cent to middle and high income groups.

Irrespective of the villages, it is observed that each 37.50 per cent belonged to low and middle income groups and only 25.00 per cent of them to high income.

f. Caste

Kuruhinashetty was the caste to which cent per cent of the master weavers at Lakkundi belonged to. However, each 40.00 per cent master weavers at Shigli belonged to *devanga* and *naamdev*, while only 20.00 per cent of them to the *kuruhinashetty* caste.

Of the pooled data 50.00 per cent of the master weavers belonged to *kuruhinashetty* and 25.00 per cent each to the *devanga* and *naamdev* sects.

g. Looms Owned

All the three master weavers (100.00%) at Lakkundi possessed 14-17 looms. On the other hand at Shigli, each 40.00 per cent owned less than 14 and more than 17 looms. However, 20.00 per cent of them had 14-17 looms.

In general, irrespective of the villages, half of the respondents owned 14-17 looms followed by each one fourth of the population with <14 and >17 looms (Table 5).

The essential raw materials required for the production of polycotton are cotton yarn, polyester yarn, dyes and dyeing chemicals. The procurement, mode of payment and frequency of purchase of these raw materials by the master weavers are included dealt in this sub heading.

4.3.1 Raw material details

Polycotton sarees unique in their appearance are woven using harmonious combinations of the body and border. Table 6 records the information of raw material used for weaving the polycotton sarees. Master weavers at both Lakkundi and Shigli purchased dyed cotton yarns for the warping of these sarees. Border warp constituted of polyester yarns in the ground as well as for extra warp figuring. Untwisted polyester yarn was used to weave the cotton warp. Extra weft figuring in the newly designed polycot sarees with *negi kasuti* motifs was woven with 2 ply twisted polyester yarns. The 2-ply cotton yarn used at Lakkundi was 100s and Shigli, 120s. Polyester of denier 80/0 was used for the body and that of 80/2 for the border and buttas. Approximately 200 – 225 grams of cotton and 250 grams of polyester was required to weave a single polycot saree at Lakkundi.

Table 6: Raw material used in the manufacture of polycotton sarees

Sl. No.	Raw material	Lakkundi	Shigli
1.	**Fibre content**		
i.	Ground warp	Mill spun, dyed cotton yarn	Mill spun, dyed cotton yarn
ii.	Border warp	Polyester	Polyester
iii.	Ground weft	Polyester	Polyester
iv.	Border weft	Polyester	Polyester
v.	Extra weft	Polyester	Polyester
2.	**Yarn count**		
i.	Cotton (Ne)	100s	100s and 120s
ii.	Polyester (Denier)		
	➢ Border (warp and weft)	80/2	80/2
	➢ Weft	80/0	80/0
3.	**Yarn type**		
i.	Cotton	2 ply	2 ply
ii.	Polyester		
	➢ Border	Doubled	Doubled
	➢ Weft	Untwisted	Untwisted
	➢ Extra weft	Two strands of double yarn	
4.	**Yarn required (6.20 mts)**		
i.	Cotton	200-225 g	250 g
ii.	Polyester	250 g	250 – 270g

The same saree of 6.20 meters woven at Shigli required about 250 grams of cotton and 250 - 275 grams of polyester.

4.3.2 Procurement of raw material

Table 7 reveals that a majority of master weavers at Lakkundi procured cotton yarn directly from the wholesale market (66.67%) and 33.33 per cent of them from the local retailers. All the master weavers bought polyester yarn, dyes and chemicals from wholesalers. Likewise all the master weavers at Shigli (100.00%) purchased cotton yarn from retailers and sixty per cent of them from wholesalers. Polyester yarn and dyes and chemicals were purchased from wholesale merchants only.

4.3.3 Mode of payment

It is clear from Table 8 that 66.67 per cent of the Lakkundi master weavers purchased the necessary raw material on cash payment and the rest 33.33 per cent of them on credit basis. However depending on the situations 33 per cent of them followed both cash and credit system of transaction.

Similarly, about 80 per cent of the master weavers at Shigli purchased raw material on cash payments and 60 per cent on credit. Forty per cent of them at times purchased on both cash and credit.

Table 7: Procurement of raw material by master weavers

(N=8)

Sl. No.	Raw material	Lakkundi (n=3)		Shigli (n=5)	
		Wholesale merchants	Local retailers	Wholesale merchants	Local retailers
1.	Cotton yarn	2 (66.67)	1 (33.33)	3 (60.00)	5 (100.00)
2.	Polyester yarn	3 (100.00)	- (0.00)	5 (100.00)	- (0.00)
3.	Dyes and chemicals	3 (100.00)	- (0.00)	5 (100.00)	- (0.00)

Figures in parenthesis indicate percentages

Multiple responses possible

Table 8: Mode of payment by the master weavers

N=8

Sl. No.	Mode of payment	Wage weavers		Total
		Lakkundi (n=3)	Shigli (n=5)	
1.	Cash	2 (66.67)	4 (80.00)	6 (75.00)
2.	Credit	1 (33.33)	3 (60.00)	4 (50.00)
3.	Both	1 (33.33)	2 (40.00)	5 (62.50)

Figures in parenthesis indicate percentages

Multiple responses possible

In general, irrespective of the villages, 75 per cent of the master weavers purchased raw materials on cash payment. About 63 percent adopted both cash and credit systems.

4.3.4 Frequency of purchasing the raw material

The frequency of raw material purchased by the master weavers is presented in Table 9. About, each 67.00 per cent of the master weavers at Lakkundi purchased raw material once a month and as and when necessary. Nearly 33.00 per cent of them bought the raw materials quarterly. Similarly 80 per cent each of the master weavers at Shigli purchased the raw material once a month and as and when necessary followed by fortnightly (60.00%) and quarterly (40.00%).

Irrespective of the places, it was observed from the table that 75 per cent each of them bought the raw material monthly and as and when necessary and 37.50 per cent each made purchases fortnightly or quarterly.

4.4 Weaving polycotton sarees with digitized motifs

Production of the newly designed polycot sarees with computerized *negi kasuti* motifs involved various processes like digitizing the selected motifs, preloom, loom and post loom processes.

Table 9: Frequency of purchasing raw material by master weavers

N=8

Sl. No.	Frequency	Wage weavers		Total
		Lakkundi (n=3)	Shigli (n=5)	
1.	Fortnightly	- (0.00)	3 (60.00)	3 (37.50)
2.	Monthly	2 (66.67)	4 (80.00)	6 (75.00)
3.	Quarterly	1 (33.33)	2 (40.00)	3 (37.50)
4.	As and when necessary	2 (66.67)	4 (80.00)	6 (75.00)

Figures in parentheses indicate percentages

Multiple responses possible

4.4.1 Digitizing the *kasuti* motifs

A look at the Table 10 reveals the type of stitch traditionally employed for the selected *kasuti* embroidery motifs. Elephant with howdah, deer-creeper, wheat spike-lotus, gopuram, birds-lotus, lotus and lotus-butta were embroidered using the '*Murgi*' stitch. Similarly *negi* stitch was extensively used to embroider the motifs *viz.*, birds-lotus, lotus, lotus butta, birds-flower pot and diagonal birds-creeper. '*Gavanti*' stitch of *kasuti* was used to embroider gopuram, lotus-buds and diagonal buds-creeper. However '*Menthi*' was used to embroider lotus-creeper, birds-flower pot, chariot and diagonal birds-creeper.

Figure 2 shows the process of digitizing motifs using Paint Shop Pro (PSP) in combination with the GC Kala – 2000 software.

The first stage is the **design input** stage wherein the designs selected for weaving were either created using mouse and keyboard or the existing designs were transferred onto the system using a colour scanner.

Design processing was the second stage of designing. On opening the PSP software the designer has two options: either to create a new file or to open an existing one. If the option was 'new file' then the designer had to specify the width x height of the design required. On the other hand if the option was 'existing file' then the

Table 10: The types of stitches traditionally employed for the selected kasuti motifs

Sl. No.	Motifs	Type of stitch traditionally employed
1.	Elephant with an howdah (*Aane ambari)*	Murgi
2.	Deer-creeper (*Chigari balli*)	Murgi
3.	Wheat spike-lotus (*Godi teni kamala*)	Murgi
4.	Gopuram (*Gopura*)	Gavanthi, Murgi
5.	Birds-lotus (*Hamsa kamala*)	Negi, Murgi
6.	Lotus (*Kamala*)	Negi, Murgi
7.	Lotus butta (*Kamalada butta*)	Negi, Murgi
8.	Lotus-creeper (*Kamalada patti*)	Menthi
9.	Lotus buds (*Maggi kamala*)	Gavanthi
10.	Birds-flower pot (*Pakshi hoodani*)	Negi, Menthi
11.	Chariot (*Teeru*)	Menthi, Murgi
12.	Diagonal birds-creeper (*Vari gubbi balli*)	Menthi, Negi
13.	Diagonal buds-creeper (*Vari maggi balli*)	Gavanthi

Note: The motifs are arranged serially as per the vernacular usage

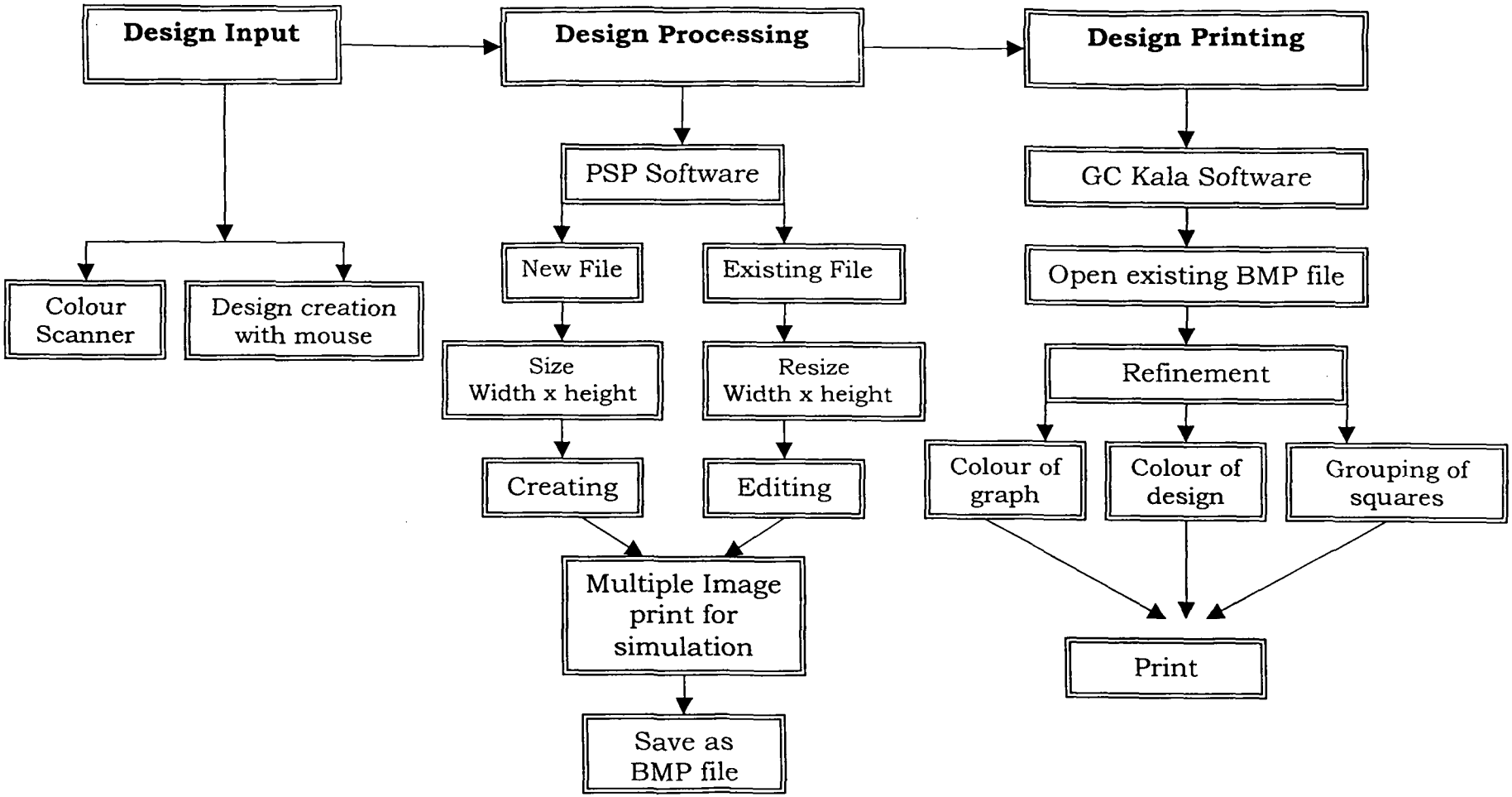


Fig. 2: Digitizing the Kasuti motifs using the software PSP and GC Kala 2000

designer had to resize the existing design (scanned) by specifying the width x height required. In practice majority of the designers use the product of the reed count and the actual width of the motif as required on the fabric for the width value. The product of the number of picks/inch and the actual length of the motif as required on the fabric is used for the height value. For example, if a 2 " x 2 " motif is to be woven on a fabric with 60 ends and 70 picks/inch, then width x height for the particular motif is 120 x 140. Soon after this command the bit map (bmp) sheet with the above specifications is ready for design creation or editing. Once the design is ready, the designer has an option to take the simulation of the design produced or can save the same as a 'bmp' file.

The third stage of designing was a key process that provided the textile designer with the **design plan** (on graph base), which aided in easy and speedy card punching. The existing 'bmp' file was opened in G.C. Kala - 2000 software. Here further refinement with respect to the colour of graph, design and grouping of squares was carried out. Grouping of squares in the graph depended on the capacity of the jacquard and is as follows:

10 x 10 squares	- Normal graph
12 x 10 squares	- 120s jacquard
16 x 10 squares	- 172-400s jacquard
24 x 10 squares	- 400-600s jacquard.

Finally, the print out of the design plan was obtained on giving print command.

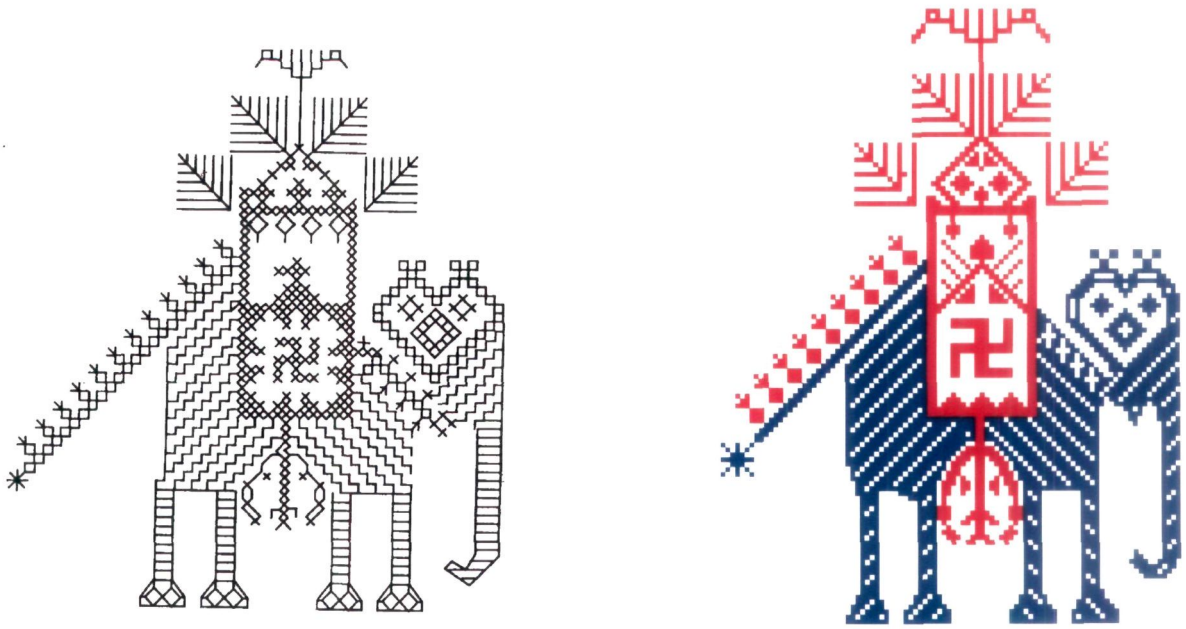
Figures 3 to 6 record the simulation and the design plans of the *kasuti* motifs selected for the study. It is imperative from the figures that chariot was designed on a 96 x 175 base, followed by elephant with an howdah requiring 96 ends and 125 picks, birds flower pot on 66 x 104 base and gopuram required 97 ends and 87 picks. Birds-lotus was designed on 87 x 87 graphical base, while wheat spike-lotus had 69 ends and 81 picks. The lotus butta was designed using 51 ends and 69 picks, whereas the lotus buds with 59 ends and 66 picks. All the creepers *viz.*, deer, modified lotus creeper, diagonal birds and diagonal buds for the pallav were designed on 120 ends each whereas the picks were 35, 69, 30 and 32 respectively.

4.4.2 Preparation of Jacquard cards

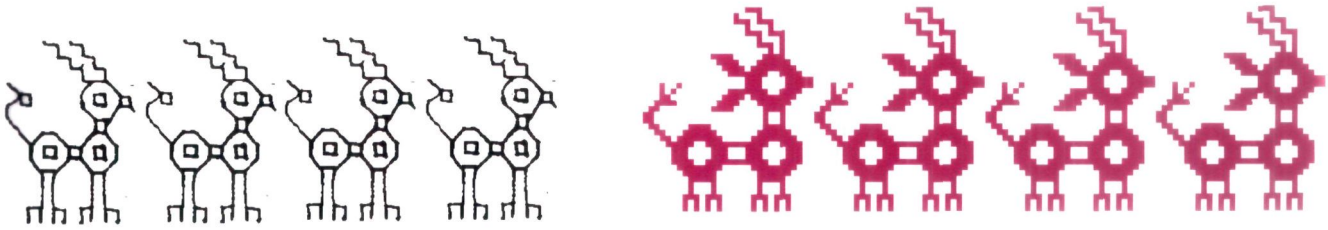
a. Punching Cards

Holes were punched on the jacquard cards as per the design using the conventional card-cutting machine. Figure 7, gives the line diagram of the conventional card cutting machine. A carriage on the surface pushes the cards forward towards the operator as the holes are being punched. The operator processes the punch heads with fingers and simultaneously operates the foot pedals one after the

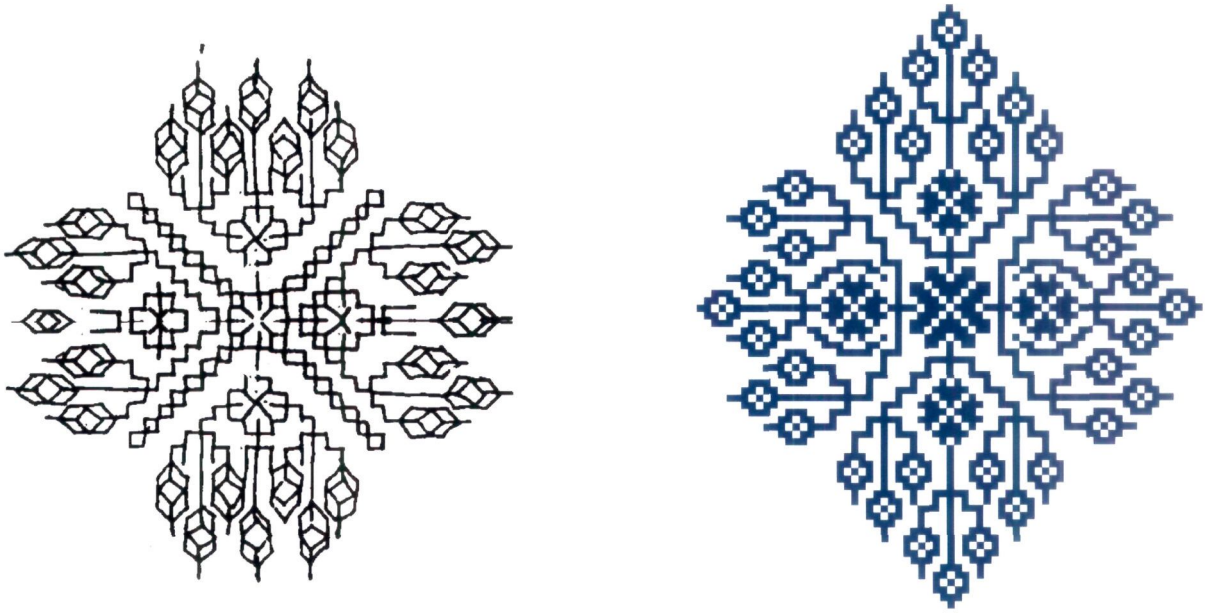
Traditional **Digitized**



Elephant with howdah (*Aane ambari*)



Deer-creeper (*Chigari balli*)



Wheat spike - lotus (*Godi teni kamala*)

Fig. 3. Simulation of the kasuti motifs

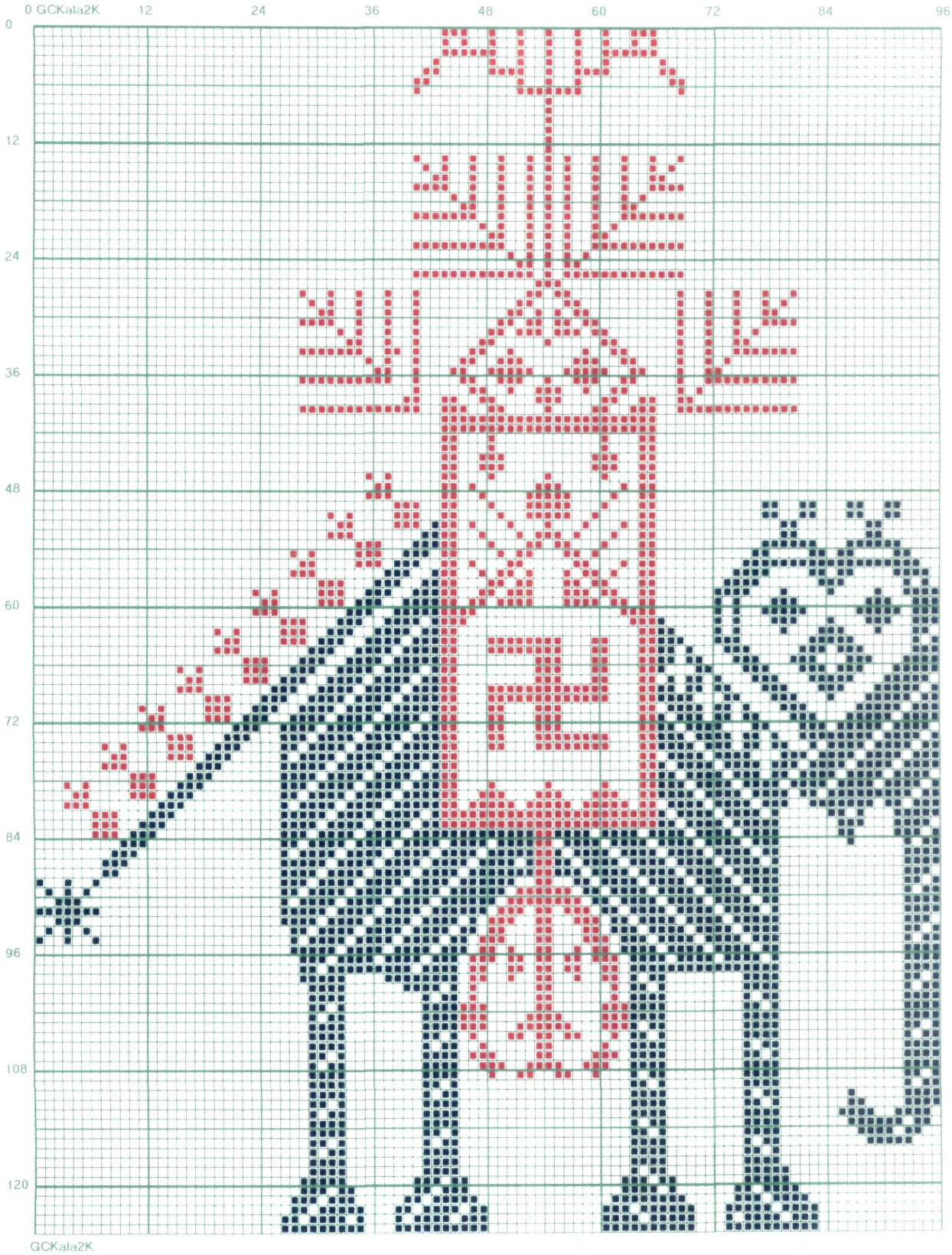


Fig. 3a: Design plan of Elephant with howdah (*Aane ambari*)

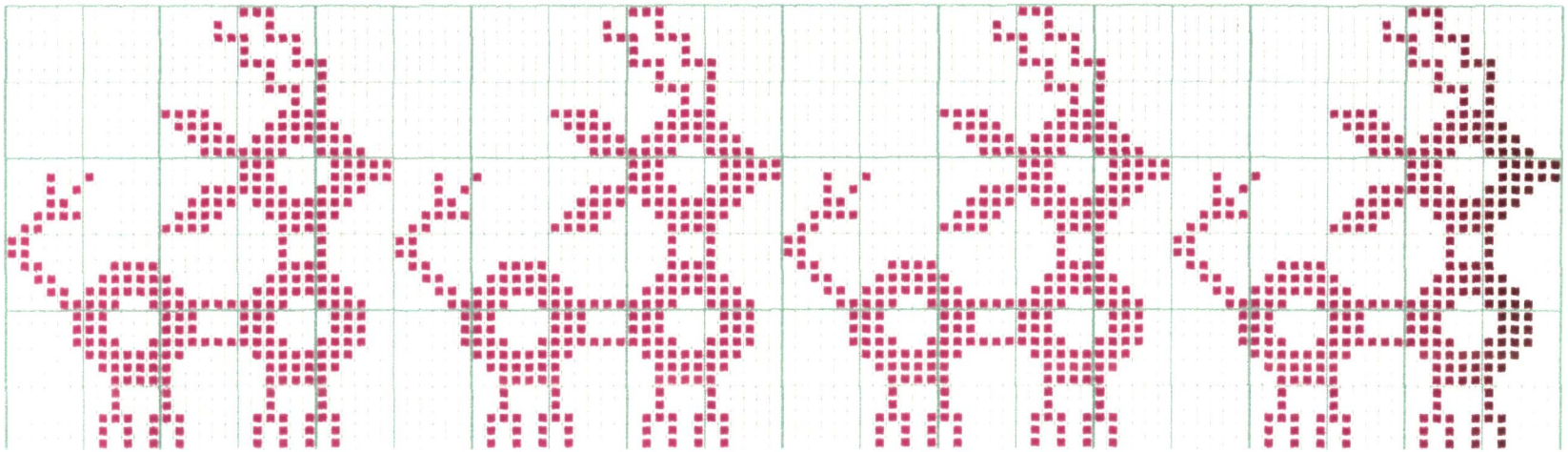


Fig. 3b: Design plan of Deer-creeper (*Chigari balli*)

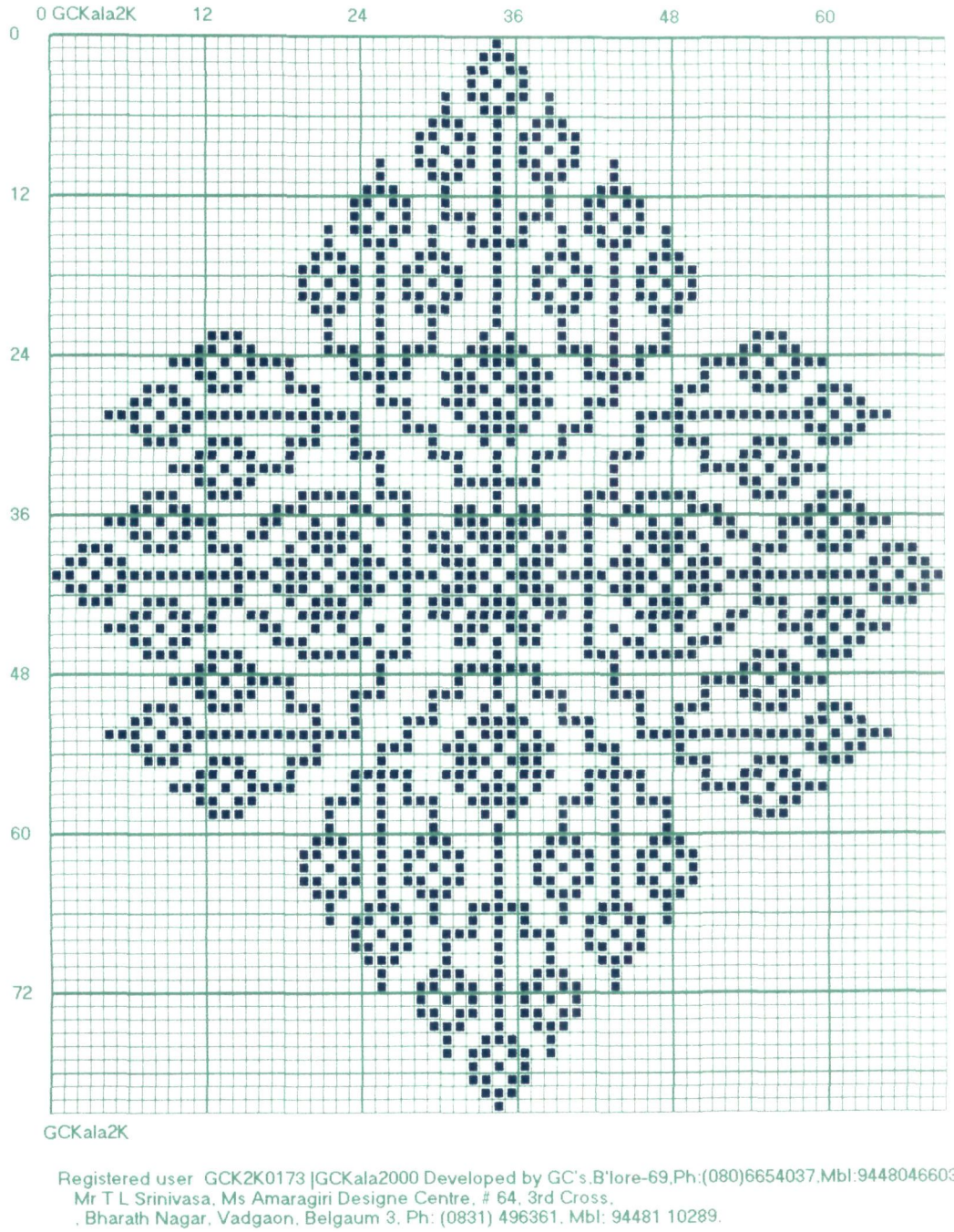


Fig. 3c: Design plan of Wheat spike-lotus (*Godi teni kamala*)

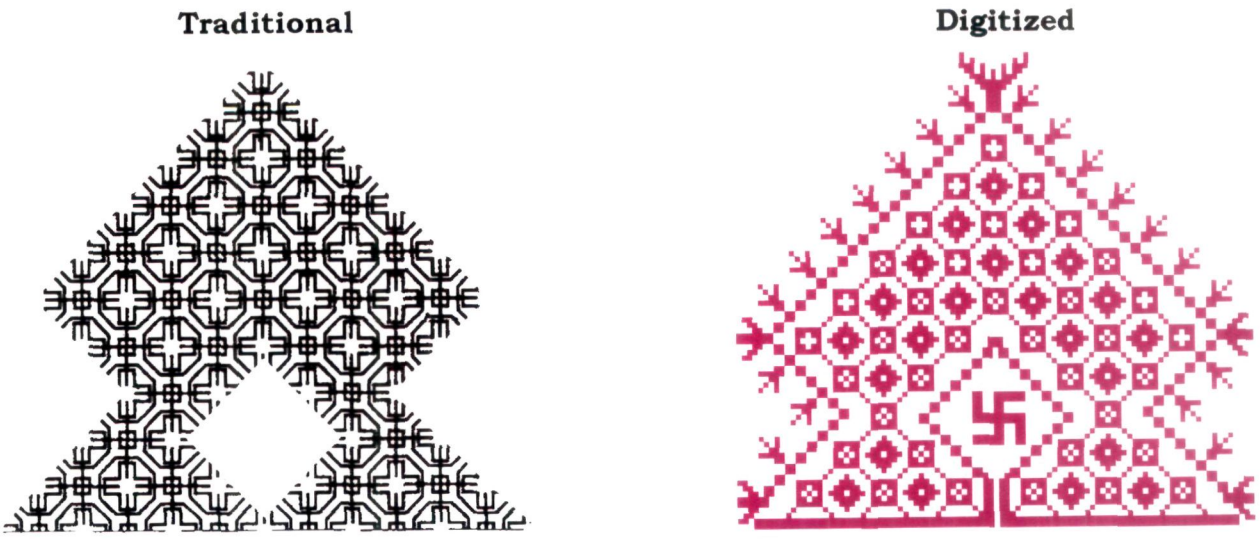


Fig. 4. Simulation of the kasuti motifs

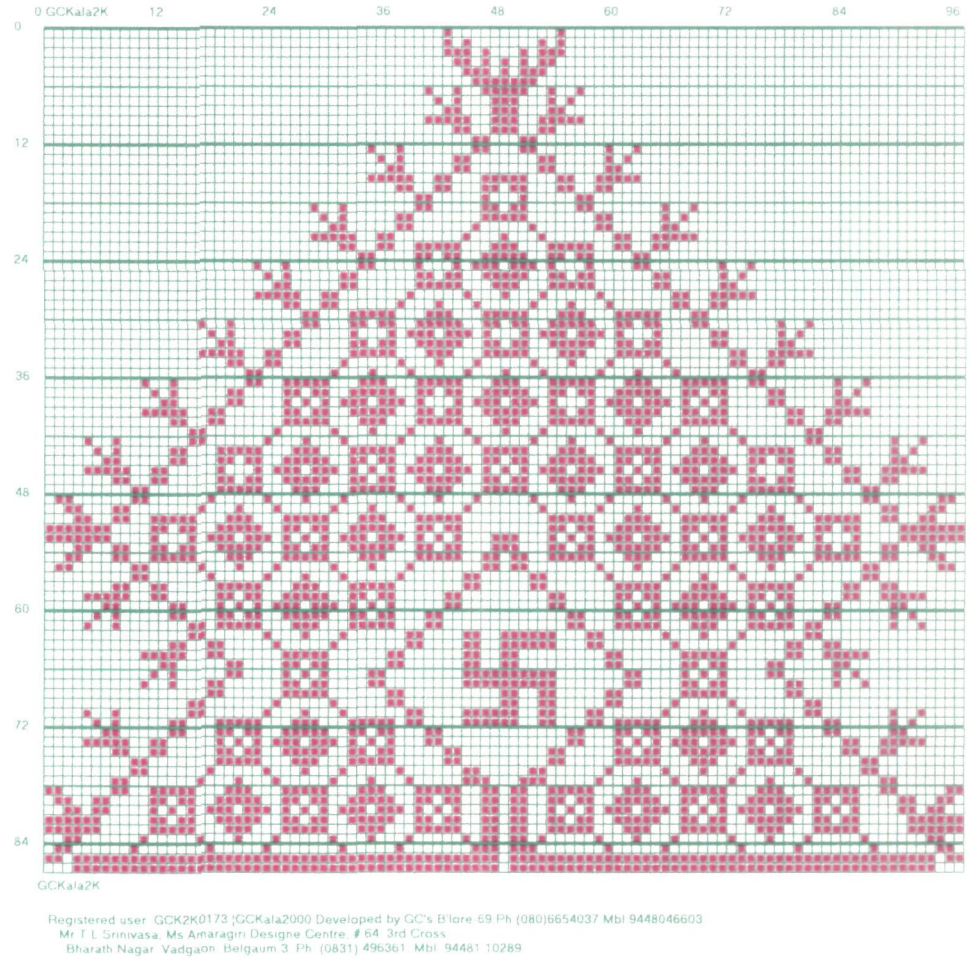


Fig. 4a: Design plan of Gopuram (*Gopura*)

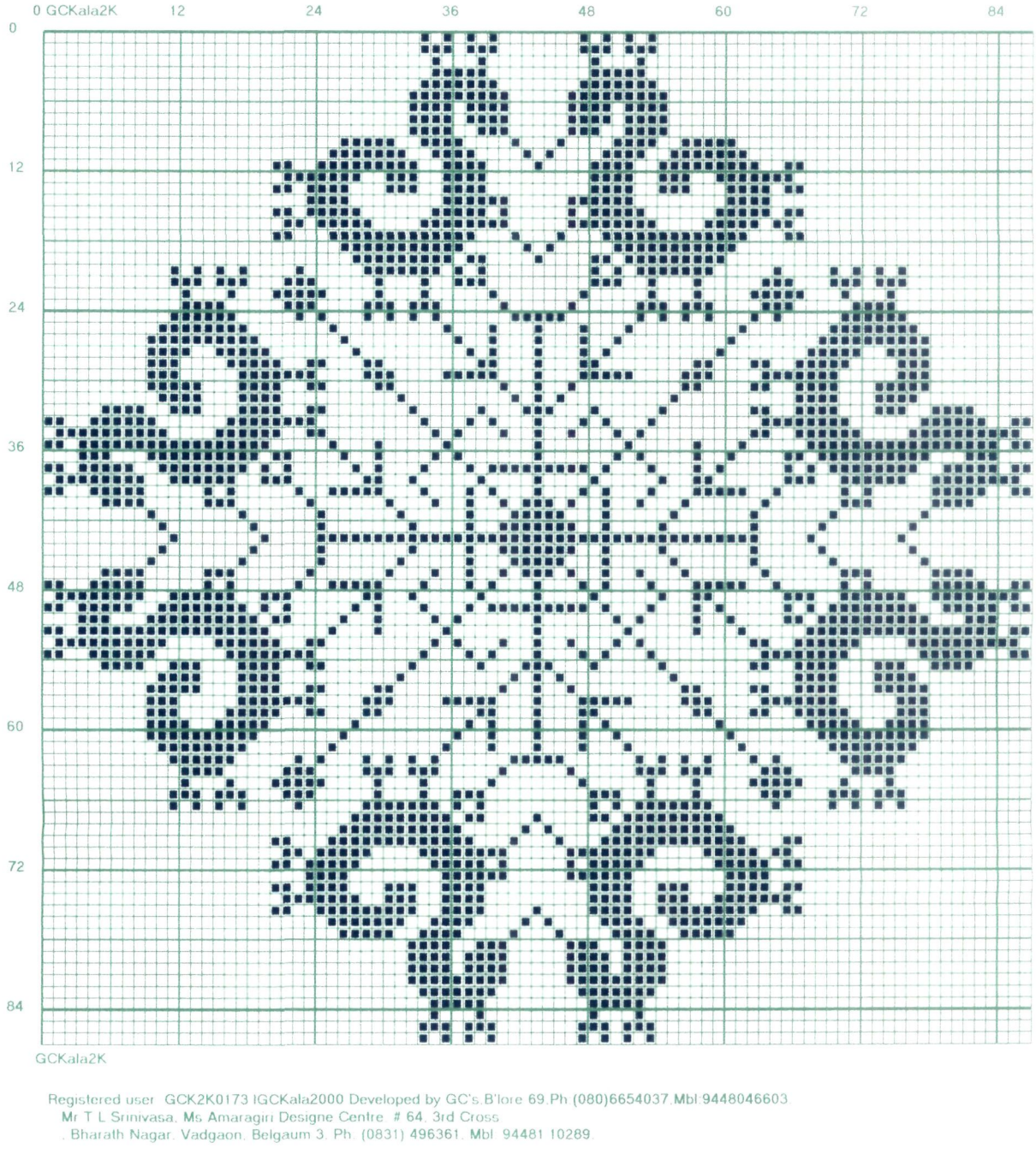


Fig. 4b: Design plan of Birds-lotus (*Hamsa kamala*)

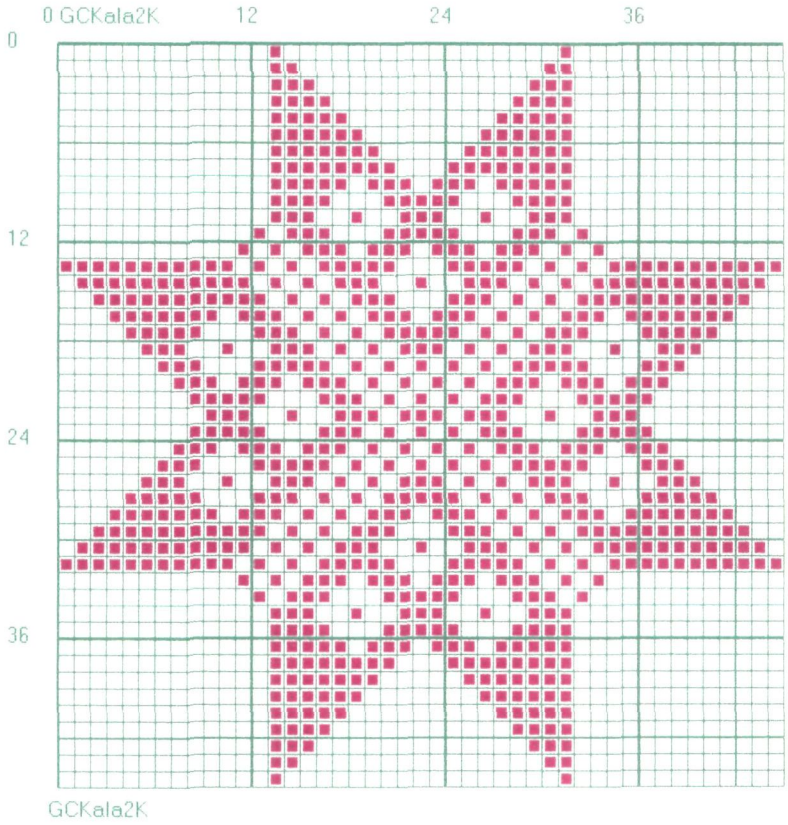


Fig. 4c: Design plan of Lotus (*Kamala*)

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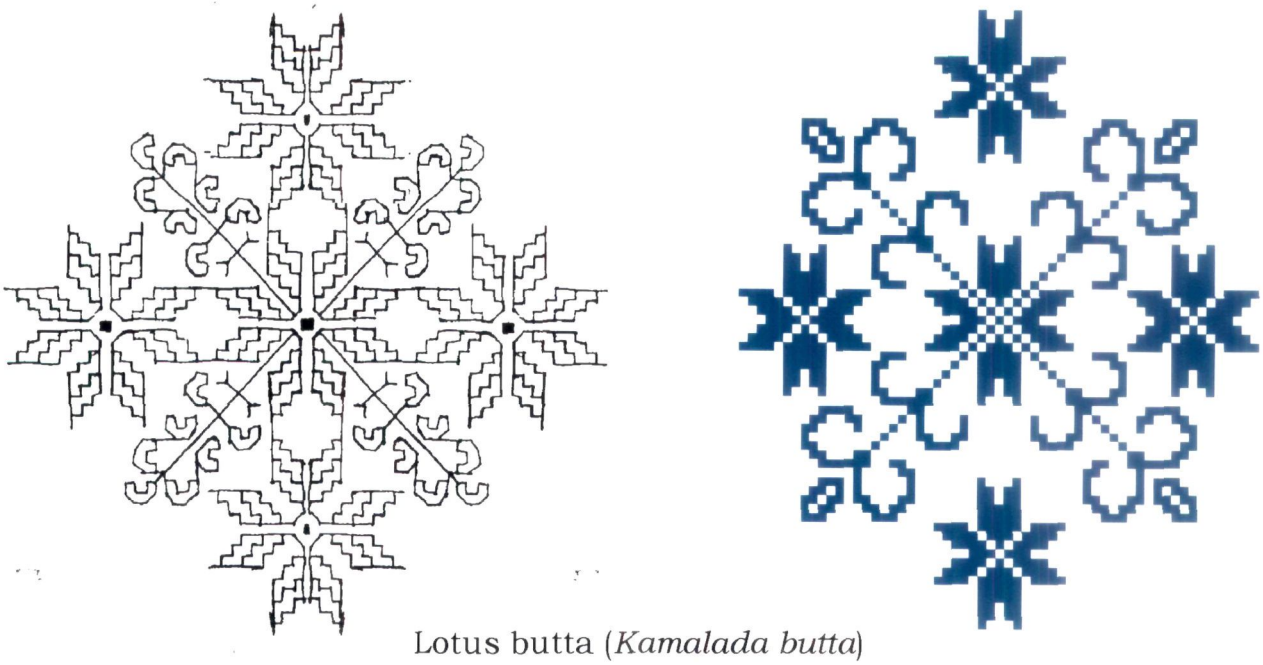
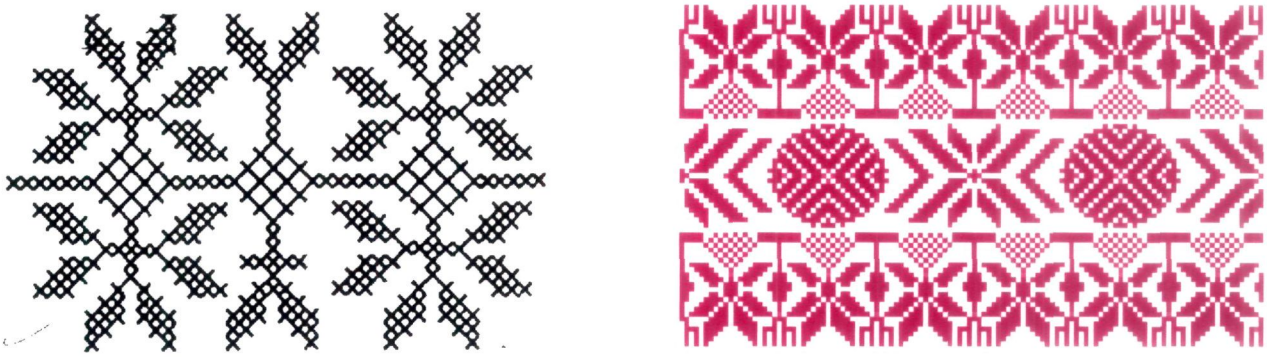
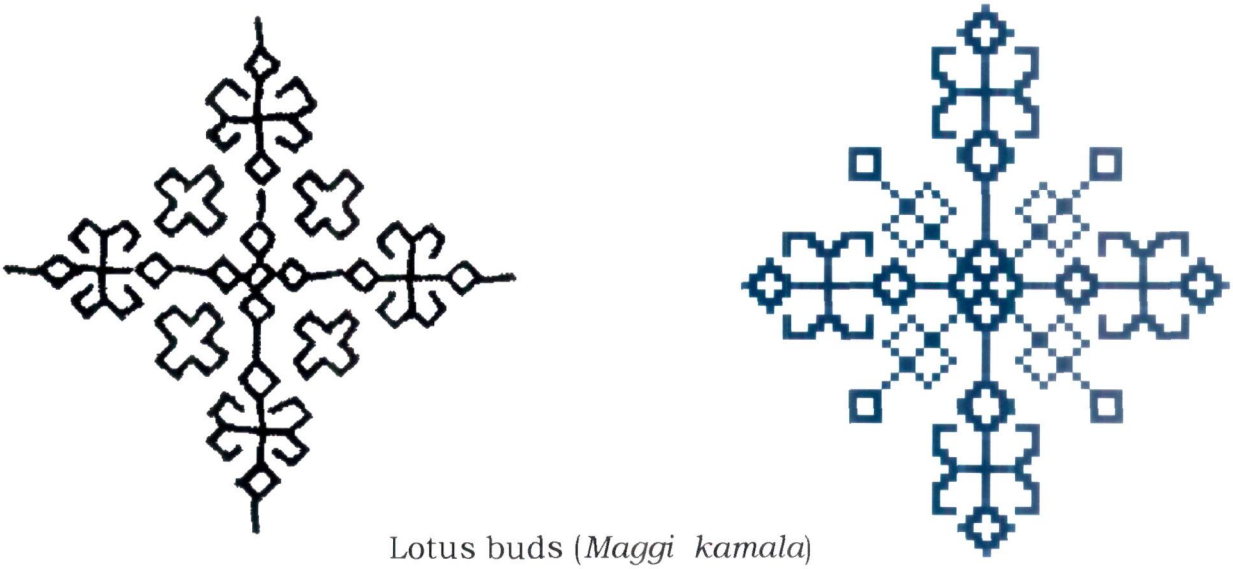


Lotus butta (*Kamalada butta*)



Modified lotus-creeper (*Kamalada patti*)



Lotus buds (*Maggi kamala*)

Fig. 5. Simulation of the kasuti motifs

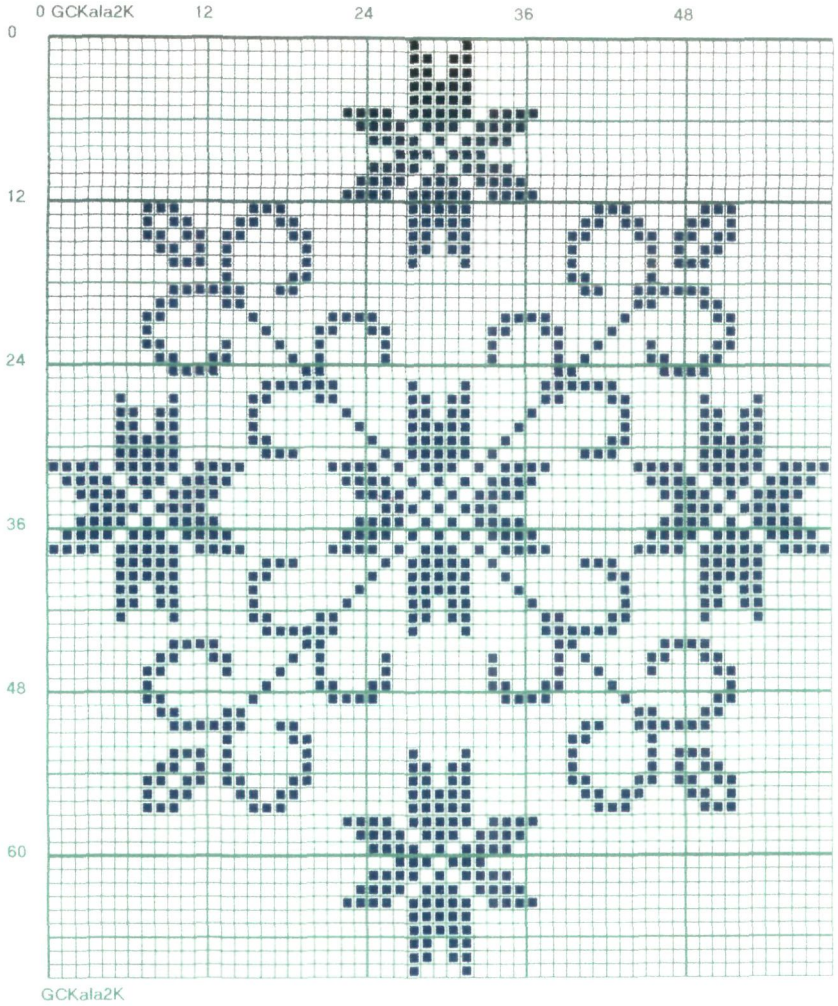
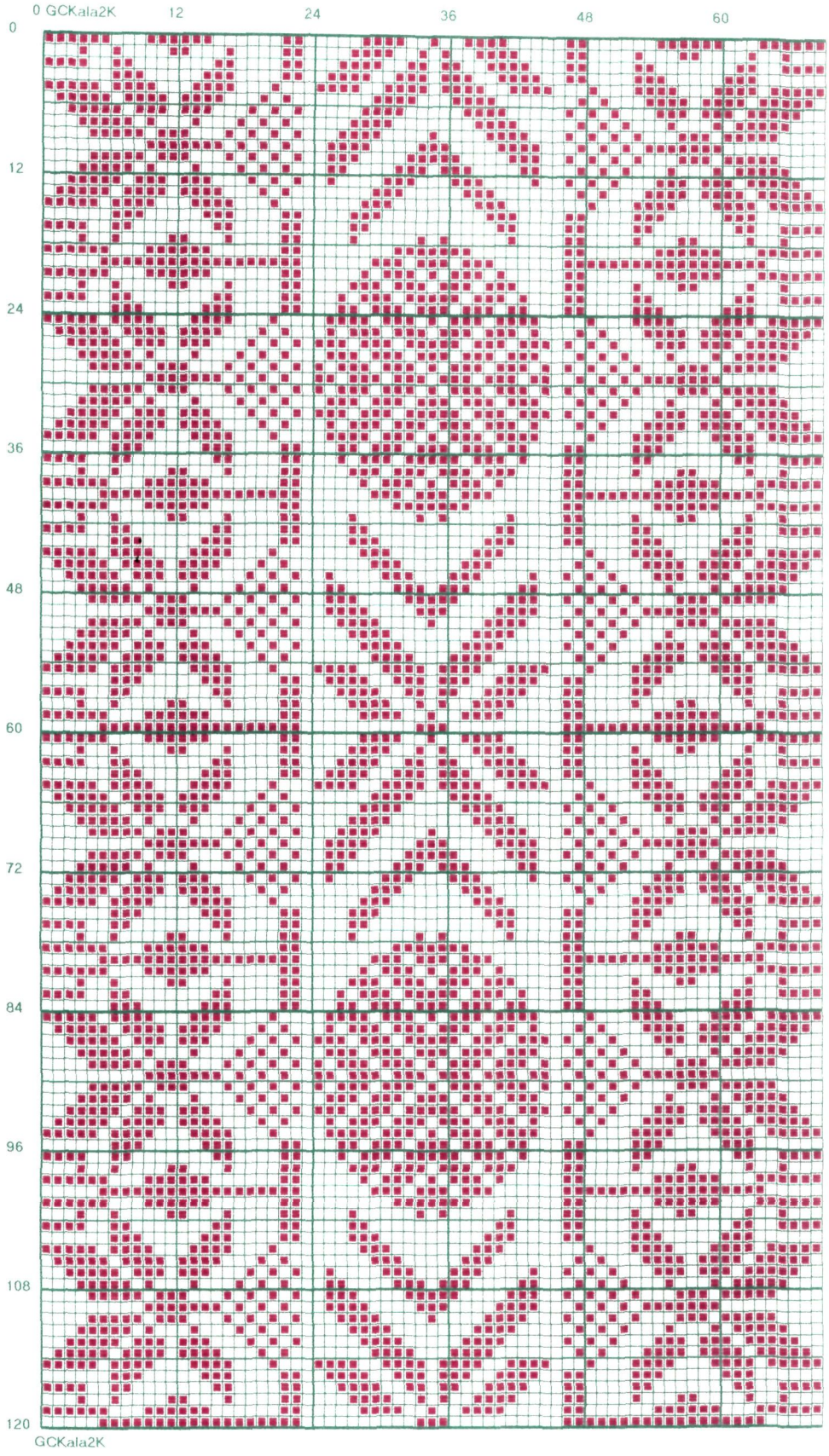


Fig. 5a: Design plan of Lotus butta (*Kamalada* butta)



Registered user GCK2K0173 IGCKala2000 Developed by GC's B'lore 69 Ph (080)6654037 Mbl 9448046603
Mr T L Srinivasa, Ms Amaragiri Designe Centre, # 64, 3rd Cross,
, Bharath Nagar, Vadgaon, Belgaum 3, Ph (0831) 496361, Mbl 94481 10289

Fig. 5b: Design plan of modified Lotus-creeper (*Kamalada patti*)

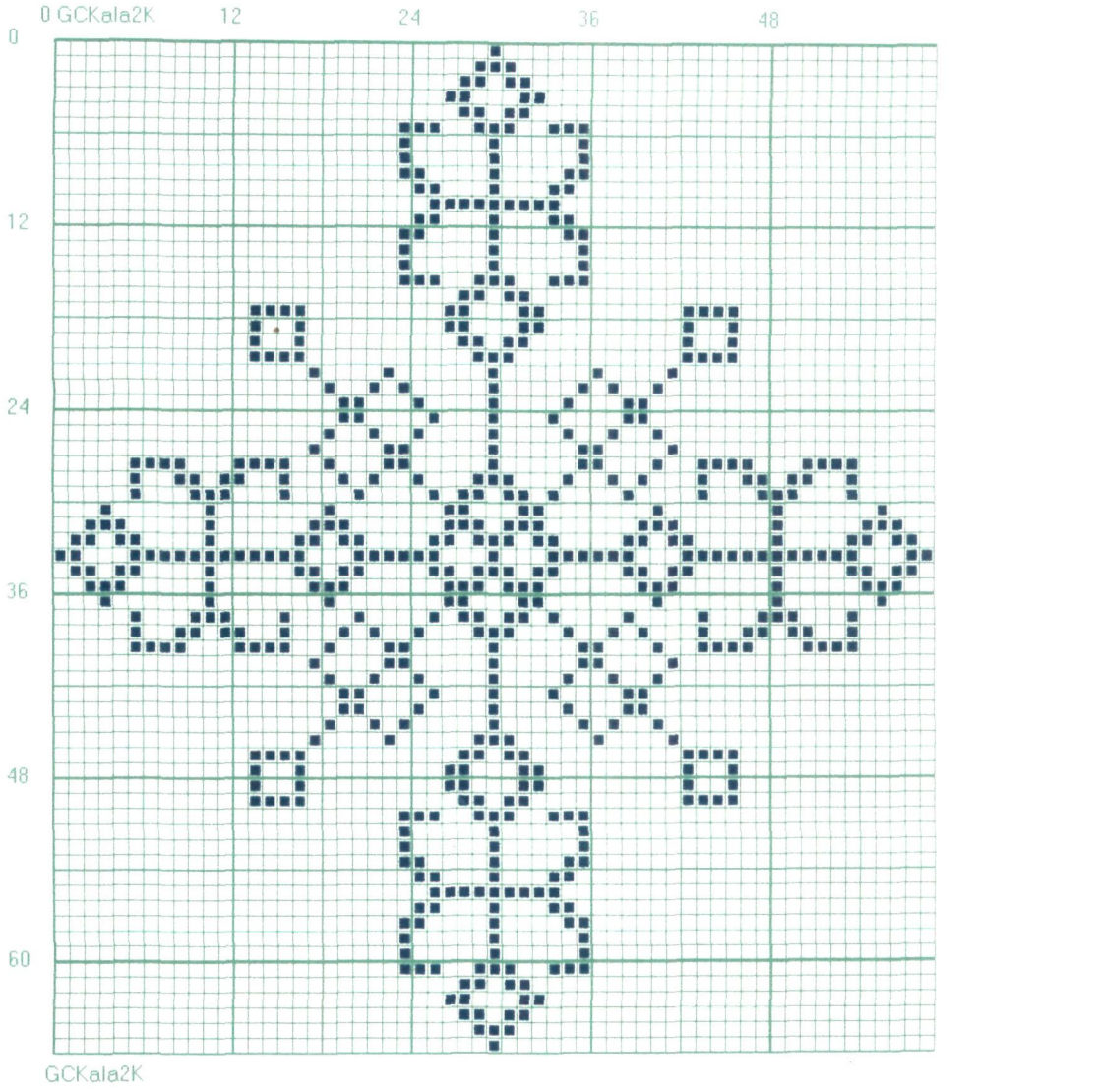
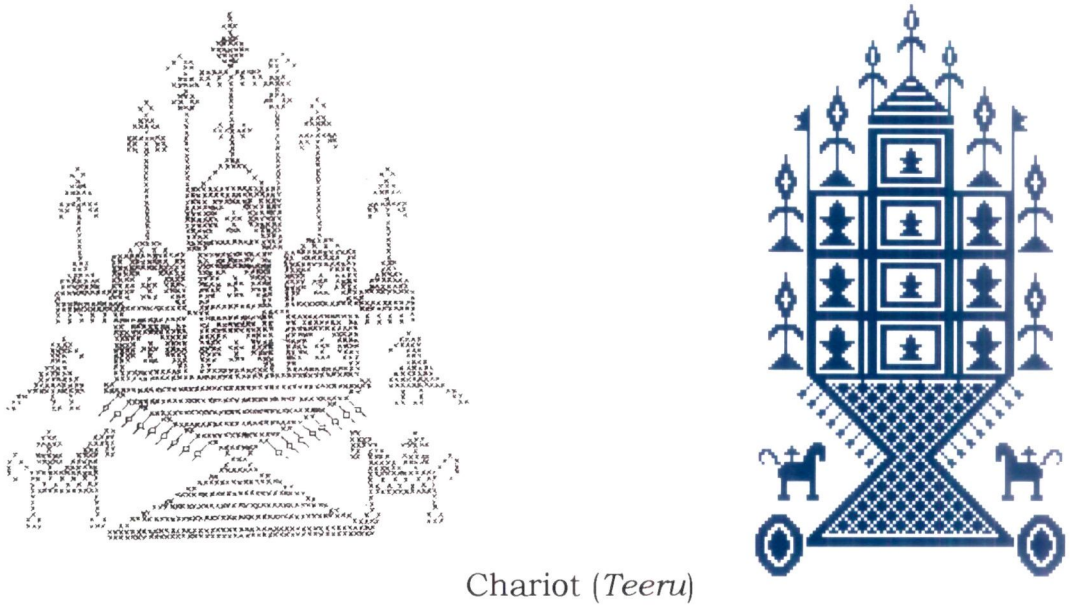


Fig. 5c: Design plan of Lotus buds (*Maggi kamala*)

Traditional **Digitized**

Birds - flower pot (*Pakshi hoodani*)



Chariot (*Teeru*)

Diagonal birds - creeper (*Vari gubbi balli*)

Diagonal buds - creeper (*Vari maggi balli*)

Fig. 6. Simulation of the kasuti motifs

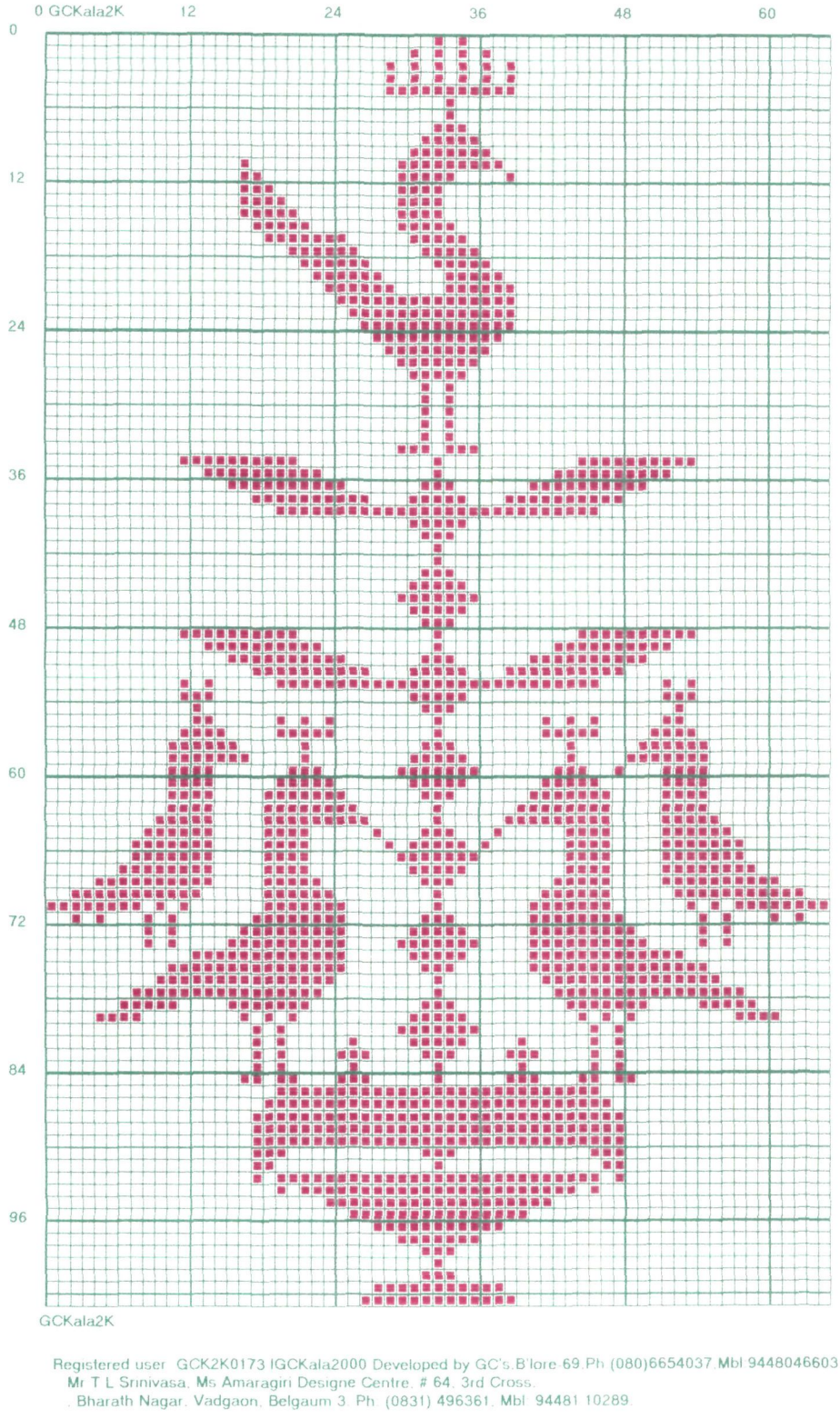


Fig. 6a: Design plan of Birds - flower pot (*Pakshi hoodani*)

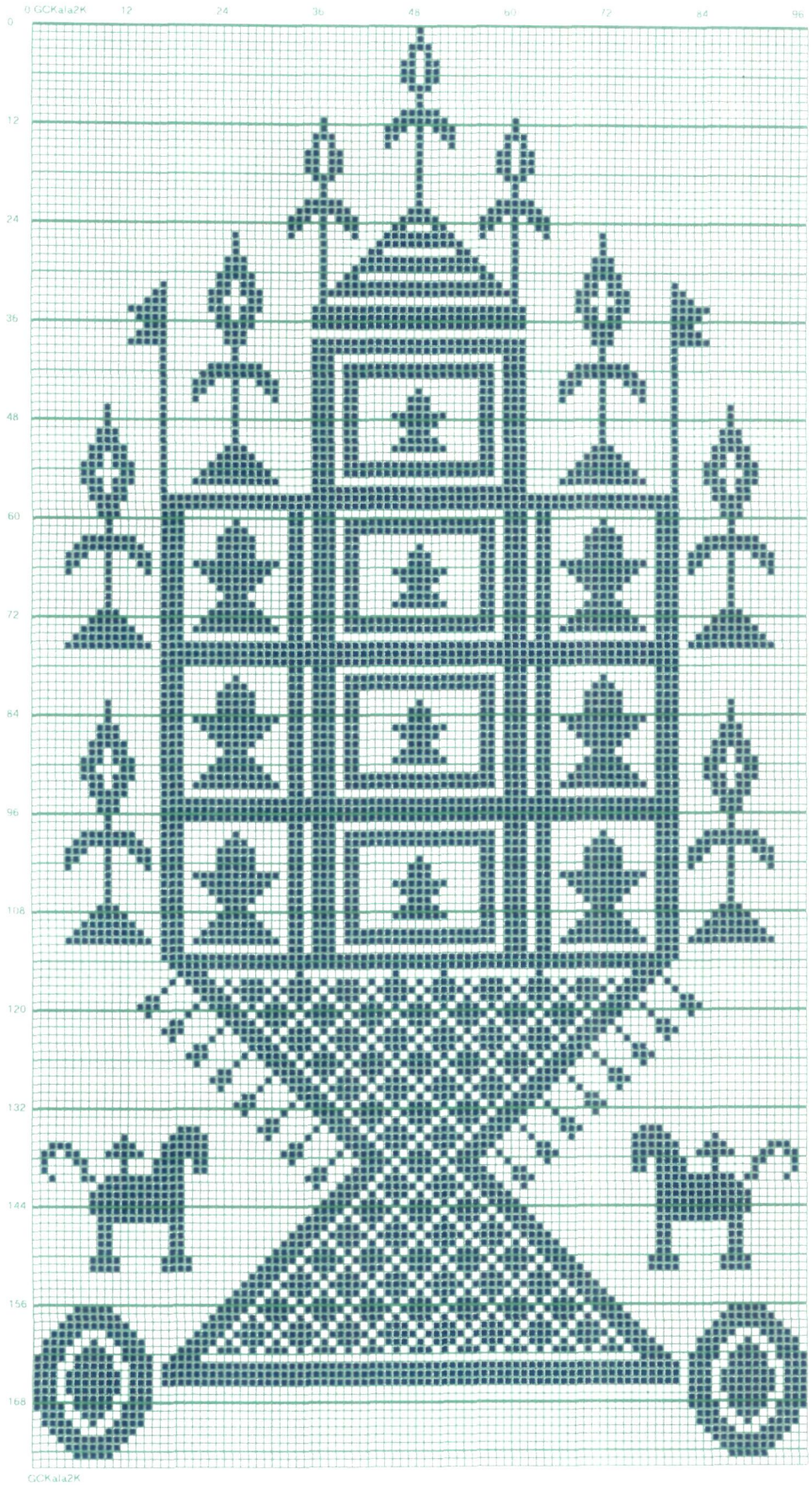


Fig. 6b: Design plan of Chariot (*Teeru*)

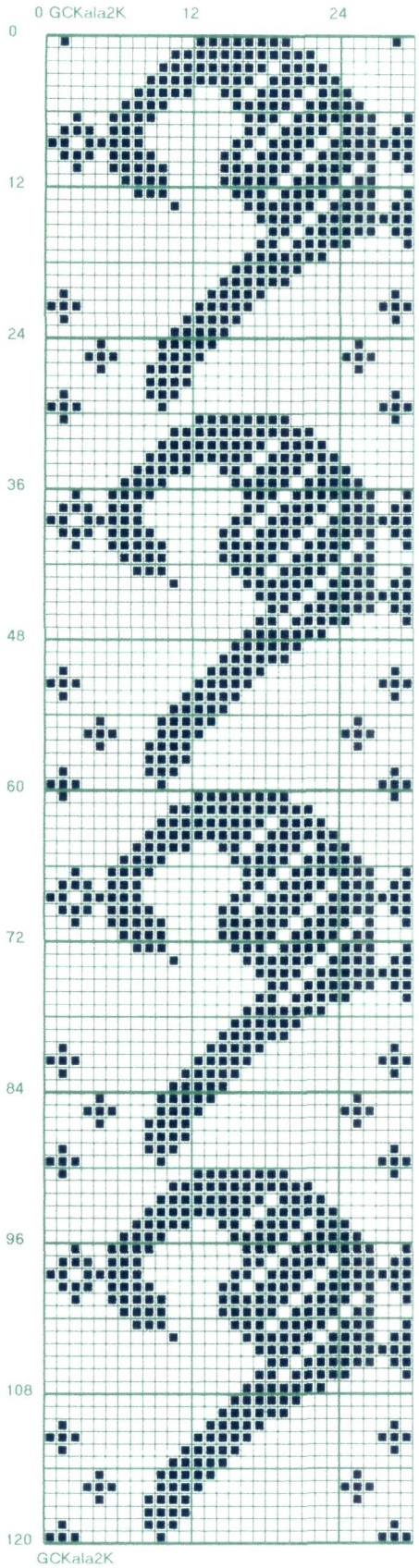


Fig. 6c: Design plan of Diagonal birds - creeper (*Vari gubbi balli*)

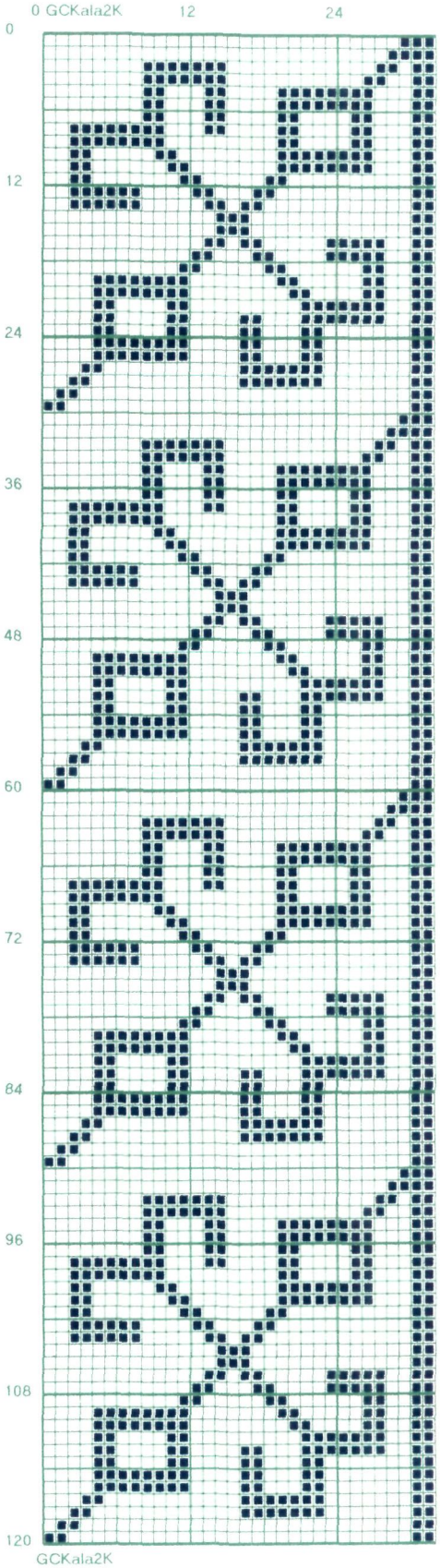


Fig. 6d: Design plan of Diagonal buds - creeper (*Vari maggi balli*)

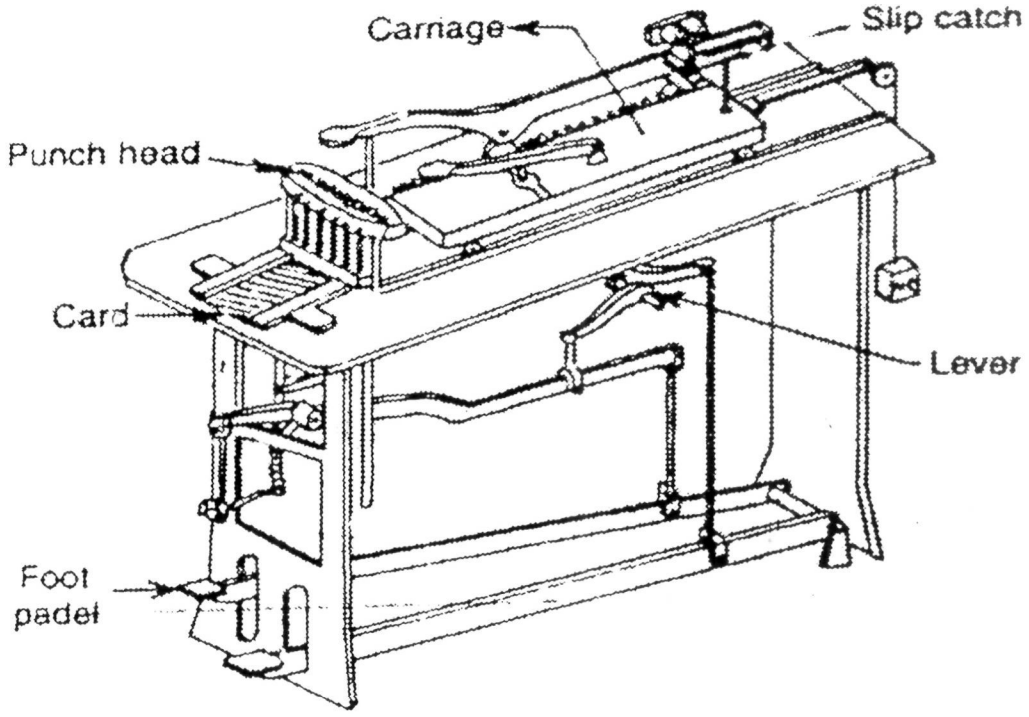


Fig. 7: The conventional card punching machine

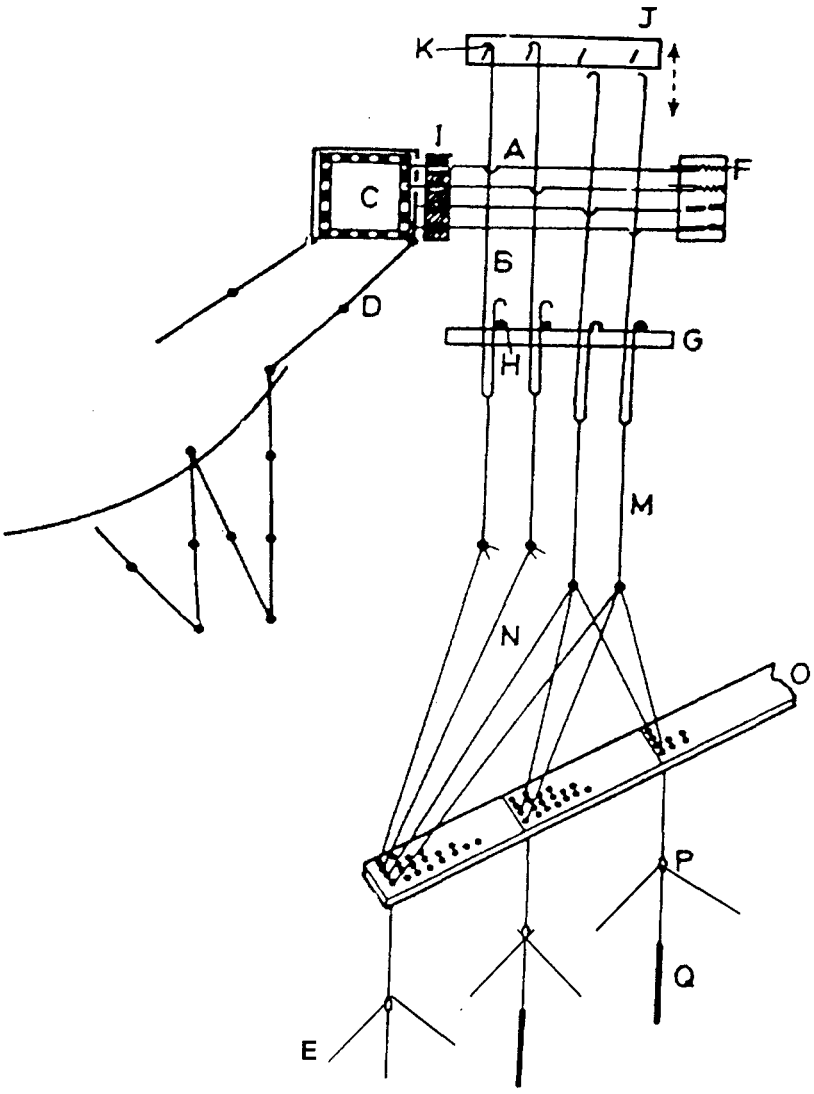
other. Punch heads were connected to the foot pedals by means of a lever and hence the machine punches the holes on pressing the pedals.

b. Lacing punched cards

The punched cards were serially placed on two wooden planks placed few inches apart. Tying was done by passing two strands of a flexible woven cord through the connecting hole on each card in the order of one up and one down. However both the cords travelled in opposite directions from the first card to the last and were secured together by a knot (Plate 11). This piecework was done by women or most of the times by children.

4.4.3 Powerloom employed to weave newly designed polycotton` sarees

Powerloom of 'Venkatesh or Gwalior' brand was employed to weave the sarees. A 0.75 hp motor operated the loom. Reed of 60s, dobby for the extra warp figuring and a cone for weaving contrast border were all additionally mounted on the loom. Weaving *kasuti* motifs in the polycot saree required a handloom jacquard of 120 needle capacity. Hence, 120s jacquard was mounted onto a wooden square on the top of the loom (Plate 12). Figure 8 explains the functional operation of a jacquard.



A Needle
B Hook
C Cylinder
D Card
E End/Warp
F Spiral spring
G Grate
H Spindles
I Needle board
J Griffe
K Lifting knives
M Neck cord
N Harness cord
O Comber board
P Mails
Q Lingoes/Weights

Fig. 8: Jacquard mechanism

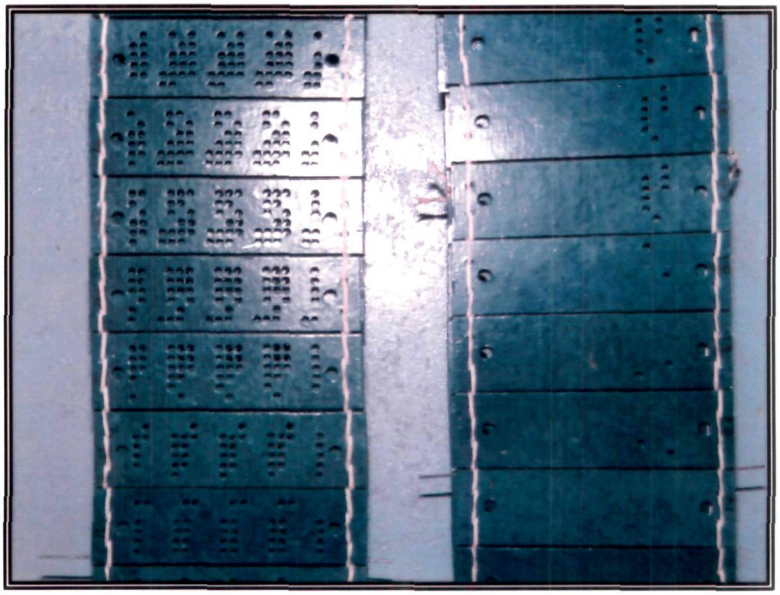


Plate 11 : Punched and laced jacquard cards

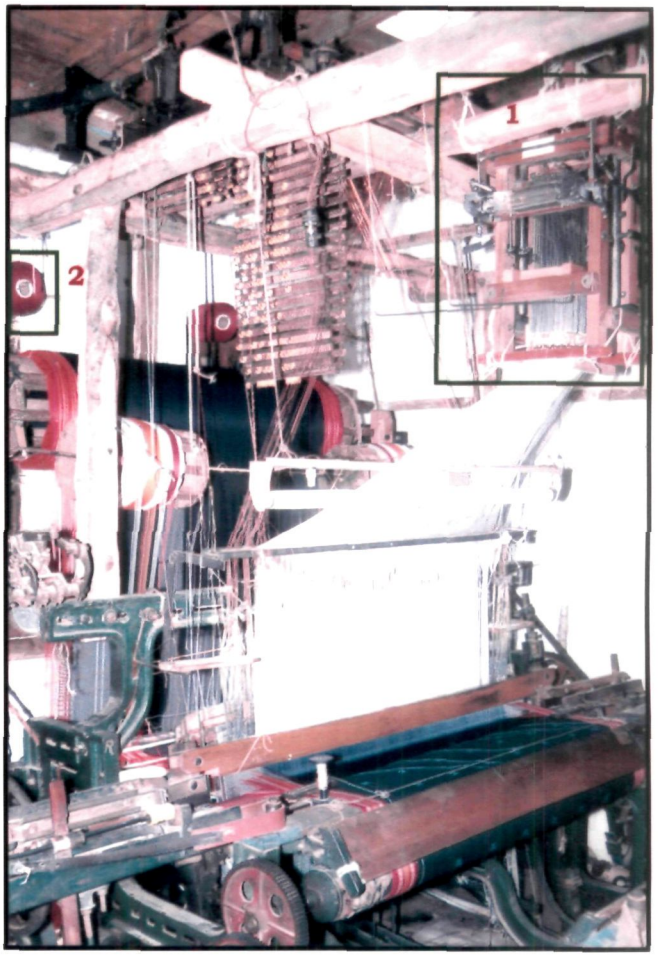


Plate 12 : Powerloom

1. Jacquard
2. *Cone technique*

The horizontal needles A are each connected to a vertical hook B by forming loop or a half-bend round the latter and are supported by a needle board I, through which they project slightly. The rear end of each needle, which is formed into a narrow loop is pressed by a spiral spring F to ensure the relation of the needle to the original position after each selection. The hooks are prevented from turning side ways by doubling up their lower ends and passing them through narrow slits in grate G with the bent ends resting on spindles H when the hooks are in the low position. The number of needles in each short row varies from 4 to 16 and the number of short rows is multiplied to give the required size of machine. It is a general rule to connect the needles and hooks in the order shown in Fig. 8, the top needle being connected to the hook farthest from the cylinder C. The same number of inclined lifting knives K are carried in an iron frame or griffe J as there are hooks B in a short row. A card cylinder C, over which the pattern cards D pass, contains on each surface a hole opposite the end of each needle. Each face of the cylinder is provided with two pegs, which act as the locating points to ensure proper registration of the card against the cylinder perforations. The cards D, the number of which is equal to the number of picks in the complete repeat of a design, are laced together at the sides and then the last card is joined to the first so that an endless chain is formed. The pitch of needles, the holes in card cylinder and cards is exactly the same. Long 'sets' or

'packs' of cards have to be suspended in proper position in relation to the cylinder. A wire, which is about 1 ½ inches longer than a card, is tied at intervals of twelve or more cards to the cords with which the cards are laced together. By means of the wires the cards hang from a frame or cradle which consists of two parallel iron bars that are rather further apart than the width of the cards and the latter pass over supporting rollers.

The harness consists of neck cords M that are suspended from the hooks B, harness cords N, which are connected to the neck cords and passed separately through holes in a comber board O, mails P and lingoes or weights Q. The number of harness cords, mails and lingoes connected to each neck-cord M, varies according to the 'tie' and 'sett' of the harness. By means of the lingoes Q, the warp threads, cords and hooks are returned to the original position after they have been raised. The purpose of the comber board O is to keep the harness cords in position to determine the number of cords per unit space.

Suitable connections from the loom provide the rising and falling movement to the knives, as well as the in-and-out movement to the cards cylinder ensuring correct synchronization of the jacquard action with the loom cycle. The cylinder is turned one quarter of a revolution as it moves back thus presenting a new card for selection

each time it moves into press against the needles. If the needle encountering the perforation in the card enters the corresponding hole in the cylinder, no action takes place. This allows hook B in its upward movement takes the hook with it, thus lifting end E into the top shed line. On the contrary, if the needle is opposed by a blank in the pattern card, the needles are forced back and this inturn presses the hook clear off the knife just prior to the commencement of its upward movement. The knife moves up but the hook which has been pressed clear remains down and therefore, the end controlled by this hook also stays down in the bottom shed line.

In practice, there are two methods of adding interlacements to floats in a design. The first method is by adding additional marks in twill or satin order, done manually on a computer while designing. The second is achieved on the loom, while connecting the jacquard needles to the warp threads. Depending on the type of design and capacity of the jacquard the weaver has an option to tie warp threads either in singles or groups of 2 or 3 to a single needle. Two or three warp ends were connected to a single needle alternated with a single thread left untied the latter intersected with the weft and checked the length of the float. Hence, this single thread formed the bottom line of the shed and was responsible for interlacements between floats.

In the digitized *kasuti* motifs, the length of the float and the interactions were manipulated on the loom itself. Two threads were tied to single needle followed by a single untied thread *i.e.*, majority of the selected motifs were woven with 2 up 1 down interlacement including elephant with howdah, deer creeper, gopuram, birds-lotus, lotus, lotus butta, lotus buds, chariot and diagonal birds-creeper.

Similarly, for weaving other motifs *viz.*, birds flower pot, wheat spike-lotus, diagonal birds-creeper and modified lotus-creeper three warp threads were tied to a single needle after leaving one thread untied. Hence the interlacement order of these motifs was 3 up and 1 down.

4.4.4 Pre-loom processes

a. Bobbin winding

The dyed cotton warp yarns were wound on the electrically operated bobbin winder. Cotton yarn was wound on 12 plastic bobbins at a time (Plate 13). However, polyester yarn available in package form was wound with the aid of winding wheel manually onto the bobbins (Plate 14).

Warping for 120 sarees is done at a time, which consumed about 25 kg -30 kgs of the cotton yarn. Small hanks of 840 yards called *bali* in a set of five were grouped together to form *'ladi'*. Many

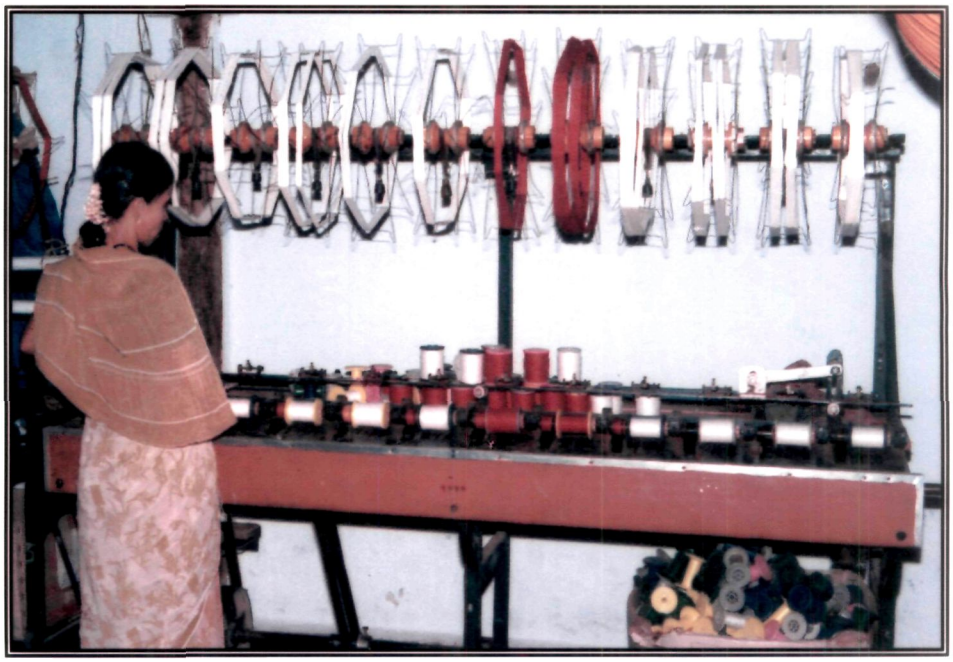


Plate 13 : Bobbin winding (cotton yarn)

Plate 14 : Bobbin winding (polyester yarn)

'ladis' put together formed a *moote* weighing 5 kgs. Five to six such *mootes* were required to wind around 312 - 320 bobbins with approximately each 800 meters yarn.

b. Warping

Sectional warping method was adopted to prepare the warp. Required number of bobbins (310-320) were arranged on the creel machine. From each bobbin, the yarn is drawn through a small reed and wound on to the warp beam. The reed is a guide to check the broken yarns. Approximately 800 meters of yarn is wound in each section and totally eight sections are wound to make the required width of the saree body (Plate 15). Two sections of the border were later wound separately on either sides of body warp, considering the colours for extra warp figuring in order.

c. Beaming

The process of transferring the previously prepared warp on the warp beam is known as beaming. The beam is provided with discs or flanges on both the sides to maintain the width of the warp sheet, to protect and preserve the selvedge ends. While winding the warp on the beam care is taken to lay individual thread parallel to each other under uniform tension.

Plate 15 : Sectional warping (cotton)

Plate 16 : Pirn winding (polyester)

d. Pirn winding

With the help of electrically operated pirn winding machine the polyester yarn from the cone or packages is transferred to the pirn. Winding 18 pirns at a time is possible on this machine, which runs by 0.25 hp motor (Plate 16).

4.4.5 Loom processes

a. Weaving

The weaving of the polycot saree commences from the pallav. To obtain contrast shade for the pallav it is customary to die the warp yarns of required length on the loom itself *i.e.*, on releasing the yarns from the back beam the weaver ties the two ends of the required length tightly by cords. The portion between the two knots is then dyed with naphthol dyes (Plate 17). Soon after dyeing, the dyed yarns are laid straight by remounting on the back beam. The entanglements in the yarn if any are brushed off by using coir brush (Plate 18).

The motifs are incorporated with the help of jacquard. On pressing the treadle the selected hooks get raised along with the warp ends. Twisted polyester weft for the extra weft figuring and untwisted ground pick in the proportion of 1:1 were inserted simultaneous till the completion of the design (Plate 19). However the ground weave is woven with untwisted polyester.

Plate 17 : Dyeing the pallav with naphthol colours

Plate 18 : Brushing the dyed cotton warp

b. Cutting and doffing of the saree

After completion of each saree an extra length of approximately an inch was woven and separated from the cloth beam with the help of knife. This however, helped to prevent the slippage of yarns through the dents. The completed saree was then folded on the loom itself by laying several folds in a zigzag fashion (Plate 20). The weaver then starts weaving the next saree.

4.4.6 Post loom Processes

Woven sarees were then systematically folded, packed neatly in polyethylene bags and finally compressed under heavy pressure (Plate 21). Compressing gave the sarees an ironed look and aided in compact packing for easy transportation.

4.5 Description of newly designed polycotton sarees

4.5.1 Fabric information

Table 11 reveals about the fabric set and dimensions of different types of sarees. The traditional saree was woven with 66 ends and 72 picks with a width of 45 inches of which body comprised of 39" and 3" border on either sides. Pallav covered 23" of the length of the saree.

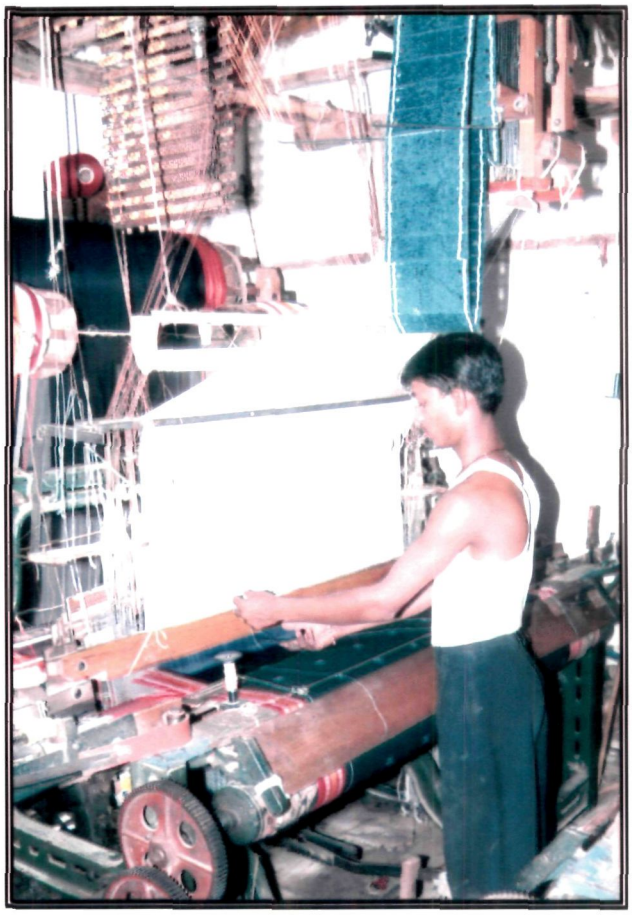


Plate 19 : Weaving motifs

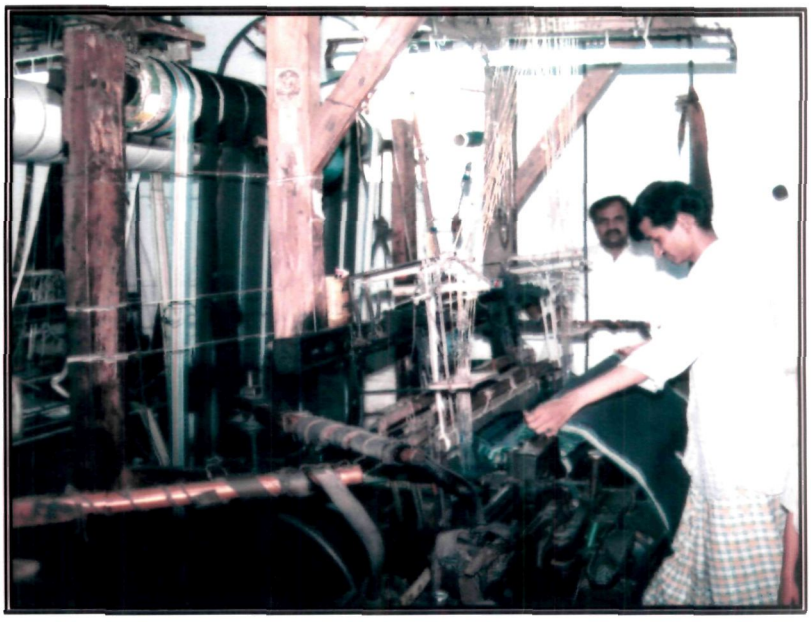


Plate 20 : Cutting and doffing of the saree

Plate 21 : Compressing folded and packed sarees

Table 11: Dimensions of newly designed polycotton sarees

Sl. No.	Type of saree	Threads/inch		Length of saree (meters)	Width (inches)		Length of pallav (inch)	Width of saree (inch)
		Ends	Picks		Body	Border		
1.	Traditional	66	72	6.00	39	3.0	23	45
2.	Saree - 1	70	80	5.80	39	2.5	25	44
3.	Saree - 2	70	76	5.80	40	3.0	26	46
4.	Saree – 3	70	78	6.25	35	5.5	25	46
5.	Saree – 4	70	78	6.25	35	5.5	31	46
6.	Saree – 5	70	78	6.00	37	4.0	30	45

Saree 1 was woven with 70 ends and 80 picks. The border was only 2.5″ on either sides and the width of 44″ including the borders. The pallav of the saree measured 25″ of the length.

Saree 2 formed 70 x 76 fabric sett with the total width measuring 46″, including both body (40″) and borders (3″ each) on either sides. This saree had a longer pallav of 26″.

Saree 3 and Saree 4, similar in fabric sett were woven with a wider border that measured 5.5″ on either side. The body was 35″ with a total width of 46″. The pallav was 25″ in length. However, the fabric sett of both the sarees was 70 x 78.

Saree 5 exhibited a fabric sett of 70 x 78.The width of the saree was 45″ inclusive of 37″ body and 4″ border on either sides and the length of the pallav being 30″.

All the sarees were woven with running blouse pieces of varied lengths.

4.5.2 Motifs employed

Table 12 reveals that the traditional polycotton sarees were plain with contrast borders on either sides. The geometrically shaped

Table 12: Motifs employed on different types of sarees

Sl. No.	Sarees	Motifs used		
		Body	Border	Pallav
1.	Traditional	Plain	Rudraksha, Chrysanthemum	Plain with 3-4 panels
2.	Saree - 1	Chariot, elephant with howdah, lotus, lotus butta (Placed just above the pallav)	Rudraksha, chrysanthemum	Plain with 3-4 panels enriched with diagonal buds - creeper, deer - creeper and small lotus buttas
3.	Saree - 2	Gopuram, swan - lotus, bud - lotus, lotus butta (Placed just above the pallav)	Rudraksha with a panel of diamond like designs	Plain with 3-4 panels enriched with diagonal buds - creeper, deer creeper and lotus buttas
4.	Saree - 3	Small lotus	Plain with geometric flowers and gingham checks above	3-4 bands of the modified lotus creeper (with rudraksha and chrysanthemum inbetween)
5.	Saree - 4	Birds - flower pot, wheat spike - lotus, diagonal sparrow - creeper, small lotus buttas (Placed just above the pallav)	Plain with geometric flowers and gingham checks above	Plain with 3-4 panels and small lotus buttas.
6.	Saree - 5	Plain with small lotus buttas	Rudraksha, Chrysanthemum	Birds - flower pot, wheat spike - lotus, modified lotus creeper

motifs *viz.*, chrysanthemum and *rudraksha* formed the main designs in the border. The border consisted of two to three stripes of the serially placed motifs. The motifs were sometimes placed alternately in a single stripe or stripes of single motif placed alternately were also found (Fig. 9). However, other popular borders woven were the *Paras*, *Gadi* (Ilkal type) and other stylized borders (Fig. 10). But the pallav remained plain with 3-4 bands of varied colours.

Table 12 further showed that saree 1 was designed with chariot, elephant with howdah, lotus and lotus buttas in the body. The border was traditional with two separate bands of *rudraksha* and chrysanthemum. Diagonal buds-creeper, deer-creeper and small lotus buttas enriched the traditional pallav (Plates 22 - 28).

Gopuram, swan-lotus, buds-lotus and lotus buttas decorated the body of saree 2. The border called the '*Paras*' had diamond like designs placed in between the traditional bands of *rudraksha*. However the pallav of this saree resembled the pallav of saree 1 (Plates 29 - 34).

Saree 3 was woven with small lotus motifs in the body. The border locally called the 'Calcutta' type was plain with a only a band of small geometrical motifs. Gingham checks created using dobby and drawbox mechanisms extended the border by two inches. The pallav

Single striped border with *rudraksha* and chrysanthemum arranged alternately

Two striped border with *rudraksha* and chrysanthemum arranged in separate rows

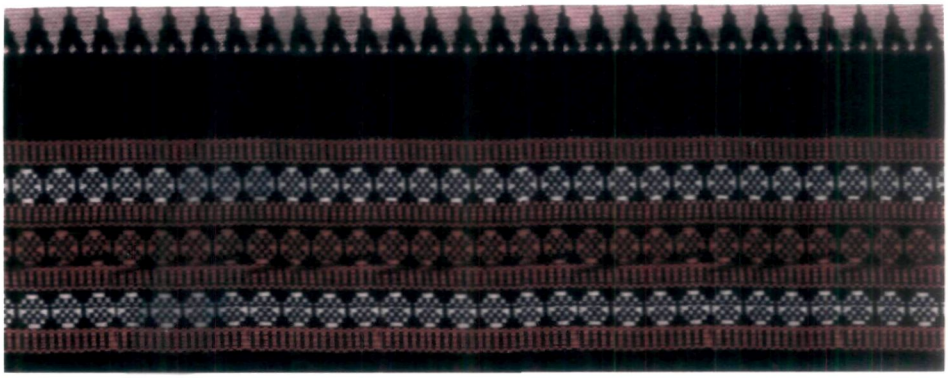
Three striped border with twp rows of *rudraksha* on either sides of chrysanthemum

Four striped border with alternate rows of *rudraksha* and chrysanthemum

Fig. 9: Traditional borders of Lakkundi polycotton sarees

Single *gadi* (*Ilkal* type) border

Three striped *gadi* (*Ilkal* type) border



Small *rudraksha* border

Paras (*Ilkal* type) border

Fig. 10: Ethnic borders of polycotton sarees

Plate 22: Saree 1 with traditional border and computerized *negi* motifs - chariot, elephant with howdah, lotus, deer - creeper and diagonal buds - creeper

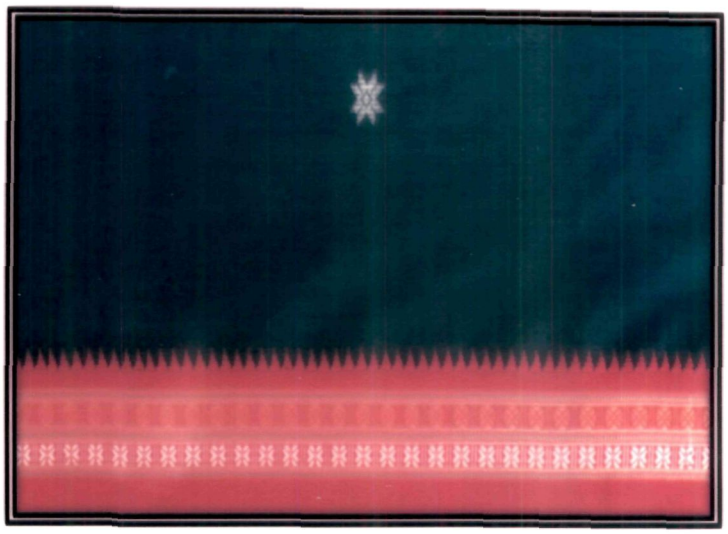


Plate 23. Traditional border

Plate 24. Chariot (*Teeru)*

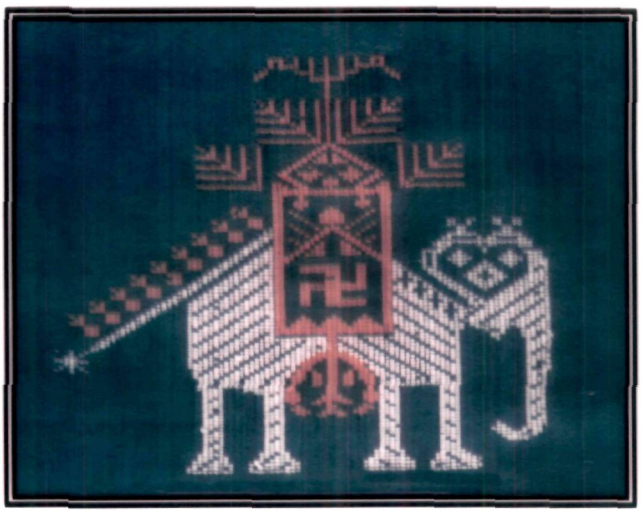


Plate 25. Elephant with an howdah (*Aane ambari*)

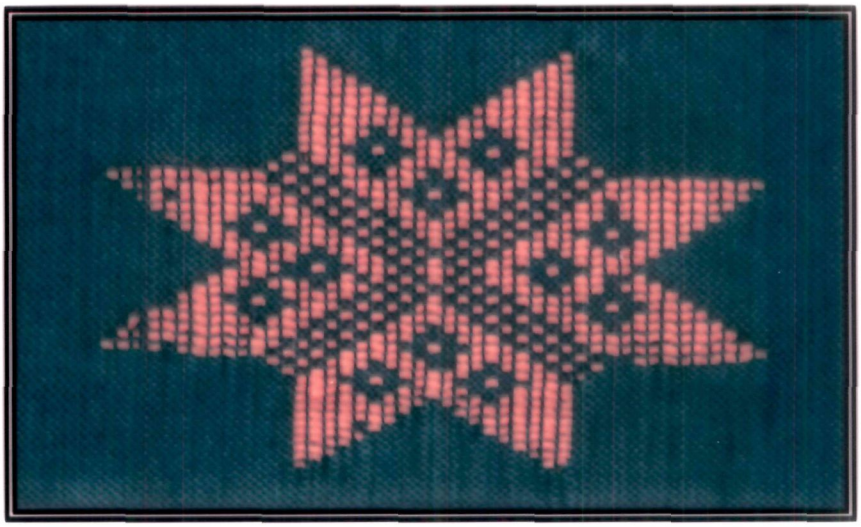


Plate 26. Lotus (*Kamala*)

Plate 27. Deer-creeper(*Chigari balli*)

Plate 28. Diagonal buds-creeper (*Vari maggi balli*)

Plate 29: Saree 2 with *paras* border and computerized *negi* motifs - gopuram, birds - lotus, lotus buds, lotus butta, deer - creeper and diagonal buds - creeper

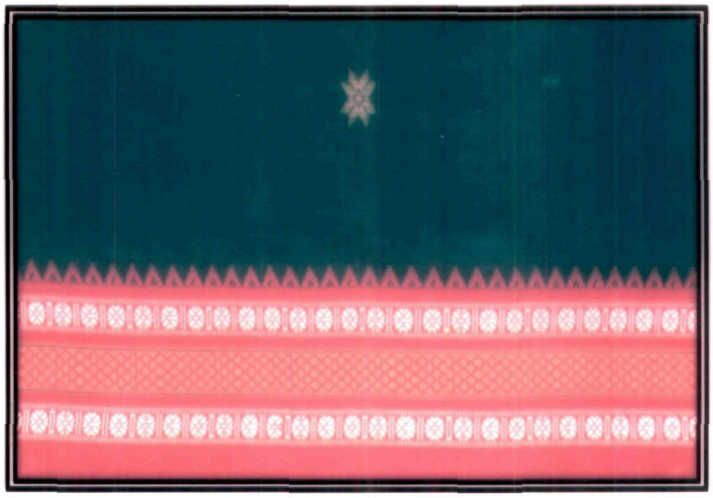


Plate 30: The *Paras* border

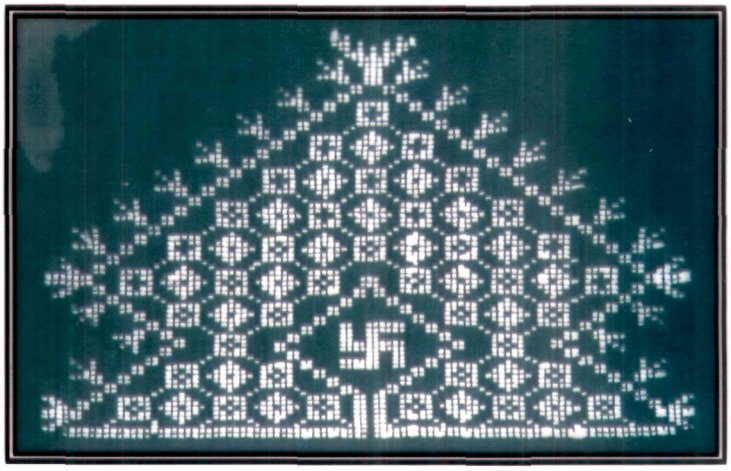


Plate 31: Gopuram (*Gopura*)

Plate 32: Birds-lotus (*Hamsa kamala*)

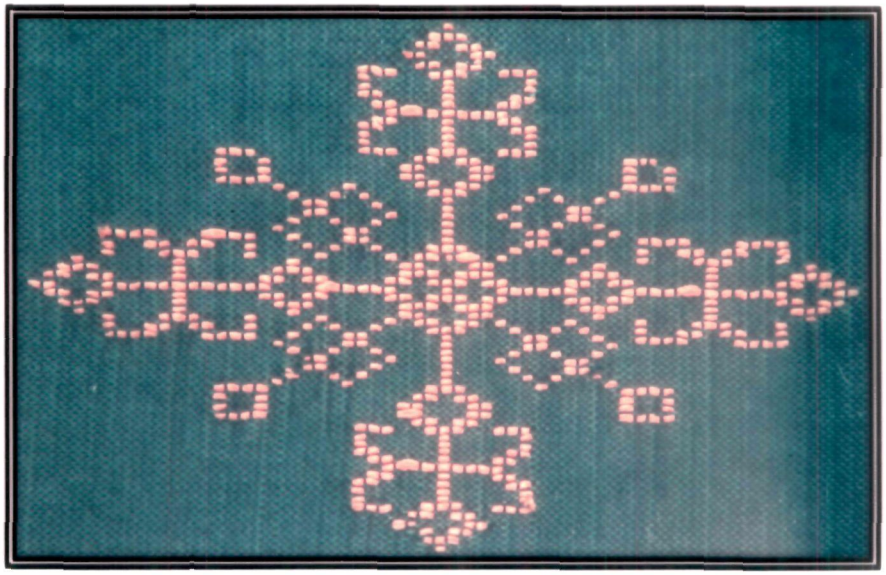


Plate 33: Lotus buds (*Maggi kamala)*

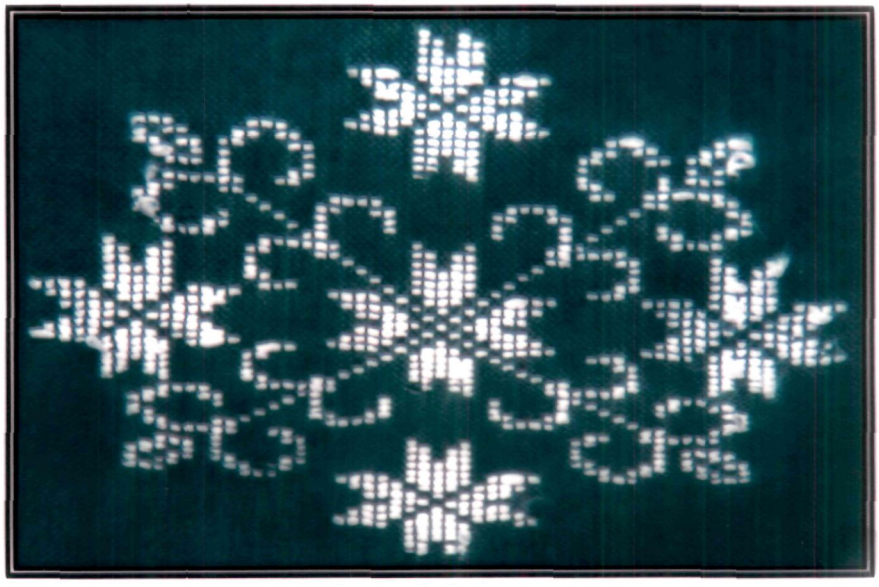


Plate 34: Lotus butta (*Kamalada butta*)

of the saree was modified with jacquard shedding wherein simple bands replaced with four decorative horizontal panels. Each decorative panel consisted of two rows of lotus creeper embedded within, was a single row of *rudraksha* and chrysanthemum (Plates 35 – 37).

The border of saree 4 was similar to the border of saree 3. However, birds flower-pot, wheat spike-lotus, diagonal sparrows-creeper and small lotus motifs were woven in the body just above the pallav (Plates 38 - 41). The pallav was traditional with bands of varied colours.

The saree 5 had plain body with small lotus and the traditional border. However, the pallav was elaborate with 3 bands of modified lotus creepers. Birds flower-pot and wheat spike-lotus were placed in between the bands (Plates 42 - 44).

4.6 Production and marketing of polycot made-ups

The production aspect included the variety of polycot made-ups produced and the rate of production of polycot sarees. The place and frequency of selling of polycot sarees were dealt under the marketing aspects.

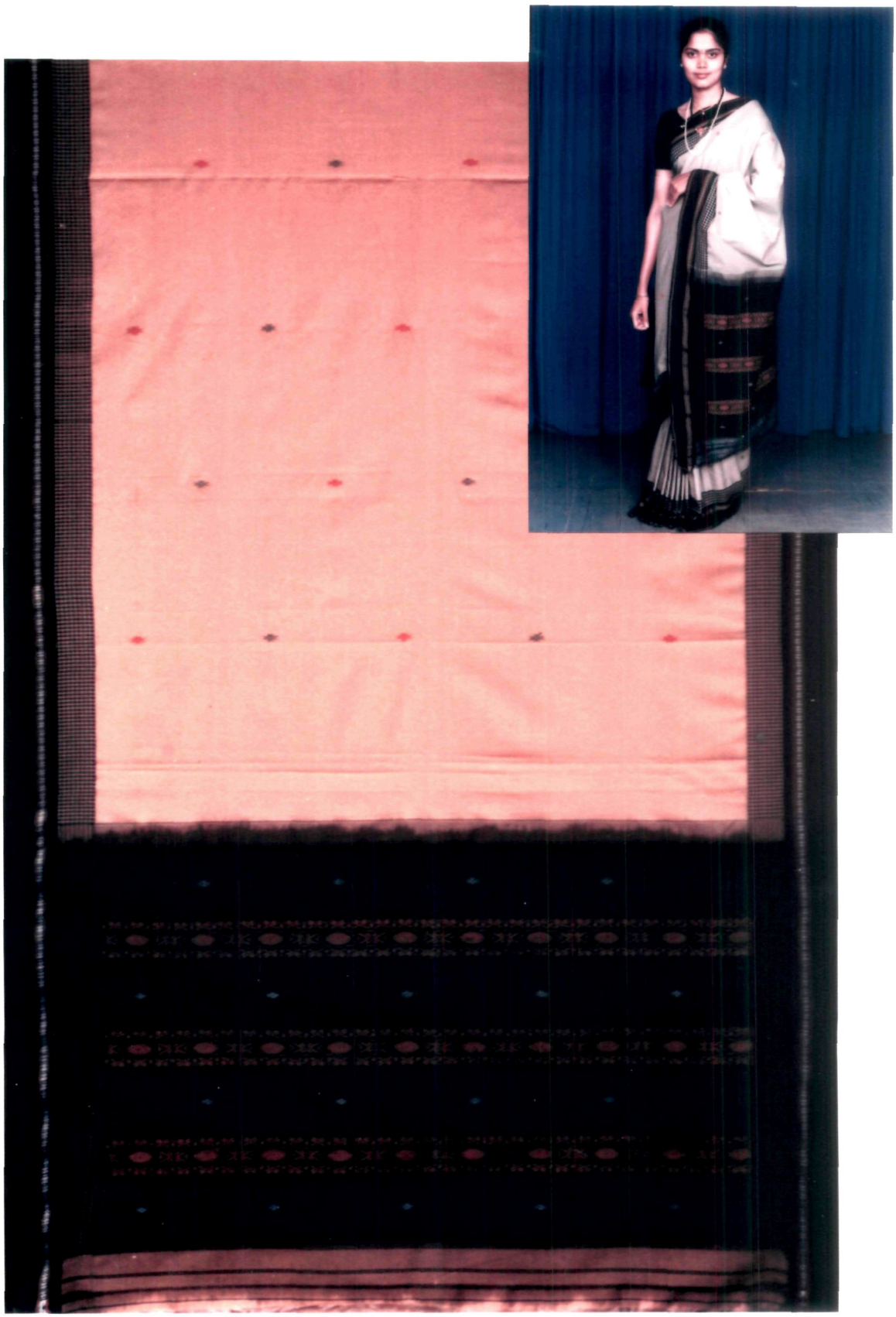


Plate 35: Saree 3 with mini checked border and jacquard pallav

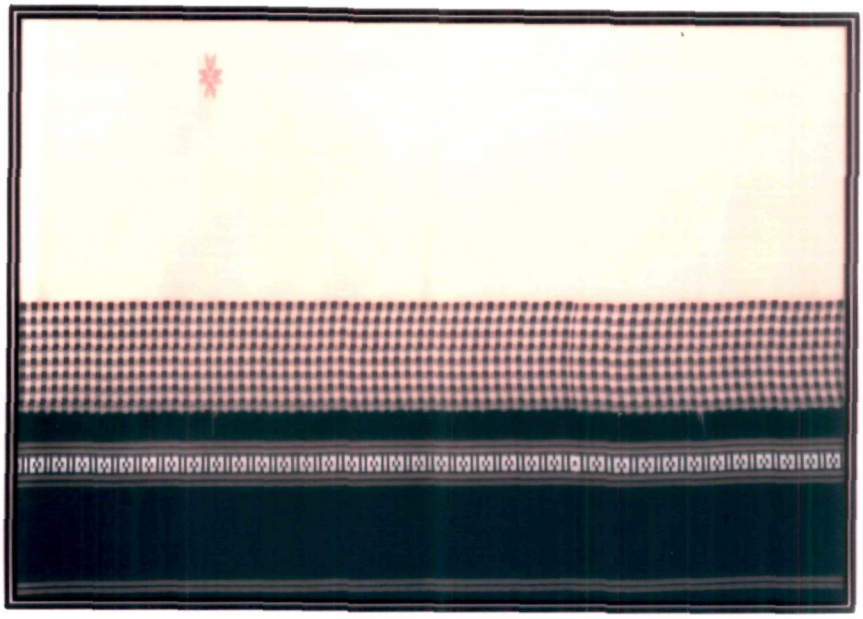


Plate 36: Mini checked border

Plate 37: Jacquard pallav

Plate 38: Saree 4 with mini checked border and computerized *negi* motifs - birds - flower pot, wheat spike - lotus, diagonal birds - creeper

Plate 39: Birds-flower pot (*Pakshi hoodani*)

Plate 40: Wheat spike-lotus (*Godi teni kamala*)

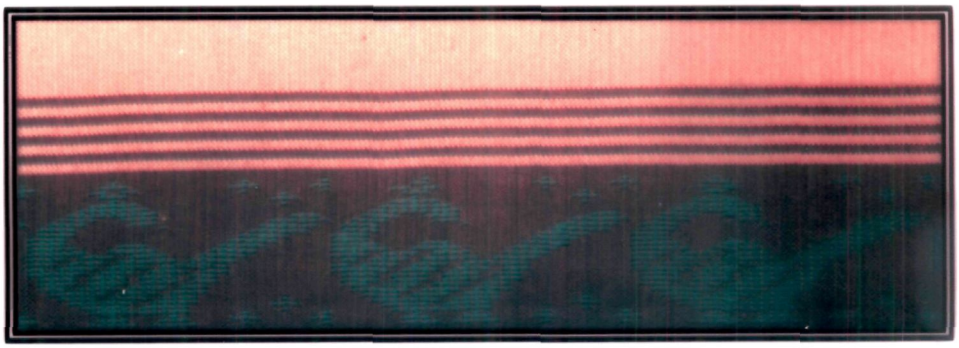


Plate 41: Diagonal birds-creeper (*Vari gubbi balli*)

Plate 42: Saree 5 with traditional border and computerized *negi* motifs - birds - flower pot, wheat spike - lotus, diagonal birds - creeper

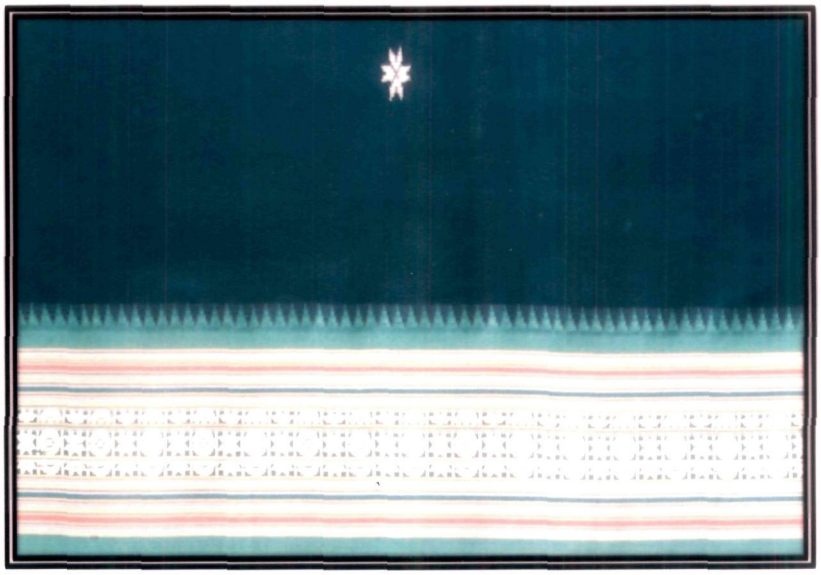


Plate 43: Traditional border

Plate 44: Modified pallav

4.6.1 Variety of polycot made-ups manufactured

A glance at Table 13 revealed that one of the master weavers at Lakkundi produced polycotton *lungis* and other two (66.67%) produced polycotton salwar kameez suits along with the production of polycotton sarees. On the other hand 80% of master weavers at Shigli produced salwar kameez suits in addition to polycot sarees whereas, 20.00 per cent exclusively produced the sarees.

4.6.2 Production rate

The rate of production of different polycotton sarees is recorded in Table 14. On an average around 20 traditional sarees without *kasuti* motifs were produced on a loom per week at Lakkundi whereas only 15 sarees were produced at Shigli. Irrespective of the villages, the average production rate of polycotton sarees per loom per week was about 17. However, nine newly designed saree types 1 and 2 were produced on a loom per week. Whereas it was possible to weave 13 sarees of type 3 on each loom/week. The rate of production of sarees 4 and 5 was approximately 11/loom/week (Fig. 11).

4.6.3 Marketing of polycotton sarees

Table 15 reveals that cent per cent of the master weavers of Lakkundi sold their produce at local wholesale dealers and

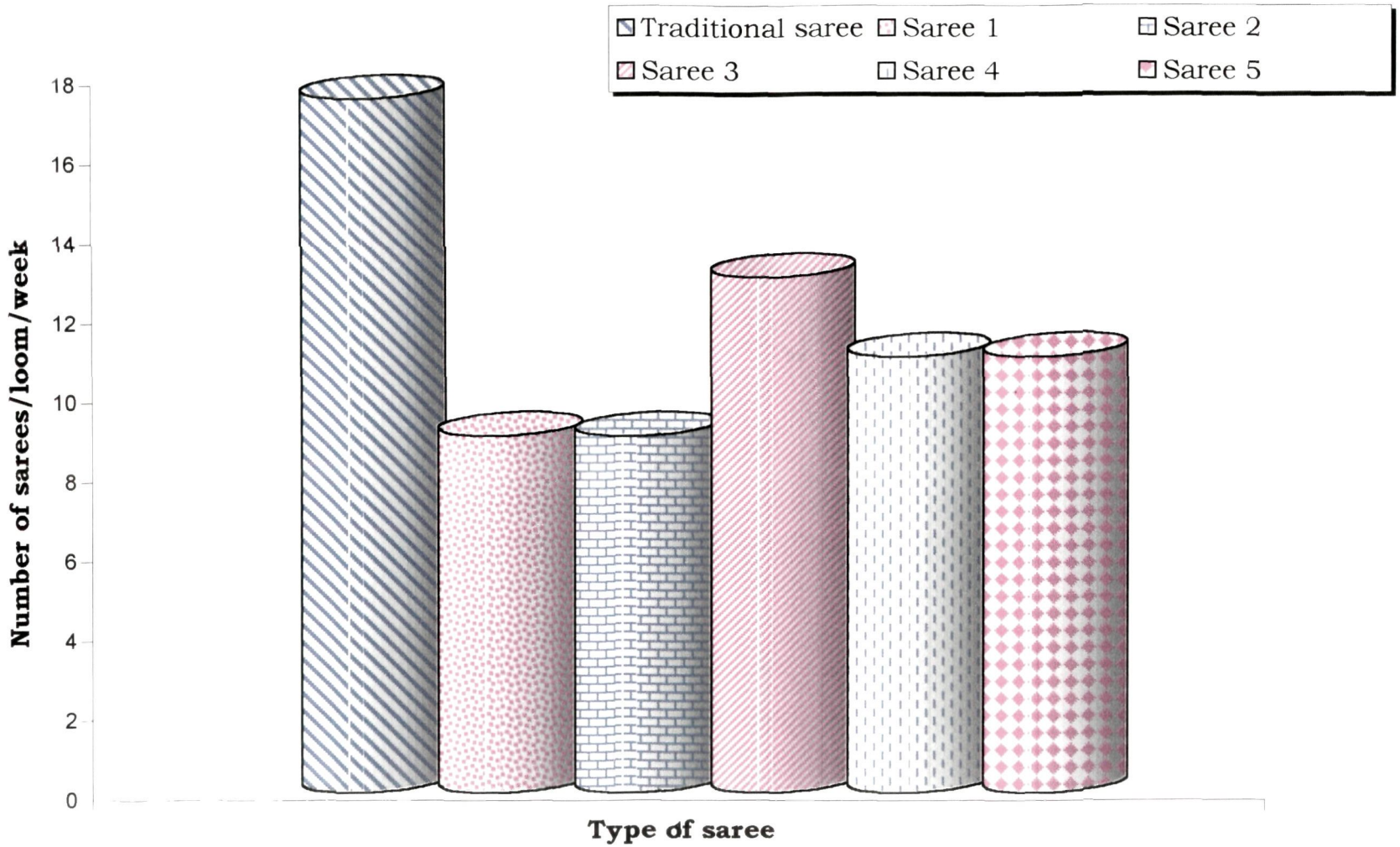


Fig. 11: Rate of production of polycotton sarees

Table 13: Variety of polycotton made-ups manufactured by the master weavers

(N=8)

Sl. No.	Products	Lakkundi	Shigli	Total
1.	Polycotton lungi	1 (33.33)	-- (0.00)	1 (12.50)
2.	Polycotton sarees	3 (100.00)	5 (100.00)	8 (100.00)
3.	Polycotton salwar kameez suits	2 (66.67)	4 (80.00)	6 (75.00)

Figures in parentheses indicate percentages

Multiple responses possible

Table 14: Rate of production of polycotton sarees

(No. of sarees/loom/week)

Sl. No.	Products	Lakkundi	Shigli	Average production
1.	Traditional plain saree	20	15	17.5
2.	Sarees 1 and 2	9		9
3.	Saree 3	13		13
4.	Saree 4 and 5	11		11

showrooms (Fig. 12). On the other hand about 40.00 per cent and 60.00 per cent of master weavers in Shigli supplied their produce to outside states and local wholesale dealers, respectively.

Irrespective of the villages, cent per cent of the master weavers sold their produce partially to the showrooms, 75.00 per cent to local wholesalers and 25.00 per cent to markets outside state.

4.6.4 Frequency of marketing

It is evident from Table 16 and Fig. 13 that master weavers at Lakkundi sold their produce weekly (100%) followed by 'as and when ordered' (66.67 %) and fortnightly (33.33%).

Similarly majority of the master weavers at Shigli sold their produce weekly (80.00%) followed by fortnightly (60.00%). About 40.00 per cent of master weavers sold their produce 'as and when ordered'.

Irrespective of the villages, majority (87.50%) of the master weavers sold the polycotton sarees weekly. Fifty per cent each of the master weavers sold the sarees once in a fortnight and 'as and when ordered'.

Table 15: Markets for the polycotton sarees produced by master weavers

(N=8)

Sl. No.	Markets	Lakkundi	Shigli	Total
1.	Local wholesalers	3 (100.00)	3 (60.00)	6 (75.00)
2.	Showrooms	3 (100.00)	5 (100.00)	8 (100.00)
3.	Outside state	-- (0.00)	2 (40.00)	2 (25.00)

Figures in parentheses indicate percentages

Multiple responses possible

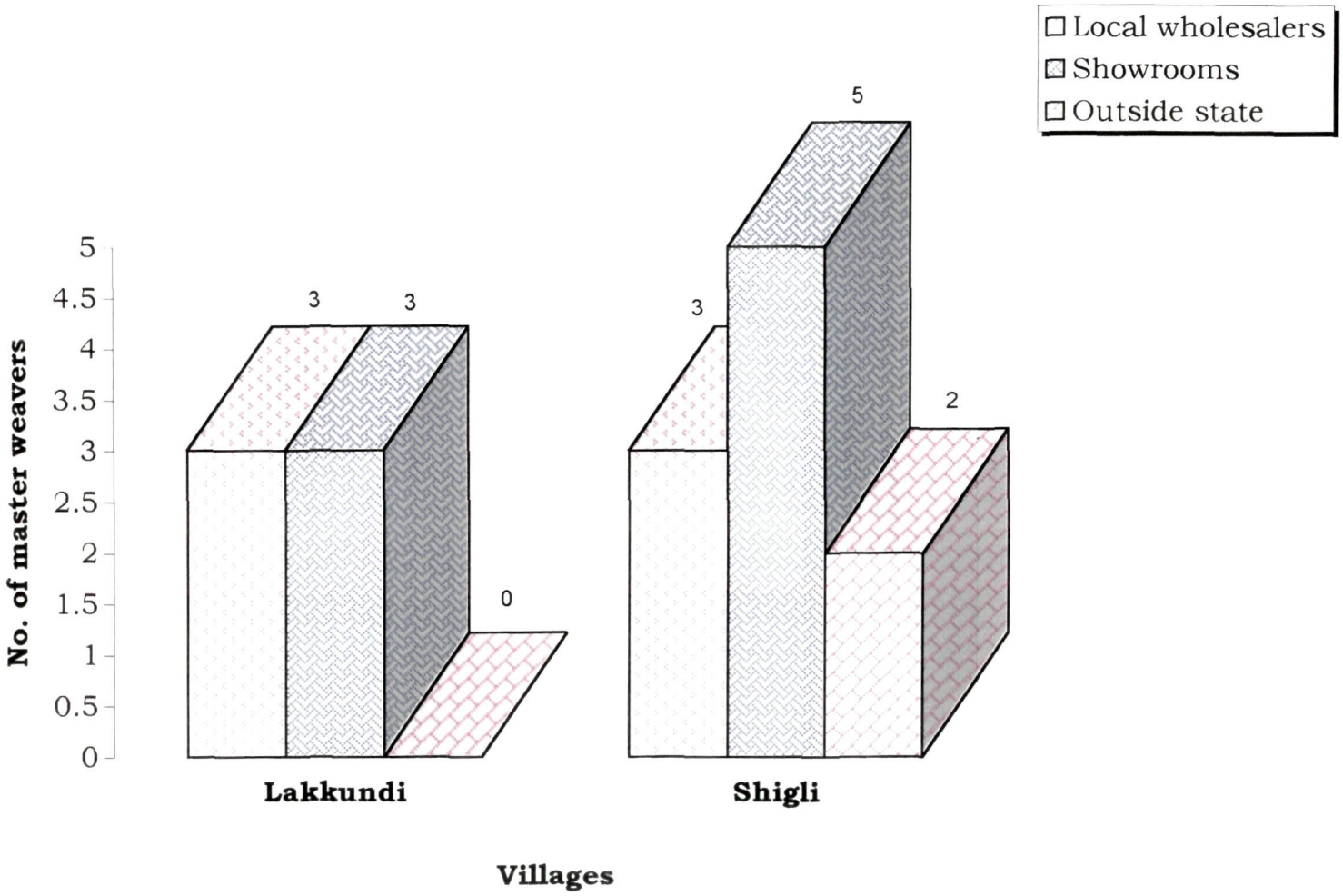


Fig. 12: Market for polycotton sarees produced by master weavers

Table 16: Frequency of marketing by master weavers

(N=8)

Sl. No.	Frequency	Lakkundi	Shigli	Total
1.	Weekly	3 (100.00)	4 (80.00)	7 (87.50)
2.	Fortnightly	1 (33.33)	3 (60.00)	4 (50.00)
3.	As and when ordered	2 (66.67)	2 (40.00)	4 (50.00)

Figures in parentheses indicate percentages

Multiple responses possible

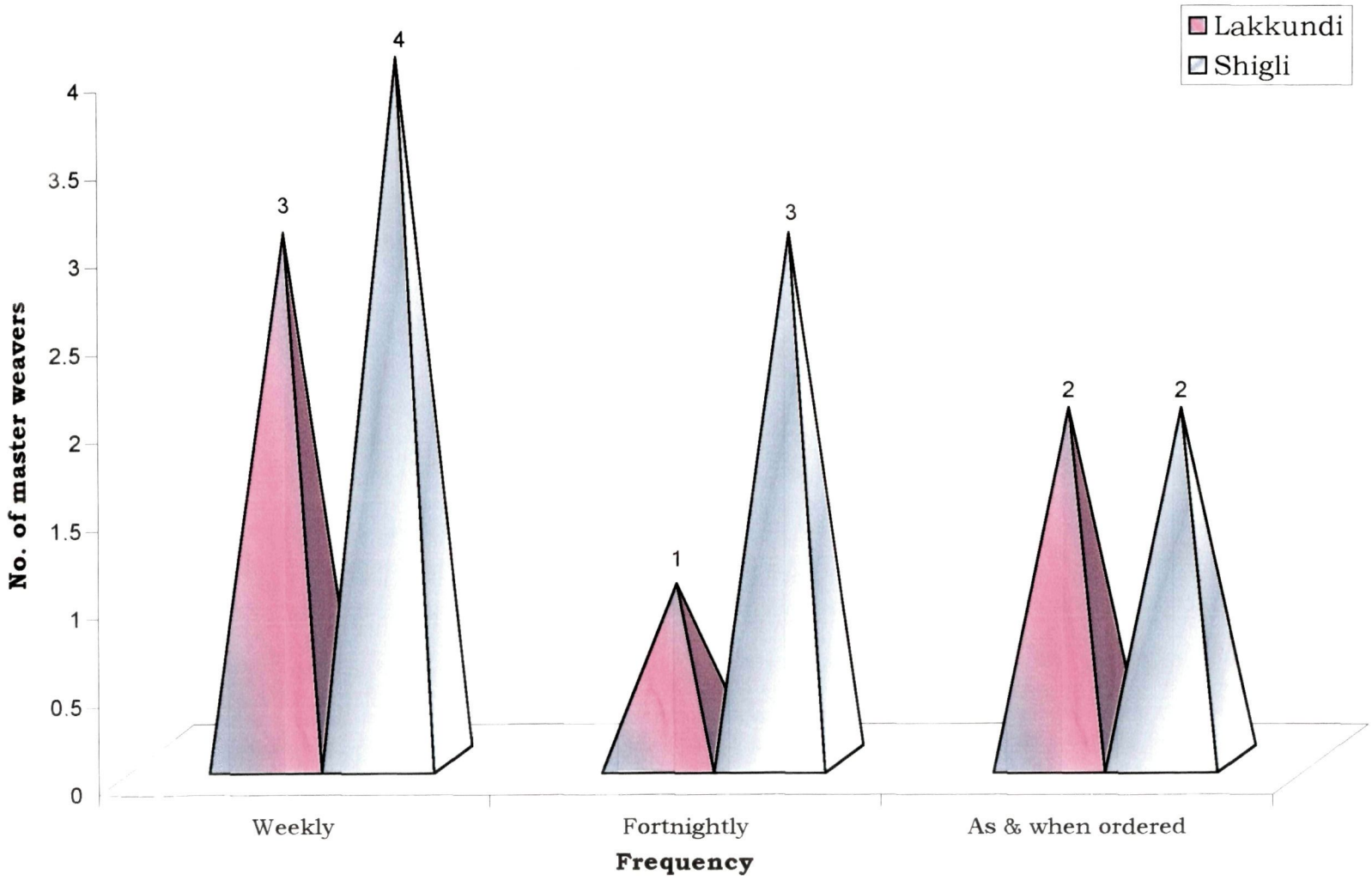


Fig. 13: Frequency of marketing by master weavers

4.7 Problems of the weavers

a. Problems of the master weavers

Table 17 focused the various problems encountered by the master weavers while procuring raw material, production and marketing of the products. Cent per cent of the master weavers at Lakkundi and Shigli faced the problem of higher prices and non-availability of required counts, especially cotton yarns. Further master weavers of Shigli expressed high prices (80.00%) and inferior quality (60.00%) of raw material as the other major problems.

Irrespective of the villages, problems faced by master weavers in order were, hike in the prices (87.50%), non-availability of required counts (62.50%) and inferior quality raw materials (37.50%).

Inadequate supply of electricity, unwillingness of the wage weavers to weave new designs and fear of introduction of value added tax (VAT) were the other problems faced by all the master weavers at Lakkundi. Similarly, master weavers at Shigli faced problems related to electricity (80.00%) and unwillingness of the weavers to weave new designs (60.00%).

On the whole irrespective of the villages majority (87.50%) of the wage weavers faced electricity problems followed by the unwillingness

Table 17: Problems faced by master weavers

(N=8)

Sl. No.	Problems	Villages		Total
		Lakkundi	Shigli	
I.	**Procurement of raw material**			
1.	High prices	3 (100.00)	4 (80.00)	7 (87.50)
2.	Inferior quality material	- (0.00)	3 (60.00)	3 (37.50)
3.	Non-availability of required counts (cotton yarns)	- (0.00)	5 (100.00)	5 (62.50)
II.	**Production problems**			
1.	Electricity	3 (100.00)	4 (80.00)	7 (87.50)
2.	Wage weaver's unwillingness to weave new designs	3 (100.00)	3 (60.00)	6 (75.00)
3.	Fear of value added tax (VAT)	3 (100.00)	3 (60.00)	6 (75.00)
III.	**Marketing problems**			
1.	Lack of demand	- (0.00)	1 (20.00)	1 (12.50)
2.	Hike in transportation cost	2 (66.67)	4 (80.00)	6 (75.00)
3.	Irregular payments	1 (33.33)	2 (40.00)	3 (37.50)

Figures in parentheses indicate percentages

Multiple responses possible

of the wage weavers to weaves new designs (75.00%) and fear of VAT (75.00%).

The table further depicts that the master weavers at Lakkundi did face a couple of marketing problems like hike in transportation cost (66.67%) and irregular payments (33.33%). On the other hand, majority of weavers at Shigli expressed hike in transportation cost (80.00%), irregular payments (40.00%) and lack of demand for the goods (20.00%) as their problems.

In general of the pooled data, 75.00 per cent of the master weavers faced the problems of hike in transportation, irregular payments (37.50%) and lack of demand (12.50%).

b. Problems of the wage weavers

Major problems faced by the wage weavers of Lakkundi and Shigli were non profitable labour (76.00%, 90.67%), lack of capital to invest on power looms (18.00% and 24.00%) and lack of government aids for self employment (10.00% and 20.00%), respectively. Only 6.00 per cent and 9.33 per cent of the wage weavers from Lakkundi and Shigli had irregular employment, respectively (Fig. 14).

Irrespective of the villages, the order of problems faced by the wage weavers was similar (Table 18).

Table 18: Problems faced by wage weavers

(N=125)

Sl. No.	Problems	Villages		Total
		Lakkundi (n=50)	Shigli (n=75)	
1.	Lack of capital to invest on powerloom	9 (18.00)	18 (24.00)	27 (21.60)
2.	Non profitable labour	38 (76.00)	68 (90.67)	106 (84.80)
3.	Irregular employment	3 (6.00)	7 (9.33)	10 (8.00)
4.	Lack of government aid for self employment	5 (10.00)	15 (20.00)	20 (16.00)

Figures in parentheses indicate percentages

Multiple responses possible

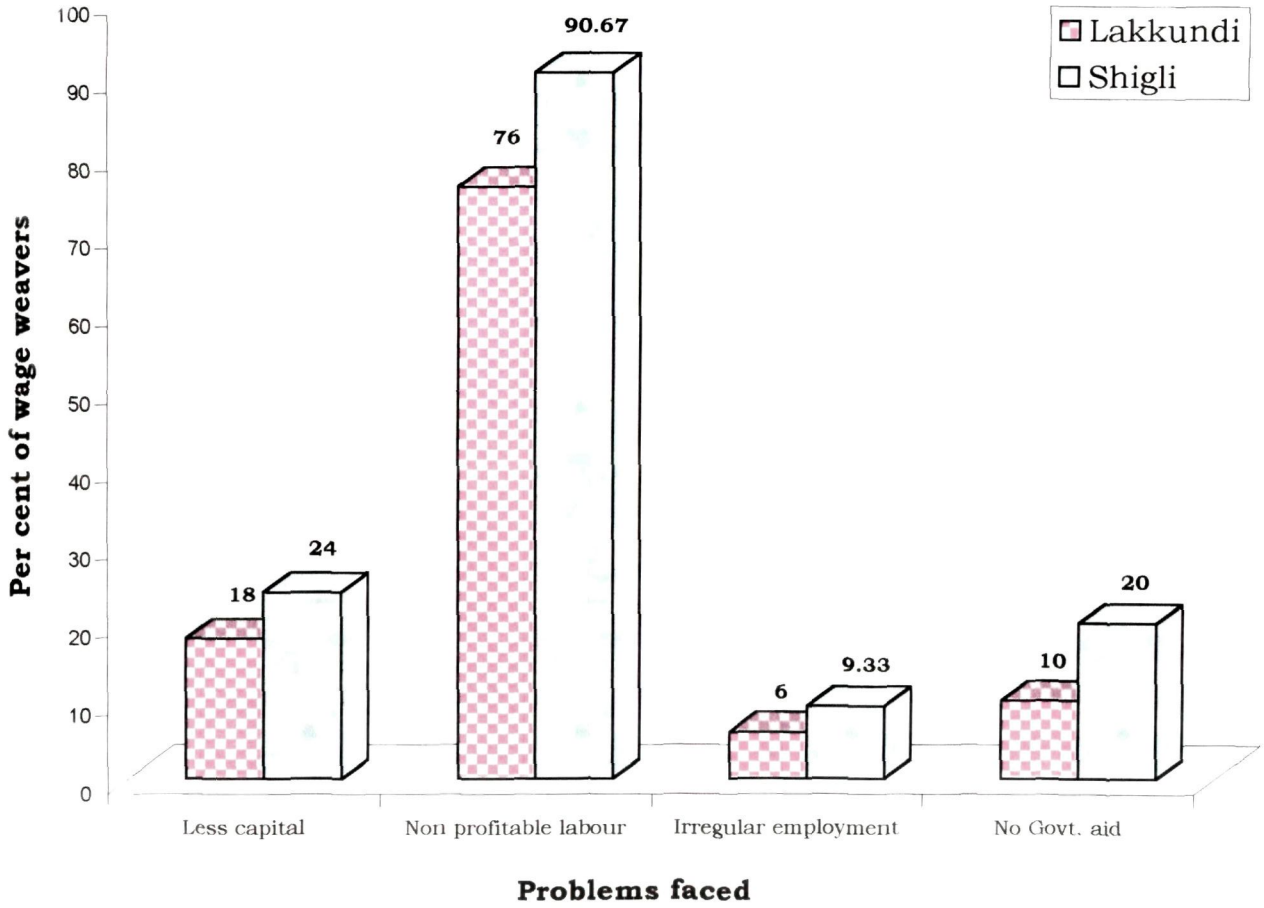


Fig. 14: Problems faced by wage weavers

4.8 Consumer acceptance for newly designed polycot sarees

4.8.1 Demographics of the consumers

The general information of the consumers included their age education, occupation and total family income explained as under;

a. Age

Table 19 reveals the distribution of the consumers according to their age. Majority of the rural and urban women belonged to the younger age group (42.00% and 38.00%), followed by middle (38.00% and 32.00 %) and older (20.00% and 30.00%) age groups, respectively.

b. Education

Majority of the rural women had secondary education (40.00%), followed by the illiterates (26.00%), primary education (18.00%) and degree and above (12.00%). Among urban consumers, majority (92.00%) were educated up to degree and above, while only 8.00 per cent had secondary education (Table 19).

In general, irrespective of the consumer's regional background, about 50 per cent of them had degree and higher education, followed by secondary education (20.00%) and 13.00 per cent, were illiterates.

Table 19: Demographics of the consumers

N=100

Sl. No.	Categories	Consumers		Total
		Rural (n=50)	Urban (n=50)	
I.	**Age**			
1.	Younger	21 (42.00)	19 (38.00)	40 (40.00)
2.	Middle	19 (38.00)	16 (32.00)	35 (35.00)
3.	Older	10 (20.00)	15 (30.00)	25 (25.00)
II.	**Education**			
1	Illiterates	13 (26.00)	-- (0.00)	13 (13.00)
2.	Primary	9 (18.00)	-- (0.00)	9 (9.00)
3.	Secondary	20 (40.00)	-- (0.00)	20 (20.00)
4.	Higher secondary	02 (4.00)	4 (8.00)	6 (6.00)
5.	Degree and above	06 (12.00)	46 (92.00)	52 (52.00)

Figures in parentheses indicate percentages

c. Occupational status

Majority of the rural consumers were unemployed (54.00%) whereas 70.00 per cent of the urban consumers were employed. Of the pooled population 58.00 per cent of the consumers were employed and 42.00 per cent were unemployed (Table 19).

d. Annual family income

Distribution of the consumers based on their annual family income is presented in Table 19. Majority of the rural consumers belonged to the low (88.00%) followed by middle (12.00%) income groups. Sixty two per cent of the urban consumers belonged to middle followed by high (36.00%) and low (2.00%) income groups.

In general, irrespective of the regional background, 45.00 per cent of the consumers belonged to low, 37.00 per cent to middle and 18.00 per cent to high-income groups.

4.8.2 Resemblance of the computerized *negi* motifs with traditional hand embroidered motifs

It is evident from Table 20 that cent per cent of the rural consumers agreed that the computerized motifs *viz.*, elephant with howdah, deer- creeper, lotus, lotus-butta and diagonal birds-creeper

did resemble with the traditional hand embroidered motifs. More than 90 per cent of the consumers mentioned that the computerized buttas *viz.*, gopuram, wheat spike-lotus, modified lotus creeper and birds-flower pot resembled the hand-embroidered motifs. Very few *i.e.*, 10 per cent of the respondents said that the computerized lotus-buds resembled the hand embroidered ones.

Among the urban consumers, majority of them agreed that the computerized motifs like gopuram (98.00%), diagonal-birds creeper (88.00%), modified lotus creeper (84.00%) and chariot (78.00%) showed resemblance to hand embroidered motifs. However, more than 50.00 per cent of the consumers agreed that all the computerized motifs resembled the hand embroidered ones. The chi square test of significance for the resemblance of computerized *negi* among the rural and urban respondents was found to be significant for the motifs *viz.*, wheat spike-lotus (7.29), swan-lotus (4.03), lotus-buds (6.78), birds-flower pot (6.78) and diagonal birds-creeper (6.38). The values were highly significant for the motifs, viz., elephant with howdah (21.95), deer-creeper (19.05), lotus (33.33) and lotus-butta (23.46)

Table 20: Resemblance of the computerized *negi* motifs with traditional hand embroidered motifs

Sl. No.	Motifs	Rural		Urban		X^2
		Yes	No	Yes	No	
1.	Elephant with howdah (*Aane ambari*)	50 (100.00)	-- (0.00)	31 (62.00)	18 (36.00)	21.95**
2.	Deer - creeper (*Chigari balli*)	50 (100.00)	-- (0.00)	34 (68.00)	16 (32.00)	19.05**
3.	Gopuram (*Gopura*)	47 (94.00)	3 (6.00)	49 (98.00)	1 (2.00)	1.04
4.	Wheat spike-lotus (*Godi teni kamala*)	45 (90.00)	5 (10.00)	34 (68.00)	16 (32.00)	7.29*
5.	Swan-lotus (*Hamsa kamala*)	22 (44.00)	28 (56.00)	32 (64.00)	18 (36.00)	4.03*
6.	Lotus (*Kamala*)	50	-- (0.00)	25	25	33.33**
7.	Lotus-butta (*Kamala butta*)	50 (100.00)	-- (0.00)	31 (62.00)	19 (38.00)	23.46**
8.	Modified lotus creeper (*Kamalada patti*)	46 (92.00)	4 (8.00)	42 (84.00)	8 (16.00)	1.52
9.	Lotus-buds (*Maggi kamala*)	20 (40.00)	30 (60.00)	33 (66.00)	17 (34.00)	6.78*
10.	Birds-flower pot (*Pakshi hoodani*)	46 (92.00)	4 (8.00)	36 (72.00)	14 (28.00)	6.78*
11.	Chariot (*Teerru*)	42 (84.00)	8 (16.00)	39 (78.00)	11 (22.00)	0.58
12.	Diagonal-buds creeper (*Vari maggi balli*)	31 (62.00)	19 (38.00)	36 (72.00)	14 (28.00)	1.13
13.	Diagonal-birds creeper (*Vari gubbi balli*)	50 (100.00)	-- (0.00)	44 (88.00)	6 (12.00)	6.38*

Figures in parentheses indicate percentages

* - Significant at 5 per cent level

** - Significant at 1 per cent level

4.8.3 Preference for hand embroidered and computerized *negi* motifs

Table 21 records the preference of the computerized *negi* motifs by the rural and urban consumers. Cent per cent of the rural respondents preferred the computerized *negi* motifs –elephant with howdah, chariot and the diagonal birds-creeper, followed by deer-creeper (98.00%), gopuram (92.00%), lotus-butta (92.00%) lotus-birds (92.00%) and diagonal buds-creeper (90.00%). On the other hand, less than 50 per cent of the rural consumers preferred hand embroidered wheat spike-lotus (46.00), swan-lotus (40.00%), modified lotus-creeper (18.00%) and birds-flower pot (12.00%).

Similarly cent per cent of the urban respondents preferred diagonal-birds creeper followed by lotus (80.00%), lotus-buds (80.00%), lotus butta (78.00%) and chariot (78.00%). However, less than 50 per cent of the urban women preferred hand embroidered wheat spike-lotus (46.00%), gopuram (40.00%), elephant with howdah (36.00%), deer-creeper (34.00%) and swan- lotus (34.00), too.

The chi square values of significance for the preference of the computerized *negi* motifs by rural and urban consumers was significant for the motifs wheat spike-lotus, modified lotus-creeper

Table 21: Preference of the hand embroidered and computerized *negi* motifs by the respondents

Sl. No.	Motifs	Rural		Urban		X^2
		H	C	H	C	
1.	Elephant with howdah (*Aane ambari*)	0 (0.00)	50 (100.00)	18 (36.00)	32 (64.00)	21.95**
2.	Deer - creeper (*Chigari balli*)	1 (2.00)	49 (98.00)	17 (34.00)	33 (66.00)	2.99
3.	Gopuram (*Gopura*)	1 (2.00)	46 (92.00)	20 (40.00)	30 (60.00)	0.00
4.	Wheat spike-lotus (*Godi teni kamala*)	23 (46.00)	27 (54.00)	23 (46.00)	27 (54.00)	3.84
5.	Swan-lotus (*Hamsa kamala*)	20 (40.00)	30 (60.00)	17 (34.00)	33 (66.00)	0.39
6.	Lotus (*Kamala*)	5 (10.00)	45 (90.00)	10 (20.00)	40 (80.00)	14.04**
7.	Lotus-butta (*Kamala butta*)	4 (8.00)	46 (92.00)	11 (22.00)	39 (78.00)	12.36**
8.	Modified lotus creeper (*Kamalada patti*)	9 (18.00)	41 (82.00)	16 (32.00)	34 (68.00)	4.34
9.	Lotus-buds (*Maggi kamala*)	4 (8.00)	46 (92.00)	10 (20.00)	40 (80.00)	0.00
10.	Birds-flower pot (*Pakshi hoodani*)	6 (12.00)	44 (88.00)	16 (32.00)	34 (68.00)	1.96
11.	Chariot (*Teerru*)	0 (0.00)	50 (100.00)	11 (22.00)	39 (78.00)	17.34**
12.	Diagonal-buds creeper (*Vari maggi balli*)	5 (10.00)	45 (90.00)	13 (26.00)	37 (74.00)	2.61
13.	Diagonal-birds creeper (*Vari gubbi balli*)	0 (0.00)	50 (100.00)	0 (0.00)	50 (100.00)	5.83

Figures in parentheses indicate percentages

H – Hand embroidery

C – computerized

** - significant at 1 per cent level

and diagonal-birds creeper. The values were highly significant for the motifs elephant with the howdah, lotus, lotus-butta and chariot.

4.8.4 Order of preference for newly designed sarees

It is observed from Table 22 that majority of the rural consumers ranked saree 1 (92.00%), saree 2 (46.00%), saree 4 (52.00%), saree 5 (68.00%) and saree 3 (54.00%) in order of preference (Fig. 15). On the other hand the order of preference for the newly designed sarees by the urban consumers was saree 4 (24.00%), saree 1 (34.00), saree 2 (32.00%), saree 3 (22.00%) and saree 5 (46.00%). However, the values of paired Z test for the significance in the order of preference for the newly designed sarees 1, 2, 3, 4 and 5 by the rural and urban consumers were 8.93, 2.55, 4.97, 0.89 and 2.42 respectively.

4.9 Comparative economics of traditional hand embroidered and newly designed polycot sarees with digitized motifs

Table 23 (Fig. 16) emphases about the cost of production of different types of sarees. Various factors like fixed cost (depreciation, repairs and maintenance), variable cost (cost of yarns, dyes, wages for dyeing, weaving and embroidery) and marketing cost (transportation) were taken into account while determining the cost of production of

Table 22: Order of preference for newly designed sarees

Sl. No.	Sarees	Ranks by Rural consumers					WAR	Ranks by Urban consumers					WAR	Z Values
		1	2	3	4	5		1	2	3	4	5		
1	Saree – 1	46 (92.00)	0 (0.00)	3 (6.00)	0 (0.00)	1 (2.00)	**1.1**	9 (18.00)	17 (34.00)	8 (16.00)	4 (8.00)	12 (24.00)	**2.86**	8.934**
2.	Saree – 2	3 (6.00)	16 (32.00)	23 (46.00)	0 (0.00)	8 (16.00)	**2.88**	14 (28.00)	8 (16.00)	7 (14.00)	5 (10.00)	16 (32.00)	**3.02**	2.55*
3.	Saree – 3	1 (2.00)	4 (8.00)	11 (22.00)	7 (14.00)	27 (54.00)	**4.11**	8 (16.00)	10 (20.00)	11 (22.00)	15 (30.00)	6 (12.00)	**3.02**	4.97**
4.	Saree – 4	0 (0.00)	26 (52.00)	5 (10.00)	9 (18.00)	10 (20.00)	**3.06**	12 (24.00)	9 (18.00)	15 (30.00)	3 (6.00)	11 (22.00)	**2.84**	0.894
5.	Saree – 5	0 (0.00)	4 (8.00)	8 (16.00)	34 (68.00)	4 (8.00)	**3.76**	7 (14.00)	6 (12.00)	9 (18.00)	23 (46.00)	5 (10.00)	**3.26**	2.42*

WAR – Weighted Average Ranking

Figures in parentheses indicate percentages

* - Significant at 5 per cent level

** - significant at 1 per cent level

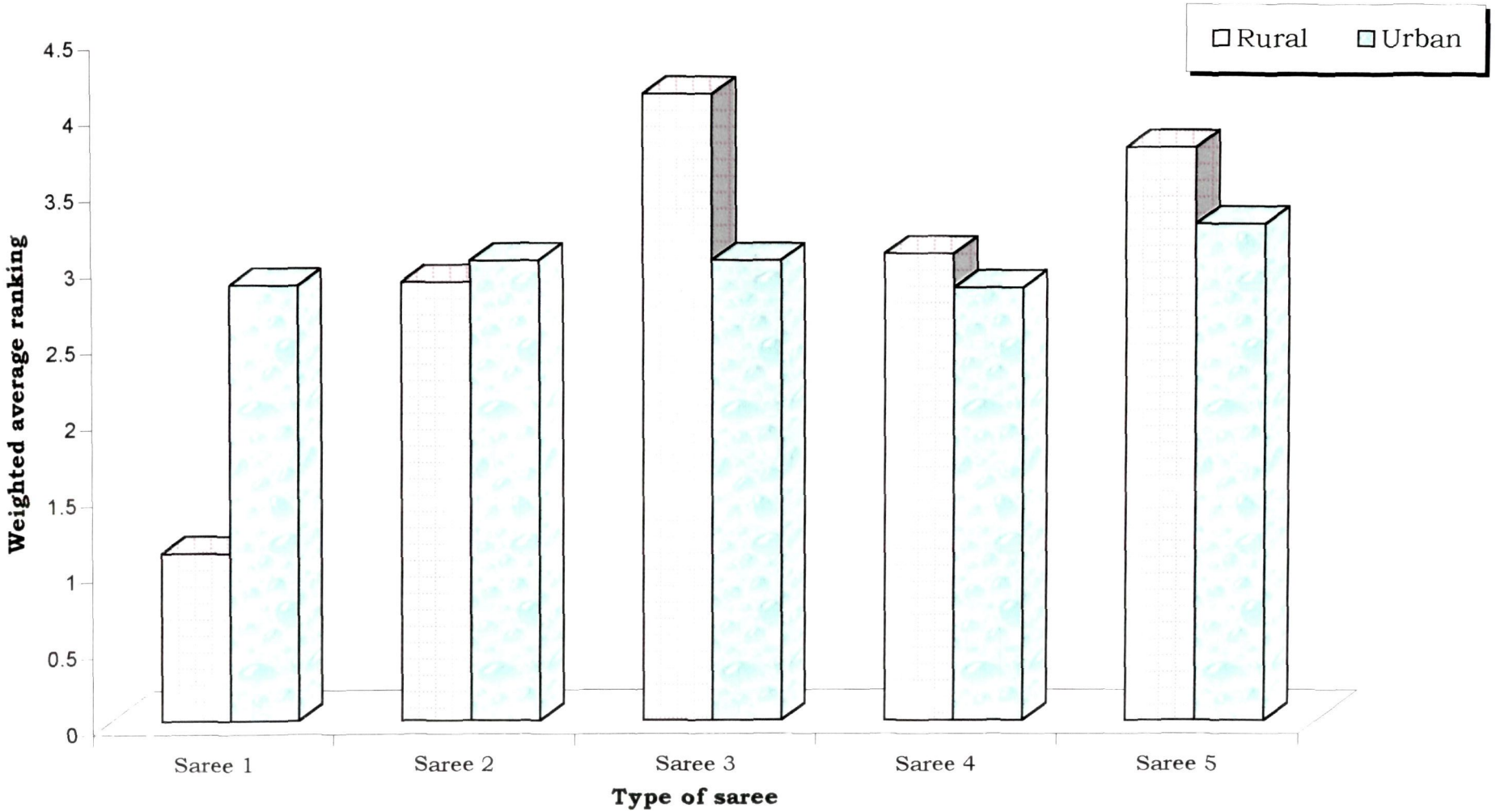


Fig. 15: Order of preference for newly designed sarees

all the of six sarees i.e., control (polycot saree with hand embroidery) and five sarees with the computerized *negi* motifs. Looking into the total cost of the control saree that accounted to Rs. 232.55, it is found that greater amount was mainly spent on the raw material (cotton - Rs. 70.65 and polyester – Rs. 41.65) followed by wages (embroidery - Rs. 75.00 and weaving – Rs. 30.00). However fixed and marketing costs accounted to be very meagre (Rs. 3.75 and Rs. 2.50, respectively). From the calculated values of total cost and total return, the weaver earned a profit of Rs. 67.45.

Similarly the total cost of each saree 1 and 2 was Rs. 250.95 encompassing 96.72 per cent of variable cost and 3.28 per cent of fixed cost including the marketing charges. However net profit earned was Rs. 99.05.

The total cost of saree 3 was Rs. 220.55 with a net profit of Rs. 129.45. The amount accounting for fixed cost was Rs. 6.45, variable cost 211.60 and transportation Rs. 2.50. Major portion of the money was spent on raw material followed by the wages.

The total cost of sarees 4 and 5 was Rs. 268.10 and Rs. 269.95 respectively. The total fixed cost of both the sarees was each Rs. 7.15 whereas the variable cost of saree 4 was Rs. 258.45 and that of saree 5, Rs. 260.30. However the cost incurred on all the variables except

Table 23: Cost of production of different types of sarees

Sl. No.	Particulars	Control		Saree 1		Saree 2		Saree 3		Saree 4		Saree 5	
		Amount (Rs.)	%	Amount (Rs.)	%	Amount (Rs.)	%	Amount (Rs.)	%	Amount (Rs.)	%	Amount (Rs.)	%
I.	**Fixed cost**												
a.	Depreciation	1.00	0.43	2.60	1.05	2.60	1.05	2.60	1.19	2.60	0.98	2.60	0.97
b.	Repairs and maintenance	2.75	1.20	5.55	2.23	5.55	2.23	3.85	1.77	4.55	1.71	4.55	1.70
	Total fixed cost	**3.75**	**1.63**	**8.15**	**3.28**	**8.15**	**3.28**	**6.45**	**2.96**	**7.15**	**2.69**	**7.15**	**2.67**
II.	**Variable cost**												
a.	Cotton yarn	70.65	30.71	78.50	31.60	78.50	31.60	78.50	36.00	78.50	29.56	78.50	29.35
b.	Polyester yarn	41.65	18.10	51.80	20.85	51.80	20.85	48.10	22.06	49.95	18.81	51.80	19.37
c.	Dyes/dyeing	9.00	3.91	10.00	4.02	10.00	4.02	10.00	4.59	10.00	3.77	10.00	3.74
d.	Wages												
	i. Weavers	30.00	13.04	100.00	40.25	100.00	40.25	75.00	34.40	120.00	45.18	120.00	44.92
	ii. Embroiderers	75.00	32.60	-	-	-	-	-	-	-	-	-	-
	Total variable cost	**226.30**	**98.37**	**240.30**	**96.72**	**240.30**	**96.72**	**211.60**	**97.04**	**258.45**	**97.31**	**260.30**	**97.33**
	Total production cost	**230.05**	**100.00**	**248.45**	**100.00**	**248.45**	**100.00**	**218.05**	**100.00**	**265.60**	**100.00**	**267.45**	**100.00**
III.	**Marketing cost**												
a.	Transportation charges	2.50	-	2.50	-	2.50	-	2.50	-	2.50	-	2.50	-
	Total cost	**232.55**	-	**250.95**	-	**250.95**	-	**220.55**	-	**268.10**	-	**269.95**	-
	Total returns	**300.00**	-	**350.00**	-	**350.00**	-	**350.00**	-	**400.00**	-	**400.00**	-
	Net profits	**67.45**	-	**99.05**	-	**99.05**	-	**129.45**	-	**131.90**	-	**130.05**	-
	Return/rupee of total cost	**1.29**	-	**1.39**	-	**1.39**	-	**1.59**	-	**1.49**	-	**1.48**	-

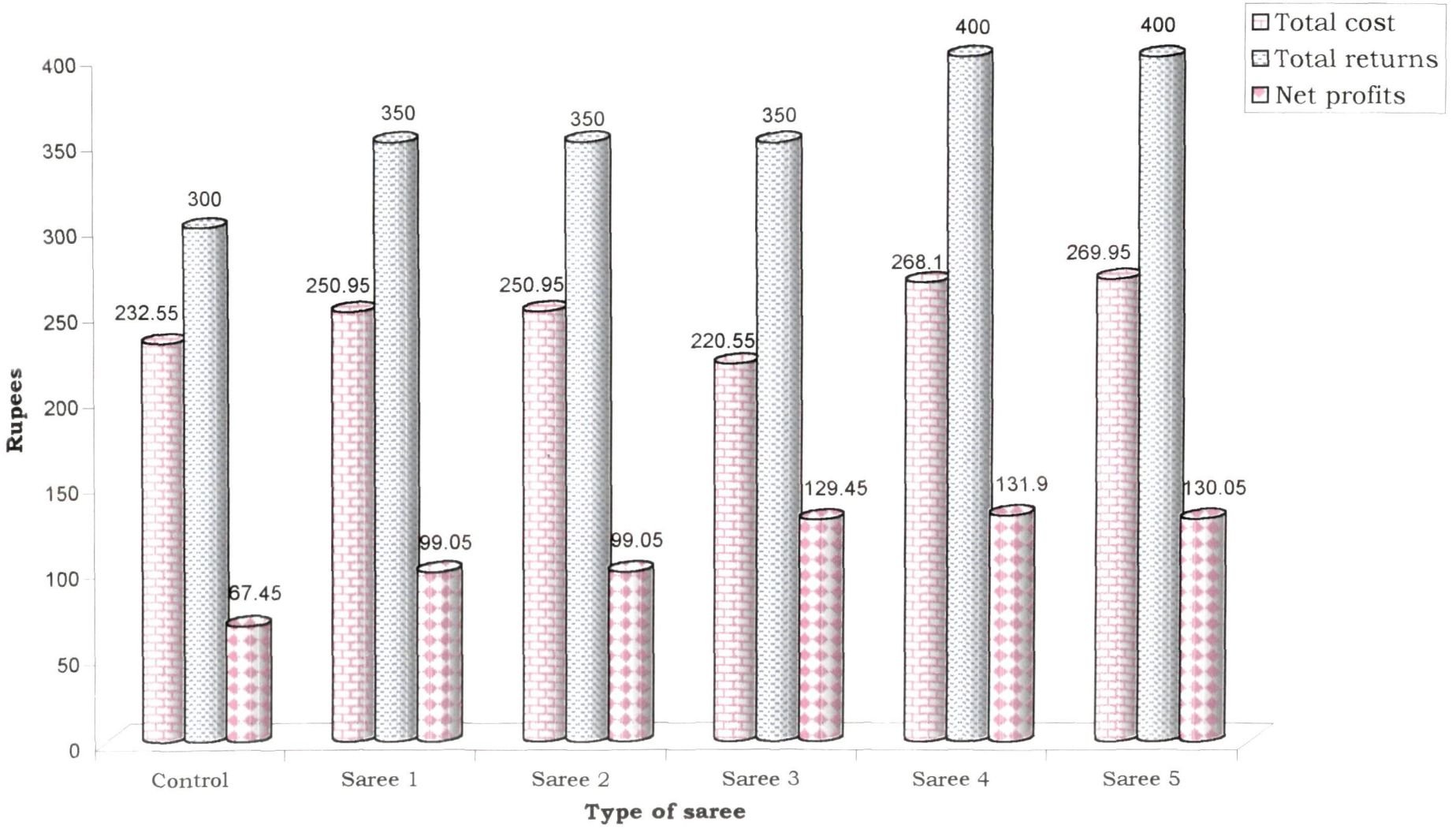


Fig. 16: Cost of production and net returns of different types of sarees

the polyester yarn for sarees 4 and 5 were the same. Cost of polyester incurred for saree 4 and 5 was Rs. 49.95 and Rs. 51.80 respectively. With a transportation of Rs. 2.50 each the net profit of the saree 4 was Rs. 131.90 and saree 5, Rs. 130.05.

On the whole the total cost of saree 5 was maximum (Rs. 269.95) followed by saree 4 (Rs. 268.10), sarees 1 and 2 (Rs. 250.95) and the traditional hand embroidered saree (Rs. 232.55). The total cost of saree 3 was the least *i.e.*, Rs. 220.55. In terms of net profit, saree 4 earned maximum (Rs. 131.90) followed by saree 5 (Rs. 130.05), saree 3 (Rs. 129.45), sarees 1 and 2 (Rs. 99.05) and traditional hand embroidered saree (Rs. 67.45).

4.10 Opinion of the consumers after wear

Many consumers came forward to purchase the newly designed Lakkundi polycotton sarees with computerized *negi* motifs and around 75-81 sarees were purchased by both rural and urban consumers during the final year of the study period. This inspired the researcher to expand her research work to gather information on suitability, wear satisfaction, comfortability, public reaction and marketability of the sarees. Keeping these factors in mind an informal interview was conducted to collect consumers opinions after wear trials, since their opinion goes in a big way to popularize these newly

designed polycotton sarees and this may be the most effective way of sales promotion, through mouth to mouth advertisement (Plates 45 and 46).

The consumers who repeatedly wore the newly designed polycotton sarees even after laundering and those who showed inclination to purchase few more sarees formed the subject, for this part of the study. On personal interview the subjects expressed their opinion, which is narrated as below:

- These sarees are best suitable for professionals like T.V., newspaper, airhostess, officials in exclusive departmental stores, executives and so on. These sarees can also best go as uniforms for teachers, NSS volunteers, receiptionists and best as a symbol of regional identity in cultural march during national festivals and sports events, too. Almost all the consumers opined that the saree could be uniquely and exclusively given as a traditional gift for all age groups.

- The sarees were found to be very comfortable by the wearers because of good air permeability, absorbency, soft feel and lightweight. Due to the compactly woven border the saree draped into graceful folds that required no additional fall usually stitched to light synthetic sarees. The saree showed

Plate 45: Consumers busy expressing their opinions about computerized polycotton sarees

Plate 46: Gals admiring each others sarees

excellent resiliency an added advantage plus simple need of care and maintenance attributed to greater demand specially from working women.

- A couple of consumers expressed that the sarees are comfortable; hence most suitable even in traveling that expresses the elegance, dignity and individuality.

- Beauty lies in the eye of the beholder. It is very pleasing to get admired by people around, when something new is worn. Saree is the universal made-up suitable for all age groups, personalities and figure types. Appreciation is not a pre-determined statement but comes out spontaneously, when something is really striking. This sort of expression was felt by almost every wearer when presented themselves in these newly designed polycotton sarees. Some expressed that even few strangers admired the saree personally and enquired about their place of manufacture and availability. Infact they mistook the computerized woven designs to hand embroidery. Some of the textile experts admire the new venture of reviving the traditional hand embroidery.

- Consumer behaviour is very strange and is very difficult to study, understand and conclude, which inturn dictates the

market trend and market strategy. In order to satisfy the consumers today, endless varieties of textile materials are flowing in the market. Consumer expects a change and new introduction always. But the sustainability of any textile material in the market depends upon its quality, appearance, comfort, price and diversity within the product. Hence the diversity in simple polycotton saree by computerized *negi* motifs is a challenge in the market. The consumers expressed that cent per cent marketability is possible not only in local market but also at national and even international market, because of its uniqueness.

Discussion

V. DISCUSSION

The findings of the present study are discussed in detail under the following sub headings.

5.1 Evolution of looms and products manufactured

5.2 Demographics of the weavers

5.2.1 Demographics of wage weavers

5.2.2 Demographics of master weavers

5.3 Raw material

5.3.1 Raw material details

5.3.2 Procurement of raw material

5.3.3 Mode of payment

5.3.4 Frequency of purchasing raw material

5.4 Weaving Lakkundi polycot sarees with digitized motifs

5.4.1 Digitizing the *kasuti* motifs

5.4.2 Preparation of jacquard cards

5.4.3 Loom and weaving technology employed to weave newly designed polycot sarees

5.5 Description of newly designed polycotton sarees

5.6 Production and marketing of polycotton sarees

5.6.1 Variety of polycotton made-ups manufactured

5.6.2 Production rate

5.1 Evolution of looms and products manufactured

The types of looms and the production of variegated textile made-ups at Lakkundi and Shigli (Tables 2a and 2b) revealed that throw shuttle pit loom existed in Lakkundi even before independence. The off white coloured *lungi* called the *ambasi phadiki dhadi panje* with contrast borders with *rudraksha* and chrysanthemum motifs on either sides was woven on the loom using three shuttles, one big for the body and two small for borders. A custom of wearing the

contrast-bordered *lungi* for rituals and marriages was a common prevailing practice then. Rayon- 'the imitation silk' flooded the Indian market during 1950s, hence replaced cotton yarns in the border. The smooth and glossy properties of rayon enhanced the richness of traditionally famous bordered *lungis* (*dhadi panje*). During 1975, majority of the weavers started weaving mercerized sarees after replacing the throw shuttle with the fly shuttle pit loom. Power looms were introduced in later 1980s along with the cone technique for weaving *lungis* of contrast polyester border. It was possible to replace the traditional technique of using three shuttles by adopting cone technique where two polyester cones placed on either sides of the loom directly interlocked (*kondi* technique) with the body weft.

It was then in the early 1990's, that the proprietor of Prasiddhi Handlooms, Bangalore encouraged the master weavers to produce polycot sarees with contrast borders similar to the bordered *lungis*. The traditionality of bordered *lungis* is still preserved in the polycot sarees. However, slight variation in the placement of the motifs *viz.*, the *rudraksha* and the chrysanthemum is made to meet the demand of the consumers.

Similarly, the oldest traditional product woven at Shigli was the *Jerigi Pethi datti*, a holy saree used to decorate idols of goddesses. The village Shigli is only 6 km away from Lakshmeshwar, the latter

being historically famous for Chalukyan architecture. It is said that Lakshmeshwar once enjoyed celebrating fairs all the year round. The custom of offering saree to goddess during fairs, probably was one of the reasons to produce small goddess sarees in bulk by the near by weavers. Weaving mercerized saree was in vogue during 1955 to 1979. Initially the sarees were woven on fly shuttle pit loom, which had a bamboo stave in place of warp beam. Shailaja (1992) reported that similar looms were used to weave mercerized sarees at different places of Northern Karnataka *viz.*, Ilkal, Gajendragad and Hubli. Popularization of power loom in the early 1970s boosted the production of mercerized sarees. By the year 1992, Lakkundi polycot sarees became popular in Dharwad market. Meanwhile, the master weavers of Shigli who visited Dharwad market to sell their mercerized cotton sarees were encouraged by the wholesale merchants to weave polycotton sarees. This was the first milestone to start polycotton sarees at Shigli. Majority of the weavers at Shigli are now producing polycotton sarees throughout the year because of consumer demand, better returns and market strategies.

5.2 Demographics of weavers

5.2.1 Demographics of wage weavers

The demographic status of wage weavers weaving polycot sarees included the age, education, type of family, size of family, total

annual income, subsidiary occupation and caste are discussed under the following sub headings:

a. Age

From the Table 4 it is inferred that majority of the wage weavers at Lakkundi belonged to middle age (52.00%) followed by older age (26.00%) and younger age (22.00%). Majority of younger wage weavers preferred to take up jobs rather than weaving. On the other hand more than fifty per cent of the middle aged preferred to continue their ancestral occupation *viz.*, weaving either *kambli* (woollen blanket) or *lungi.* Hence, only 26.00 per cent of them worked as wage weavers. The majority of the middle-aged wage weavers fell in the age range of 28-38 years. However, these findings are similar to the findings of Karunanidhi (1986).

On the other hand, more than one third of the wage weavers in Shigli belonged to each middle and younger age groups, whereas about one fifth of them to older group. This group of older wage weavers wished to continue their tradition of weaving mercerized cotton sarees on fly shuttle pit loom. On the other hand, majority of the middle and younger family members worked as wage weavers and enhanced the total family income.

b. Education

It is noticed from Table 4 that majority of the wage weavers (64.00%) in Lakkundi were educated up to primary level whereas, 12.00 per cent, illiterates. None of them undertook higher education, which may be due to their financial crisis, non-availability of local educational facilities and lack of encouragement from the elders to go for higher education. However, these results are on par with the findings of Mamatha and Naik (1997) and Sanapapamma and Mahale (2001).

It is surprising to note that cent per cent of wage weavers at Shigli were literates, of which 65.00 per cent with secondary education followed by higher secondary (21.33%) and primary (12.00%). About 3.00 per cent were degree holders. It was heartening to note that even the degree holders worked as wage weavers which may be due to the financial crisis, non-availability of employment opportunities, lack of funds to invest on heavy machinery and imposment by the elders to continue in ancestral occupation.

c. Family type

It is apparent from the Table 4 that about 56.00 per cent of the wage weavers at Lakkundi fell in the category of joint family and the remaining to nuclear family systems. At Shigli the results were vice

versa, *i.e.,* majority (65.33%) belonged to nuclear family. Irrespective of the locations, totally 56.80 per cent of the wage weavers belonged to the nuclear family system. It is of course true that nuclear family offers lesser burdens than joint family. Further, because of lack of facilities, opportunities, comfort in terms of shelter, food, clothing and problem of social adjustment in joint family, many wage weavers opted for nuclear family system. The present findings are in conformity with the findings of Mamatha and Naik (1997), Sunita (2000) and Sanapapamma and Mahale (2001).

d. Family size

As far as family size was considered majority of the wage weavers from both Lakkundi and Shigli belonged to medium family size with 4 - 7 members. At Lakkundi 28.00 per cent of them had large families with more than 7 members. Looking back at the type of family, it was observed that majority of the Lakkundi wage weavers belonged to joint family system. Hence, it is but natural that the size of the family was large. On the other hand, the prevailing family type at Shigli was the nuclear system. The members in large families probably were curtailed of basic amenities; hence intelligently the wage weavers opted for medium family norms that reduced the financial risk and provided opportunities of comforts (Table 4).

e. Subsidiary occupation of wage weavers

Majority of the wage weavers at Lakkundi had *Kambli* weaving as their subsidiary occupation. Historically, Lakkundi was also known for the *Kambli* (woolen blankets) woven by the sheep rearing community - the *Kurubas*. The *Kamblis* produced with coarser deccani wool had very good market in the rural areas. In their joint family system it was possible for one of the family members to exclusively look after the weaving and marketing of *kamblis*. On the other hand some of the families other than shepherd community women did work as wage weavers for KHDC and as farm labours, who added to the family income. Two of the wage weavers owned a tea and a butcher stalls that helped them to earn subsidiary income (Table 4).

Similarly, majority of the wage weavers (40.54%) at Shigli earned additional/subsidiary income through agriculture. The ancestral occupation of majority of the wage weavers was agriculture followed by weaving mercerized sarees on the fly shuttle pit loom. Wage weavers opined that agriculture as a subsidiary occupation was seasonal and could not earn significant income during the last 2-3 years. Secondly, the traditional production of mercerized sarees woven on the fly shuttle pit loom was slow, time consuming and added meagre amount to the total family income. In other words it

may be inferred that even after adopting the subsidiary occupations majority of the wage weavers at Shigli belonged to the low-income group.

f. Total annual income

Based on the total annual income, the wage weavers were classified into three-income groups viz., low, middle and high (Table 4). Majority of them at Lakkundi belonged to high-income group with an annual income of Rs. 31, 728/-. Contradictorily, at Shigli they belonged to low-income group, Rs. 21, 456/- per annum. This might be because of the opportunities available for Lakkundi wage weavers to earn more through subsidiary occupations like agriculture, *kambli* weaving, weaving for Karnataka Handloom Development Corporation (KHDC) and other petty business. Further, with the existing joint family system more than one member of the family may move out to work and support the family income. The reason being vice versa at Shigli where, with small family norms only the head of the family earned the livelihood as wage weaver. Agriculture with seasonal calamities was less profitable. These findings are partly in conformity with the findings of Mamatha and Naik (1997), and Sunitha (2000), where majority of the weavers belonged to middle followed by low-income groups.

g. Caste of wage weavers

It is noticed from Table 4 that, majority of the wage weavers belonged to Kuruhinshetti caste followed by Naamdevas and Kurubas. This is probably because of the total population, *kuruhinshetti* and *kurubas* constituted a major group compared to d*evangas*. However, Haridas (1998) mentioned the dominance of *devanga* sects in the historically famous ancient Lakkundi. However, *kallals*, *lingayats* (*panchamsali* and *ganigers*) and Muslims lately involved themselves in weaving polycots, which may be because of easily and locally available employment opportunity.

5.2.2 Demographics of master wearers

It is imperative from Table 5 that majority of the master weavers at Lakkundi belonged to older age group, whereas at Shigli, belonged to younger. With the assurance from Bangalore based wholesaler the 'Prasidhi Handlooms' regarding better value for polycotton sarees the older master weavers of Lakkundi made an effort to diversify their product. Having not given the assurance of marketability these master weavers would not have taken the risk of manufacturing polycotton sarees. However, the production of these sarees was gradually increased by expanding their markets. On the other hand the elderly master weavers at Shigli were not fully

convinced and hence felt it risky to weave polycotton sarees. But the young and enthusiastic weavers studied the consumer behaviour and realized the importance of diversification and thus adopted the cone technique to manufacture polycotton sarees.

As far as education of the master weavers was considered most of them were educated upto primary level. Reasoning out, lack of encouragement for studies, financial support improper schooling facilities in the village and added responsibilities in their early childhood might be the factors affected their education.

It was clearly noticed in the study area that almost three fourth of the master weavers lived in joint family system, depicting the Indian traditionality. Weaving is the art, transferred from generation to generation where the sons shouldered the responsibility of weaving along with their fathers and grandfathers and never thought of taking up other profession. Weaving is that craft, involves almost every family member from adolescent to non-agerian. It was but natural that the members in such family were relatively more and usually ranged from 9 to 12. On the other hand few per cent of them were aware about the advantages of having few children, which was evident from nuclear family system.

The total annual income presented in Table 5 revealed that majority of master weavers at Lakkundi fell in the low income group category while at Shigli in the middle (40.00%) and high (40.00%) income groups. The annual income is basically affected by set of factors *viz.*, the total looms possessed, total production per week, the returns and subsidiary income from other sources, if any. The master weavers of Lakkundi did face one or the other problems aforesaid. On the other hand, the master weavers at Shigli owned more number of looms and earned better returns. In addition these master weavers refined the product quality and introduced new designs that fetched better prices in the market. They did get good subsidiary income from agriculture that in turn enhanced their annual family income.

Among the master weavers the *devangas* and *naamdevas* predominated the weavers community and led in the production of polycotton sarees. However, Shailaja, 1992 mentioned in her study that *nekars* and *devangas* were once famous for their outstanding production in weaving in northern Karnataka.

It is evident from the results that half of the master weavers owned around 14 - 17 looms and one fourth of them more than 17. This depicted their socio-economic condition and working system. It was easy to manage these many looms and keep ready the

preparatory work, since in the joint family every member contributed his/her share of work in preloom, loom and post loom processes.

5.3 Raw material

Although the basic type of raw material used in the production of the sarees was same, slight variations existed in the quality of the material purchased, frequency of purchase, procurement and mode of payment which are discussed as under

5.3.1 Raw material details

Not much difference was found in the quality of raw material used at Lakkundi and Shigli. In newly designed computerized polycotton sarees the extra weft figuring was created two strands of double polyester yarn. Shigli weavers used finer cotton warp yarns (120s), than Lakkundi weavers (100s), probably to produce finer quality sarees, a demand from the consumers and wholesalers (Table 6).

5.3.2 Procurement of the raw material

It is imperative from Table 7 that cent per cent of the Lakkundi master weavers purchased cotton yarn from the wholesale markets. Gadag, a district place, 11 kms away from Lakkundi has major

spinning mills and dyeing units. Hence it was easy for the master weavers to purchase the raw materials from Gadag itself. On the other hand master weavers at Shigli most of the times purchased cotton yarn from retailers at Lakshmeshwar, 6 kms away from Shigli. Lakshmeshwar is historically famous for weaving mercerized sarees, hence has a retail market for cotton yarn. At times the Shigli master weavers did purchase cotton of required counts from Gadag or Hubli and got it dyed from dyers at Betageri near Gadag. Polyester was purchased from wholesale dealers at Belgaum. However Hubli was the place to purchase chemicals and dyes on wholesale.

5.3.3 Mode of payment

Results in Table 8 depicted that majority of master weavers purchased all the raw material on cash payment and rest on credit. Factors like the socio-economic status of the master weavers and taking advance payments from the wholesalers who placed orders for sarees might have influenced the mode of payment. Sometimes the master weavers did purchase the raw material on credit.

5.3.4 Frequency of purchasing the raw material

It is apparent from Table 9 that 75.00 per cent each of the master weavers purchased the raw material 'monthly' and

'fortnightly' whereas 37.50 per cent each made purchases 'quarterly' or 'fortnightly' respectively. This may primarily be due to the reason that raw materials are purchased based on the number of looms owned and the quantity of orders received from the wholesalers. The frequency of purchasing little amount of dyes and chemicals used only for pallav dyeing was relatively less.

5.4 Weaving Lakkundi polycot sarees with digitized motifs

Production of the newly designed polycot sarees with computerized *negi kasuti* motifs involved various processes like digitizing the selected motifs, pre-loom, loom and post-loom processes.

5.4.1 Digitizing the *kasuti* motifs

It was more advantages to convert the *kasuti* motifs on computer than manual designing. The manual process was time consuming, slow, required skill and was less flexible to change, modify and replicate the design. On the contrary it was possible to produce good number of designs in short time on computer that saved labour too. These results are in line with the studies conducted by Chajjed and Shah (1993) and Kumar and Nerli (2001). The complex processes of converting the diagonal lines of the design into

parallel lines were made easier by using commands like cut, copy, paste, rotate/flip, array, mirror, offset and fill available in the textile designing software's – Paint Shop Pro (PSP) and GC Kala 2000 (Fig. 2).

5.4.2 Preparation of Jacquard cards

The dimension of the selected *kasuti* motifs ranged from 1cm to 6cms. Thus, digitizing of *kasuti* motifs to *negi* form was done by keeping the size of the motif unaltered to retain the traditional flavour. No other technique than jacquard was found to be suitable to incorporate the designs in the saree body, hence the handloom jacquard of minimum capacity (120 needles) was selected. The jacquard cards were punched and laced manually according to the motifs.

5.4.3 Loom and weaving technology employed to weave newly designed polycot sarees

The dobby shedding with cone technique to weave motifs in the border was already in use on the powerloom since a decade. Hence the handloom jacquard was the only additional attachment made on the powerloom to weave motifs in the body and the pallav.

5.5 Description of newly designed polycotton sarees

It is apparent from the Table 11 that of the newly designed sarees the cloth sett was relatively better in the Saree 1 (70/80). The

width of the saree was maximum (46 ") as noticed in the Saree 2, 3 and 4. The borders of Saree 3 and 4 were wider because of the additional gingham checks of two inch woven above the regular border. Among the five sarees, Saree 2 was woven with a narrow border of two inch. This sort of diversity in the dimensions was made in the sarees mainly because of the demand by the consumers *i.e.*, some of them preferred small border while few others wider. Further a variation in the width of the saree was observed and this may be done to meet the requirement of different types. Thus it was inevitable for the master weavers to produce sarees with variation in the dimensions of body, border and pallav.

Plates 22-44 (Table 12) exhibited the woven sarees along with *kasuti* motifs. Legends, myths and sacred lore have greatly influenced the decorative theme and motifs of the folk crafts. The folk embroideries are not merely designs worked on the fabric but are symbolic manifestations of various themes of cultural heritage. Hence maximum efforts were made to preserve the traditional look of sarees 1 and 2 by way of selecting and placing the motifs similar to the traditional hand embroidered motifs.

In folk embroidery, chariot is compulsorily accompanied with the elephant with howdah. The creepers of buds and lotus flowers symbolised the decoration usually made on the chariot of Lord Shiva,

while serially placed deer's (deer-creeper) depicted the procession. The large and small lotus butta in the folklore depicted the offerings made to the Lord Shiva during pooja (saree 1). Gopuram along with birds-lotus formed the theme for 'aasana', a mat for the offerer (saree 2).

However unlike hand embroidery, in computerized weaving, it was possible to weave single motif across the width of the saree using extra weft figuring. Thus different motifs in a theme were placed in different rows. However, use of more than one colour in a single motif increased the number of floats on the wrong side, hence use of many colours in single motif was a barrier compared to hand-embroidered motifs.

Modified pallav was the specialty of saree 3. the traditional multicoloured band effect in the saree was replaced by four rows of lotus creeper woven across the width of the pallav. This modification was planned to meet the demand of the special group of consumers who wished to have a simple polycotton saree with emphasis on jacquard pallav.

The most attractive motif, the birds-flower pot was then, embroidered on mockleno door curtains. The effect of the motif used to be made bold with cross-stitch. In the present study an effort was

made to incorporate this motif on saree 4 and the effect was much better on computerizing and weaving than hand embroidering. Further the birds-flower pot motif is woven along with other motifs *viz.*, wheat-spike lotus and diagonal-birds creeper to give a special effect.

Saree 5 was different from other four sarees, where the pallav was elaborately decorated with bands of modified lotus creeper, birds-flowerpot and wheat-spike lotus. It is necessary to mention here that sarees 3, 4 and 5 were exclusively designed to create variety in production.

5.6 Production and marketing of polycotton sarees

The production aspect included the variety of polycot made-ups manufactured and the rate of production of polycot sarees. The place and frequency of marketing these sarees were dealt under the marketing aspects.

5.6.1 Variety of polycotton made-ups manufactured

It is evident from the Table 13 that among the three master weavers at Lakkundi two were involved in weaving salwar suits and one in the production of polycot *lungi* with contrast border (*dhadi panje*). The powerlooms with cone technique were introduced at

Lakkundi during 1988-89, initially to weave the polycot *lungis*. Lack of demand and market for polycot *lungis*, on one side and rise in the demand and popularity of polycotton sarees on the other hand may be the reason to bring diversification in the products by the master weavers. However one of the master weavers did reserve two of his powerlooms exclusively for to weave polycot *lungis* probably with the idea to capture new markets for these unique bordered *lungis*. These *lungis* are exclusively used by priests/pandits, sages and brahmin men while performing various rituals and by the bridegrooms in marriage not only as *lungi* that is wrapped around the waist, but as a holy shawl draped in front over both the shoulders. On the other hand the master weavers at Shigli did weave salwar suits only on bulk orders from the wholesalers.

5.6.2 Production rate

The production rate of the traditional polycotton sarees/loom/week was relatively higher (20 sarees/loom/week) at Lakkundi as compared to Shigli (15 sarees/loom/week), which may be because of the higher efficiency of the wage weavers (Table 14 and Fig. 11).

Among the newly designed sarees, the production rate of saree 3 was more (13 sarees/loom/week) followed by sarees 4 and 5 (11

sarees/loom/week) and sarees 1 and 2 (9 sarees/loom/week). The loom stoppage was quite frequent because each motif was woven with separate shuttle where the loom stopped after insertion of each pick since the motif was manually interwoven. The number of cards (picks/repeat) in the particular design was also another factor that influenced the rate of production *i.e.*, higher the number of cards greater the frequency of loom stoppage and lesser the rate of production. In other words it may be expressed as number of cards in a design inversely affected the production rate. Moreover the sarees with extra weft figuring both in body and pallav took additional time. But the production rate to certain extent depended on the efficiency of weaving and jacquard operation. Hence the production of the sarees 1 and 2 was relatively less as compared to saree 3 where the latter, the shuttle moved vigorously across the width of the cloth to weave designed bands in the pallav.

5.6.3 Market for polycotton sarees

From Table 15 it is evident that majority of the master weavers sold their goods to exclusive showrooms, which clearly indicates that the polycotton sarees have greater demand in urban areas and are the same in vogue. Almost seventy five per cent of the master weavers sold their polycotton sarees to the local wholesalers who in turn sold these sarees as 'Dharwad' sarees to nearby markets, sometimes

outside the state too (Fig. 12). It was heartening to learn that these beautiful sarees manufactured at Lakkundi are identified as 'Dharwad' saree but at the same time Lakkundi weavers were deprived of the credit of initiating and nourishing these exclusive sarees.

5.6.4 Frequency of marketing

A glance at Table 16, revealed that majority (87.50%) of the master weavers, who owned 14 to 17 looms sold the polycotton sarees once a week (Fig. 13). The lack of storage facilities may be one of the reasons for supplying fresh goods to the wholesalers. Fifty per cent of them did sell the sarees once in fortnight probably to economize the transportation charges. On the other hand fifty per cent of them sold the sarees as and when ordered *i.e.*, hike in the demand during marriage and festivals enforced the wholesalers as well as retailers (showrooms) to place bulk orders as per the buying trend of the consumers. This opportunity was best made use of by the master weavers who produced commercially to distribute as and when ordered.

5.7 Problems of weavers

It is apparent from Table 17 that the major problems faced by the master weavers while procuring raw material were hike in the

price and the non-availability of required counts of cotton yarn. During production the major problem faced by the weavers was irregular supply of electricity because of which the wage weavers were imposed to work for less than eight hours. This inturn affected the output per week. The main reason for interrupted power supply was regular load shedding practiced legally. Another major problem faced by the master weavers was unwillingness of the wage weavers to weave new designs. At this juncture on analysis it was learnt that in fact the wage weavers showed willingness to weave new designs provided better wages were given. One of the wage weavers clearly mentioned that weaving sarees with extra weft figures is not only labour intensive but did affect the rate of production per week because of loom stoppage. Since the wage weaver is a worker paid on piece basis, his weekly earnings were drastically affected. Therefore it is not the wage weavers who were unwilling to weave new designs but it is the master weavers who were unwilling to pay better remuneration for new designs. Hence the diversification in the product since ages was not noticed. Hike in transportation cost was a major marketing problem posed by majority of the master weavers (75.00%). This was mainly due to improper distribution of raw material and hike in the prices of cotton fibers and yarn. Hence, it is felt that the government need to take some remedial measures to provide adequate raw materials to reduce the cost of transportation

and marketing. However, similar results were observed in the studies conducted by Singh and Malhi (1989), Mamatha and Shailaja (1997).

When master weavers faced one or the other problem it is but natural that the jobbers working under them also faced some. The first remark that came from the wage weavers was their dissatisfaction towards wages (Table 18 and Fig. 14). It was opined that this job work was less profitable. Some of them expressed their inability to buy powerlooms for themselves because of lack of funds. The initiation of powerloom adversely affected handloom sector since the former was labour recessive and production intensive. That was the reason by 2000 almost all the handlooms came to standstill. Thus it is inevitable for the handloom weaver to work as wage weaver in powerloom sector since with poor educational background these artisans knew no other craft better than weaving. Further some of the artisans didn't even have regular employment throughout the year.

5.8 Consumer acceptance for the newly designed polycot sarees

5.8.1 Demographics of the consumers

It is observed in Table 19 that majority of the consumer's from both rural and urban background belonged to younger age group (<29 years) and very few to the older (>38 years). In rural Karnataka,

saree is still a traditional wear worn both by adolescent girls and elderly women. Nevertheless even urban ladies showed interest for the traditional sarees. Hence, the sample consisted of consumers of all the age groups interested in the traditional wear, the saree.

When education of the consumers was preferred majority of the urban cluster were with degree and higher education (92.00%). This may be because of the better education facilities, zeal to study, awareness of the importance of education, higher economic status, better opportunities and encouragement received by family members. On the contrary one fourth of the rural consumers were illiterates maybe because of no encouragement, early marriage, lack of education and financial facilities to study in the rural areas.

It was interesting to note that more than fifty per cent of them were employed. From this it is evident that the changing social norms have improved the status of women. Besides the newly structured policy of reserving 33 per cent of the government jobs for women has encouraged them to take up employment. Moreover, educated women both in rural and urban areas preferred to become self-sufficient/sustainable by way of earning means their livelihood. These may be few reasons for the increasing trend observed in the employment of women. Further urban consumers belonged to higher income group since it depended on the qualification, designation,

employer, total years of experience and salary on one hand and on the other hand the family income was also supported by number of family members working, size and type of family, subsidiary occupation and so on.

5.8.2 Resemblance of the computerized *negi* motifs with traditional hand embroidered motifs

More than sixty per cent of the urban consumers accepted almost all the computerized buttas since they resembled hand embroidered motifs. On the other hand majority of the rural consumers expressed the resemblance of all he computerized motifs, except two *viz.*, swan-lotus and lotus buds to that of embroidered ones. However the X^2 values for the opinion for the resemblance of the computerized *negi* motifs *viz.*, elephant with howdah, deer creeper, lotus and lotus butta among the rural and urban consumers was highly significant. Further the X^2 values for the wheat-spike lotus, swan-lotus, lotus buds, birds-flowerpot and diagonal birds-creeper were significant at 5 per cent level implying the better resemblance of these motifs with the traditional hand embroidery, hence making them more acceptable (Table 20). The null hypothesis that the computerized woven *negi* motifs do not resemblance the hand embroidered motifs was hence rejected

5.8.3 Preferences for the hand embroidered and computerized *negi* motifs

Result presented in Table 21 revealed that all the rural women preferred computerized *negi kasuti* motifs *viz.*, elephant with howdah, chariot and diagonal birds-creeper, followed by deer-creeper (98.00%), lotus buttas (92.00%) and diagonal buds-creepers (90.00%). Because in rural areas the sarees are commonly embroidered with these motifs and these motifs appeared almost alike after computerizing. Further it is believed sacred to wear embroidered sarees having chariot and elephant with howdah motifs during rituals.

More than half of the urban consumers preferred all the computerized embroidery motifs, since it resembled the hand embroidery. In general, as compared to the rural respondents, majority of the urban responders preferred hand embroidered motifs may be because of greater affinity for traditional and ethnic designs.

The chi-square values for hand and computerized embroidery motifs among the rural and urban respondents was found to be highly significant for motifs *viz.,* elephant with howdah, lotus, lotus butta and chariot, whereas the results were significant at 5 per cent level for the motifs wheat spike-lotus, modified lotus-creeper and the diagonal birds-creeper.

The respondents opined that the digitized *kasuti* motifs were more uniform, compact, elegant and unique by themselves. Many of the respondents mentioned that sarees with single motif appeared prettier and did appreciate the idea of reviving '*negi*' stitch through digitizing

Urban respondents preferred sarees with hand embroidered *kasuti* motifs because of their elegancy, multicolored buttas in a single row, delicacy and the traditionality. Hand embroidered *kasuti* motifs with *murgi* and *gavanti* stitches looked identical on either sides of the fabric and hence were uniquely preferred. However, few expressed dissatisfaction with the hand embroidery and mentioned irregular stitches, varied stitch lengths and high cost as the drawbacks.

5.8.4 Order of preference for newly designed sarees

It is interesting to note that rural women preferred sarees 1, 2, 4, 5 and 3 in order. The sarees 1 and 2 were given higher rankings since the motifs were placed similar to traditional themes. This clearly indicated that the rural consumers still have a strong traditional belief that the sanctity of the saree is preserved only when motifs are placed as per the customary themes. Hence the sarees woven with traditional blend were more preferred than those with

modified pallavs. These results are also justified by the fact that the motifs *viz.*, elephant with howdah, chariot, diagonal birds-creeper and deer-creeper in saree 1 and gopuram, lotus butta, swan-lotus and diagonal birds-creeper in saree 2 were preferred by majority of rural respondents (Table 22 and Fig. 15).

On the contrary the preference for birds-flower pot varied with its placement in the saree *i.e.*, in saree 4 the birds-flower pot woven just above the pallav was given better ranking than the saree 5, where the same motif woven within the pallav.

It is a customary practice among rural women to embellish the pallav that draped gracefully over the shoulders and head. The most common way of draping saree is to pleat at the waist and throw one end over the left shoulder and then onto the right side by covering the head. Women in the leisure time decorated the pallav alone with traditional folk art the *kasuti* embroidery. Therefore rural women even today preferred similar type of decoration in the newly designed computerized sarees.

On the other hand the order of preference for the newly designed sarees by the urban consumers was saree 4, 1, 2, 3 and 5. The saree 4 was preferred most by the urban respondents may be because of the uniquely stylized border with traditionality of the

motifs and their placement in the body. However, the traditionally designed sarees 1 and 2 were also preferred that may be because of their growing interest towards ethnic fashions.

The *z* tests of significance for comparing the weighted average ranking of rural and urban groups were found to be highly significant for the sarees 1 and 3. Whereas, the values were significant at 5 per cent level for the sarees 2 and 5 implying that a significant difference in the order of preference for the newly designed sarees by the rural and urban consumers existed.

5.9 Comparative economics of traditional hand embroidered and newly designed polycotton sarees with digitized motifs

It is apparent from Table 23 (Fig. 16) that the total cost of saree 5 was maximum (Rs.269.95) followed by saree 4 (Rs. 268.10) which may be due to the higher wages paid to the weaver that accounted to about 45 per cent of the total production cost. Secondly, saree 5 was woven with additional polyester yarn to incorporate the digitized *negi* motifs *viz.*, modified lotus-creeper, wheat spike lotus and the birds-flower pot in the pallav.

The total cost of the saree 3 was the lowest (Rs. 220.55) as compared to hand-embroidered saree (Rs. 232.55). This may be because about 32 per cent of the total cost of production was paid as

wages to the embroiderers in addition to 13.04 per cent to the wage weavers. Further saree 3 was designed with jacquard pallav without any motifs in the body thus, the wages paid to the weaver was Rs. 75.00 (34.00% of the total production cost), much lesser than the other four sarees.

It was interesting to note that though the returns calculated for saree 3 was same as that of sarees 1 and 2, the net profit earned by saree 3 was remarkably high *i.e.*, Rs. 129.45. It is hence clear from Table 23 that the wages paid and value of fixed cost for saree 3 were relatively less compared to sarees 1 and 2.

Likewise, sarees 1 and 2 showed similar trends in the cost of production incurred including the fixed (Rs. 8.15) and variable cost (Rs. 240.30). Though both the sarees were woven with two separate sets of traditional motifs, required almost same number of jacquard punched cards. Moreover, the cost incurred on the depreciation, repair and maintenance, raw material and wages paid were all same. Thus, the net profit earned from both the sarees was also same (Rs. 99.05).

On the whole, the production of saree 3 seemed to be more profitable since it earned Rs. 1.59 for every rupee invested and when rate of production was considered of the five newly designed sarees,

saree 3 accounted for higher rate of production *i.e.*, 13 sarees/loom/week as compared to other sarees.

5.10 Opinion of consumers after wear

The informal interview conducted to collect consumers opinion after wear trails revealed that the sarees best suited as professionals, national and festival wears for all age groups. These sarees being light in weight provided very good aeration, absorbency and resiliency, which inturn expressed dignity and elegancy. Ease of care and maintenance was an added advantage. Looking into the quality characteristics of the newly designed sarees the consumers assured about its marketability not only in domestic but also in international markets.

In a nutshell it may be inferred that hand embroidery was elaborate and time consuming. *Kasuti* with '*negi* stitch' required skilled and expertised artisans, lacking which adversely affected the rate of embroidery significantly and inturn affected the earnings of the artisans. With this background, the *negi* stitch of *kasuti* was revived mechanically to help another sector of artisans, the weavers.

Even though the production of the plain traditional sarees was fast, the time spent for surface enrichment by way of hand embroidery was high. Moreover, *negi* motifs were never used or seen

in the hand embroidery. Hence, a perusal of the Table 23 revealed that the production of newly designed sarees with computerized *negi* motifs had several advantages *viz.*, time saving, better earnings for the wage weavers and better returns for the master weavers.

But, of course hand embroidery being unique has importance and sanctity of its own. The traditional Karnataka *kasuti* is elaborate, requires skill and hence works out to be more costlier. In today's fast changing fashion, traditionality being the fame and interest of the elite in the society, people are ready to spend. These elite who demand the fashionable traditional made-ups, inturn dictate the cost thus making the cost of embroidery less accessible and affordable for the middle and low-income groups. Hence this elaborate embroidery is more suitable for the traditional and expensive silk sarees, which surely enhance and restore the traditionality.

On the other hand, *negi kasuti* motifs would go unseen and may gradually become extinct, unless efforts are made to revive it. Hence, this technology of computerizing *negi* motifs and incorporation through jacquard hastened the production process and thus made traditionality available for women consumers of all income groups.

Summary

VI. SUMMARY

The present study on 'Weaving computerized negi motifs in traditional Lakkundi sarees' was conducted to study the historical background of weaving polycotton sarees at Lakkundi, to document the possibility of modifying and computerizing negi *kasuti* motifs, to explore the possibilities of weaving Lakkundi sarees with computerized negi motifs, to estimate market potentiality of newly designed sarees and to assess the comparative economics of traditional and newly designed sarees.

The study has been carried out during the year 2000-03. Totally 125 wage weavers, 8 master weavers from Lakkundi and Shigli of Gadag district were interviewed using a self structured questionnaire by personal interview method to collect the historical background and demographics of polycot saree weavers. Digitizing of 13 commonly used *kasuti* motifs was done by using two softwares – Paint Shop Pro (PSP) and GC Kala-2000 (Gurubrahma Conception's Kala). Finally, five different types of sarees were produced on the powerloom using a jacquard attachment for incorporation of motifs through punched cards. Consumer acceptability for the newly designed sarees was assessed by interviewing 50 each rural and urban women using a self structured questionnaire by personal interview method.

The results of the present study are summarized as follows:

History of handloom weaving at Lakkundi

- Contrast bordered *lungi* (*Ambasi phadiki dhadi panje*) resembling the polycotton sarees were produced at Lakkundi even before independence on the throw shuttle pit loom.

- Fly shuttle pit looms were used at Lakkundi for weaving the mercerized sarees during 1975.

- During 1988 powerloom with cone technique was introduced into the village to produce the contrast bordered *lungis*.

- The weaving of polycotton sarees with cone technique for the contrast border was started in the early 1990s by the encouragement of merchants from 'Prasidhi Handlooms', Bangalore.

History of handloom weaving at Shigli

- At Shigli the traditional product *jeerigi pethi datti* – a small goddess saree was woven on the throw shuttle pit loom during 1954 and even before.

- The fly shuttle pit looms however, marked the beginning of weaving mercerized sarees during 1955.

- The cone technique of weaving polycot sarees was however adopted by the progressive master weavers of Shigli within 2 years of its birth.

Demographics of wage weavers

- Majority of the wage weavers belonged to middle age group with secondary education.
- Maximum number of wage weavers had nuclear families with medium family size.
- The subsidiary occupation of majority of wage weavers at Lakkundi was *Kambli* (woollen blanket) weaving, whereas agriculture at Shigli.
- Most of the wage weavers belonged to the *Kuruhinashetty* (grocery business) caste followed by the *Devangas*.

Demographics of master weavers

- Majority of the master weavers belonged to both younger and older age groups and had education upto primary level.
- With medium family size, majority of the master weavers had joint family norms.

- About 50 per cent of master weavers belonged to the middle income group with the total annual income between Rs. 90,372/- to Rs. 1,11,228/-

- Majority of the master weavers belonged to Hindu *kuruhinashetty* caste.

- Majority of the master weavers owned 14-17 powerlooms.

Raw materials

- The polycotton saree is composed of cotton warp and polyester weft with border exclusively of polyester.

- Cotton warp of 100s or 120s and polyester weft of 80s formed the body, whereas border with 80/2 polyester.

- The extra weft figuring was produced by employing twisted polyester of 80/2d.

- Raw material was purchased from Betageri-Gadag, Hubli and Lakshmeshwar, once in a month on cash payment by majority of the master weavers.

Production of Lakkundi polycot sarees with digitized motifs

- The *kasuti* motifs were digitized using the software Paint Shop Pro (PSP).

- The hard copy of the design plan was prepared using another software GC Kala – 2000.

- The jacquard cards were punched on conventional card punching machine and laced serially.

- Finally first and the last cards were tied together to form an endless jacquard pattern chain.

- Jacquard of 120-needle capacity was the additional attachment made on the existing powerlooms essentially incorporate computerized negi *kasuti* motifs in polycotton sarees.

- The jacquard was tied in the order of three up, one down or two up, one down to check the length of the floats.

Description of newly designed polycot sarees

- The newly designed sarees were woven with better fabric sett than the control (traditional plain sarees).

- All the sarees were woven with running blouse piece.

- The width of the body usually remained same but the border varied. Thus the width of the saree depended on the size of the border.

- Sarees 1, 2 and 4 were woven with digitized *negi* motifs, retaining traditionality.

- Sarees 3 and 5 were woven with elaborate pallav, to meet consumer demand, a revival over traditionality.

Production and marketing of polycotton made-ups

- On an average about 17 traditional simple sarees were produced per week. However, the rate of production of computerized saree was relatively less because of extra weft figuring that led to loom stoppage.

- In addition to polycotoon sarees, polycot *lungis* and salwar suits were produced and marketed mainly through showrooms.

- Very few master weavers directly marketed their goods to wholesales, outside the state.

Weavers problems

- Hike in the cost of raw material and transportation as well as irregular load shedding were the main problems of master weavers.

- Non-profitable labour was main problem of the wage weavers.

Demographics of consumers

- Most of the consumers from rural and urban areas belonged to younger age group with education upto degree level.

- Though majority of the consumers were employed they still fell in the category of low income.

Resemblance of the digitized motifs with hand embroidered motifs

- Many of the rural consumers opined that the computerized elephant with howdah, deer creeper, lotus, lotus butta, diagonal birds creeper, gopuram and wheat spike-lotus had resemblance with the hand embroidered motifs.

- More than half of the urban consumers agreed that all the computerized motifs resembled the hand embroidered ones, but showed preferences for both hand and computerized motifs.

Order of preference

- Irrespective of order of preference the consumers preferred sarees 1, 2, 3 and 4.

Cost comparison

- The production cost of newly designed sarees 1, 2, 4 and 5 was higher by 1.08 to 1.15 folds than the traditional hand embroidered ones. Saree 3 was reasonably inexpensive.
- The net profit earned on newly designed saree was remarkably higher than the traditional one.

IMPLICATIONS AND RECOMMENDATIONS

The findings of the present study gives a clear picture of the historical background of the production and origin of traditional polycotton sarees, the weaving technology existed, demographic conditions of the master weavers and the wage weavers and the problems faced by them. The method of incorporating the negi *kasuti* motifs onto the fabric during weaving itself was the technology developed.

However the findings of the study will be helpful (1) for the students to study the historical background and socio-economic status of the weavers involved in weaving the traditional polycot sarees (2) modern textile designers to incorporate these computerized folk motifs in their products (3) as a historical documentation of traditional polycotton sarees and computerized folk embroidery (*kasuti*) motifs (4) to transfer the technologies of producing sarees with *kasuti* motifs to the weavers community (5) as a source, of treatise that depicts all the authentic information regarding traditional and newly produced polycotton sarees (6) to enhance the horizon of producing variety of polycotton sarees to meet the consumer's taste (7) to export the newly designed polycotton sarees with digitized negi *kasuti* motifs.

Further, it was observed on investigation that almost all the handloom weavers shifted to weaving polycotton sarees because of lack of financial assistance to start their own powerloom production and expressed their dissatisfaction towards wages paid by the master weavers. On the other hand master weavers faced problems while procuring raw material, in production process and marketing. The master weavers were discontented by the attitude of the wage weavers who refused to weave new designs. Hence it is essential to provide some financial assistance to the handloom weavers who inturn manufacture exclusive handloom made-ups and earn better livelihood. Training is necessary for wage weavers and master weavers to improve the existing technology and to obtain scientific knowledge on economics of weaving technology. The knowledge of the fast growing CATD and its advantages need to be imparted to the weavers.

SUGGESTIONS FOR FURTHER STUDY

- Value addition to other polycot madeups using the digitized folk embroidery motifs.
- Digitizing other motifs of *Kasuti* to create variety of woven designs.
- Producing traditional silk sarees with digitized folk embroidery motifs.
- To assess the durability and comfort properties of polycotton sarees.
- To develop software programmes to embroider *kasuti* on the woven fabric.

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* - Originals not seen

Appendices

APPENDIX I

QUESTIONNAIRE I

HISTORICAL BACKGROUND AND SOCIO-ECONOMIC STATUS OF HANDLOOM WEAVERS

I. GENERAL INFORMATION

1. Name of the respondent :
2. Gender :
3. Age :
4. Caste/religion :

Sl. No.	Name of the family members	Relation to the respondent	Age (years)	Education	Occupation	Income/ month

5. Income from other sources **Yes/No**

If yes, Source 1. _____

2. _____

3. _____

Total Rs. _____ / annum

6. Origin of weaving

i. Main occupation of the ancestors: _____

ii. Looms existed

a. Throw shuttle (Year:)

b. Pit loom (Year:)

c. Fly shuttle (Year:)

d. Semi automatic (Year:)

e. Automatic (Year:)

f. Powerloom (Year:)

iii. Products manufactured

Sl. No.	Product	Cotton (Year)	Silk (Year)	Polyester (Year)	Cotton/ Polyester (Year)
1.	Sarees				
2.	Choli material				
3.	Lehanga pieces				
4.	Dhoti				
5.	Towels				

iv. Mode of marketing :

v. Historical background :

III. Present status

1. Category to which you belong?

a. Working independently

b. Wage weaver

c. Working for master weaver

d. Working for co-operative societies

2. What type of looms are presently existing?

   a. Throw shuttle (Year:)

   b. Pit loom (Year:)

   c. Fly shuttle (Year:)

   d. Semi automatic (Year:)

   e. Automatic (Year:)

   f. Powerloom (Year:)

3. Raw material used

   a. Cotton yarn

   b. Silk yarn

   c. Rayon yarn

   d. Polyester yarn

   e. Blends/union yarn

4. From where do you procure the raw material for weaving and on what basis?

Source of procurement	**Producers**	**Local dealers**	**Master weavers**	**Co-operative societies**	**Others**
On cash					
On credit					
In exchange of finished goods					
On partial payment					
Installment payment					

5. Did you face any problem while procuring raw material?

   If yes, WHICH of the following problems did you face?

   a. Untimely supply

   b. Inadequate quantities

   c. High prices

   d. Adulteration

   e. Non availability of required counts

   f. Any other (specify)

6. Involvement of family members:

6.1: Pre-loom processes -

i. (%)

ii. (%)

iii. (%)

iv. (%)

6.2: Loom processes

a.

b.

6.3: Post-loom processes

a. Gaiting the loom

b. Folding

c. Packing

d. Marketing

7. How many hours per day do you work? _____

8. How many months in a year are you engaged in weaving? _____

9. Do you get continuous employment? Yes/No

If No,

a. What are your activities in free time

i.

ii.

iii.

10. On what basis do you get your payment?

a. Per piece

b. Weekly

c. Monthly

11. Do you under take dyeing? Yes/No

If yes

Yarns	**Dyes used**		
	Direct	**Azo**	**Disperse**
Cotton			
Silk			
Rayon			
Polyester			

MOTIFS

12. Type of designs produced on the handloom sarees

Sl. No.	Motifs	Floral	Bird	Animal
a.	Traditional			
b.	Stylized			
c.	Geometrical			
d.	Combination of the above			

13. Motifs are collected from

a. Self creation

b. Customers

c. Master weavers

d. KHDC

e. Books/Magazines

f. Old samples

g. Others (Specify)

WEAVERS PROBLEMS

14. Are you working to full capacity

Yes/No

If No, what are the reasons for low productivity?

a. Shortage of raw material

b. Shortage of finance

c. Lack of proper dyeing facility

d. Lack of technical know-how

e. Lack of demand

f. Other problems, if any

15. From where do you get loan, for what purpose?

a. Money lenders

b. Co-operative societies

c. Master weavers

d. Friends/ relatives

e. Bank

16. What are the difficulties faced in obtaining loans?

17. To whom do you merchandise the finished goods?

a. Wholesaler

b. Master weavers

c. Co-operative societies

d. Customers

e. Any others (Specify)

18. Do you face any constraints with merchandising practices?

a. Lack of demand

b. Non-profitable labour

c. Hike in transportation charges

d. Threat for powerlooms

e. Lack of publicity

f. Any other (Specify)

19. Solutions that you seek for the problems.

APPENDIX II

QUESTIONNAIRE II

CONSUMER ACCEPTABILITY FOR NEWLY DESIGNED POLYCOTTON SAREES WITH COMPUTERIZED NEGI KASUTI MOTIFS

I. General Information:

1. Name of the respondent :
2. Age :
3. Occupation :
4. Annual family income :
5. Education :

II. Preferences

1. Rank the sarees in order of preference
   - Saree 1
   - Saree 2
   - Saree 3
   - Saree 4
   - Saree 5

2. Resemblance of saree with computerized motifs with hand embroidered sarees

Motifs	Resembles hand embroidery		Acceptance			Order of preference for motifs	
	Yes	No	Highly acceptable	Moderately acceptable	Not acceptable	Hand Embr.	Compu. Embr.
Aane ambari							
Teeru							
Kamala							
Gopura							
Kamalada butta							
Maggi kamala							
Hamsa kamala							
Vari maggi balli							
Chigari balli							
Pakshi hoodani							
Godi teni kamala							
Vari gubbi balli							
Kamalada patti							

3. Do you prefer hand embroidered kasuti sarees? **Yes/No**

IF yes, then state the reasons for the preference of hand embroidered kasuti sarees

1. Elegant
2. Multi colours available
3. Variety of buttas in a single row
4. Traditional look
5. Delicacy
6. Identical on either sides of the saree

If No, mention the reasons

1. Motifs irregularly embroidered
2. Varied stitch length
3. High cost of embroidery
4. Time consuming

4. Do you appreciate the newly designed saree with computerized kasuti motifs? **Yes/No**

If yes, mention the reasons,

1. Uniform and compact
2. Elegacy
3. Series of single motifs are prettier
4. Represents the diminishing negi kasuti motifs
5. Uniqueness
6. Inexpensive compared to hand embroidered

IF No, mention the reasons,

1. Monotonous
2. Single coloured motifs
3. Floats on the reverse side
4. Single motif in a row
5. Motifs not identical on both the sides

WEAVING COMPUTERIZED *NEGI* MOTIFS IN TRADITIONAL LAKKUNDI SAREES

Jyoti V. Vastrad

ABSTRACT
2003

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Major Advisor

The present investigation entitled 'Weaving computerized *negi* motifs in traditional Lakkundi sarees' was conducted during 2000-03. Totally 125 wage weavers and 8 master weavers from Lakkundi and Shigli villages of Gadag district were interviewed using self-structured questionnaire by personal interview method to collect the historical background and demographics of polycot saree weavers. PSP and GC Kala-2000 software was used to digitize thirteen commonly used *kasuti* motifs. Five sarees were woven on the powerloom by incorporating *kasuti* motifs with jacquard mechanism. Fifty each rural and urban women expressed their acceptability for newly designed sarees. History revealed that contrast-bordered *lungi* resembling the polycot sarees was produced even before independence on throw shuttle pit loom at Lakkundi. Merchants from Prasiddhi handlooms, Bangalore during 1990's encouraged weaving polycot sarees with cone technique. Majority of the wage weavers belonged to middle age with secondary education belonged to nuclear families whereas, majority of master weavers followed joint family norms. *Kuruhinashettys* and *Devangas* predominated weaver's community. Sarees 1, 2 and 4 were woven with digitized *negi* motifs, retaining traditionality. Sarees 3 and 5 were woven

with elaborate pallav, to meet consumer demand, a revival over traditionality. The weavers produced 17 plain sarees per week. However, the rate of production of computerized saree was relatively low because of extra weft figuring that led to loom stoppage. Many of the rural consumers opined that the computerized elephant with howdah, deer creeper, lotus, lotus butta, diagonal birds creeper, gopuram and wheat spike-lotus resembled the hand-embroidered motifs. In general the consumers preferred sarees 1, 2, 3 and 4. The net profit earned on newly designed sarees was remarkably higher than the traditional. There is a need to train the local weavers to weave sarees with computerized motifs.