



WEAVING DESIGNER MATS USING SILK SELVEDGE WASTE

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ABSTRACT

The area chosen was designing, a creative field that stir the imagination. Four mats were designed and construction using silk selvedge waste as the weft yarns during weaving.

The main aim of the study was to find out the acceptance of designer mats woven using silk selvedge waste.

The various objectives include:

1. Recycling :Utilize silk waste (selvedge) as yarns to create mats using different weaving techniques.
2. To design the mats.
3. To study the significance of 2 different techniques of construction –plain weave and tapestry weave.
4. To evaluate the acceptance of designed; plain and tapestry woven mats

The acceptances evaluation was done by the mean of questionnaire method. Mats were displayed to a set population of respondents to check their acceptances. 30 respondents were the chosen sample size. The result was analyzed discussed and presented in the form of tables and graphs..

From the survey the acceptance of the mats were judged and concluded as follows:

- The best design is sample C & D with 50 % respondents ranking them as excellent.
- The best placement of designs was that of sample C & D with 50% ranking it as excellent.
- The best mats in terms of overall appearance is sample C and D with 50% ranking it as excellent and hence the best mats of the collection with the highest excellent rating in all was sample C and D.

CHAPTER-I

INTRODUCTION

Design is the creation of a plan or convention for the construction of an object or a product. Design has different connotations in different fields.

Weaving is a method of fabric production in which two distinct sets of yarns or threads are interlaced at right angles to form a fabric or cloth. Some of the other methods of fabric construction are knitting, lace making, felting, and braiding or plaiting. The longitudinal threads are called the warp and the lateral threads are the weft or filling. (Weft or woof is an old English word meaning "that which is woven".) The method in which these threads are inter-woven affects the characteristics of the cloth.

The majority of woven products are created with one of three basic weaves: plain weave, satin weave, or twill. Woven cloth can be plain (in one colour or a simple pattern), or can be woven in decorative or artistic designs. Weaving is done on a loom; there are various types of looms differing in this mechanism of operation. A stationary package of yarn is used to supply the weft yarns in the rapier machine. At one end of a rapier, a rod or steel tape carries the weft yarn. The other end of the rapier is connected to the control system. The rapier moves across the width of the fabric, carrying the weft yarn across through the shed to the opposite side. The rapier is then retracted, leaving the new pick in place. In some versions of the loom, two rapiers are used, each half the width of the fabric in size. One rapier carries the yarn to the centre of the shed, where the opposing rapier picks up the yarn and carries it the remainder of the way across the shed. The double rapier is used more frequently than the single rapiers due to its increased pick insertion speed and ability to weave wider widths of fabric. All fabrics woven on rapier looms have double selvedge, to obtain the correct tension in the fabric, post weaving the selvedge created on the extreme is cut as the fabric is being taken up by the fabric beam and discarded as waste.

A handloom is a simple machine used for weaving cloth of different fibres operated by manual means. Handloom fabric is popular because it's easy to care for and comfortable. The material is strong and durable. When the weather is hot and humid handloom fabrics absorb the moisture easily and are comfortable to wear. In cold weather, if the fabric remains dry, the fibres retain body heat, these materials are easy to clean; it can be laundered or dry-cleaned or hand washed.

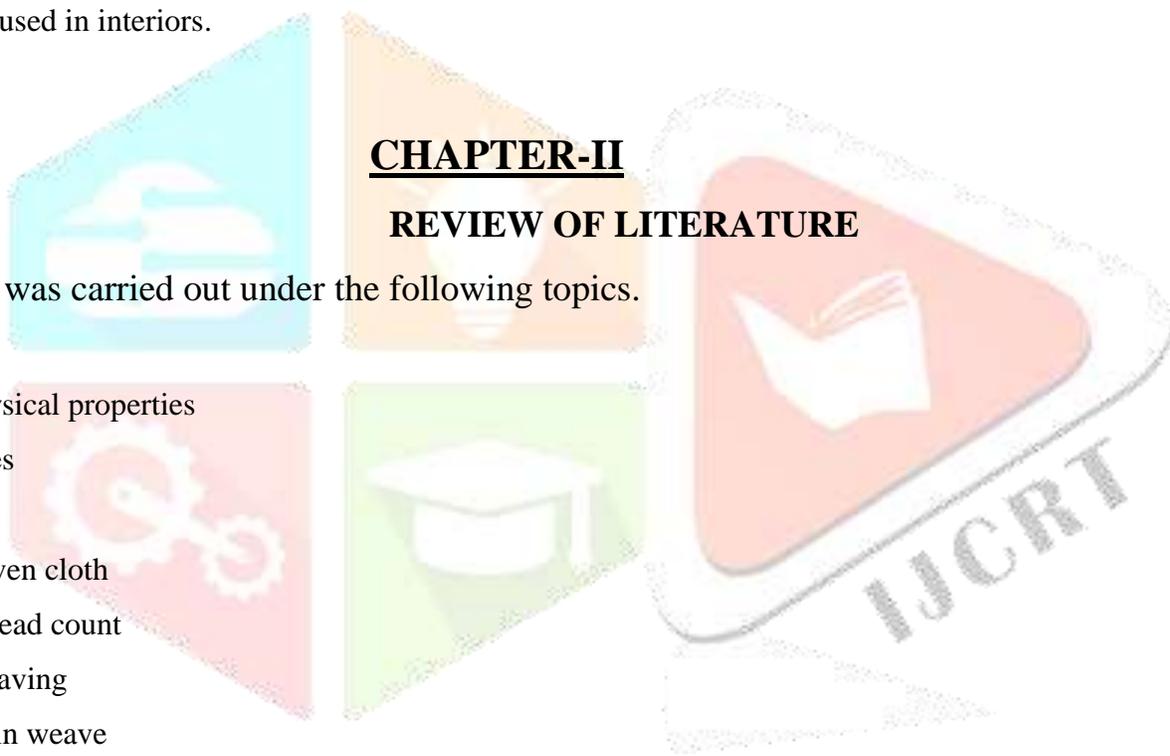
The selvage or selvedge is the term for the self-finished edges of fabric. The selvages keep the fabric from unravelling or fraying. In woven fabric, selvages are the edges that run parallel to the warp (the longitudinal threads that run the entire length of the fabric), and are created by the weft thread looping back at the end of each row. In knitted fabrics, selvages are the unfinished yet structurally sound edges that were neither cast on nor bound off. Historically, the term selvage applied only to loom woven fabric, though now can be applied to flat-knitted fabric.

Recycling and reusing fibrous waste is one of the most important environmental tasks that face the world, to reduce environmental loading and promote the most effective use of resources. In this study, the rapier loom silk selvedge waste was used to produce functional rugs.

A dhurrie is a thick flat-woven rug or carpet used traditionally in India as floor-coverings. The concept of durries is different from a rug or carpet but since the dhurries serve the same purpose as carpet or rugs they can be described as one. Durries can be used year round. The cotton dhurrie is warm in winters and cool in summers.

The finishing on hand woven rugs is usually done by tying the Warp yarns into fringes or tassels. This means each single tassel strand (usually cotton) runs from one end all the way through the middle of the rug to the opposite side. If the fringes or tassels untie, or get torn, or wear off, the knots of the rug begins to pull away and unravel, and this has an impact on the value of the rug. With hand woven rugs, where the fringe or tassels are the foundation that the rug knots are tied around, it's not that easy to unravel a rug.

Interior design describes a group of various yet related projects that involve turning an interior space into an "effective setting for the range of human activities" that are to take place there. An interior designer is someone who coordinates and manages such projects. Rugs and durries form a large part of visual and functional appealing products used in interiors.



CHAPTER-II

REVIEW OF LITERATURE

Review was carried out under the following topics.

2.1 Silk

2.1.1 Physical properties

2.1.2 Uses

2.2 Woven cloth

2.2.1 Thread count

2.2.2 Weaving

2.2.3 Plain weave

2.2.4 Tapestry weave

2.2.5 Rapier loom

2.2.6 Hand loom

2.3 Selvedge waste recycling

2.3.1 Uses of silk waste

2.3.2 Sources

2.3.3 Processing

2.4 Durries

2.4.1. Manufacturing

2.4.2 Uses

2.5 Carpet

2.6 Techniques used in mat making

2.1 SILK

Callandine, Anthony (1993) says that Silk is a natural protein fibre, some forms of which can be woven into textiles. The protein fibre of silk is composed mainly of fibroin and produced by certain insect larvae to form cocoons. The best-known type of silk is obtained from the cocoons of the larvae of the mulberry silkworm *Bombyx mori* reared in captivity (sericulture). The shimmering appearance of silk is due to the triangular prism-like structure of the silk fibre, which allows silk cloth to refract incoming light at different angles, thus producing different colours.

Silks are produced by several other insects, but generally only the silk of moth caterpillars has been used for textile manufacturing. Many silks are mainly produced by the larvae of insects undergoing complete metamorphosis, but some adult insects such as web spinners produce silk, and some insects such as raspy crickets produce silk throughout their lives. Silk production also occurs in Hymenoptera (bees, wasps, and ants), silverfish, mayflies, leafhoppers, beetles, lacewings, fleas, flies and midges.

2.1.1 Physical properties

According to Hill, John E. (2009) that silk fibers from the *Bombyx mori* silkworm have a triangular cross section with rounded corners, 5-10 μm wide. The fibroin-heavy chain is composed of beta-sheets, due to a 59-mer amino acid repeat sequence with some variations. The flat surfaces of the fibrils reflect light at many angles, giving silk a natural shine. The cross-section from other silkworms can vary in shape and diameter: crescent-like for *Anaphe* and elongated wedge for tussah. Silkworm fibers are naturally extruded from two silkworm glands as a pair of primary filaments (brin), which are stuck together, with sericin proteins that act like glue, to form a bave. Bave diameters for tussah silk can reach 65 μm .

Silk has a smooth, soft texture that is not slippery, unlike many synthetic fibers.

Silk is one of the strongest natural fibers but loses up to 20% of its strength when wet. It has a good moisture regain of 11%. Its elasticity is moderate to poor: if elongated even a small amount, it remains stretched. It can be weakened if exposed to too much sunlight. It may also be attacked by insects, especially if left dirty. Silk is a poor conductor of electricity and thus susceptible to static cling.

2.1.2 Uses

Silk's absorbency makes it comfortable to wear in warm weather and while active. Its low conductivity keeps warm air close to the skin during cold weather. It is often used for clothing such as shirts, ties, blouses, formal dresses, high fashion clothes, lining, lingerie, pajamas, robes, dress suits, sun dresses and Eastern folk costumes. Silk's attractive luster and drape makes it suitable for many furnishing applications. It is used for upholstery, wall coverings, window treatments (if blended with another fiber), rugs, bedding and wall hangings. While on the decline now, due to artificial fibers, silk has had many industrial and commercial uses, such as in parachutes, bicycle tires, comforter filling and artillery gunpowder bags.

A special manufacturing process removes the outer irritant sericin coating of the silk, which makes it suitable as non-absorbable surgical sutures. This process has also recently led to the introduction of specialist silk underclothing for people with eczema where it can significantly reduce it. New uses and manufacturing techniques have been found for silk for making everything from disposable cups to drug delivery systems and holograms. The major silk producers are China (54%) and India (14%).

2.2 Weaving

Collier, Ann M (1978) say, Weaving is a method of fabric construction in which two distinct sets of yarns or threads are interlaced at right angles to form a fabric or cloth. The other methods are knitting, lace making, felting, and braiding or plaiting. The longitudinal threads are called the warp and the lateral threads are the weft or filling.

The way the warp and filling threads interlace with each other is called the weave. The majority of woven products are created with one of three basic weaves: plain weave, satin weave, or twill. Woven cloth can be plain (in one colour or a simple pattern), or can be woven in decorative or artistic designs.

Selvages form the extreme lateral edges of the fabric and are formed during the weaving process. The weave used to construct the selvage may be the same or different from the weave of the body of the fabric cloth. Most selvages are narrow, but some may be as wide as 0.75 inches (19 mm). Descriptions woven into the selvage using special jacquards, colour or fancy threads may be incorporated for identification purposes. For many end-uses the selvage is discarded. Selvages are 'finished' and will not fray because the weft threads double back on itself and are looped under and over the warp.

2.2.1 Thread count

According to Haynes, Williams (1976) Thread count is the number of horizontal and vertical threads woven in one square inch of fabric. Thread count can range from 80 to 1000 depending yarn count and also. In general, the higher the thread count, the softer the fabric feels and the more pill-resistant it is.

200-220 as a good thread count, 230-280 as better, and 300-400 as best. Higher thread count are usually significantly more expensive and not everyone agrees that the higher count means a better quality.

Two additional components are important when considering thread count: yarn size and ply.

Yarn size: - refers to the thickness of the yarns that are used to make the fabric. A higher yarn size means a finer yarn. Generally sheets are made from a yarn size range of 40 to 100. Obviously, the finer the yarn, the more of them will fit in a square inch.

Ply: - refers to the number of individual yarns used as a strand. Single ply fabrics are woven from one, individual yarn; 2-ply fabric is made from yarns that are twisted together and then woven. If 2-ply yarn is used, the finished construction will have twice the thread count of the same construction made from single ply yarn. 2-ply yarn must be made from a very high yarn size (like 100) or they will feel thick and heavy.

Another important consideration is fiber. Sheets may be made from various cottons, various cotton blends, polyester, or other man-made fibers. Cotton/polyester blends outsell cotton sheets largely because they wrinkle less and cost less.

2.2.2 Plain weave

According to Kadolph, Sara J (2007) Plain weave (also called tabby weave, linen weave or taffeta weave) is the most basic of three fundamental types of textile weaves (along with satin weave and twill). It is strong and hard-wearing, used for fashion and furnishing fabrics.

In plain weave, the warp and weft are aligned so they form a simple criss-cross pattern. Each weft thread crosses the warp threads by going over one, then under the next, and so on. The next weft thread goes under the warp threads that its neighbour went over, and vice versa.

2.2.3 Tapestry weaves

Campbell, Thomas P.(2007) says tapestry is a form of textile art, traditionally woven on a vertical loom. However, it can also be woven on a floor loom as well. It is composed of two sets of interlaced threads, those running parallel to the length (called the warp) and those parallel to the width (called the weft); the warp threads are set up under tension on a loom, and the weft thread is passed back and forth across part or all of the warps. Tapestry is weft-faced weaving, in which all the warp threads are hidden in the completed work, unlike cloth weaving where both the warp and the weft threads may be visible. In tapestry weaving, weft yarns are typically discontinuous; the artisan interlaces each coloured weft back and forth in its own small pattern area. It is a plain weft-faced weave having weft threads of different colours worked over portions of the warp to form the design.

2.2.4 Rapier loom

According to article published by www.britannica.com/EBchecked a stationary package of yarn is used to supply the weft yarns in the rapier machine. One end of a rapier, a rod or steel tape, carries the weft yarn. The other end of the rapier is connected to the control system. The rapier moves across the width of the fabric, carrying the weft yarn across through the shed to the opposite side. The rapier is then retracted, leaving the new pick in place. In some versions of the loom, two rapiers are used, each half the width of the fabric in size. One rapier carries the yarn to the centre of the shed, where the opposing rapier picks up the yarn and carries it the remainder of the way across the shed. The double rapier is used more frequently than the single rapier due to its increases picks insertion speed and

ability to weave wider widths of fabric. The housing for the rapiers must take up as much space as the width of the machine. To overcome this problem, looms with flexible rapiers have been devised. The flexible rapier can be coiled as it is withdrawn, therefore requiring less storage space. If, however, the rapier is too stiff then it will not coil; if it is too flexible, it will buckle. Rigid and flexible rapier machines operate at speeds operating at speeds ranging from about 200 to 260 ppm, using up to 1300 meters of weft yarn every minute. They have a noise level similar to that of modern projectile looms. They can produce a wide variety of fabrics ranging from muslin to drapery and upholstery materials.

Newer rapier machines are built with two distinct weaving areas for two separate fabrics. On such machines, one rapier picks up the yarn from the centre, between the two fabrics, and carries it across one weaving area; as it finishes laying that pick, the opposite end of the rapier picks up another yarn from the center, and the rapier moves in the other direction to lay a pick for the second weaving area, on the other half of the machine.

Rapier machines weave more rapidly than most shuttle machines but more slowly than most other projectile machines. An important advantage of rapier machines is their flexibility, which permits the laying of picks of different colours. They also weave yarns of any type of fiber and can weave fabrics up to 110 inches in width without modification.

Defective and Damaged silk skeins were used to blend with Lyocell fibres. The main objective of this work is to develop the technology to process the above blends on existing short staple spinning system. This concept has the techno economical edge over the prevailing the long staple spinning system. The yarns were developed by optimizing parameters in blow room, carding, draw frame, simplex and ring frame. 30s and 60s Ne yarns were developed. The yarns were tested for the tenacity, evenness and imperfections, hairiness properties.

2.2.5 Handloom

Barber, E. J. W. (2009) a handloom is a simple machine used for weaving. In a wooden vertical-shaft looms, the heddles are fixed in place in the shaft. The warp threads pass alternately through a heddle, and through a space between the heddles (the shed), so that raising the shaft raises half the threads (those passing through the heddles), and lowering the shaft lowers the same threads—the threads passing through the spaces between the heddles remain in place.

The major components of the loom are the warp beam, heddles, harnesses or shafts (as few as two, four is common, sometime even upto sixteen), shuttle, reed and take-up roll. In the loom, yarn processing includes shedding, picking, battening and taking-up operations. These are the principal motions. All operations are carried out manually.

- **Shedding** is the raising of part of the warp yarn to form a shed (the vertical space between the raised and un-raised warp yarns), through which the filling yarn, carried by the shuttle, can be inserted. On the modern loom, simple and intricate shedding operations are performed automatically by the heddle or headles frame, also known as a harness. This is a rectangular frame to which a series of wires, called heddles or headles, are attached. The yarns are passed through the eye holes of the heddles, which hang vertically from the harnesses. The weave pattern determines which harness controls which warp yarns, and the number of

harnesses used depends on the complexity of the weave. Two common methods of controlling the heddles are doobby's and a Jacquard Head.



Shuttles

- **Picking** As the harnesses raise the heddles or headles, which raise the warp yarns, the shed is created. The filling yarn is inserted through the shed by a small carrier device called a shuttle. The shuttle is normally pointed at each end to allow passage through the shed. In a traditional shuttle loom, the filling yarn is wound onto a quill, which in turn is mounted in the shuttle. The filling yarn emerges through a hole in the shuttle as it moves across the loom. A single crossing of the shuttle from one side of the loom to the other is known as a pick. As the shuttle moves back and forth across the shed, it weaves an edge, or selvage, on each side of the fabric to prevent the fabric from ravelling.
- **Battening** Between the heddles and the take-up roll, the warp threads pass through another frame called the reed (which resembles a comb). The portion of the fabric that has already been formed but not yet rolled up on the take-up roll is called the fell. After the shuttle moves across the loom laying down the fill yarn, the weaver uses the reed to press (or batten) each filling yarn against the fell. There are two secondary motions, because with each weaving operation the newly constructed fabric must be wound on a cloth beam. This process is called taking up. At the same time, the warp yarns must be let off or released from the warp beams. To become fully automatic, a loom needs a tertiary motion, the filling stop motion. This will stop the loom, if the weft thread breaks.

2.3 Silk selvedge waste

According to Jagannathan Srinivas the selvage (US English) or selvedge (British English) is the term for the self-finished edges of fabric. The selvages keep the fabric from un-ravelling or fraying. The selvages are a result of how the fabric is created. In woven fabric, selvages are the edges that run parallel to the warp (the longitudinal threads that run the entire length of the fabric), and are created by the weft thread looping back at the end of each row. In knitted fabrics, selvages are the unfinished yet structurally sound edges that were neither cast on nor bound off. Historically, the term selvage applied only to loom woven fabric, though now can be applied to flat-knitted fabric.

Silk waste includes all kinds of raw silk which may be unwindable, and therefore unsuited to the throwing process. Before the introduction of machinery applicable to the spinning of silk waste, the refuse from cocoon reeling, and also from silk winding, which is now used in producing spun silk fabrics, was nearly all destroyed as being useless, with the exception of that which could be hand-combed and spun by means of the distaff and spinning wheel, a method which is still practiced by some of the peasantry in India and other countries in Asia.

Silk non-woven are used to prepare products like bed covers, vanity bags, mobile covers, table mats and wall hanging etc

2.3.1 Selvedge waste recycling

Recycling and reusing fibrous waste is one of the most important environmental tasks that face the world, to reduce environmental loading and promote the most effective use of resources. First, the silk selvedge waste was opened and converted into fibrous form. The opened silk fibres were mixed with wool and polypropylene staple fibres in the proportions of 35/15/50, 35/35/30 and 15/35/50. The functional composites were produced by compression molding technique with optimum process conditions. The effect of silk and wool fibre content on the mechanical properties of silk/wool hybrid fibre polypropylene composites was studied by measuring the tensile strength, flexural strength and impact strength of the resultant composite material. The thermal conductivity and water uptake properties of the composites were also studied.

- Possibilities of production of silk non-woven's from different silks and silk wastes have been explored
- The processes have been standardised
- Varieties of silk non-woven's were developed from the silk wastes generated during weaving in rapier looms (selvedge waste), raw silk testing (seriplane waste), cooking and reeling waste (cooker & reeler waste), Eri noil waste (Eri Mill spinning waste)

2.3.2 Other Sources of Silk waste

The supply of waste silk is drawn from the following sources:

- The silkworm, when commencing to spin, emits a dull, lusterless and uneven thread with which it suspends itself from the twigs and leaves of the tree upon which it has been feeding, or the straws provided for it by attendants in the worm-rearing establishments: this first thread is unreliable, and, moreover, is often mixed with straw, leaves and twigs.
- The outside layers of the true cocoon are too coarse and uneven for reeling; and as the worm completes its task of spinning, the thread becomes finer and weaker, so both the extreme outside and inside layers are put aside as waste.
- Pierced cocoons, that is, those from which the moth of the silkworm has emerged-and damaged cocoons.
- During the process of reeling from the cocoon the silk often breaks; and both in finding a true and reliable thread, and in joining the ends, there is unavoidable waste.

- Raw silk skeins are often re-reeled; and in this process part has to be discarded: this being known to the trade as gum-waste. The same term gum-waste is applied to "waste" made in the various processes of silk throwing; but manufacturers using threads known technically as organizes and trams call the surplus "manufacturer's waste."

2.3.3 Processing of silk waste

Rayner, Hollins (1903) A silk "throwster" receives the silk in skein form, the thread of which consists of a number of silk fibres wound together to make a certain diameter or size, the separate fibre having actually been spun by the worm. The silk-waste spinner receives the silk in quite a different form: merely the raw material, packed in bales of various sizes and weights, the contents being a much-tangled mass of all lengths of fibre mixed with much foreign matter, such as ends of straws, twigs, leaves, worms and chrysalis. It is the spinner's business to straighten out these fibres, with the aid of machinery, and then to so join them that they become a thread, which is known as spun silk.

All silk produced by the worm is composed of two substances: fibroin, the true thread, and sericin, which is a hard, gummy coating of the fibroin. Before the silk can be manipulated by machinery to any advantage, the gum coating must be removed, really dissolved and washed away. Where the method used in achieving this operation is through fermentation, the product is called schappe. The former, schapping, is the French, Italian and Swiss method, from which the silk when finished is neither so bright nor as good in colour as the discharged silk; but it is very clean and level, and for some purposes essential, as, for instance, in velvet manufacture.

2.4 Different methods of carpet/mat construction

2.4.1 Rugs

The history of weaving rugs starts with nomadic tribes building makeshift looms and using wool from their wandering flocks of sheep. These rugs were designed depicting nature as seen by the weavers, flowers, animals and trees, or illustrating their culture and religious beliefs with symbols and motifs. They were hung from the walls of tents or huts, they were laid on the ground or floor and they were used as seat covers or saddle bags - simply to sleep, live or to pray on. The first known oriental rugs came from Persia, Turkey and Egypt, the Caucasus and Central Asia - Marco Polo discovered some of the earliest fine Orientals in the 13th century whilst travelling in Persia. Prior to that time good specimens were scarce due to the perishable nature of carpets and the fact that they were made to be used. Much care was taken of rugs and carpets and the fact that they were greatly cherished and valued by those who owned them. At one time they were regarded as better than money and even used for paying taxes! The great Egyptian Queen Cleopatra actually presented herself to Caesar - rolled up inside a carpet! Rugs of entirely different style and design emerged from China and Tibet usually featuring symbols of their Buddhist and Taoist religions. Finally India learned the art from the Persian weavers, developing a style to suit the tastes of their Mogul emperors.

2.4.2 Dhurrie

According to www.merriam-webster.com/dictionary/dhurrie

Dhurrie is a thick flat-woven rug or carpet used traditionally in India as floor-coverings. The concept of dhurrie is different from a rug or carpet, but since the dhurries serve the same purpose as carpet or rugs they can be described as one.

2.4.2.1 Manufacturing

Dhurries are made manually by skilled artisans on a traditional horizontal loom or vertical loom. In Rajasthan pit looms are also used for weaving in which weaver sits in a pit and feet are used in weaving. The maximum breadth is 24".

Madhya Pradesh dhurries are known for their sturdy character and delightful colours. Rajasthan, Uttar Pradesh, Punjab and Himachal Pradesh, make distinctive type of dhurries. In some part of these states the dhurries make a part of dowry given at the time of a daughter's marriage.

Several important centres of dhurrie-making in pre-Independence Punjab are now in Pakistan; however, in present-day Punjab, the areas around Ludhiana, Faridkot and Bhatinda are fairly prolific and well-known.

Dhurries made in Rajasthan at Salawas are known as Panja dhurries and are exported on large scale. Khairabad in Uttar Pradesh is a major dhurrie making centre. Citapore Rugs (Sitapur dhurries) made here are based on flat weave technique using horizontal looms. Besides cotton, jute, rayon and chennile dhurries are also made here and exported all over the world.

2.4.2.2 .Uses

They have a variety of use depending on size, pattern and material. The smallest one is 12" by 12" and is used as a table cover for telephone stands and flower vases. They are also made in sizes that are ideal for doing meditation 24" by 24", known as an Aasan.

Dhurries used in large political or social gatherings may be as large as 20 feet by 20 feet. Dhurries are easily portable being light weight and foldable. They come in variety of colour combinations and patterns catering to the needs of any taste or occasion.

Dhurries have a low maintenance cost as they do not get infected by Silverfish or other insects responsible for destroying carpets.

Dhurries can be used year round. The cotton dhurrie is warm in winters and cool in summers. and in variety of combination of all these materials. This material is first converted into thread and then woven into dhurries.

2.4.3 Carpet

According to article on Merriam-webster.com.A carpet is a textile floor covering consisting of an upper layer of "pile" attached to a backing. The pile is generally either made from wool or a manmade fibre such as polypropylene, nylon or polyester and usually consists of twisted tufts which are often heat-treated to maintain their structure.

The carpet is produced on a loom quite similar to woven fabric. The pile can be plush or Berber. Plush carpet is a cut pile and Berber carpet is a loop pile. There are new styles of carpet combining the two styles called cut and loop carpeting. Normally many colored yarns are used and this process is capable of producing intricate patterns from pre-determined designs (although some limitations apply to certain weaving methods with regard to accuracy of pattern within the carpet). These carpets are usually the most expensive due to the relatively slow speed of the manufacturing process. Carpets made in India, Pakistan and Arabia are very famous.

2.4.4 Other techniques used in mat making

Needle felt

These carpets are more technologically advanced. Needle felts are produced by intermingling and felting individual synthetic fibers using barbed and forked needles forming an extremely durable carpet. These carpets are normally found in commercial settings such as hotels and restaurants where there is frequent traffic.

Knotted

On a knotted pile carpet the structural weft threads alternate with a supplementary weft that rises at right angles to the surface of the weave. This supplementary weft is attached to the warp by one of three knot types such as shag carpet which was popular in the 1970s, to form the pile or nap of the carpet. Knotting by hand is most prevalent in oriental rugs and carpets. Kashmir carpets are also hand-knotted.

Tufted

These are carpets that have their pile injected into a backing material, which is itself then bonded to a secondary backing made of a woven hessian weave or a man made alternative to provide stability. The pile is often sheared in order to achieve different textures. This is the most common method of manufacturing of domestic carpets for floor covering purposes in the world.

METHODOLOGY

AIM: Designing woven sitting Mats using of silk selvedge waste.

OBJECTIVES:

- Utilize silk selvedge waste from rapier looms as weft yarn to create mats.

- To design the mats.
- To study the significance of 2 different techniques for developing design –plain weave and tapestry weave.
- To evaluate the acceptance of designed plain and tapestry weaving techniques on mats.

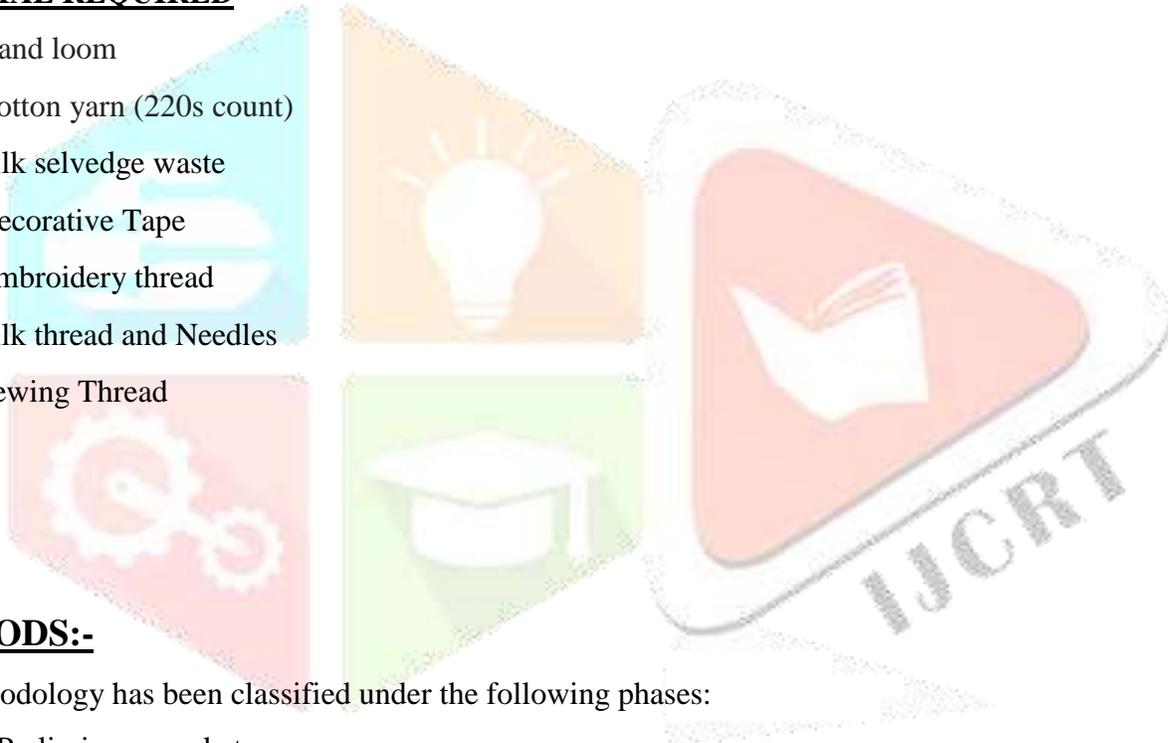
NEED OF THE STUDY: From the pilot study it is found that mats with silk selvedge waste are not available in the market. This study was taken out, to check acceptance of designer mats made using silk selvedge waste.

Designing of mats

Different colours shades of silk selvedge waste were used to designed and developed four mats.

MATERIAL REQUIRED

- Hand loom
- Cotton yarn (220s count)
- Silk selvedge waste
- Decorative Tape
- Embroidery thread
- Silk thread and Needles
- Sewing Thread



METHODS:-

The methodology has been classified under the following phases:

Phase-1. Preliminary market survey.

Phase -2. Experimentation

1 PHASE

PRELIMINARY INTERVIEW SCHEDULE TO STUDY THE AVAILABILITY OF HAND LOOM SILK WOVEN MATS IN THE MARKET.

The Researcher, got to know of the Silk selvedge waste being generated during the fabric construction process on rapier looms, and discovered that not much was being done with this valuable waste product. In this day of recycling and conservation the researcher thought to investigate if it was possible to try and create wealth from waste.

In order to do that a first survey was conducted with the various organizations to see what peoples are doing with silk selvedge waste. Through this survey it was discovered that although basic silk waste has been reused in a numerous ways such as for wigs for dolls, carpet weaving etc..... there was very limited usage of silk selvedge waste, as it was mainly being used as fillers for a padding and stuffing in pillows and quilts.

The investigator thought of then designing sitting mats incorporating the selvedge waste as weft yarns in order to use the property of the length obtained in the cut selvedge waste.

The next step was then to check the prevailing trends in the market dealing with mats. Through surveys and interviews with different shops retailing mats the data collected was analysed and it concluded that the current trend was of people to regularly upgrade or changed small mats in their homes as these were economically priced. Keeping this point regarding cost in mind the investigator designed three mats using plain weave technique and one using simple tapestry technique.(more intricate the design, the more time to make; hence affects the cost.)

PHASE -2

EXPERIMENTATION

Phase II consisted of translating the designs into products and then taking a survey to access the acceptance of the product.

DEVELOPMENT OF DESIGN, DRAFT AND PEG PLAN FOR MATS

STANDARD MEASUREMENTS OF MAT

Standard measurement chart for floor coverings.

20x24"
20x28"
22x28"
20x30"
24x30"
24x36"
27x39"
27x40"
32x40"
30x40"

38x45"

STANDARDISATION OF MEASUREMENT CHART FOR MATS

SL. NO	LENTH	WIDTH
SAMPLE:1	75cm(30")	100cm(40")
SAMPLE:2	110cm(44")	100cm(40")
SAMPLE:3	85cm(34")	100cm(40")
SAMPLE:4	75cm(30")	100cm(40")

DEVELOPMENT OF BASIC MAT LAYOUT

Four mats were developed using randomly chosen sizes.

Using these measurements the mats were woven on a handloom.

Preparation of weaving:

Weaving is done with two sets of yarns; the warp yarns and weft yarns. Both of them have to be readied for the process of production.

Preparation of warp yarns-

The lengthwise threads are called warp individually they are known as ends. Yarns that are going to be used as warp must pass through few operations. They are:

1. Spooling
2. Warping
3. Starching.

Spooling: In spooling the yarns are wound on large spools or cones which are placed on a rack called creel from these creel the yarns are wound on a warp beam which is similar to a huge spool by section warping.

Warping:

Starching:

Preparation of weft yarns

Pirn winding: The yarns are given the required amount of twist and then it was wound over the spools. Then Pirn winding frame is used to transfer the spools of yarn onto the pirns till they are able to fit into the shuttle.

Method of developing mats,

- Design
- Draft
- Peg plan

Design

The weaving was done with plain weave design. The design indicates the interlacement of warp and weft threads in the repeat of the design. It is made up of a number of squares, which constitute the repeat size of a design. The vertical direction of the squares indicates the picks and the horizontal direction indicates the ends. A blank in a square indicates that a warp goes below the corresponding weft and 'X' mark in the square indicates that the warp floats above the weft.

DESIGN

X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X

FIG I

DRAFTING PLAN

The draft plan indicates the manner of drawing the ends through the heald eyes and it also tents the number of heald shafts required for a weave repeat. Hence, straight draft was used to produce the cloth.

DRAFTING PLAN

			X				X
		X				X	
	X				X		

X				X			
---	--	--	--	---	--	--	--

FIG 2

PEG PLAN

Peg plan denotes the order of lifting the heald shafts. In a peg plan the vertical space indicates the ends and the horizontal space indicates the picks. The peg plan depends upon the drafting plan. The weaving requires 4 heald shafts. Each heald shafts are lifted in four combinations with insertion of weft yarns. The lifting order was 1 and 3 and 2 and 4.

	X		X
X		X	
	X		X
X		X	
	X		X
X		X	
	X		X
X		X	

FIG 3: PEG PLAN

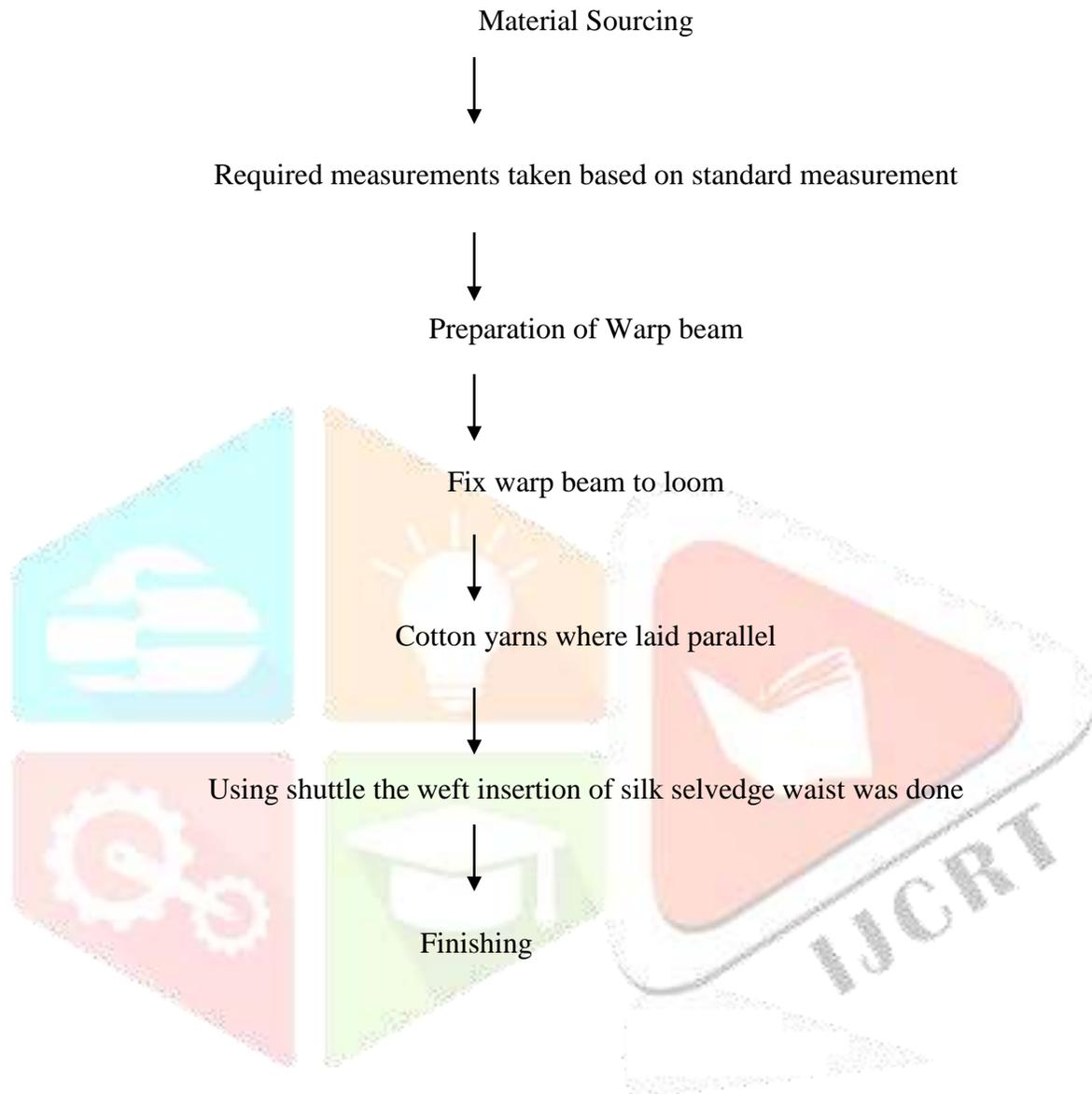
DENTING PLAN

Generally for the fabric construction 2ends/dent were made. The yarn count of weft is very thick as it is reusing selvedge waste off the rapier loom.

X	X	X	X				
				X	X	X	X

FIG 4: DENTING PLAN

Basic process flow for mat construction



Using this basic method the 4 mats are developed. 3 with plain weave and 1 with Tapestry weave.

1st mat is constructed with plain weave, the colour combination is Blue and Grey the measurement length is 75cm by 100 cm width. The Mat has 640warp yarns and 300weft. The fabric count is Per inch: 16 warp yarns and 8 weft yarns are used.

2nd mat is done with plain weave with colour combination of orange and Green – the mats were woven separately and then cut and stitched to required measurements The measurement length is 110cm and 100

cm width. It has 640 warp and 440 weft yarns in total. Fabric Count is Per inch: 16 warp yarns and 10 weft yarns are used.

3rd mat is done with plain weave using multi coloured yarns. Dimensions of mats: Length 85cm by width 100 cm. Number of warps 640 to 340 wefts in full mat with Fabric count being 16 warps and 10 weft yarns are used per inch.

4th mat is done using tapestry weave; the colour combination is red and grey the dimensions are length 75 cm and width 100cm. The total Yarns in the mats are 440 warp yarns and 300 weft. Fabric count per inch: 16 warp yarns and 8 weft yarns are used.

Selection of colour for the mats

By doing the market survey it was found that the availability of silk selvedge waste in the production was with limited colours such as orange, red, blue, grey, sky blue by this availability of raw material the selection of colours for four mats was chosen.

Looking at the availability of silk selvedge waste the colour combinations were selected. As Grey selvedge waste was in larger quantity compared to the rest of the colours, it was decided to use grey in combination with other colours as it is a neutral colour and will combine well with nearly all other colours.

For sample 1:- The colour used was blue and grey is a primary colour and the other is a neutral colour.

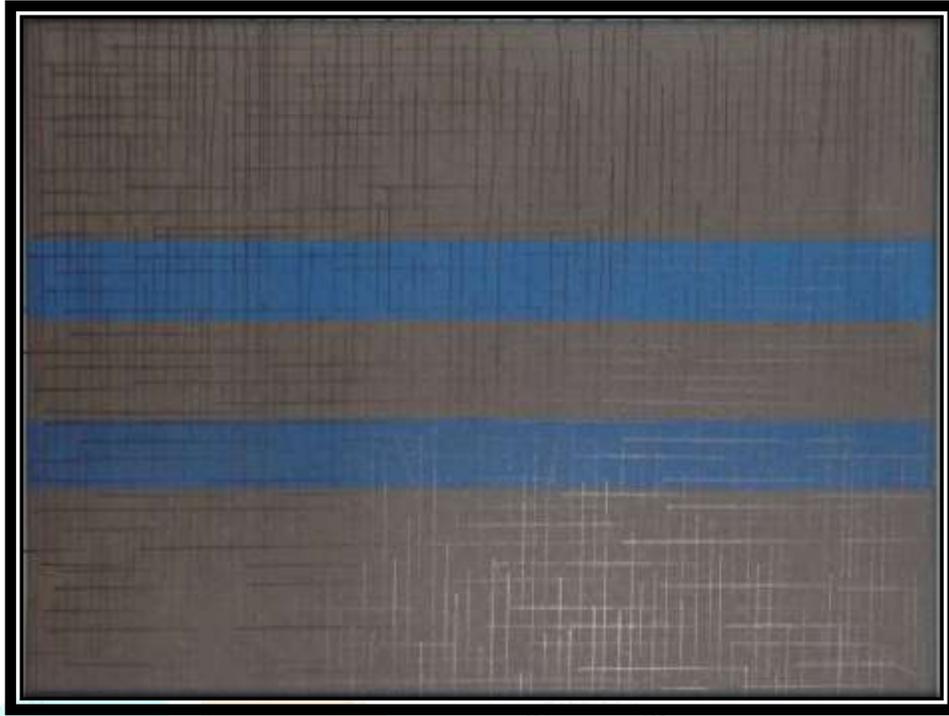
Sample 2:-The colours used were orange and green, both these colours are secondary colour..

Sample 3:- The colours used were Rama Green, Orange, Maroon Grey, Blue, Peach, Black, they were laid in random stripes to enhance and compliment each other.

Sample 4:- The colour used is grey and red. Here primary colour Red and Neutral Grey has been used to make the mat.

SAMPLE 1

DESIGN FOR 1st MAT

**FIG 5**

Plain Weaving Technique is used

Mats design with Silk selvedge waste of Blue and grey.

Designed features: Finishing is done by creating tassels; tying groups of black cotton warp left after weaving together.

FIG-6

			X				X
		X					X
	X					X	
X				X			

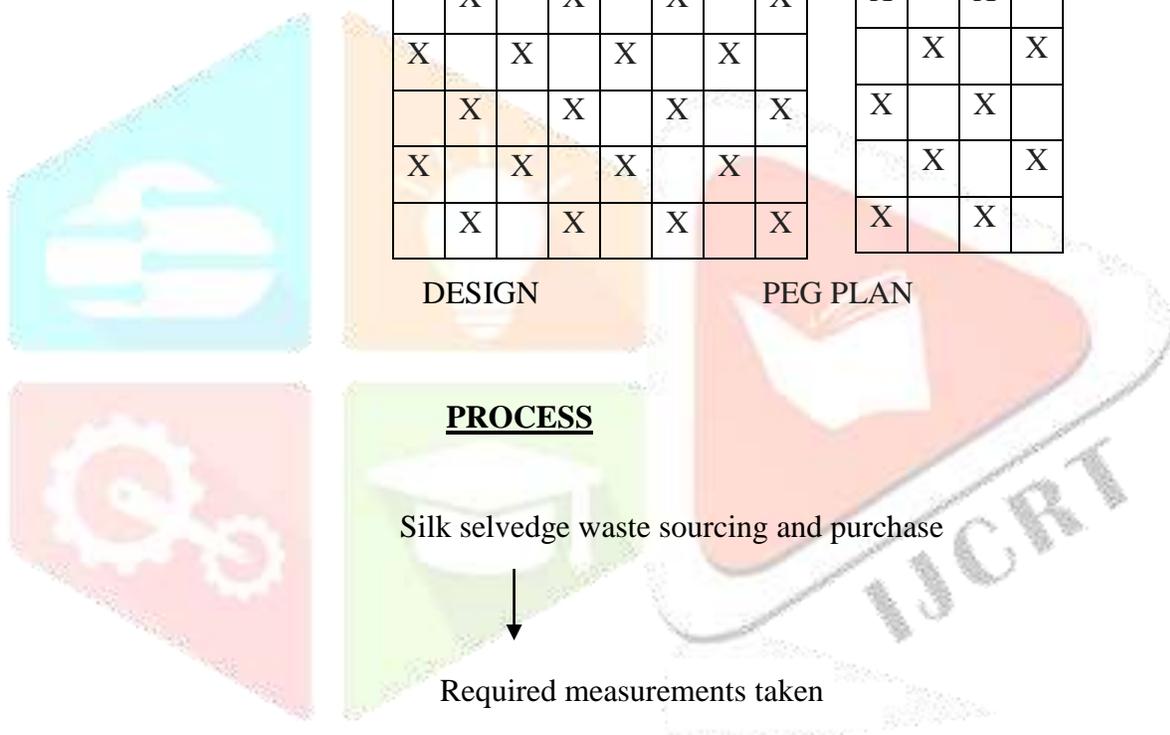
DRAFTING PLAN

X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X

DESIGN

	X		X
X		X	
	X		X
X		X	
	X		X
X		X	
	X		X
X		X	

PEG PLAN



PROCESS

Silk selvedge waste sourcing and purchase



Required measurements taken



Preparation of Warp beam



Fix warp beam to loom



Cotton yarns where laid parallel



Using shuttle the weft insertion of silk selvedge waste was done.



Finishing

Product 1



FIG-7

COST SHEET OF SAMPLE 1

Raw material cost	Quantity	Amount in Rs.
Silk selvedge	1 Kg	200
Cotton thread	50 grams	200
Labour cost	500 per day	500
Total		900
Profit 10%		24
Selling price		924

SAMPLE 2

DESIGN FOR 2nd MAT

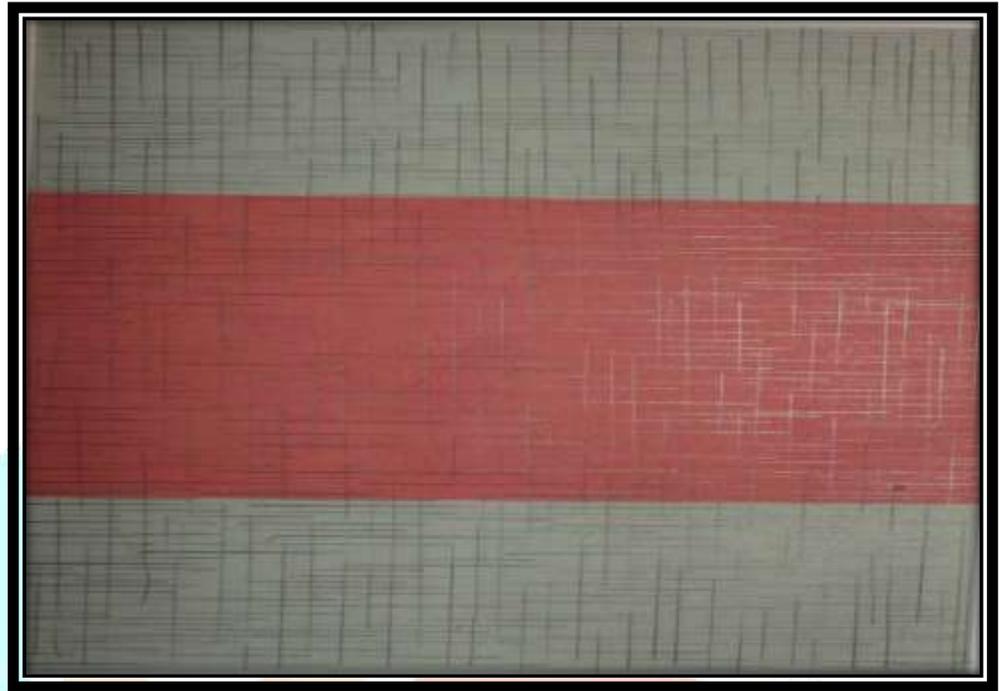


FIG-8

Plain Weaving is used.

Mats design with Silk selvedge waste of green and orange.

The two different colours were woven separately and then cut and stitched together

Designed features: Finishing is done by stitching a decorative tape on the seams and also on the sides parallel to the seams.

FIG-9

			X				X
		X				X	
	X				X		
X				X			

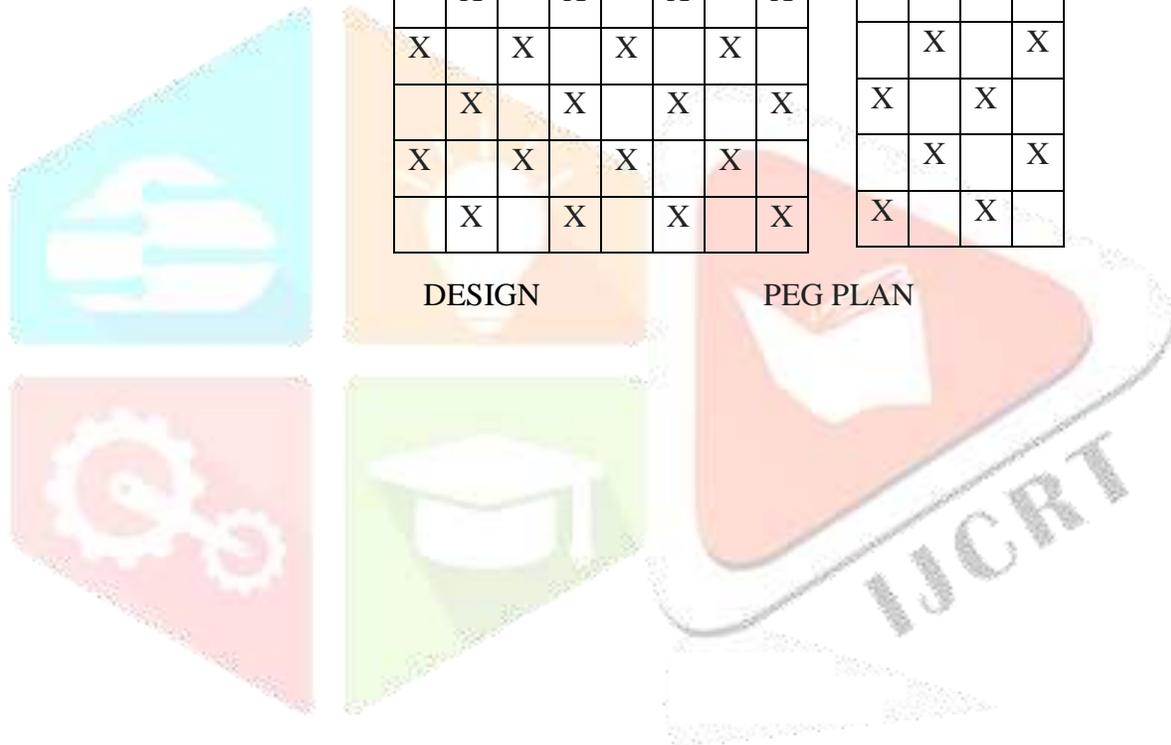
DRAFTING PLAN

X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X

DESIGN

	X		X
X		X	
	X		X
X		X	
	X		X
X		X	
	X		X
X		X	

PEG PLAN



PROCESS

Silk selvedge waste sourcing and purchase



Required measurements taken



Preparation of Warp beam



Fix warp beam to loom



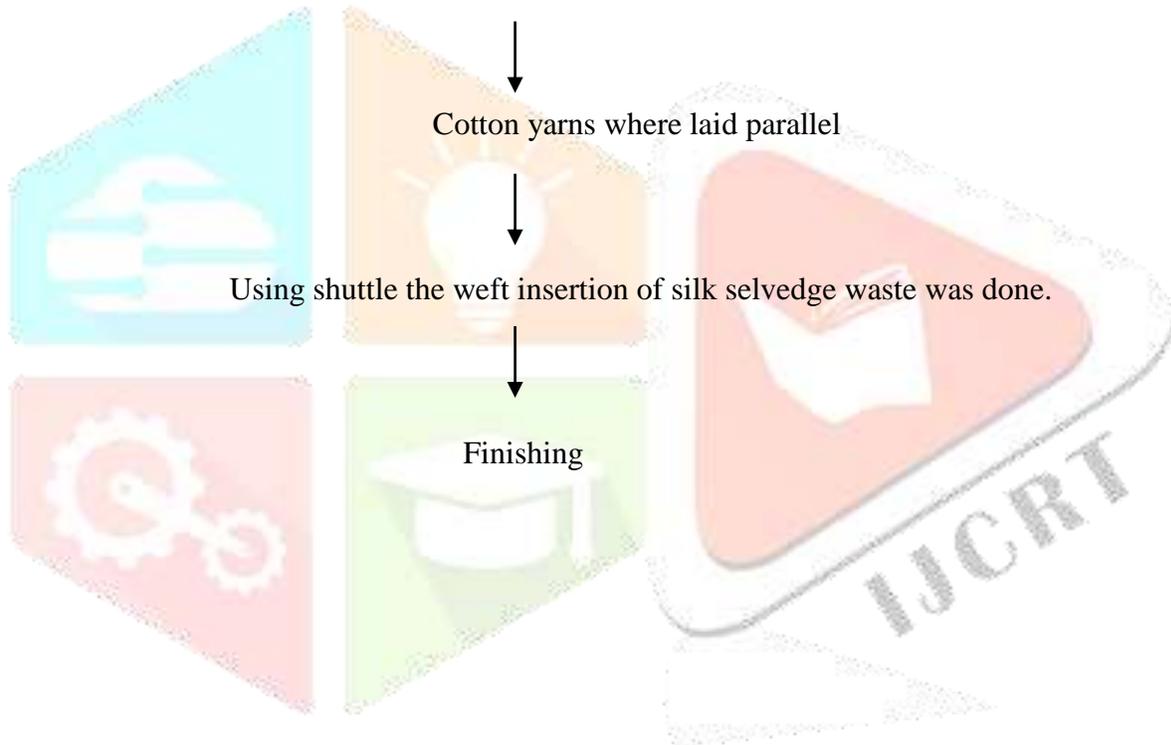
Cotton yarns were laid parallel



Using shuttle the weft insertion of silk selvedge waste was done.



Finishing



Product 2

FIG-10

COST SHEET OF SAMPLE 2

Raw material cost	Quantity	Amount in Rs.
Silk selvedge	1.5Kg	300
Cotton thread	50grms	200
Decorative lace	5 mtrs	75
Labour cost	Per day 500/-	750
Total		1325
Profit 10%		24
Selling price		1349

SAMPLE 3**DESIGN FOR 3rd MAT****FIG-11**

Weaving Technique is used

Mats design with Silk selvedge waste of multi colours.

Designed features: Finishing is done with folding the raw edges and separated silk thread was used to make tassels.

FIG-12

			X				X
		X				X	
	X				X		
X				X			

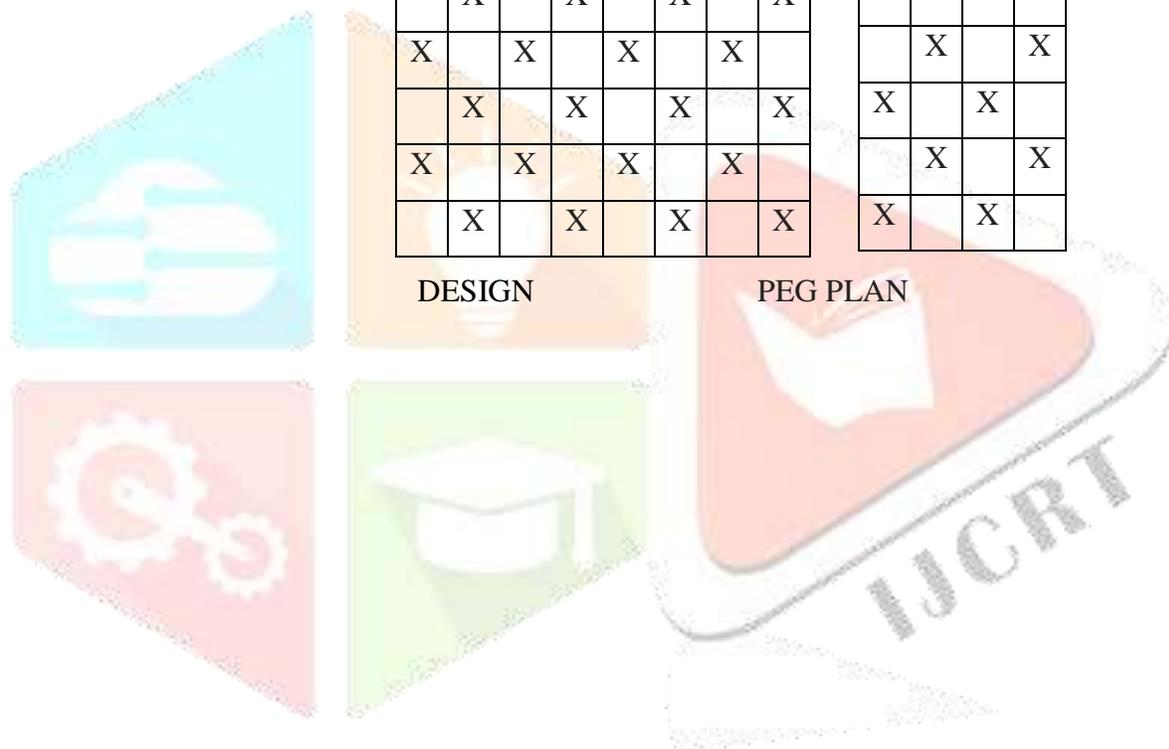
DRAFTING PLAN

X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X
X		X		X		X	
	X		X		X		X

DESIGN

	X		X
X		X	
	X		X
X		X	
	X		X
X		X	
	X		X
X		X	

PEG PLAN



PROCESS

Silk selvedge waste sourcing and purchase



Required measurements taken



Preparation of Warp beam



Fix warp beam to loom



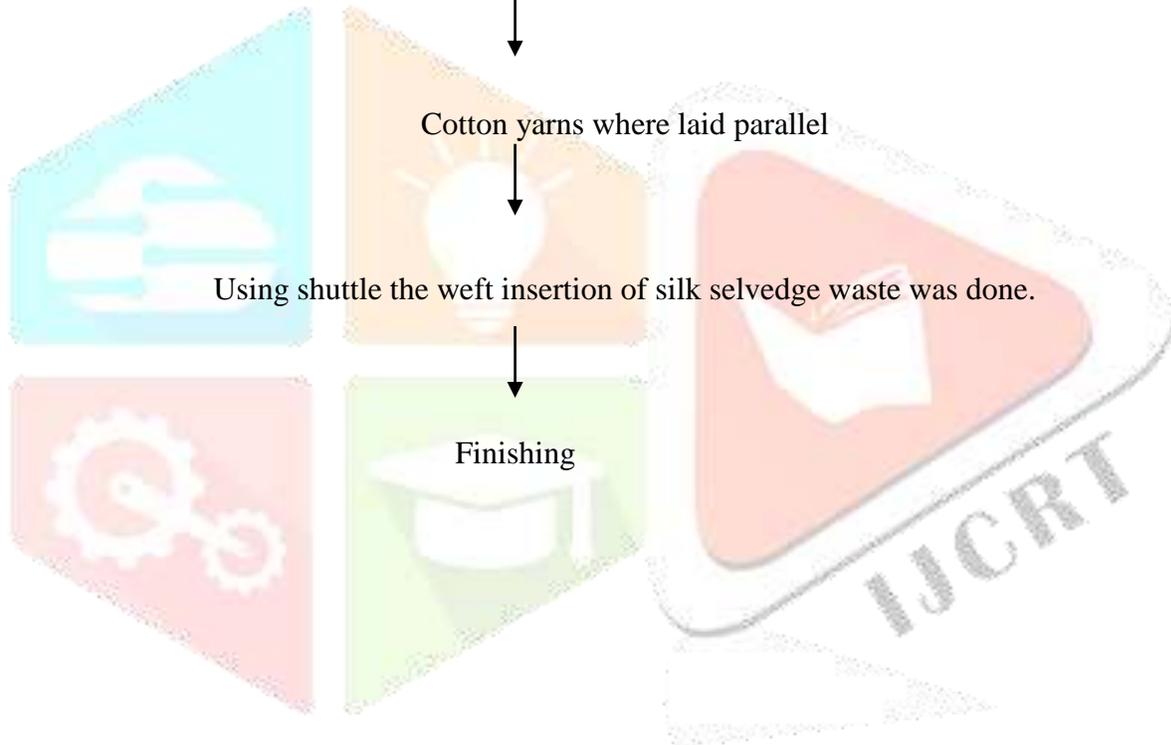
Cotton yarns where laid parallel



Using shuttle the weft insertion of silk selvedge waste was done.



Finishing



Product 3**FIG-13****COST SHEET OF SAMPLE 3**

Raw material cost	Quantity	Amount in Rs.
Silk selvedge	1.5 Kg	300
Cotton thread	70gm	300
Tassel Thread	50 grams	100
Labour cost	Per day 500	1000
Labour cost for tassels	2 days	200
Total		1900
Profit 10%		24
Selling price		1924

DEVELOPMENT OF DESIGN, DRAFT AND PEG PLAN FOR SAMPLE-4

DESIGN

Tapestry weaving is used, the weaving was done with tapestry weave. The design indicates the interlacement of warp and weft threads in the repeat of the design. It is made up of a number of squares, which constitute the repeat size of a design. The vertical direction of the squares indicates the picks and the horizontal direction indicates the ends. A blank in a square indicates that a warp goes below the corresponding weft and 'X' mark in the square indicates that the warp floats above the weft.

DESIGN

							X
						X	X
					X	X	X
			X	X	X	X	X
		X	X	X	X	X	X
	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X

FIG-14

DRAFTING PLAN

The draft plan indicates the manner of drawing the ends through the heald eyes and it also tents the number of heald shafts required for a weave repeat. Hence, straight draft was used to produce the cloth.

DRAFTING PLAN

			X				X
		X				X	
	X				X		
X				X			

FIG-15

PEG PLAN

Peg plan denotes the order of lifting the heald shafts. In a peg plan the vertical space indicates the ends and the horizontal space indicates the picks. The peg plan depends upon the drafting plan. The weaving requires 4 heald shafts. Each heald shafts are lifted in four combinations with insertion of weft yarns.

PEG PLAN

							X
						X	X
					X	X	X
				X	X	X	X
			X	X	X	X	X
		X	X	X	X	X	X
	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X

FIG-16

DENTING PLAN

Generally for the fabric construction 2ends/dent were made. The yarn cont of weft is very thick as it is reusing selvedge waste off the rapier loom

DENTING PLAN

X	X	X	X				
				X	X	X	X

FIG-17

SAMPLE 4**DESIGN FOR 4th MAT**

FIG-18

Tapestry Weaving Technique is used
Mat designed with Silk selvedge waste in red and beige
Designed features: Finishing is done with tassels of single colour

FIG-19

DRAFTING PLAN

			X				X
		X				X	
	X				X		
X				X			

								X
								X X
						X	X	X X
				X	X	X	X	X X
			X	X	X	X	X	X X
		X	X	X	X	X	X	X X
	X	X	X	X	X	X	X	X X
X	X	X	X	X	X	X	X	X X

DESIGN

								X
							X	X
					X	X	X	X
				X	X	X	X	X
			X	X	X	X	X	X
		X	X	X	X	X	X	X
	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X

PEG PLAN

PROCESS

Silk selvedge waste sourcing and purchase



Required measurements taken



Preparation of Warp beam



Fix warp beam to loom



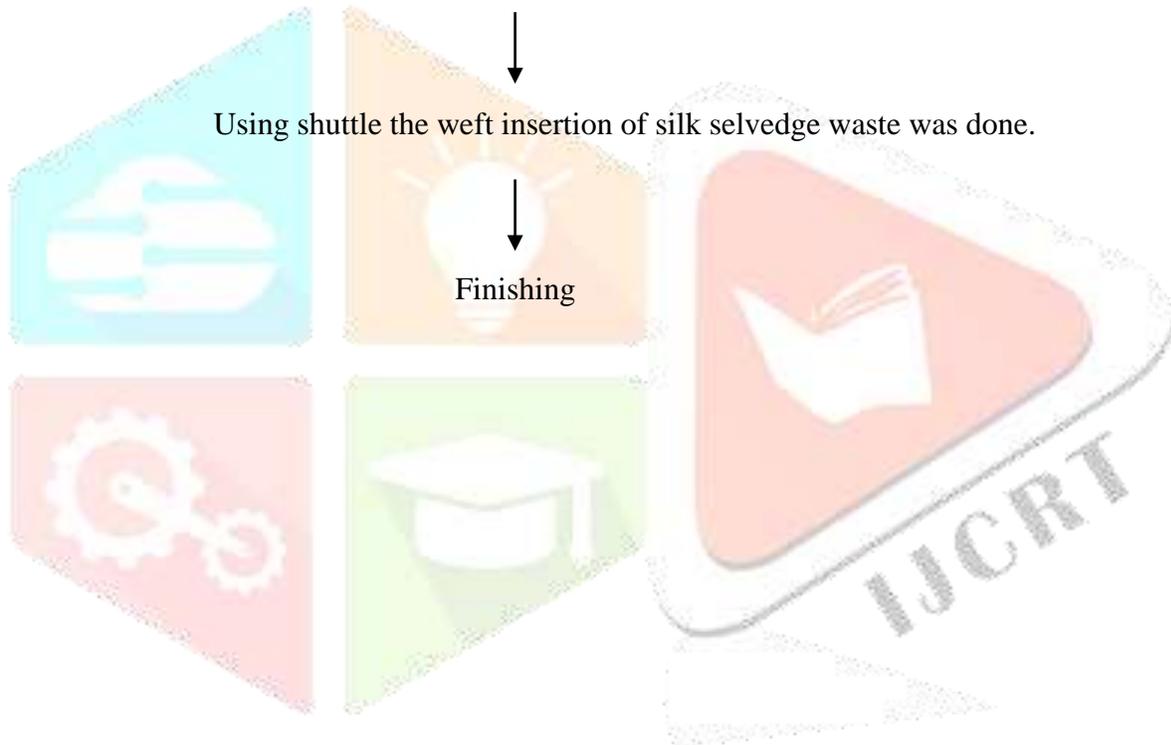
Cotton yarns were laid parallel



Using shuttle the weft insertion of silk selvedge waste was done.



Finishing



Product 4



FIG-15

COST SHEET OF SAMPLE 4

Raw material cost	Quantity	Amount in Rs.
Silk selvedge	2 Kg	400
Cotton thread	50gram	200
Tassel Thread	50grams	100
Labour cost	Per day(2) 500	1000
Labour cost for tassel	2 day	200
Total		1900
Profit 10%		24
Selling price		1924

RESULT AND DISCUSSION

1. TABLE-1: Awareness of mats used for sitting.

Aware	No of respondents	Percentage
-------	-------------------	------------

Yes	20	67%
No	10	33%
Total	30	100%

The table 1 shows clearly that 67% of the respondents are aware of mats being used for sitting and 33% of the respondents are not aware of mats used for sitting

2. TABLE-2: Awareness of mats made of silk.

Method	No of respondents	Percentage
Yes	12	40%
No	18	60%
Total	30	100%

From the above table it is clear that 40% of the respondents are aware of mats made of silk and 60% of the respondents are not aware of mats made of silk.

3. Table-3: Preferences of mat finished with tassels.

Preferences	No of respondents	Percentage
Yes	10	33%
No	20	67%
Total	30	100%

The table 3 clearly shows that 33% of the respondents prefer mats finished with tassels and 67% of the respondents do not prefer mats finished with tassels.

4. Table4: Awareness of tapestry weaving.

Awareness	No of respondents	Percentage
Yes	10	33%
No	20	67%
Total	30	100%

The table 4 clearly shows that 33% of the respondents are aware of tapestry weaving and 67% of the respondents are not aware of tapestry weaving

5. Table 5: Kind of mat people prefer

Preferences	No of respondents	Percentage
Woven	20	67%
Knitted	10	33%
Non-woven	00	00%
Felted	00	00%
Total	30	100%

From the above table it is clear that 67 % of the respondents prefer woven mats and 33 % of the respondents prefer knitted mats.

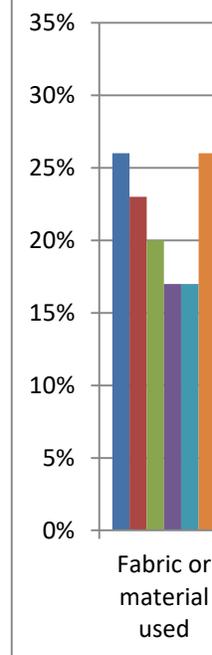
6. Table 6: Type of material people prefer.

Material	No of respondents	Percentage
Cotton	12	40%
Polyester	3	10%
Nylon	00	00%
Silk	15	50%
Total	30	100%

The above table shows that 40% of the respondents prefer cotton material for mats, 10% of the respondents prefer polyester material for mats and 50% of the respondents prefer silk material for mats.

7. Table7: Criteria for shopping the mats From the above table it is clear that

Criteria Rating	1		2		3		4		5		6	
	Fabric or material used	08	26%	07	23%	06	20%	05	17%	05	17%	08
Quality	06	20%	06	20%	05	17%	06	20%	07	23%	06	20%
Design	06	20%	05	17%	06	20%	04	13%	06	20%	06	20%
Texture	05	17%	05	17%	08	26%	05	17%	05	17%	05	17%
Price of product	05	17%	07	23%	05	17%	10	33%	07	23%	05	17%



The

above table shows that 27% of the respondents select mats based on choice of fabric used for mats, 23% of the respondents select mats based on quality and 20% of the respondents select mats based design, 27% of the respondents select mats based on texture and 33% of the respondents choose mats depending on its price.

8. Table 8: Preferences of additional finishing for mat

Prefer	No of respondents	Percentage
Fringes	09	30%
Lace	09	30%
String of beads	00	00%
Tassels	12	40%
Total	30	100%

From the above table it is clear that 30 % of the respondents prefer fringes for their mats, 30% of the respondents prefer lace for their mats. 40% of the respondents prefer tassels for their mats.

9. Table9: How often do you change your mats

Frequency	No of respondents	Percentage
Every 2 months	10	33%
Once a year	05	17%
Every 5 months	10	33%
More than 2 years	05	17%
Total	30	100%

From the above table it is clear that 33% of the respondents change their mats every 2 months, 17% of the respondents change their mats once a year, 33% of the respondents change their mats every 5 months and 17% of the respondents change their more than 2 years.

10. Table 10: Method of Cleaning of mats

Cleaning	No of respondents	Percentage
Dry cleaning	05	16.5%
Hand wash	15	51%
Vacuum cleaner	05	16.5%
Machine wash	05	16.5%
Total	30	100%

From the above table it is clear that 17 % of the respondent clean mats by dry cleaning them, 50% of the respondent clean mat by hand washing them, and 17% of the respondent clean mats using vacuum cleaner, and 17% of the respondent clean mats in a machine wash.

11. Table 11: Preferences of colour for their mats.

Criteria	No of respondents	Percentage
Dark colour	13	43%
Light colour	5	17%
Both	12	40%
Total	30	100%

From the above table it is clear that 43% of the respondents prefer dark colour for their mats, 17% of the respondents prefer light colour for their mats and 40% of the respondents prefer both colours for their mats.

12. Table 12; Kind of technique you prefer

Technique	No of respondents	Percentage
Weaving	20	67%
Tapestry	10	33%
	30	100%

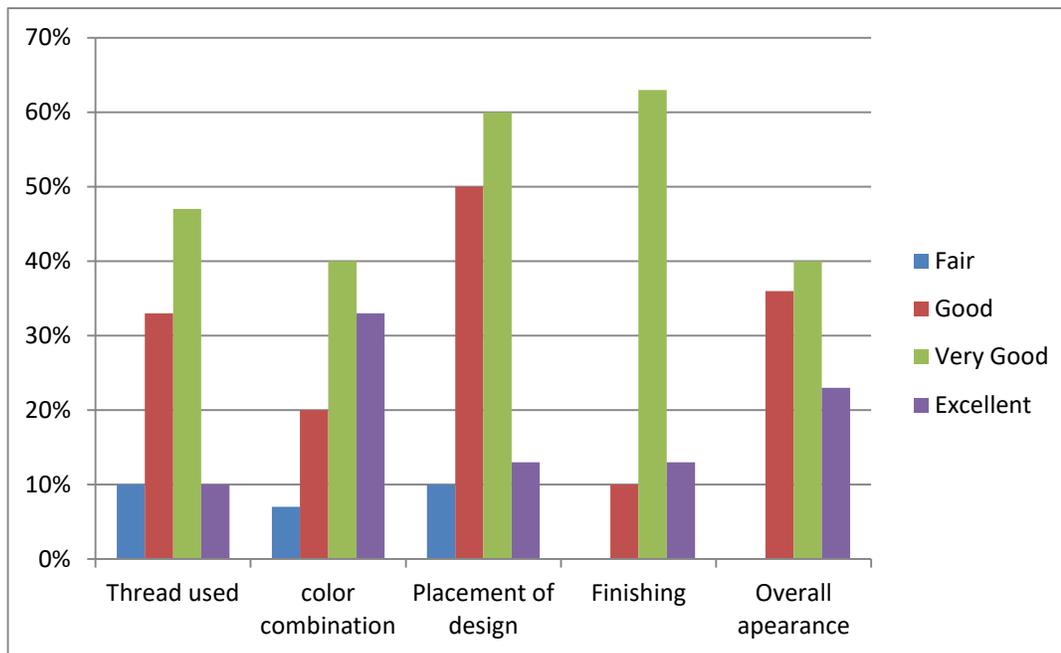
From the above table it is clear that 66% of the respondents prefer plain weaving technique and 33% of the respondent prefers tapestry weaving.



13. Rating

Sample 1

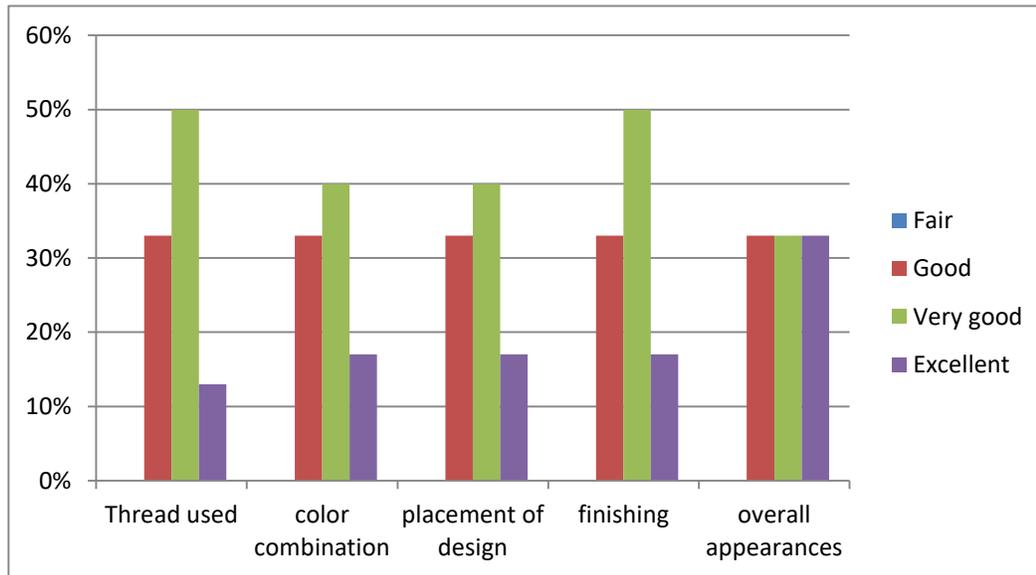
Rating	Thread used		Colour combination		Placement of design		Finishing		Overall appearance	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Fair	03	10%	02	7%	03	10%	0	00%	0	00%
Good	10	33%	06	20%	14	47%	03	10%	11	36%
Very Good	14	47%	12	40%	10	33%	19	64%	12	40%
Excellent	03	10%	10	33%	03	10%	08	26%	07	24%



The above table shows that, 47% of the respondents feel that thread used is very good, 40% of the respondents feel that colour combination is very good, 60% of the respondents feel that placement is very good, 63% of the respondents feel that finishing is very good, 40% of the respondents feel that over all appearances is very good.

Sample 2

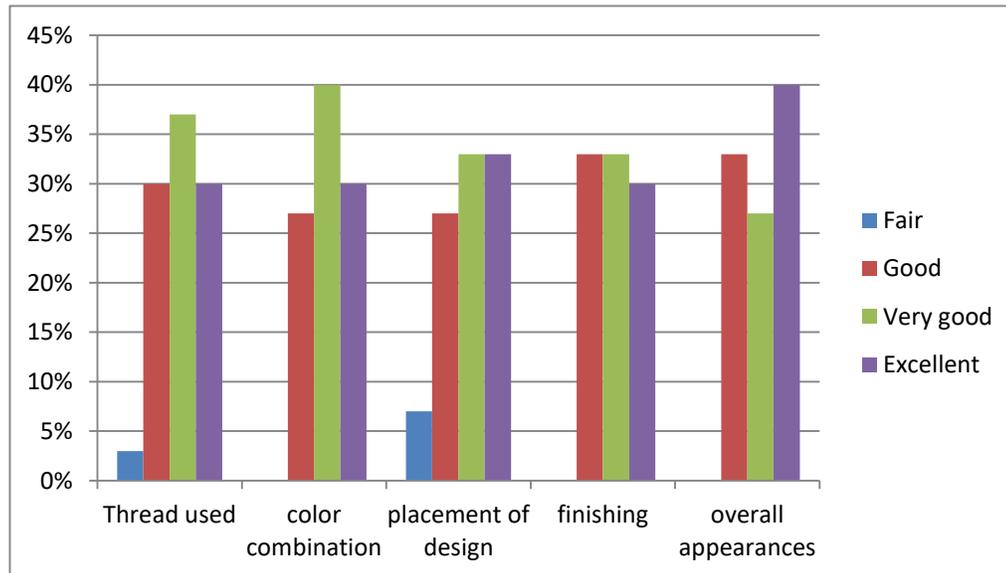
Rating	Thread used		Colour combination		Placement of design		Finishing		Overall appearance	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Fair	01	03%	00	00%	01	03%	00	00%	00	00%
Good	10	33%	10	33%	08	27%	10	33%	12	40%
Very Good	15	51%	12	40%	11	37%	15	50%	8	27%
Excellent	04	13%	08	27%	10	33%	05	17%	10	33%



From the above table it's clear that 50% of the respondents feel that thread used is very good, 40% of the respondents feel that colour combination is very good, 37% of the respondents feel that placement is very good, 50% of the respondents feel that finishing is very good, 33% of the respondents feel that over all appearances is excellent.

Sample 3

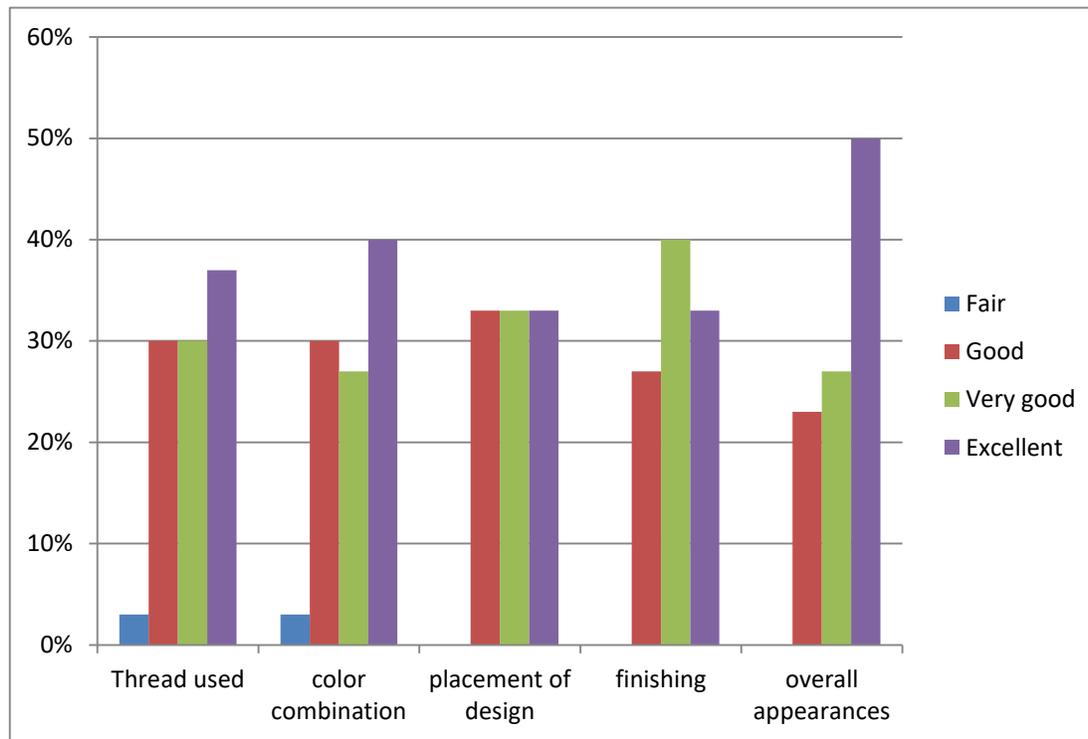
Rating	Thread used		Color combination		Placement of design		Finishing		Overall appearance	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Fair	01	03%	01	03%	02	7%	01	03%	00	00%
Good	09	30%	8	26%	08	27%	10	33%	10	33%
Very Good	11	36%	12	40%	10	33%	10	33%	8	27%
Excellent	09	31%	09	31%	10	33%	09	31%	12	40%



The above table shows that 37% of the respondent feel material used is very good and excellent, 40% of the respondents feel thread used is very good, 33% of the respondents feel that colour combination is very good, 33% of the respondents feel that placement of design is very good, 27% of the respondents feel that finishing is very good, 40 % of the respondents feel that over all appearances is excellent.

Sample 4

Rating	Thread used		Colour combination		Placement of design		Finishing		Overall appearance	
Fair	01	03%	01	03%	00	00	00	00	00	00
Good	09	30%	09	30%	12	40%	08	27%	07	23%
Very Good	09	30%	08	27%	10	33%	012	40%	8	27%
Excellent	11	37%	12	40%	8	27%	10	33%	15	50%

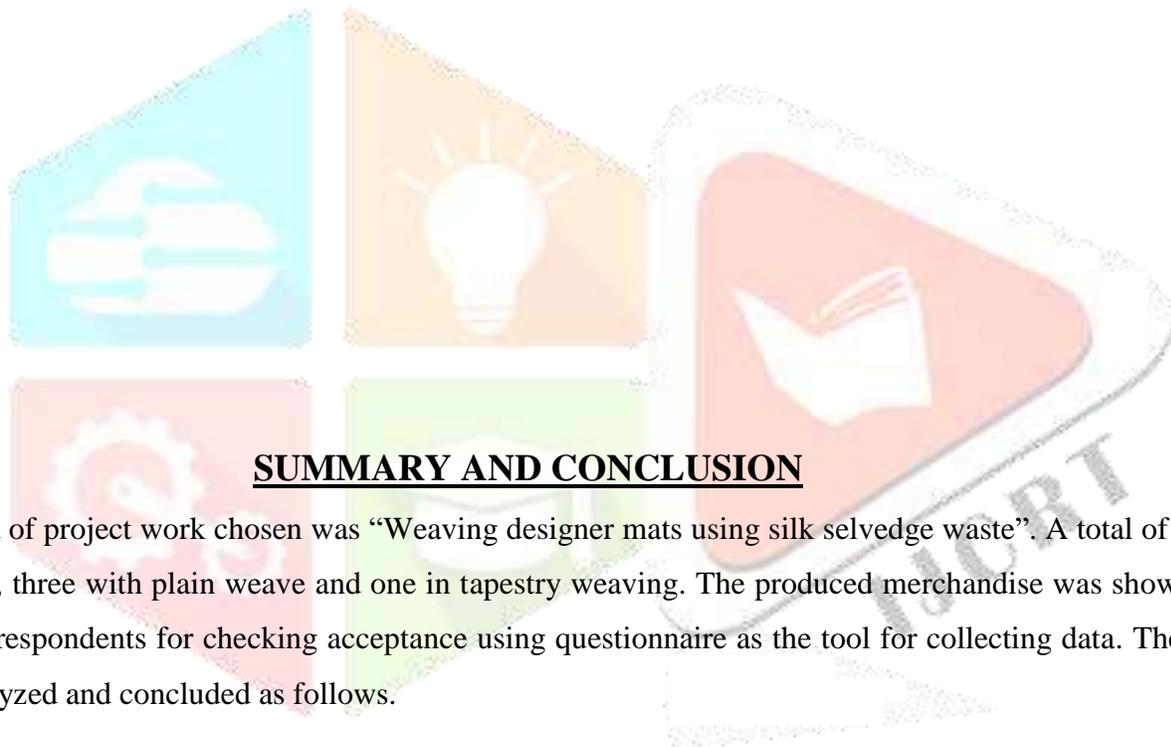


From the above table it's clear that 30% of the respondents feel that thread used is excellent, 27% of the respondents feel that colour combination is excellent, 33% of the respondents feel that placement is excellent, 40% of the respondents feels that finishing is excellent, 50% of the respondents feels that over all appearances is excellent.

Table17: Rating according to cost

Rating	Sample-A (924)		Sample-B (1374)		Sample-C (1624)		Sample-D (1724)	
Very Expensive	02	07%	01	3%	02	07%	04	13%
Affordable	17	56%	16	53%	16	53%	15	50%
Not expensive	03	10%	05	17%	04	13%	01	03%
Cheap	00	00%	00	00%	00	00%	00	00%

From the above table it is clear that 56% of the respondents felt that sample A is affordable, 53% of the respondents felt that sample B is affordable, 53% of the respondents felt that sample C is affordable and 50% of the respondents felt that sample D is affordable.



SUMMARY AND CONCLUSION

The area of project work chosen was “Weaving designer mats using silk selvedge waste”. A total of four mats were designed, three with plain weave and one in tapestry weaving. The produced merchandise was shown via a display to thirty respondents for checking acceptance using questionnaire as the tool for collecting data. The tabulated was then analyzed and concluded as follows.

SAMPLE 1,

47% of the respondents thought that the thread used was very good, 40% of the respondents felt that colour combination was very good, 60% of the respondents felt that placement was very good, 63% of the respondents felt that finishing was very good, 40% of the respondents felt that over all appearances was very good.

SAMPLE 2,

50% of the respondents felt that thread used was very good, 40% of the respondents felt that colour combination was very good, 37% of the respondents felt that placement was very good, 50% of the respondents felt that finishing was very good, 33% of the respondents felt that over all appearances was excellent.

SAMPLE 3

37% of the respondent felt material used was very good. 40% of the respondents felt thread used was very good, 33% of the respondents felt that colour combination is very good, 33% of the respondents felt that placement of design was very good, 27% of the respondents felt that finishing was very good, 40 % of the respondents felt that over all appearances was excellent.

SAMPLE 4

30% of the respondents felt that thread used was excellent, 27% of the respondents thought that colour combination was excellent, 33% of the respondents felt that placement was excellent, 40 % of the respondents felt that finishing was excellent, 50 % of the respondents felt that over all appearances was excellent.

THRED USED:- 51% of the respondents felt that sample 2 was excellent and 47% of respondents though that sample 1 was very good.

COLOUR COMBINATION:- 40% of the respondents felt that sample 1,2,3, was very good and sample 4 was excellent.

PLACEMENT OF DESIGN:- 47% of the respondents felt that sample 1 was good and 40% of the respondents though that sample 4 was good.

FINISHING:- 64% of the respondents felt that sample 1 was very good and 50% of the respondents felt that sample 3 was very good and 40% of the respondents felt that sample 4 was very good.

OVER ALL APPEARENCE:- 50% of the respondents felt that sample 4 was excellent and 40% of the respondents felt that sample 3 was excellent, and 40% of respondents though that sample 1 was very good and 40% of the respondents felt that sample 2 was good.

Conclusion

1. 67% of the respondents liked the woven mats and 33% of the respondents accepted the mat woven using tapestry techniques.
2. The designer mats were appreciated by age group of above 20-25 years 30% respondents liked surface embellishment of attaching of decorative tape and 33% respondents liked surface embellishment of attaching tassels used to enhance the mats.
3. 64% of the respondents liked sample A the most because of the finishing used on the mat, 50% of the respondents liked sample B the most because of the finishing of mat. 50% of the respondents liked sample D the most, because of the colour combination and different weaving technique used. 40% of the respondents rated sample C second for the finishing and color combination.
4. The respondents felt that the designer mats can be used in homes and function halls, because of the design and finishing.

SUGGESTION AND LIMITATIONS

LIMITATION:

- Silk selvedge waste was unravelling a lot during the weaving process.
- Study was limited to plain weave and tapestry weave.

SUGGESTIONS

- Construction using machines of mats with silk selvedge waste can be tried.
- Mats can be constructed with using other looms like dobby etc.
- More intricate designs can be tried out.
- The durability of the mats can be tested.

APPENDIX**NAME:****OCCUPATION:****AGE:****ADDRESS:**

1. Are you aware of mats used for sitting?

Yes

No

2. Are you aware of mats made of silk?

Yes

No

3. Do you prefer mat finished with tassels?

Yes

No

4. Are you aware of tapestry weaving?

a) Yes

b)No

5. What kind of mat do you prefer?

a) Woven

b) Knitted

c) Non-woven

d) Felted

6. What type of material do you prefer?

a) Cotton

b) Polyester

c) Nylon

d) Silk

7. When shopping for the mat what do you look for? list in order of preference (give 1 to most preferred 6 to least liked)

a) Fabric or material used

b) Quality

- c) Design
e) Texture
- d) Colour of the product
f) Price of product

8. Do you prefer additional finishing for your mats? if yes, which?

- a) Fringes
c) String of beads
- b) Lace
d) Tassels

9. How often do you change your mats?

- a) Every 2 months
c) Every 5 months
- b) Once in a year
d) More than 2 years

10. Do you clean the mats regularly?

- a) Dry clean
c) Vacuum cleaner
- b) Hand wash
d) Machine wash

11. what colour do you prefer for your mats?

- a) Dark colour
c) Both the colours
- b) Light colour

12. Which kind of technique do you prefer?

- a) Weaving
b) Tapestry

13. Rating: 1. Fair 2. Good 3. Very Good 4. Excellent

Sample1

Characteristics	1	2	3	4
Thread used				
Colour combination				
Placement of design				
Finishing				
Overall appearance				

Sample2

Characteristics	1	2	3	4
Thread used				
Colour combination				
Placement of design				
Finishing				

Overall appearance				
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Sample3

Characteristics	1	2	3	4
Thread used				
Colour combination				
Placement of design				
Finishing				
Overall appearance				

Sample4

Characteristics	1	2	3	4
Thread used				
Colour combination				
Placement of design				
Finishing				
Overall appearance				

14. Give your rating on the cost of the sample

- A. Very expensive B. Affordable
C. Not expensive D. Cheap

Sample	Rating
A	924
B	1374
C	1624
D	1724

SIGNATURE

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