Wood Block Making Craft of Pethapur: Evolution and Promotion

Synopsis of Proposed Thesis

by

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- **Oral Paper Presentations**

1. Presented a paper entitled "**Ergonomic Risk Factors faced by the Wood Block Makers of Pethapur, Gujarat- India: An Analysis**", at The Global Conference on Research in Human Factors and Ergonomics organized virtually by R & R Knowledge Solutions, Sri Lanka held virtually from 11th - 12th July 2022

2.Research paper presented entitled "**Wood Block making Craft of Pethapur**" at the 5th International Textiles and Costume Congress 2019 held on "Indigenous Textile Crafts: Global markets and Trends", organized by the Department of Clothing and Textiles, Faculty of family and Community Sciences, The Maharaja Sayajirao University Of Baroda, Vadodara from 3rd – 5th October, 2019.

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INTRODUCTION

'*Craft is remembering that art is seen, felt and heard as well as understood, knowing that not all ideas start with words, thinking with hands as well as head.'*

- Mark Jones, Director, Victoria and Albert Museum

The craft in India presents both the widest canvas of creative activity and the broadest spectrum of development. Handicrafts are not products of individual artists, enveloped in a shell of inward looking egocentricity, searching for a method of intense self-expression. It is an art of people, which means that skills are not in the individuals but have seeped, spread and taken root through time, through generation, through communities, through music and dance, rituals and prayers. The artisan and craftspeople of India are touched away in the narrowest lanes and remotest villages and the crafts of daily use are largely crowded but by the flashing garish symbols of new city life. (Jaitley J, 1990)

India since ancient times enjoyed a monopoly of cotton and in particular of printed goods. Considering the great antiquity of India's skill of dyeing, its expertise in printing cloth with dyes and pigments probably matured early. (Robinson S, 1969)

The oldest known patterned fabrics from India are from Gujarat. They were resist dyed and printed cotton excavated at Fostat. The stylistic delineation of the patterns was based on the decorative style of West Indian painting and design. The combination printing and painting which is found in many of the textile fragments is also typical techniques used at present at Ahmedabad, Deesa in North Gujarat and in the printing centers of Kutch. (Desai J.)

The main tool of hand block printing is a wooden block. It is a finely carved stamp by trained craftsmen, which requires concentration, precision and patience. The craftsmen must have good knowledge of geometry to make a perfect block for seamless printing in terms of design, repeat and level of block.

Pethapur situated 40 kms away from Ahmedabad is the only surviving center of wood block carving in Gujarat. *Gajjar* community of block makers in Pethapur village was closely involved with the *Saudagiri* trade, with the Kingdom of Siam (modern day Thailand). *Saudagiri*, the trade textile of Gujarat is an example of exquisite Indian craftsmanship; once extremely popular for its grid based intricate block print designs on cotton (Madderpat) especially made for the Siam (Thailand) Royal courts. It was exported in large volumes to Siam for almost a century i.e. around 1842 - 1958. This trade continued vigorously until the advent of World War II which signaled a death blow to the *Saudagiri* trade route. The *Saudagiri* trade was controlled and monitored by three main trading companies namely *Maskati, Vashi* and *Baghi.* At its peak the village of Pethapur had more than three thousand artisans working in its workshops. (Chattopadhyay K.) It was this trade which had made Pethapur, a wood block making hub.

Saudagiri declined due to several reasons which include the growth of industrialization; development of the screen printing industry almost during the same period i.e. 1945 causing a gradual decline of this craft. The legacy of commercial and cultural dialogue between Thailand and India came to an end leaving its mark of existence in historical records, oral traditions and few surviving pattern books with the block makers in India. It is believed that this was the turning point for the craft and its stakeholders since the craftsmen had no business from traders from Siam with the closure of trade routes after World War II.

Presently only few craftsmen are engaged in this craft. Researcher's Masters Dissertation (Trivedi V, 2011) on life history of Master craftsmen Shri Maneklal Trikamlal Gajjar, revealed that there were only few craftsmen engaged in this craft. With the younger generation not interested in shouldering this legacy and culture of craft, it was suggested that concerted efforts were needed to keep this once flourishing craft of woodblock making alive and explore ways to retard the process of human induced extinction.

Thus, the researcher had undertaken this extended study to further understand the evolution of the woodblock making craft from the period after the *Saudagiri* trade ceased. Studying the socio-economic conditions of the surviving craftsmen along with the changes caused both in their life and their craft would help in understanding the cause and effect of this human induced extinction and suggest ways to make the craft more robust in conjunction with their mode of production and living to overcome all adversities. Measures to build capacities of the craftsmen and promote the craft to a level that brings in added vigour in the craftsmen and recognition to the craft was envisaged. Building linkages between all participants of craft, i.e. policy planners, educators, Government, NGOs and consumers was pictured too for holistic growth of the existing craftspeople residing in Pethapur and evolving their craft through promotion.

Rationale of the study

Wood block is the main tool and pre requisite for hand block printing. It is a finely carved stamp using teak wood. Wood block making craft is as old as hand block printing. A perfectly carved wood block is a must for seamless printing. Pethapur is one of the surviving centers of wood block making in Gujarat. Pethapur is famous for its finely carved wooden blocks all over the globe since the time of *Saudagiri* trade. During this period (1839- 1940) the craft flourished and more than 1500 craftsmen were engaged to this craft. At present the number of craftsmen engaged in this craft has decreased to less than twenty. Thus the study was undertaken to delineate growth factors and the reasons behind the gradual decline by studying the evolution of the craft. The in-depth study of evolution of the craft will portray a whole picture or story about the craft in the last six decades such as factors that influenced the growth and decline, past events, education, technology and interrelationships and present status to develop a systematic document for future references. The researcher understands that the crafts sector is a major contributor to the economy, it aids in job creation and

culture preservation too, thus, it becomes imperative to safeguard the interests of the creator of crafts and promote the craft for their better sustenance at all times.

1.1 Specific objectives of the study

1.1.1 To study the origin and the history of the craft with special reference to '*Saudagiri'* prints and its trade

1.1.2 To study the socio economic status of the craftsmen residing in Pethapur

1.1.3 To study the changes taken place over the years in wood block making craft

1.1.4 To analyze the work pattern of the craftsmen and their workplace using ergonomic approach

1.1.5 To explore the opportunities for capacity building of wood block makers of Pethapur

1.1.6 To promote the craft of wood block making at different platforms

1.2 Delimitation of the study

1.2.1 The period to study the evolution of the craft was considered from 1949 onwards i.e. after the period of *Saudagiri* trade

REVIEW OF LITERATURE

The related literature to the present study was collected from the different sources like books, magazines, journals and dissertation from the libraries as well as e-resources.

The review of literature had been classified under the following headings:
2.1 Theoretical review
2.2 Research review

2.1 Theoretical review

- 2.1.1 History of hand block printing
  - Hand block printing centers of India
  - Trade of Indian printed textiles
  - Wood block making centers of India
- 2.1.2 *Saudagiri* trade
- 2.1.3 History and geography of Pethapur
- 2.1.4 Types of woods used in block making and its characteristics
- 2.1.5 Existing Government Schemes for the craft and craftsmen
- 2.1.6 Ergonomic principles and its advantages
- 2.1.7 Capacity building and its strategies

2.2 Related research review

2.1 Theoretical review

2.1.1 History of hand block printing in India:

Block printing was a special form of printing first developed in China. The earliest known example with an actual date is a copy of the Diamond Sutra from 868 A.D, though the practice of block printing is most likely about two thousand years old. Dye in cotton cloth is said to have existed between India and Babylon from Buddha's time. Printed and woven cloths travelled to Indonesia, Malaya and the Far East.

Records show that far back the 12th century, several centers in the south of the western and eastern coasts of India became renowned for their excellent printed cotton The brush or *kalam* was used on the southeastern coast and the resist applied. Printing and dyeing of cotton in Rajasthan was developed in the medieval age. In the 17th century, Surat was established as a prominent center for export of painted and printed calicos. (Edwards E, 2016)

Textiles have played an important role in concepts of power and kingship throughout Asia. Indian textiles traded across the Bay of Bengal have had a formative influence on local societies as esteemed items and have often taken on significant ritual roles (Barnes, 2005: 150). The import of textiles included the double *–ikat silk patola* and block printed cotton textiles, which were traded to the region because of their status and then provided the motivation for the development of local design. Inscriptions from Java dated back to late ninth to the thirteenth century the list of various gifts presented at ceremonies were in form of imported Indian textiles (PosrithongP, 2013)

India has a long and distinguished history of textiles with a vast repository of ancient motifs, techniques and ideas. Geography and climate were influencing factors as well as religions, traditions and history. Gujarat in western India adjacent to Arabian Sea had provided the oldest history of textile manufacture and was renowned for their arts of block-printing and dyeing. (PosrithongP, 2013)

Trade of Indian printed textiles

The evidence of textiles remains at Fustat in Egypt give proof that block-printing of both mordant and resist dyeing was a long-established textile art in western India by the fifteenth century. From about CE 1600 to 1800 India became the greatest exporter of textile in the world, especially in the technique of mordant dyeing, which gives intense colour that did not fade which was used since the second millennium BCE. Until the eighteenth century, India was able to produce more technically advanced textiles amongst the world. The network of Indian textile trade extended over the entire region of South and Southeast Asia in the sixteenth and seventeenth centuries. Every region had its particular costume preference as per the season, rituals and aesthetic needs. The silk *patola* from Gujarat were more popular and considered as royal legacy in Indonesia, Brocade were more popular in the Malay Peninsula, while the Thais preferred printed and painted cotton pieces. Initially Indian trade textiles were bartered for spices in Southeast Asia. (PosrithongP, 2013)

2.1.2 *Saudagiri* trade

Nakhoda Abdultyeb Esmailji was the founder of the Maskati Company, owned a textile factory in the Astodia area of Ahmedabad and textile shops in Ahmedabad and Bangkok, as well as in Phnom Penh in Cambodia. The process of making *pa lai* started when the gray cloth was washed and bleached before being printed by the factory workers. After printing the fabric was dried and dyed. After starching the finished fabric was sent back to Bombay for export to Bangkok. There were three other agencies in Bangkok, namely Malabari, Vashi and Baghwall got their design guidelines from their Siamese counterparts and accordingly commissioned the block making at Pethapur near Ahmedabad. The printing was done at Ahmedabad. These *pa lai***,**printed and painted cottons. For the Thai market were known as *Saudagiri Meaning* tradetextiles amongst Gujarati producers. (PosrithongP, 2013)

The *Saudagiri* motifs were floral and geometric though the geometric grid always governed the pattern. The basic floral form is conceived by a square, a rectangle, a circle, a triangle, a rhombus or a combination of some of these forms. The cloth was first dyed and in any one colour and then printed in three other colours. The three different blocks were used to print respectively using outline block, filling block and background block. There were separate blocks used for the body of the fabric and borders. Maskati and other Gujarati merchants first came to seek their fortune in Bangkok as British citizens. After the Bowring Treaty dated 18 April 1855, was signed the Indian merchants allowed to trade and own land in Thailand as local citizens. This was the time when the trade with Indian textiles flourished. The imported textiles had been gradually replacing the local textile production of the

farmer communities in the areas and finally the decline of local textile production. The trade report in Bangkok mentioned that 68,361 *culies* worth 549,380 *baht* of Indian painted and printed were imported to Thailand in 1887 this increased to 102,587 *culies* worth 671,460 *baht* in 1888. The Indian textile business struggled during the Second World War and began to decline after the war due to various reasons. One cause was the beginning of the *pa lai*, which was started in 1932 by a Chinese named AkSeng. He has started printing with synthetic dyes. The result was superior with good quality and bright colours. After this success, factories began to use screen printing machines to replace the hand block printing. (PosrithongP, 2013)

History is always written by victors. It is a blend of archaeological traditions deciphered to suit the times, oral legends and 'grandmother' stories gleaned from the local populace. Historically, it is the most gorgeous mode of order and delivery which held true in a selective trade between Siam and India for almost 250 years. *Saudagiri*, the word probably Arabic for traders, has lost its connection to that style of printed fabric in the sands of time.

Indian textiles held sway and were much coveted in the western world and in Southeast Asia till the advent of World War II when a ship carrying an entire consignment bound for Thailand was torpedoed by a German submarine off Bombay harbor. This resulted in financial ruin and change in professions for diverse communities linked with the trade. Research scholars have called the entire Siamese trade lasting over two centuries as *Saudagiri* Prints, whose journey began with the block makers of Pethapur and ended on the sublime torsos of Siamese royalty. The Dutch East India Company controlled much of this trade and was the pioneer in infiltrating Southeast Asia to open it up for the exploitative exposure of the 'white man'. Indian textiles exported to the then country of Siam dominated trade to the extent that commoners were banned from wearing it as it began to create a drain on the royal exchequer. Some experts today believe that the specific *Saudagiri* printed textile and its typical motifs originated as a fashion fad in the late 1930s and was cut short due to financial constraints created due to the War Blockades.

Salimbhai at his Jamalpur Haveli serves hot tea to beat the heat and tales of his great-grandfather, Laduji (when he smiled, his cheeks resembled laddoos) Dinaji Chakchakta - the Mistry and main overseer of Abdul Kader Hussein Ali Vasi & Co's main hand-printed textile manufacturing unit. The 3,000-sq yard workshop was located in an area still known as "*Vasi no sancho" in* Jamalpur. (PosrithongP, 2013)

Teak was specially imported from Burma in those days to construct a planned workshop with segregated space for each job. It was designed as an opulent haveli with intricately carved pillars and beautiful wooden facades, bearing intertwined flowering vines. The ground floor of the two-storey structure was given to workshops. The first floor was a typical Bohra living space where Moizbhai or Mohsinbhai, the owners of Vasi & Co, came up with new print designs in line with changing fashion trends in overseas markets.

The entire process, including block-making was handled here. Each department was dovetailing perfectly under the experienced guidance of Laduji. The only time the fabric left the premises was for river-washing, again involving specialized washers.

Then the ready fabric was trundled off to the Southeastern Asian markets via an elaborate sea route. World War II and the Japanese embargo on Burma teak along with war on the overland route gradually caused the *Saudagiri*trade to fold up. The disaster at Bombay Harbour, in which another *Surti Bohra* business house *Maskati &* Co lost a lot of goods, virtually signed the death warrant for Pethapur as a haven of block-making.

Laduji, creatively utilized some of the *Saudagiri* blocks to make kerchiefs and scarves which Vasi & Co. continued to export to the Gulf via Aden until 1970 when civil war in Yemen forced the company to wrap up the enterprise. Screen and machine-printing were also in competition. By this time, the present generation had branched off into other lines of business and the Jamalpur workshop was finally closed down with Laduji Rangat & Mistry marking the last entry on the red-tinted leather account book and closing down the premises in 1971. The building was dismantled and sold off piecemeal as no heritage awareness was in place then. Salim Chakchakta, the *Chhipa*, and his sons still continue the family tradition, albeit for the local and national markets. They were doing extremely well, and best of all, have managed to conserve most of what their great grandfather left behind. (Kagdi A, 2015)

2.1.3 Hand block printing centers of India

Block printing is practiced in many different geographical regions of India with each area having its own particular local aesthetic. The main centers where block printing is practiced are:

- Andhra Pradesh: Hyderabad, Machalipattnam (Kalamkari)
- Gujarat: Ahmedabad (Pethapur), Kutch, Porbandar, Rajkot
- Rajasthan: Bagru, Chittroli, Sanganer, Jaipur, Jodhpur
- Madhya Pradesh: Bagh, Behrongarh, Indore, Mandsar, Burhanpur
- Uttar Pradesh: Benares (Block-makers), Farrukabad, Pilakhuan (Block-makers)
- West Bengal: Calcutta, Serampur
- Each of these regions traditionally had distinct design elements with unique color schemes and motifs. Although the commercialization of the craft has seen a convergence in design elements between the various regions, block printed fabric by expert craft workers from each of these regions are still identifiable by its region of origin.(Edwards E., 2016)

2.1.4 Types of wood used in block making and its characteristics

Teakwood

Botanical name: Tactona Grandis Linn.f

Origin: Native to India, Myanmar and Thailand

Strength: Strong

Durability: Very Durable and highly resistant to termite damage

Flooring, furniture, carving, extensively use for ship and boat building

Uses: Versatile wood

Sheesham:
Botanical name: Dalo
Origin: Punjab to Assam in the Strait in India and Nepal, Bangladesh,Bhutan, Myanmar, Afghanistan, Pakistan, Iran and Iraq.ub-Himalayan
Strength: Strong
Durability: Very Durable and highly resistant to termites
Uses: First class timber for Cabinetry and furniture, paneling and flooring. Also used for boat building, carving and engraving, printing blocks

Tamrind:
Botanical name: Tamarindus Indica
Origin: Widely planted throughout tropical regions
worldwide
Strength: Strong
Durability: very durable regarding decay resistance, and resistant to insect attack
Uses: Furniture, carvings, turned objects, and other small specialty wood items.

2.1.5 History of Pethapur

Pethapur was established by Jeta and Varsinh, sons of KaransinhVaghela, who already had established kingdoms in Kalol and Sanand. After the separation of their kingdom of Rupal village in Kalol taluka during the year of 1505 according to Gujarati calendar, HimmatsinhjiThakor became the first king of Pethapur. He was the king of 60 villages. Gadhada village of Sabarkantha was also a part of Pethapur state. The last ruler of the erstwhile princely state of Pethapur was BhupendrasinhFatehsinhVaghela, the 15th generation descendant of King Pethasinh. He was educated at Indore's Daly College which boasts of alumni from India's royal families. (Sindha P., 2008)

Pethapur was an independent state. The *Mahajans*of Pethapur had trade relations with the Deshavar and thus the workers were sent from Mumbai and Jaipur to design a palace. The palace of Pethapur was designed by an engineer of Jaipur and the resemblance of the carving style of Muslim style could be seen on the pillars of the palace even today. At the time of British rulers, Pethapur state was under the British Political Agent and Mahikantha Agency. The four corners of Pethapur village were *Golimata gam todani, Sabarmati River, Rayaniyutalav*and *Gadhavi no tebo.* Pethapur state became famous at the National and International level at that time for wood blocks, guns, bobbins etc. There were many artisans from the Bhavsars and Khatri community engaged in the printing of cloth. The printing was done using blocks carved in Pethapur itself. The printed cloth was then exported to Siam. There was a bobbin factory of Chimanlal AtmaramSuthar in Pethapur having 200 workers. The bobbins were also exported to other countries. In the earlier times, the traders of Pethapur had their business with many other countries such as- Singapore, Paris, Siam (Thailand). A hand print of *Ras*(a dance form of Gujarat) written by the King Shreepal was preserved at the *Dosiwadani pol*, Ahmedabad. It was made at Pethapur in the year 1821-1822. There was a resemblance of the finely carved houses of Pethapur, bandhani, colourful dupattas etc. could be seen in the hand print. There

were many industries developed in Pethapur related to letter '*b*' like ***b****andhani*, ***b****anduk*(gun), **b**obbins made for cotton mills, ***b****idi* (cigarette), ***b****ataka* (potatoes) and ***b****iba* (wooden blocks). It had a good association with the letter '*b*' (Sindha P., 2008)

A huge portion of land in Pethapur was given away to the government to build Gujarat's capital Gandhinagar. In 1960, when the old Bombay State was bifurcated into the present states of Maharashtra and Gujarat, Bombay was given to Maharashtra. It was then decided to build an entirely new capital for Gujarat. On March 1, 1960, Gandhinagar was declared the capital of Gujarat by Jivraj Mehta. Many government offices were there in Pethapur before Gandhinagar was established. (Sindha P., 2008)

The *Gajjar* community of block makers in Pethapur village was closely involved with the *Saudagiri* fabric trade with the kingdom of Siam (modern day Thailand). They interpreted Thai patterns on wooden blocks which were then sent to Ahmedabad to be printed. This trade continued vigorously until the advent of World War II which signaled a death blow to the *Saudagiri* trade route. The *Saudagiri* trade was controlled and monitored by three main trading corporations namely Vashi, Baghi and Maskati. At its peak the village of Pethapur had more than three thousand artisans working in its workshops. (Robinson S, 1969)

2.1.6 Existing Government schemes for the craft and the craftsmen:

Schemes by development commissioner of handicraft - DHC

A) National Handicraft Development Programme -NHDP

a**)** Ambedkar HastshilpVikasYojna

i) Dastkar ShashktikaranYojna
ii) Design and Technology Upgradation
iii) Human Resource Development
iv) Direct Benefit to Artisan
v) Infrastructure and Technology Support

b) Mega Cluster
c) Marketing support
d) Research and Development

B) Comprehensive Handicrafts Cluster Development Scheme – CHCDS

The objective of the scheme is to develop the clusters with world-class infrastructure that caters to the business needs of the local artisans and SMEs to boost production and export.

- National family benefit scheme:
- Pradhanmantri Shram Yogi Maan-DhanYojna
- Coir Udyami Yojana
- Prime Minister's Employment Generation Programme
- Sukanya Samriddhi Yojana
- Deendayal Antyodaya Yojana
- Pradhan MantriJan-DhanYojna
- Rajeev Gandhi Shilpiswastya BimaYojna

Marketing support:

- Gandhi Shilp Bazar (GSB) /Craft Bazar (CB)
- Exhibitions (including Thematic Exhibition)
- National Handicrafts Fair
- Hiring of built up space in events organized by other organizations
- Craft Awareness Programme
- Craft Demonstration Programme
- Participation in international fairs and exhibition
- International craft exposure programme/ culture exchange programme
- Compliance, social and other welfare measures
- Buyers seller meet and Reverse buyer seller meet

Direct benefit schemes

- Support to artisans in indigent circumstances
- Interest Subvention
- Margin Money
- Issue/renewal of Photo-ID cards
- Bima Yojana to Handicraft Artisans
- Pradhanmantri Jeevan Jyoti Bima Yojna
- Pradhanmantri Suraksha Jyoti Bima Yojna
- Converged/ modified Aam Aadmi Bima Yojana

2.2 Related research review

A related research review was done to extract information from the similar studies already done to support the outcome of the present study and also to identify research gaps.

Sarkar S. (1998) conducted a study on Indian Craft- Technology: static and changing- A case study of the *Kansari's* craft in Bengal, 16th to 18th Centuries. Using a different methodology, this study seeks to re-examine the notion of stagnant craft technique in India. Studied with reference to the *Kansari's* (brazier's) craft to Bengal, the second most important craft of the province, the study analyzed the expansion of this craft since the 16th century, and examined the changes which took place in *Kansari's* technique of production, forming their basis of their craft expansion since the late 16th century. The reasons for the frequent repetitions of such interpretations are primarily two: absence of in-depth studies of Indian artisanal industries of technological change, which prejudice such studies.

A project report by Smith D. and Kochhar R. (2004) on "The Dhokra Artisans of Bankura and Dariapur, West Bengal: A case study and knowledge archive of technological change in progress" described the process of village renewal in the Bengal region of India. It dealt with the replacing of an ancient but inefficient metal-foundry technique in the village with another which was almost as ancient but more efficient. The research had provided valuable raw material for development of theory

and practice of the use of new interactive media in the archiving and management of unspoken knowledge. The project was set in the context of a wider exploration of the potential capability of multimedia as a tool for ethnographic research. A detailed photographic and digital video record was made of the Dhokra craft processes. In addition, individual and group interviews and discussions were recorded. A preliminary record was published on the Internet as 'bankurahorse.com' and a more comprehensive multimedia program was under development. It was concluded that using multimedia as a tool it was possible not only to track and record the processes of change in Bikna but also to develop an active archive of aspects of the artisans' changing knowledge base

Trivedi V. (2011) undertook a case study on Wood Block Making Craft of Pethapur. A descriptive study was planned and a personal interview with a semi structured interview schedule was prepared based on the preliminary visits. The objectives of the study were to study the life history of the Master craftsman, to document the tools, materials and method of block making and also to document the collection of design. Dissemination of the craft was also done.The craft passed through generation to generation in the *Gajjar* family. Family tree of ManeklalGajjar was mentioned in the research work. Mr. ManeklalGajjar, the master craftsman was the third generation artisan in his family engaged in this craft. According to him, the craft of block making originated around 150-200 years ago in Pethapur. The wood blocks of ManeklalGajjar were traded world over. The craft of block making flourished during *Saudagiri* trade and ended in 1940. The collection of traditional designs as well as wood blocks with him which include *Saudagiri* print, and for the other crafts like batik, kalamkari all with varied sizes and combinations of paisley, butti, butta, border and pallav. Dissemination of the craft was done through websites, brochures and greeting cards. It was revealed that data through websites and international visitors too indicated its reach to a large audience.

Dua S. (2014) conducted a research to trace the history and trade of printed textiles of Gujarat; to examine the ornamentation style of these traded textiles as well as the influencing factors from a contemporary point of view. Documentation of motifs and patterns were also done for the traded textiles from Gujarat focusing mainly on Ajrakh. Purposive sampling method was followed to select printed textiles from Gujarat which include *Saudagiri*, Maat-Ni-Pachedi and Ajrakh printing. The research also stated that *Saudagiri* the printed trade textiles flourished from 1852 to 1958 i.e. continued till Second World War was extremely popular among the Siamese people who referred to them as "*Pha Gujarat*" and art inspiration is taken from temple architecture of Thailand. It was printed on coarse fabric with poor registration marks and mainly used as a skirt. Bombay merchants supplied the dyers with the cloth and the charge for dyeing any of the enclosed patterns was at the rate of one penny per yard.

Singh G. (2017) attempted a study on Pethapur wood block makers. The study was about socio-economic status, documentation, local technology, market linkages and

external influences. The researcher has stated various suggestions after the study which was that there is a need of design intervention, training of women and youth, new product range, computer literacy for the betterment of the craftsmen and craft survival. These were very much similar to the objectives of present study.

Singh A et al. (2019) conducted a study on assessment of musculoskeletal risk factors amongst the male workers engaged in craft sectors of Jaipur. The study investigated the problems in four craft sectors in Jaipur namely carpet washing, trimming, alignment and wood carving. A field study was conducted in 13 workshops and 122 male respondents were randomly selected for the survey. The data regarding pain occurrence at different body and hand regions among the participants were collected through questionnaire. Mean perceived exertion among the respondents during respective craft tasks was estimated according to Borg's rate perceived exertion (RPE) scale. The highest prevalence of symptoms in the body regions reported for the last 12 months were the Wrist, lower back, shoulders as well as most prominent discomfort was observed in hand regions. These discomfort regions could be due to the poor workstation, hand tool design and awkward working posture. The study also revealed that the mean scores of the RPE were significantly higher with the higher age and experience. It could be postulated that the work system and hand tools should be redesigned that may reduce the symptoms of musculoskeletal disorders.

Research gap

The gap identified from the literature review is listed below:

- The process of making the chisels and dies (*edi*) required to be documented as there was no mention in literature reviewed.
- An overlapping of information was observed about the history wood block making craft
- The information on all the existing craftsmen was lacking in literature reviewed
- No significant studies carried out on ergonomic analysis of work pattern and workplace of the wood block makers.

METHODOLOGY

Operational definitions:

Evolution: A study of chronological development of craft with observing ups and downs

Promotion: A promotion refers to an increase of level or position of the craft and the craftsmen

The research's overall purpose was to look into the evolution and promotion of the wood block making craft of Pethapur, which is on the point of extinction. The goal was to perform a comprehensive examination of how wood blocks were manufactured, consumed, and dispersed in relation to man, material, method, machinery, and merchandise. The analysis of historical and existing records revealed the elements that influenced the growth and decline of the craft and craftsmen, allowing the researcher to better analyze their difficulties and expand their opportunities to enrich the craft for its further benefits. Therefore a mixed method approach was used to achieve the aims of the study. A research comprised of historic research, socio-economic and qualitative research.

3.1 Preliminary Research

3.1.1 Pilot study

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3.5 Phase IV Promotion of the Craft

3.5.1 Selection of Promotional methods: DIY hand block printing kit, Website and Craft Documentary

3.1 Preliminary research

Area of research: Case study, Documentation, Capacity building,

Type of research: Historical research, Qualitative research, Descriptive research

Present research was aimed towards the evolution of the craft by studying the historical events, trade pattern, community involved, its making to dispatch as well as the end use of wood blocks incorporating the information of various stakeholders involved in the craft and then to promote the craft. This inclusive approach formed the process of conceptualization and developed the model of research. Thus the pilot study with the present situation helped in defining the elements required for the study and narrowing down the research.

Pilot Study

The basic information about the craft and the craftsmen was accomplished with the present context through the field survey and with the support of literature survey. A literature survey was conducted prior to the pilot study to understand the background of the craft. The primary information was gathered from the craftsmen engaged in this craft. The practicing craftsmen were identified by the snowball sampling technique. The related information was gathered by interview method, observation method and discussion method. An open ended interview schedule was prepared to study the present status of the craft and the craftsmen of Pethapur. The data was collected during December 2017 to March 2018.

The number of craftsmen engaged to the craft, the socio-economic status of the craftsmen, craft skill, problems faced, reasons behind the decrease in the number of the craftsmen such factors were studied. The latest development and changes had also been taken into consideration.

3.2 Planning of research: Conceptual framework and research design

Conceptual framework was prepared on the basis of preliminary research. It represented all the elements and stakeholders related to the study. The diagram explains the relationship between each participant in the given time frame. The figure shows the relationship between the craftsmen and end users, craftsmen and the government initiatives.

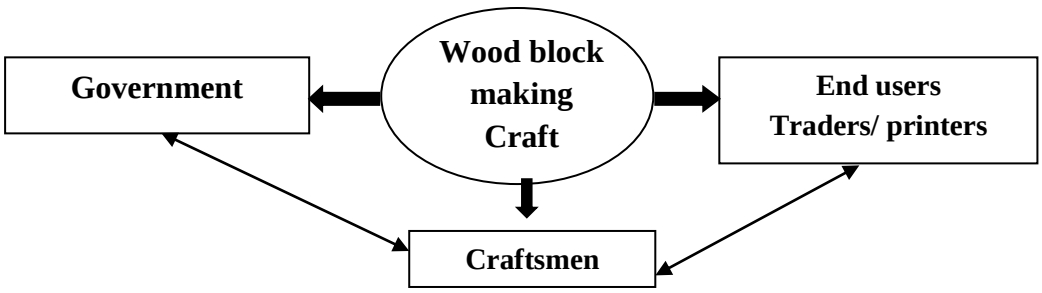

Figure 3.1a: Conceptual framework

Research design

The methods and tools used to achieve the goals, analysis of data collected; the process followed was presented in the form of flowchart of research design shown below in three different charts according to the objectives. Each chart shows the methods and procedure followed to accomplish the goals objective wise. Phase II and III were planned in order to promote the craftsmen

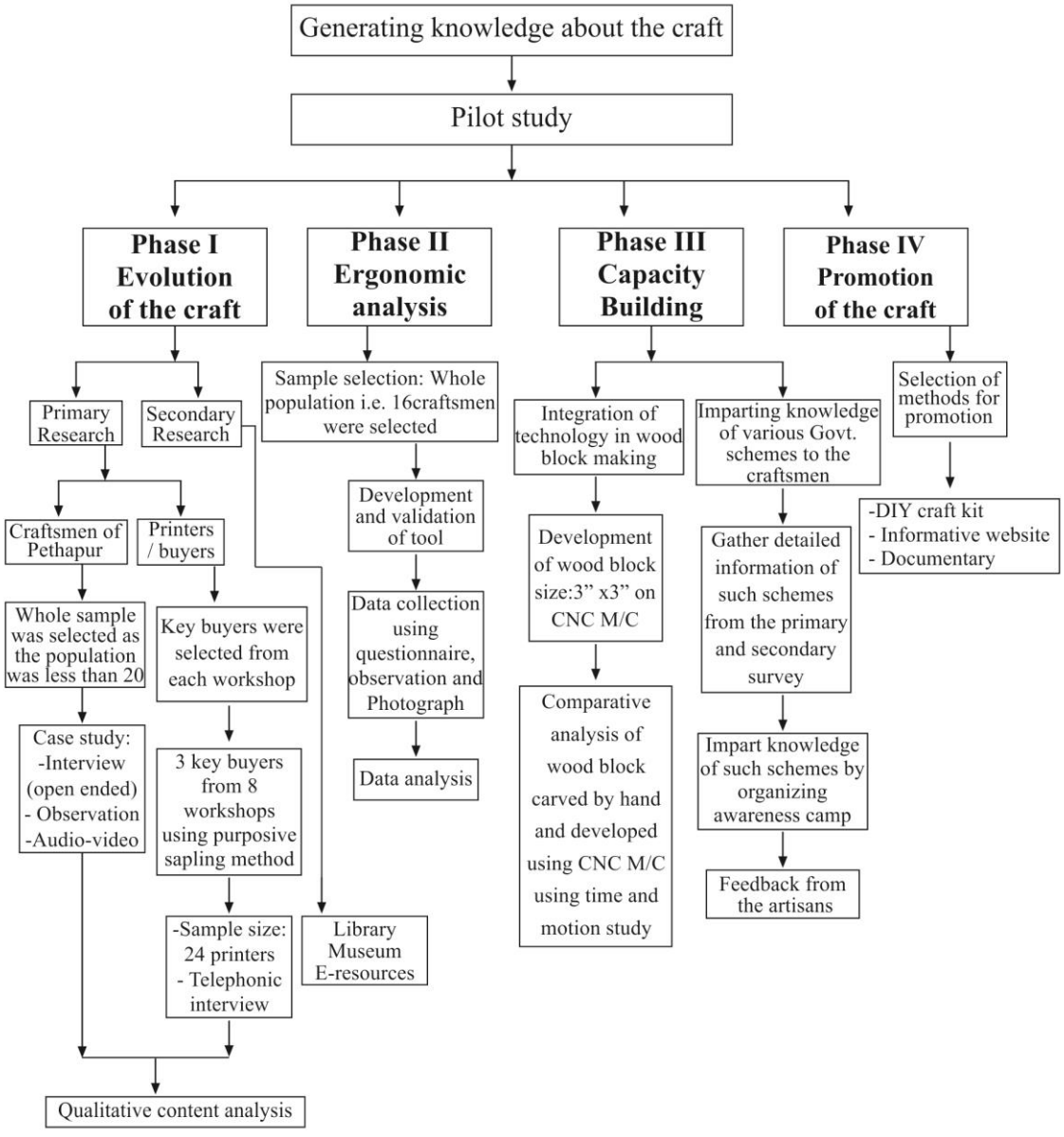

Figure 3.1b: Research design

3.2. Phase I Evolution of the craft

3.2.1 Desk research

Literature survey was conducted to collect the secondary information regarding the origin, history, past events, *Saudagiri* trade to support the firsthand information as well as to relate and compare it with the existing situation. The written data collected through various published and unpublished records which includes; unpublished master's dissertation, books, gazetteers, research papers, unpublished craft documentation, newspaper special articles, magazines, local magazines and special issues. Books referred for the study were textiles and costumes, Government policies, archival records. In addition to this various books and research articles were accessed and referred to on Google scholar and Google books. Literature found on wood blocks was limited and very much overlapping which has been discussed in the review of literature.

The library visited for the same were:

- ShrimatiHansa Mehta Library, The Maharaja Sayajirao University of Baroda, Vadodara
- Oriental Library, Vadodara
- Library of tribal section, Gujarat Vidyapeeth, Ahmedabad
- Knowledge Management Center, National Institute of Design, Ahmedabad
- Resource Centre, National Institute of Fashion Technology, Gandhinagar

The samples of wooden blocks and printed textiles available at Calico Museum, Ahmedabad and Shreyas folk museum, Ahmedabad were studied.

3.2.2 Primary Research

Primary research was carried out to obtain firsthand information related to the craft. It was collected using a multi-methodological approach. The methods implemented for the data collection were interview method, case-study method, observation method, discussion method using appropriate tools

3.2.2.1 Sample selection:

The sample selection for data collection was classified in two categories;

a) woodblock, b) the key buyers of Pethapur wood blocks.

a) Sample selection of the craftsmen residing at Pethapur:

It was found from the pilot study that there were only 18 craftsmen engaged to the craft. Therefore the whole population (all the fifteen craftsmen) was selected as a sample. As a sample size was small a case study method was employed for data collection.

b) Sample selection of buyers/printers/traders

The printers who ordered blocks from Pethapur were selected and interviewed. The key buyers of all the existing workshops of Pethapur were selected. The buyers were identified from the craftsmen during the field visits. The local buyers were interviewed personally and those who were distant were contacted and a telephonic interview was planned. The buyers selected were mainly from Ahmedabad, Vadodara, Kutch and Bagh (Madhya Pradesh). Three key buyers from each workshop were

selected. Therefore 24 buyers from eight workshops were selected using purposive sampling method. The selection criteria were kept on the basis of early buyers (buying blocks form 10-15 years), frequent buyers and recent buyers.

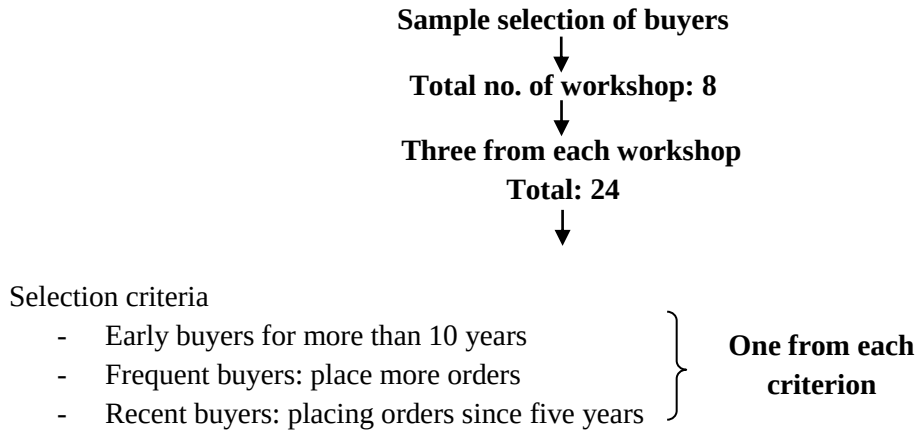

Figure 3.2 Sample selections of buyers

c) Other stakeholders:

The information related such as *Saudagiri Trade*, additional or rare information on wood blocks were collected by contacting old printers, researchers, Government officials, Printers of *Saudagiri* fabric by snowball sampling method

1) Prapassorn Posrithog: Researcher
2) Afzal Butiwala, S/O Salim Chakchkta, Ahmedabad, *Saudagiri* Printer
3) Ms. SatyaSrinivasan, Sr. Scientist, Office of IPR: GI
4) Block makers migrated from Farukhabad

3.2.2.2 Development of tool:

To collect detailed information regarding the craft a semi structured interview schedule was prepared based on preliminary research and literature review. Separate interview schedules were prepared for the wood block makers and the printers.

The schedule for the craftsmen was prepared to gather information on the demographics of craftsmen, socio-economic profile, craft details, craft skills, existing status, changes occurred, problems faced, benefits from government, awareness of craftsmen with regards to various schemes and policies available to them by the government. The schedule was prepared in English language and explained to the respondents in Gujarati and field notes were taken.

The separate schedule for the key buyers was prepared as they were one of the important stakeholders of the craft as an end-user. A telephonic interview was executed to acquire details in terms of- changes taken place in the wooden block – its cost, size, design, quality, packaging, dispatch, time taken to complete an order. It was prepared in English and it was explained in local dialects to those who were not comfortable with English.

Interview was supported with photography as well as audio-video recording to trace utmost information without missing on any. Furthermore the photographs taken were also helped in execution of collected data.

All the respondents were informed and briefed about the research prior to conducting an interview. An informed consent was taken from all the respondents.

3.2.2.3 Method of data collection

Information related to the evolution of the craft was collected using various methods such as case study, interview and participant observation method. To achieve the desired results data collected by extensive and continuous field visits from the pilot study. Field visits were made for the pilot study during December 2017 to March 2018. Major data collection was done in the year of 2018 and 2019. Remaining data collection was taken up in September 2020 after the pandemic. Methods employed for data collection discussed below.

i) Case study method

A case study method is a popular form of qualitative analysis and involves a careful and complete observation of a person, a family, an institution, a cultural group or the entire community. It is an in-depth study and deals with the process that took place and their interrelations. An in-depth study was done to collect minute details and clear insights related to the origin of craft, documentation of tools and techniques followed, changes taken place, problems faced, craft skills, community practicing the craft and to determine the interrelationship amongst them.

ii) Interview method

A semi structured interview schedule was prepared to elicit the first hand and detailed information from the craftsmen. The schedule included demographic details and socio-economic profile of the craftsmen. The information regarding craft skills, craft experience, problems faced, technology advancement and awareness of beneficiary schemes was also acquired from the interview. In addition to this some questions were also asked to clear the query caused at the time of interview

The key buyers of each workshop of Pethapur were also interviewed as they were the actual end users of blocks. It helped in gaining the insight into the quality and characteristics of the wood blocks of Pethapur, trade details, changes taken place throughout the decades, mapping the strength, weakness and its causes. Their perspective on the above details as an end user of wood blocks was aided with better understanding and clarity in studying the evolution.

iii) Participant observation method

Participant observation method is commonly used in studies of social sciences. Researchers have chosen this method to collect and record experiences of the respondent. Becoming a part of the respondent's daily life, observing their routine, lifestyle, and work pattern researcher was enabled to record the natural behavior of the respondent as well as to gather information which could not easily obtained during the interview. Verification of data collected was also possible by participant observation method.

3.2.2.4 Data analysis

The data collected was in the form of field notes, audio-visual recordings, photographs and archives. It was analyzed according to the stages of research design and organized in such a manner by answering the research questions. The data collected to study the evolution of the craft was analyzed in the form of description, comparison, establishing relationships amongst the events that occurred and supported with the photographs, drawings, tables, graphs and charts for better presentation of data and clarity.

Phase II and III were planned in order to promote the craftsmen in terms of increasing work efficiency and capacity building through technology advancement and make them aware of various beneficiary schemes.

3.3 Phase II: Ergonomic analysis of the work pattern of the craftsmen and their workplace

3.3.1 Ergonomic study- to increase productivity

Ergonomic analysis was planned to increase the productivity of the craftsmen. It was taken up to analyze the work pattern of the craftsmen and their workplace with an ergonomic approach. Steps followed to achieve the same as described below.

3.3.1.1Sample selection

All the fifteen block makers of Pethapur i.e. the whole population were selected as samples for ergonomic study.

3.3.1.2 Development of tool

A Modified Musculoskeletal Questionnaire was used to collect the requirements from the respondents. It was divided in three sections: a) socio-demographic information i.e. age, experience, education, marital status, health habits, working hours, Job tasks and workspace related information etc.; b) Body part discomfort interview i.e. pain/discomfort at different body sites, palm, wrist and finger regions, knee and leg (using the Nordic Musculoskeletal Questionnaire (Body part discomfort scale, developed by Corlett, E.N & Bishop, R.P.); c) postural analysis (using the Rapid Upper Limb Assessment [RULA] method) from the existing craftsmen in Pethapur.

The questionnaire was developed in the English language and it was validated by the expert. The questions were verbally explained in local language to the craftsmen and filled by the researcher. Each craftsman was explained about the RULA scale and Standard Nordic questionnaire before the interview.

Physical parameters

Physical parameters such as height and weight were measured by measuring tape and the weight was measured by weighing scale. The Body mass Index was computed from the data collected using standard equations.

3.3.1.3 Validation of the tool

The questionnaire developed for the study was validated by the expert, Dr. G.D. Acharya, Professor Emeritus, Atmiya University, Rajkot. The suggestions and comments given by the expert with regards to ergonomic study were incorporated and implemented.

3.3.1.4 Data Collection

Data collected for the ergonomic analysis was using a questionnaire method. Questions were asked to respondents and answers were recorded by the researcher in the form of field notes and photographic documentation. Physical parameters such as height and weight were recorded manually by the researcher using appropriate measuring tools. Information related to the workspace and organization was gathered by questionnaire supported with observation and photography.

3.3.1.5 Data analysis

The sample selected for the study was equal to population. The craftsmen residing in Pethapur were fifteen. Therefore the whole population was selected for the study. As the sample size was 15, which was less than 30, the average mean, the association between the two variables were analyzed using tables and graphs. The justification for the same was supported with graphs, tables and photographs wherever required.

3.4 Phase III Exploring the for capacity building of the wood block makers of Pethapur

Capacity building was planned to increase and enhance the work efficiency through technology advancement and impart knowledge of beneficiary schemes. The systematic procedure followed is discussed below in detail.

3.4.1 Integration of technology in wood block making craft

From the literature survey it was found that CNC (Computer Numeric Control) machines can be used to minimize the labour and enhance productivity by saving time and energy. . Therefore, to achieve this goal an exposure visit to the CNC workshop at Naroda GIDC, Ahmedabad was planned. The block makers who agreed as well as convenient and could take out time from their work were taken to the workshop and a small wooden block was tried out.

3.4.1.2 Development of a wood block on CNC Machine

During the visit a small wooden block of 3” x 3” size was prepared and analyzed. The simple geometric design was selected and sent to the operator for job making prior to the visit. Job making software, functioning of machine, time consumed, results were observed and discussed amongst the block makers and the workshop owner.

3.4.1.3 Comparative analysis of developed wooden block

The developed block was analyzed in terms of fineness, time consumed, costing and maintenance. It was also compared with the hand carved block. Analysis and comparison was done by discussing with the craftsmen and the operator by recording notes and audio-visual tools and presented in the form of description supported with

table and photograph. It was concluded with the best possibilities with CNC machines and its limitations.

3.4.2 Imparting Knowledge of Government Schemes for Craftsmen- how to avail benefits from such schemes

As discussed in the beginning it was analyzed from the pilot study that there was a need to inform craftsmen about the various schemes developed by the Government for the benefit of the craft and the craftsmen. Thus the steps followed to fulfill the particular aim described below.

3.4.2.1 Gathering detailed information of existing Government Schemes

There were numerous schemes developed by the government including each craft and craftsmen. The researcher had acquired the knowledge of such schemes from the official websites, literature survey and also by visiting the government offices at Udyog Bhavan, Sachivalay, Office of District Commissioner, Gandhinagar, Gujarat. An extensive list of various schemes was prepared. After that the appropriate schemes for this particular craft were identified and listed out.

3.4.2.2 Imparting knowledge of such schemes to the craftsmen

An awareness camp was organized for the craftsmen to disseminate the knowledge of such schemes at the Pethapur village itself. Government officials were invited as resource persons in order to get comprehensive knowledge and make the craftsmen familiar with such schemes. The purpose of the seminar was to make the craftsmen familiar with such schemes, the process of availing the scheme in terms of documents required, benefits of the schemes and its policy.

3.4.2.3 Feedback from the participants

Feedback from the craftsmen was collected after the camp in the form of a questionnaire and it was analyzed using appropriate measures.

3.5 Phase IV Promotion of the Craft

3.5.1 Selection of various platforms to promote the craft

Promotion of the craft was done using various platforms to reach larger audiences by covering all different age groups and likeminded people within a limited span. The methods selected for the promotion were DIY craft kit, website and documentary.

3.5.1.1 DIY Craft kit

The idea behind choosing the DIY Craft kit for the promotion of craft is that the things made by him, give a person satisfaction, happiness and immense joy. A person gets involved into the process by making, experiencing and creating an object by himself. A kit contained woodblock, a handkerchief/set of napkins/ set of storage pouches/ sling bag/ a stole, colour, wooden stick, an imprint of block on paper, a piece of sponge and a brochure. Such six different types of kits were developed by keeping one product in each. The procedure followed for making DIY kit described below

a) Preparation and selection of designs for making wood blocks

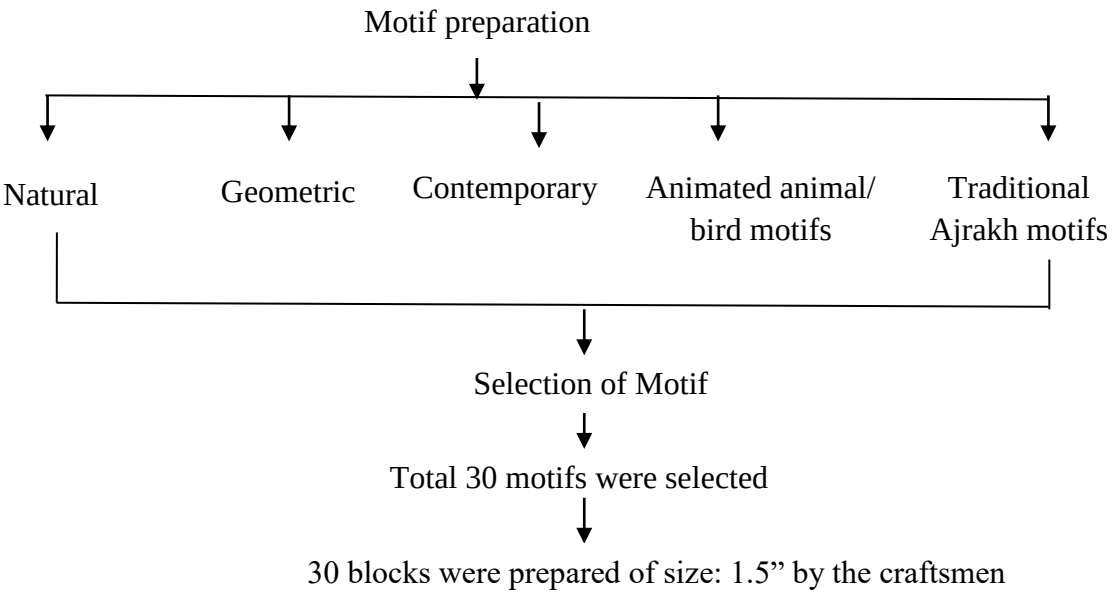

Figure 3.3: Procedure followed for preparation of motif and block for DIY kit

b) Motif preparation

Motifs were prepare keeping in mind the following points

- **Target group:** Motifs were prepared by keeping in mind the target group i.e. the women and the kids.
- **Category of designs:** There were five different categories selected for the motif such as natural, geometric, contemporary, animated designs of animals and birds and traditional Ajrakh motifs randomly selected by keeping in mind the target group, simple motifs as easy to print for beginners, the multiple uses of blocks on various products.
- **Appropriate for printing**: It is important to select the size of the motif according to the product. The bigger motif would affect the aesthetics of the final product. Thus the size of the motif was kept as 1.5” so as it is suitable to print on multiple products such as cushions, dupattas, stoles, napkins, table mats, bags etc. Total 50 motifs were created out of which 30 were selected. The motif selection was based on the minimal time consumed for carving; designs attract the kids and can be used on various products.
- **Block making:** The selected motifs were then sent to the block makers at Pethapur for carving. The motifs are distributed in such a way that the craftsmen from each workshop get a chance and everyone gets involved. (Figure 3.4 and 3.5)

Figure 3.4: Selected Motifs for making wood blocks

Figure 3.5: Prepared wood blocks

c) Selection of accompanying elements of kit

The additional items were required to be added in the kit for printing so as the kit will complete. Such accompanying elements are listed below.

Colour for printing: Fevicryl fabric colour has been selected for printing as it is easy to use, its availability, quality and people are aware of these colours.

Paint brush: A smaller size of flat paint brush with wooden handle was selected to take out colour.

A piece of sponge: A piece of sponge is required to add in the kit for the purpose of padding to dip the block. It served the purpose of printing colour trays.

An imprint of block on paper: An imprint of block on paper was added into the kit for the reference of the user.

A pocket book containing information about the craft and the existing craftsmen, Instructions for printing along with a QR code of tutorial video was also included in kit.

d) Selection of product to be printed

Muslin fabric was selected to construct various products because of its absorbent property, availability and user friendly. Products constructed for printing were multipurpose pouches, table mates, tote bag and sling bag. One product with one block was kept in each kit

3.5.2 Development of website

An informative website was developed to promote the craft globally. A common website for wood block making craft was created including all the existing workshops and details of each craftsman.

3.5.3 Documentary

"Documentary is a historical phenomenon, a practice with a past." According to film scholar Carl Plantinga, "documentaries assert a belief that given objects, entities, state of affairs, events or situations actually occur (ed) or exist (ed) in the actual world as portrayed." Documentaries speak about actuality and present a real picture. A short documentary was planned with the length of 10-20 minutes. The script in the form of questions to be asked to the craftsmen was prepared first.

RESULTS AND DISCUSSION

4.1 Phase I: Evolution of the craft

The changes that occurred have been studied in terms of community, raw material, tools, process, design and size of wood block, quality and cost with that of past events happening. The ups and downs have been studied through the major events that happened and led to the changes. An evolution studied was divided into three parts for better understanding. It has been described below.

4.1.1 Historical background of the craft

The origin and history was traced out by studying the major episodes that occurred and resulted as turning points for the craft after the period of *Saudagiri* trade were analyzed through both the primary and secondary sources.

***Saudagiri* trade:**

The renowned *Saudagiri* trade had made Pethapur, a wood block making hub. During the period of *Saudagiri* trade **(**1839- 1940) there were around 122 households involved and 1500 craftsmen engaged in wood block making craft. It was hundred years of trade ended by 1940 due to the Second World War i.e. (1939- 1945).

Technological development:

The development of the screen printing industry almost during 1945 caused a gradual decline of this craft.

Establishment of the Capital City Gandhinagar:

Establishment of the Capital of Gujarat 'Gandhinagar' (1960) and commencement of Gandhinagar Thermal Power Station (1977) also gave an opportunity to work at Government printing press and Gujarat Electricity Board (GEB).

Mechanized printing and financial crisis:

Therefore it can be said that during the 1990's a gradual decline took place in the craft of wood block making. Development of mechanized printing has resulted in a gradual decrease in the number of wood block makers. This has also led to the financial crisis (1992) and many block makers have started other jobs or businesses.

Earthquake:

In January, 2001 earthquake was a natural disaster which had affected majorly the Kutch region. Kutch, one of the major hand block printing centers of Gujarat. Many printing workshops as well as other crafts were destroyed in the earthquake. After an Earthquake Government and Non-Government Organizations had come up and initiated the rebuilding of crafts of Kutch region. This had resulted in an upsurge in demand of hand block printed textile in both export as well as local market which trickled down to the block makers of Pethapur who got enough orders to overcome their financial crisis. Hence the craft was rising up once again. But the decrease in the number of craftsmen could not be retained.

According to the wood block makers:, "*bhukamp pachhi kaam vadhyu che atakyu nathi. Ghana orders ave che ame pahochi nathi valta."* After the earthquake there was no looking back and they were getting enough orders and work from printers.

Therefore it could be said that the growth in wood block craft has been observed after the earthquake.

According to the researcher's earlier study conducted in 2011, the strength and weakness of the craftsmen were studied which helped in understanding the progression and regression of the wood block making craft respectively. There were some external and internal factors analyzed that contributed to its growth or decline.

The factors that contributed to the progression of the craft were:

- Good design skills and well documented designs
- Carving skills
- Dedication to the work
- Quality of wood block

The factors that contributed to the regression of the craft were:

- Wood quality and cost
- Lack of design skills and inability to adapt to making newer designs
- Jealousy among the block makers
- Competitors (screen printing)
- Shortage of workers
- Lack of interest in younger generation to learn this craft due to higher education

4.2.2 Changes taken place

The craft has undergone changes at every stage of its making through the passage of time. The present status has been described below.

a) Community shift

Traditionally the craft was governed/practiced by the *Gajjars* i.e. Carpenter community. The skill has passed through generations. The *Gajjars* had been pioneered for initiating wood block making in Pethapur. They were associated with the carpentry work and wood carving. The forefathers of *Gajjars*were went to Africa and worked as royal carpenters. From the literature review it has been found that after returning from Africa they had started wood block making. It was the time of *Saudagiri* trade.

The*Gajjars* were the only owners of the workshops under which people from other communities such as *Prajapatis, Thakors*working as*karigars.* The type of work they were given on the basis of their skill such as initially the all laborious work given and then gradually they were given the carving of filling block and outline block. These *karigars have* learnt the craft skills with the experience and started their own workshops. Gradually the decrease in the numbers of craftsmen from *Gajjar Community* had taken place and *Prajapatis* have taken over the craft in practice.

At present there was only one craftsman GhanshyambhaiGajja**r** left from *Gajjar* community in Pethapur. There were various reasons such as the newer generation was not interested in pursuing the craft as they were well educated and getting better earnings, many of them find it laborious and less profitable, the financial crisis could also be one of the reasons for leaving the craft. Some craftsmen were having only girl

children as there was no one in the next generation left to take the craft forward. This has gradually resulted in minimizing the engagement of *Gajjars*.

The *Prajapatis* have taken over the craft for the last three decades. At present there were seven workshops of *Prajapatis*and only one workshop owned by *Gajjar.*

b) Raw material

Wood:

It was the main raw material used for making a block. The seasoned teak wood was used for making an entire block because of its inherent properties of water resistance and long shelf life which is suitable for making a block.

Earlier

The wood was sourced from the forests of South Gujarat. It was purchased through auction. There was an active block making co-operative society and it was responsible for purchasing wood at a reasonable rate for all the block makers at Pethapur. After that the wood was distributed amongst all according to each one's requirement. The society has been inactive since 1982. Purchasing wood directly from the forest was much more advantageous because the craftsmen were getting good quality wood at a reasonable price.

Earlier the wood block makers used to purchase unseasoned wood and it was in a log form. Thus the wood used to cut in to desired pieces first at Pethapur by themselves and then seasoned at their workplace by stacking and covering the wood pieces with thick cloth or quilt

Present

At present all the block makers purchase the wood mainly from timber mart at Idgah Chowk and Naroda area of Ahmedabad and Mansa near Gandhinagar. All the craftsmen made an independent purchase as per their individual need. They also got the wood pieces cut at the same place as per their requirement thus it was easier and convenient for transport and storage by saving time and energy at the same time. The wood purchased was seasoned teak wood and mainly a pillar of old houses. Thus there was no need to season the wood. In addition to this, at present block makers made the purchase of wood as per the availability of wood and their requirement and did not stock the wood for the whole year. The reasons behind were the cost, availability and amount of an appropriate wood for block making with the dealer.

Figure 4.1: *Patli nu lakdu* (Pillars of old houses)

It has been shown in figure 4.1 that at present wood blockers purchase wood from the timber mart and the pillars of old houses locally called *Patli* used for making blocks. Selected wood was used to weigh first and then cut into required sizes. The price of the wood was decided on the weight earlier wood was sold on per cubic foot.

Oil

Oil was used at the end of the wood block making process. The prepared block used to be immersed in oil till 2-3 days. This was done for achieving the protective layer to prevent water related damage to the block as it undergoes washing after every use. Oil was also used for the finishing purpose. Most commonly the cooking oil i.e. groundnut oil or cottonseed oil was used as easily available. At present most of the craftsmen stopped immersing the block in oil and many times printers themselves used to immerse the block in oil before use. In addition to this a *khaddi* / chalk powder was used for creating base for tracing a design on wood piece and an oil paint used to take an impression of prepared woodblock on to the paper to check the result of carved design as well as for record and reference. Since four decades craftsmen started using the white poster colour to create base

c) Tools used

Traditionally all hand tools were used for making a block such as hand saw, hand file, fiddle, hand drill, chisels (Figure 4.2). Since a decade the craftsmen have started using electric tools such as hand drill machines, grinder, trimmer etc. Trimmers have been used for finishing a wood piece. Trimmer is used for removing negative areas in the filling block (Figure 4.3). Hand drill machines are mainly used for making air holes in a block which is a very tedious job. The use of such tools has saved energy and time by increasing productivity and maintaining quality.

a. Different types of fiddle/ hand drills and files

b. Set of tools used in drawing/ making design

c. Different types of chisels and dies such as pointed,

Figure 4.2 a,b,c : Hand tools

d. Trimmer: used to remove negative area from filling block

e. Different types of grinders used to finish a wood piece

f. Drill machine: used dill air holes in wood

Figure 4.3 d,e,f : Mechanized tools

b) Process of wood block making (Earlier and present)

The process of wood block making is tedious and time consuming. It began with the sourcing of wood to dispatch of prepared blocks. This whole process is divided into different stages. The sequential process of wood block making has been described below. There have been major changes observed in the making of wood blocks in the last two decades. Thus, a process followed by the craftsmen at present discussed along with the traditional process for better understanding block. It requires skill, precision and concentration at each stage of its making. Traditionally the whole process was done by hand. The change has also occurred in the process of block making. The process has also been changed with the use of mechanized tools which was discussed above.

Process

The sequential process of block making has shown below.

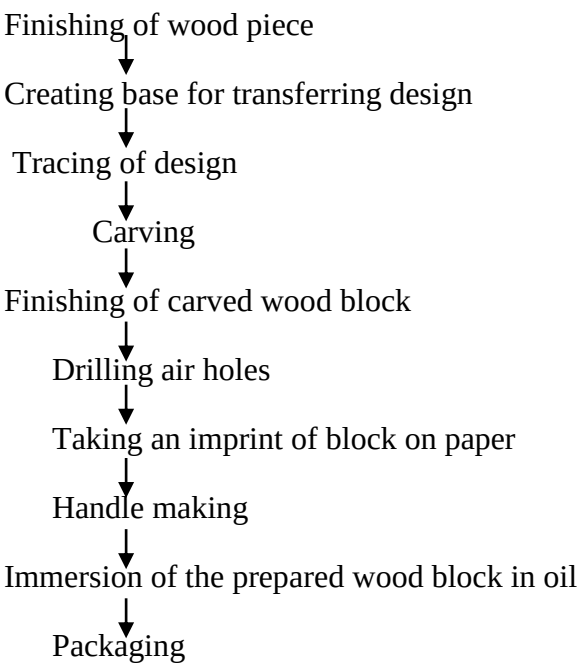

Figure 4.4: Sequential process of wood block making

Finishing of wood piece

It is essential to make a wood piece smooth and leveled before proceeding to a further stage. The process was divided in three different steps:

- Scrapping
- Leveling
- Final finishing

a. Scrapping

b. Checking the level with scale

c. Leveling and polishing of wood piece using file

d. Rub the wood piece on sand stone for polishing of wood piece

Figure 4.5 a,b,c,d : Finishing of wood piece

Traditionally the wood piece was finished by scrapping it with hand plane to remove hard wood. The leveling was done using file. The level was checked simultaneously after every little amount of filing. After the leveling process, wood piece was then rubbed on the rough and smooth river stone along with water for the polishing purpose (Figure 4.5). This whole process would take 45 minutes to one hour.

Present

The finishing of wood piece has been easier using grinders and time taken for finishing has been decreased to 15 minutes. Simultaneously level has been checked with scale. After that a rough stone has been used to rub over a wood piece along with water for the polishing (Figure: 4.6).

Figure 4.6: Finishing of wood piece using electric grinder

Creating a base on to the wood piece

Khaddi was applied onto the wood piece first for creating white base. So that design traced could be clearly visible or to perform the drawing.

At present a white poster colour or a chalk powder solution is used for creating a base for unavailability of *khaddi* and for saving the time.

Drawing or Tracing of the design

The process of transferring design is an important step. It requires knowledge of geometry and a good drawing skill. This step includes measuring the design, taking accurate measurement of each motif, modification of design if needed i.e. enlargement or reduction of design. This was done traditionally using two methods. One was tracing from paper using a blunt chisel and the other using a graph method. In this method the measurement was taken using a compass then marked onto the wood piece. Thus the design was directly drawn on a wood piece using a compass, scale and different shaped chisels. This whole process takes 6-8 hours.

Present

At present the block makers use the photocopy technique for the enlargement and reduction of the design as it has easily done by the use of photocopy. The younger generation of block makers lack good drawing skills. Thus the photocopy and computerized print made the enlargement and reduction of the design easier. After that the similar process is followed for the tracing. This method saved their little time but yet a time taking stage.

Carving

The carving process was divided in following steps:

- Drilling the holes in negative area of design
- Breaking the holes
- Clearing the base
- Carving
- Finishing

The carving process was different for outline block, filling block and background block. The time taken for carving an outline block was more as compared to filling block and background block.The holes were drilled using fiddle drill form the negative part of the design. Different sizes of drills were used as per the fineness of design. Then the holes were broken using a mallet and sharp chisel and the base was made clear. After this the design was carved carefully by giving proper shape to each motif using appropriate chisels.

Present

For a decade block makers started using electric grinder, trimmer and hand drill machine to drill out holes. The trimmers and grinders majorly used in carving of filling block and background block. The use of such tools saved their time and energy.

Drilling air holes

After the carving process the air holes were drilled throughout the wood block to avoid air pressure while printing. The air holes were drilled at all four sides of an outline block vertical and horizontal at 90 degree angle. This was done traditionally using a fiddle drill by hand. This process was also tedious and time consuming.

Present

At present the air holes were created using drill machines which resulted in saving time and energy.

Handle making

Traditionally the handle was carved out from the same wood piece. The thickness of the wood piece taken was 3 inches at that time so half of it was utilized in handle making. This method was time consuming at the same time usage of wood was more and that ultimately affected the price of the wood piece.

Present:

Since a decade the block makers had started making the handle separately. They used to buy teak wood bands of a minimum length 2 feet and then cut into the desirable handle size. After this the handle was attached to the wood block using nails. This method had eventually saved time and reduced production cost.

4.2.3 Phase II Ergonomic analysis

4.2.3.1 To analyze the work pattern and workplace of the craftsmen

A Modified Musculoskeletal Questionnaire was used to collect the requirements from the respondents. The results were divided into different sections that are demographics, Work space and job tasks, and Rapid upper limb assessments (RULA).

Work and job task related information:

The mean working hours of block makers were recorded as 10 hours per day. It was reported that out of 15, except two all other craftsmen were working for 8-10 hours a day. All of the craftsmen reported the resting hours of two hours which include both lunch time and rest time. It was also reported that the majority of the craftsmen were taking short breaks during work of 5-10 minutes for 4-5 times. Short breaks could be for refreshments or sometimes to relax from steady posture by stretching legs or changing position. It was also found from the result that there was no system of weekly off. Although, there was always an option that craftsmen would get leave anytime for a particular reason.

Body part experiencing discomfort

The results from the body part experiencing discomfort Scale showed that there was not any noticeable discomfort experienced by the young craftsmen. It was also found to be strong to disrupt discomfort experienced in lower back, lower leg and knee. Most of the senior artisans experienced such kind of pain regularly. The young craftsmen didn’t experience any musculoskeletal disorder but the amount of disorder

and pain increases at the time of severe workload. Most of the senior artisans (n=5) experienced such kind of pain regularly and it was reported as disrupting discomfort according to the scale. Therefore it can be said that the amount of pain increases with the exertion in work as well as increases with the growing age. There is a significant association with age and MSDs.

Postural analysis

The result of the rapid upper limb analysis scale was scored 4 and 5. The postural score of nine craftsmen showed the 4. According to the RULA scale the analysis under this particular score said that further investigation required and the changes may be needed. The most affected posture was lower back and knee.

Ergonomic analysis of table used for block making

A table is the most essential and most used equipment in block making. There were two types of tables used. The one with three legs is called *tarbaiyo*in local language and the other desk is called *mez*.

Table 4.1: Analysis of table used for block making

Specifications	Desk (*Mez)*			A table with three legs (*Tarbaiyo)*		
Average Size	L	B	H	L	B	H
	11.5”	14”	13.5”	14.5”	17.5”	11”
Thickness of board/base	1”			1.5”		
Made up of	Teakwood			Teakwood		
Drawers	Yes, two or three			No		
Legs	four			Three		
Use	Used in making and tracing of design			Used in carving process		
limitations	No drawers			Less movement possible of for legs		

The size of both types of tables used by each craftsman i.e. sixteen was measured including its length, width, height and thickness. The amount of variation observed in the size of tables used at different workshops by each craftsman was minute. After that the average size was measured. The size of the table was varying person to person due to the height of an individual.

From the table 1 it was observed that the average height of a desk found was 11.5”x14” x 13.5” (L x B x H) as well as the average size of the table with three legs called *Tarbaiyo* was found 14.5” x 17.5” x 11” (L x B xH). From the average size it has been said that the height of the table was near to 1 ft. The tables used were the same as the earlier ones. There were no changes made till date except the repairing. Many craftsmen used to keep stone or wood pieces under the leg of the table to adjust

the height of the table or some used to place a wood piece under the actual block to increase height. Therefore it has been said that the height of the table should be in proportion to the height of a craftsman otherwise it would affect the work posture and increase an ergonomic risk.

4.2.4 Phase III Capacity building of the craftsmen

4.2.4.1 Integration of technology in wood making craft

An exposure visit to the CNC workshop, Ahmedabad was arranged and a block having size of

3" x 3" was tried out on a CNC machine. The purpose of making blocks using a CNC machine was to analyze the advantages and limitations of the use of technology. Following criteria were considered.

- Accuracy and fineness
- Cost, Time and maintenance

It was analyzed that the time taken for job making (making a design on software) was 2 hours which was the same as the time consumed in making a block on a machine. Power consumption and maintenance of the machine would become a tough task for the craftsmen. The level of accuracy achieved was good enough but it was lacking with the sharp corners at one side. Thus craftsmen had to revise the block and finish the same wood block. Therefore it was analyzed that it was better for the craftsmen to acquire them with knowledge of designing software which would result in saving time and energy.

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a. Computer Numeric Control (CNC) m/c

b. Carving of wood block on CNC m/c

c. Carved wood block using CNC

Figure 4.7: Carving of wood block on CNC m/c

4.2.4.2 Imparting knowledge of Government Schemes

There were various schemes for the up-liftment of the craft and craftsmen. From the literature review various schemes were studied and listed out. After that all the schemes were categorized in different groups such as Direct benefit to the artisan scheme, cluster development schemes and the schemes through which an institute or an organization could apply and provide benefit to the particular craft through various

training and workshops. Among these categories, the schemes which were appropriate and applicable to the wood block craft and craftsmen were listed out and the knowledge of such scheme was imparted to the craftsmen. A camp was organized under *Hastkala Setu Yojna*, by Entrepreneurship Development Institute (EDI), Ahmedabad at Pethapur.

4.2.5 Phase IV Promotion of the Craft

Figure 4.8: Entrepreneurship awareness camp organized at Pethapur by under the aegis of EDI, Ahmedabad: *Hastkala Setu Yojna*

Craft promotion was done using various methods to reach out to larger audiences. DIY hand block printing kit, website and short documentary were created to make people aware about such a craft and to disseminate people about the base of the hand block printing. It would be instrumental in learning about the craft, bringing craftsmen in limelight, helpful in sensitizing the craft to all generations of people.

Conclusion

Wood block making craft of Pethapur is famous for its finely carved wood blocks over the years. It is on the verge of extinction and a serious action was needed to be taken as there are only a handful of craftsmen left. The present study was aimed to understand the problems and prospects of the lone traditional center of wood block making in Gujarat through its evolution over a period of time and promotion of the craft as well as the craftsmen through ergonomic analysis and capacity building.

It was concluded from the study that craft has undergone major changes after the *Saudagiri* trade till date such as community shift, less interest in younger generations to take the craft forward, less profit earned against the labour involved, cost and quality of raw material.

It was analyzed from the ergonomic study that work place needs to be re-arranged using ergonomic principles and the table used in making block need to be re-designed with adjustable height.

From the comparative analysis of traditional wood block and the wood block developed on CNC m/c, was discovered that the learning of design software such as Auto CAD, Photoshop proved to be the better option to enhance the work efficiency against. The awareness camp organized for the promotion of the craftsmen was successful and the craftsmen were satisfied with the information and knowledge shared by the Govt. officials. They agreed to participate in such workshops and camps organized in future.

References:

1. Bisht, D. S. & Khan, M. R.(2019). Handle Design of Woodworking Tools: Preferences and Recommendations of Craftsmen and Design Students. Retrieved from http://dspace.nitrkl.ac.in/dspace/handle/2080/3441
2. Chatopadhyay K. (1975).*Handicrafts of India*, Indian council for cultural relation, New Delhi, pp. 46-47.
3. Desai J.(1982).*An experimental study of block printing using linoleum and other materials to produce different block*, unpublished master's dissertation, The Maharaja SayajiraoUniversity of Baroda, Vadodara.
4. Dhamija J. (1980).*Crafts of Gujarat (Living traditions of India)*, Mapin international, pp. 65-108.
5. Dua S. (2014).*Study of the Tradition and Evolution of Ornamentation styles and Motif Vocabulary of the Printed Textiles from Gujarat,* Unpublished Doctoral thesis of Department of Clothing and Textiles, faculty of family and Community sciences, The Maharaja Sayajirao University of Baroda, Vadodara.Edwards E. (2016), *Block Printed Textiles of India, Imprints of Culture,* Niyogi Books, New Delhi, India
6. Kagdi A. (2015).*Revitalization of Traditional Saudagiri Prints of Gujarat*, Unpublished master's dissertation Department of Clothing and Textiles, faculty of family and Community sciences, The Maharaja Sayajirao University of Baroda, Vadodara.
7. Kamti, M. K et al. (2022). Occupational Health Profile of Workers in Terracotta Handicraft Industry: Ergonomics Intervention. In *Technology-Enabled Work-System Design* (pp. 149-159), Springer, Singapore.
8. Kumar, D et al. (2019). A literature review of ergonomics factors in handicraft sector. Retrieved from https://www.indianjournals.com/ijor.aspx?target=ijor:sjdm&volume=19&issue=2&article=005
9. Mahmood, W et al. (2021). Upper extremity musculoskeletal disorders and exposure to Ergonomic risk factors among handicraft workers. *Pakistan Journal of Medical Sciences*, *37*(2), 494. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7931295/
10. Mrunalini, A., &Logeswari, S. (2016). Musculoskeletal problems of artisans in informal sector–a review study. *Int J Environ, Ecology, Family and Urban Studies*, *6*(1), 163-170.Retrieved from https://www.researchgate.net/profile/AMrunalini/publication/325402305_MUSCULOSKELETAL_PROBLEMS_OF_ARTISANS_IN_INFORMAL_SECTOR_A_REVIEW_STUDY/links/5b0c0827aca2725783eb28d8/MUSCULOSKELETAL-PROBLEMS-OF-ARTISANS-IN-INFORMAL-SECTOR-A-REVIEW-STUDY.pdf

11. Posrithong, P. (2013). Indian trade textiles as Thai legacy. *The Sea, Identity and History. From the Bay of Bengal to the South China Sea*, 329-349.
12. Rahman, M. et al. (2006). Musculoskeletal discomfort among workers in mould making manufacturing industry, *28*(4.22), pp 23-38. Retrieved from https://www.researchgate.net/publication/282837828_Musculoskeletal_discomfort_among_workers_in_mould_making_manufacturing_industry
13. Robinson S. (1969).*History of printed textiles*, M.I.T press, Cambridge, pp. 6-9.
14. Roy, A. K. et al. (2010). Environment, Occupational Health and Safety in the Craft Sector in India (Base Line Study of Selected Craft Clusters). *All india artisans and craft workers welfare association*. Retrieved from http://www.switch-asia.eu/site/assets/files/1983/research-baseline-study-environment-occupational-health-safety-issues-the-crafts-sector.pdf
15. Sarkar S. (1998).*Indian craft-technology : static or changing,-A case study of the Kansari's craft in Bengal, 16th to 18th centuries*, Indian journal of history of science, , 33(2), pp. 131-142
16. Smith D. and Kochhar R. (2004). West Bengal: The Dhokra Artisans of Bankura and Dariapur*A Case Study and Knowledge Archive of Technological Change in Progress*. Retrieved from http://rajeshkochhar.com/data/publications/bankura.pdf
17. Sharma A. (1983).*A study of the Bagru printing*, Unpublished master's dissertation Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara.
18. Singh, G. (May, 2017). Wood block makers of Pethapur, LinkedIn. Retrieved from https://www.linkedin.com/pulse/woodpeckers-pethapur-gurmeet-singh
19. Sindha P., Times of information, Annual Diwali edition, Pethapur, Gandhinagar, 2008, pp. 20-25.
20. Trivedi R., (1961).*Selected crafts of Gujarat*, Census of India 1961, Volume V-part VII-A, pp-3-25,
21. Trivedi V. (2011). *Traditional KnowledgeofWood Block Making Craft of Pethapur – A Case Study*, Unpublished master's dissertation Department of Clothing and Textiles, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara.