

CHAPTER 1

INTRODUCTION

The handloom sector holds a significant place in India's cultural and economic landscape. Despite the cultural significance, artisanal value, and export value, the handloom sector, especially in Varanasi city of UP, India, encounters many challenges, making itself difficult to sustain amid the forces of the modern market and its mechanisms. The survival of the handloom sector is becoming progressively more complicated under such market conditions. The problems encompass a wide range of issues, spanning from economic and technological obstacles to social and environmental concerns, leading to vulnerable conditions for weavers and weaving houses. With the existence of such challenges and uncertainties linked to the markets, it is challenging for the handloom sector to revive or sustain itself without comprehending the root causes of these issues and understanding the strategies required to mitigate their effects.

The Indian handloom sector, one of the world's oldest and most significant industries (Dey and Paul, 2023), has a glorious past. This intricate crafts sector represents India's diverse and astounding culture and reflects its enduring traditions. Handloom products have a rich history and have been praised internationally for their remarkable styles, aesthetics, artistry, and dexterity (Kumar et al., 2021). Handloom weaving in India serves both self-consumption and commercial purposes (Bajpeyi et al., 2010). India is the largest global producer of handloom products, accounting for 95% of hand-woven fabric supplied to international markets, including the USA, France, the UK, Italy, and others, as indicated by the India Brand Equity Foundation in 2020. While neighbouring countries like

Bangladesh, Nepal, and Pakistan also engage in small-scale production of handloom products, India leads in terms of quantity and global reach. The export of Indian handloom products held substantial value, reaching US\$ 343.69 million in the financial year (FY) 2019, with a continued positive trend into FY20, reporting exports of US\$ 226.05 million until November 2019 (India Brand Equity Foundation's data, 2020). Furthermore, within the domestic market, the handloom sector captures a notable fifteen percent share in the country's cloth production market, reflecting its enduring significance in India's textile landscape.

1.1 Handloom sector in India

India's handloom sector is widespread, with its presence in twenty-seven states and four union territories, contributing to product diversity related to each state and territory, integrating its creations with its own distinct cultural, traditional, and custom influences (Mandal, 2014). Among these regions, Assam, West Bengal, Tamil Nadu, Manipur, and Uttar Pradesh have significant numbers of handloom weavers, with 12.8 lakhs, 6.31 lakhs, 2.43 lakhs, 2.24 lakhs, and 1.90 lakhs, respectively. These numbers highlight their pivotal role in shaping this thriving sector (Fourth All India handloom census 2019-20).

According to the Fourth All India Handloom Census (2019-20), the handloom sector is a significant employer, supporting a workforce of 35,22,512 weavers, making it the second-largest unorganized sector in India regarding employment. The Handloom sector is a major source of income in some rural areas of India. The fourth all-India handloom census revealed that out of 35,22,512 actively engaged weavers, 86.69% were in rural areas, while the remaining 13.31% operated in urban settings. The census also emphasized that 72.28% of the weavers were female (Fourth all India handloom census 2019-20). Figure 1.1 illustrates the distribution of handloom workers based on gender.

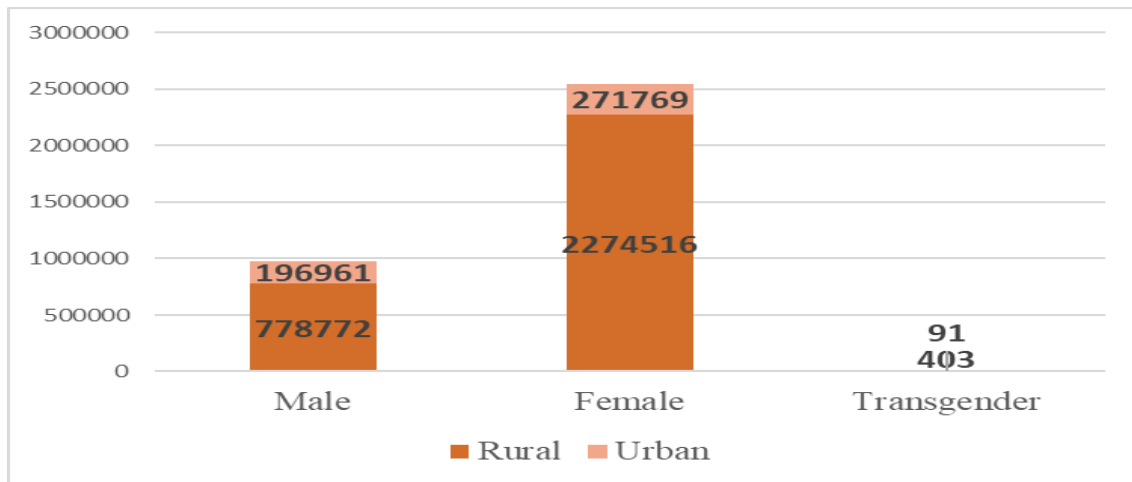


Figure 1.1 Number of handloom workers by gender (Source: Fourth all India handloom census 2019-20)

This significant female participation in the handloom industry highlights women's pivotal role in preserving traditional textile craftsmanship and contributing to household income. Now, let's delve into the types of looms employed by these skilled weavers to weave their intricate designs and produce a wide range of beautiful fabrics.

1.1.1 Types of looms

Some of the most operated looms include the Pit loom, Frame loom, Loin loom, Manipuri loom, Rajasthani loom, and Kashmiri loom. Figure 1.2 shows the use of various types of looms in India.

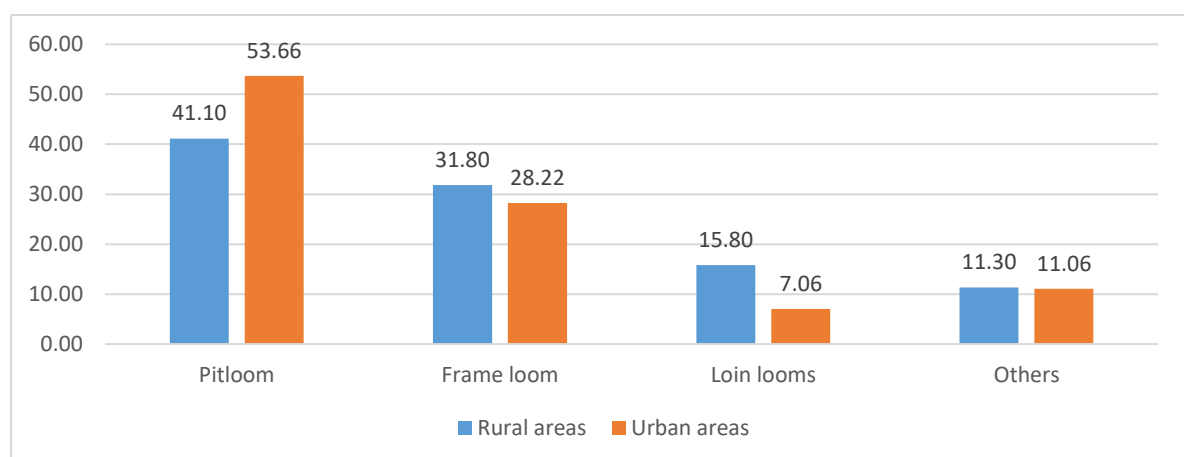


Figure 1.2: Percent of loom used in weaver households in rural areas and urban areas (Source: Fourth all India handloom census 2019-20)

It can be seen from Figure 1.2 that weavers use 41.1% of pit looms and 31.8% of frame looms in rural areas. While 53.66% of pit looms and 28.22% are frame looms in

urban areas (Fourth All India handloom census 2019-20). The following subsections explain some of the types of looms in brief.

1.1.2 Pit Loom

As the name suggests, the pit loom is partially positioned over a pit, so the weaver sits in the pit for the weaving. A "Pit Loom" is a traditional wooden weaving device crafted by weavers, and these looms have a stronger basement when compared to frame loom. Figure 1.3 represents the traditional pit loom use by weavers.

1.1.2.1 Frame Loom

Frame looms operate on a mechanism similar to pit looms. But the key difference is that the frame looms are constructed entirely above the surface. This unique design characteristic allows frame looms to be effortlessly relocated from one location to another. Figure 1.4 shows the frame loom used by weavers.

1.1.2.2 loin looms

loin looms are simple to construct and easy to use. They have neither permanent fixtures nor heavy frames. The weaver sits with a loom, fixing the back strap and keeping her legs against the footrest, which is adjustable for keeping the loom in tension. Figure 1.5 represents the loin loom used by weavers.

Other looms like the Manipuri loom, Rajasthani loom, and Kashmiri loom, are used locally in their respective states, while the rest of the looms are visible over the whole of India. Pit loo and frame looms have maximum use in the handloom sector, especially in Varanasi city. With these looms, the weaver produces a diverse range of uniquely designed products (explained in the next section), catering to customers' preferences (Mandal, 2014).



Figure 1.3: Pit loom



Figure 1.4: Frame loom



Figure 1.5: loom (Source: Utsav (2023))

1.1.3 Type of Handloom products

The handloom sector produces an array of products, including saree, dhoti, sarong, and lungi, towels, blankets, handkerchiefs, and dress material for customers of all ages and genders. The distribution of products across India is depicted in Figure 1.2. Figure 1.2 clearly shows that the saree product shares the maximum pie of this pie chart. So, the handloom sector primarily focuses on traditional garments for women (Bhagavatula, 2010). Approximately 6.83 lakh handloom households, constituting around 22.9% of all handloom weavers in India, are engaged in weaving sarees.

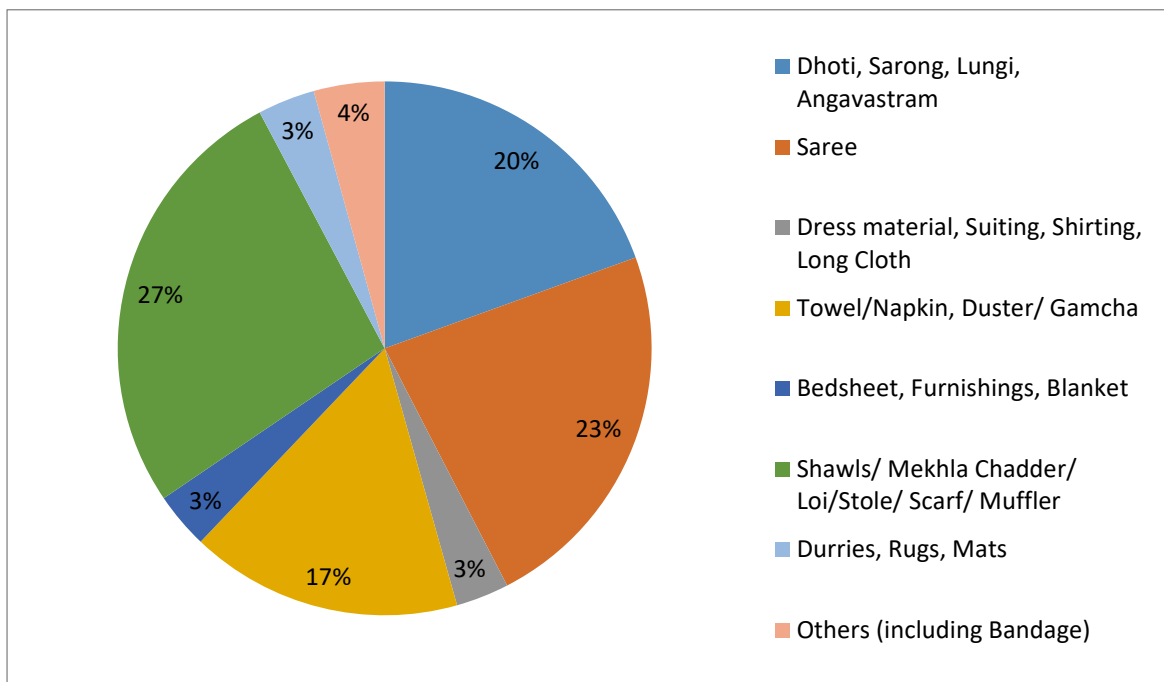


Figure 1.6: Distribution of weaver households by production of major fabrics (Source: Fourth all India handloom census 2019-20)

The manufactured handloom products are sold to the customers using different sales channels, as mentioned in section 1.1.3.

1.1.4 Distribution of Weaver Sales Channels

The fourth India handloom census (2019-20) indicates that a significant proportion of weavers (64.1%) prefer selling their products in the local market (Figure 1.3), with the most widely used traditional method. On the other hand, 17.6% of weavers associated with master weavers to sell their products. A smaller, 8.8%, percentage of products are sold through co-operative societies or alternative channels. Other alternatives for sale include organized fairs (1.0%), exports (0.4%), and e-commerce (0.2%). Additionally, there is a category labeled as "others," which accounts for 8.0% of the total sales.

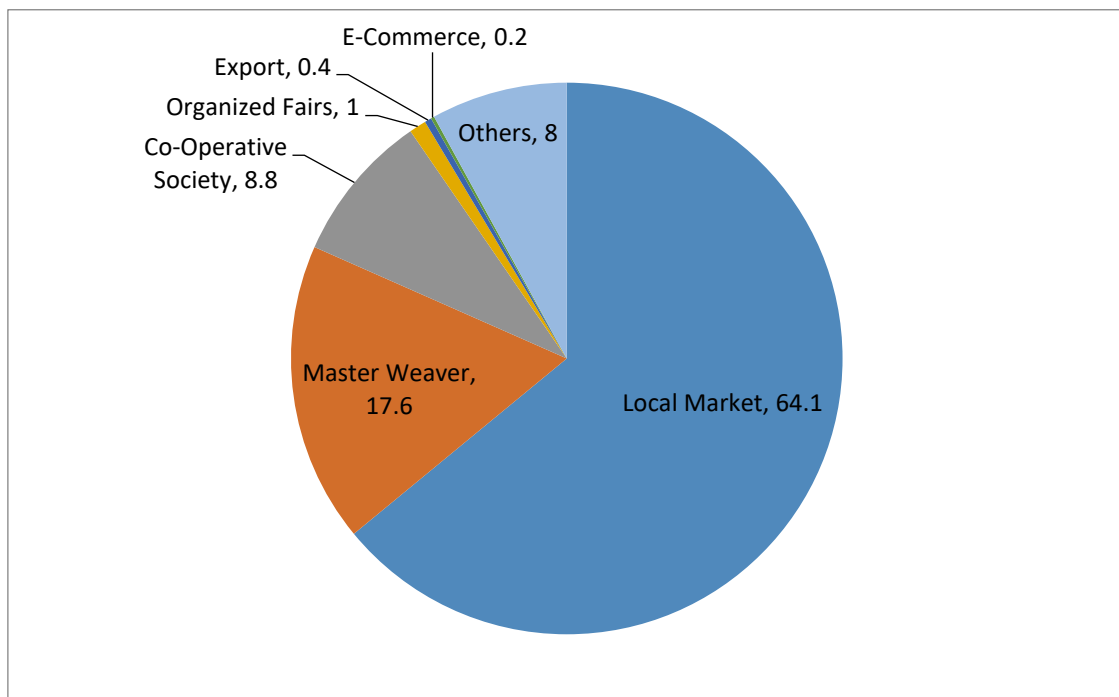


Figure 1.7: Source of sales by handloom households in percentage (Source: Fourth all India handloom census 2019-20)

In India, every state's handloom sector has its own identity. In the state of Uttar Pradesh (UP), many cities contribute towards the weaving of handloom products, and it is one of the most vibrant and diverse handloom hubs in the country.

1.2 Utter Pradesh Handloom sector

According to Textile weaving prosperity (2018), Uttar Pradesh (UP) embraces the fifth-highest number of handlooms in the country, with 2.58 lakh handloom weavers, and it ranks 5th in total silk production in the country. In addition, it is also the third highest fabric-producing state of India, producing 13.24% of national production. Utter Pradesh has different handloom production centers, as shown in Table 1.1.

Table 1.1: Handloom products and their manufacturing centers in Utter Pradesh

Centers	Products
Amroha	Picnic Mats
Azamgarh	Silk sarees, mixed sarees and fabrics, kharrimats
Agra	Mats, bedsheets, furnishing, heavy dress materials, chenille cotton carpets
Barabanki	Stoles, scarves, lungis
Etawah	Bedsheets, dress materials, mats, mixed fabrics
Farrukhabad	Cotton print, bedsheets, dress materials, mats, chenille cotton carpets, mixed fabrics
Fatehpur-sikri	Heavy cotton fabrics, dress materials, mats, chenille cotton carpets, mixed fabrics
Ghaziabad	Jacquard furnishing, bedspreads, terry towels, linen, home furnishing
Gorakhpur	Terry towels, toweling, furnishing, dress material
Hathras	Chenille rugs, cotton carpets, fabrics
Kanpur	Mats, dusters, cotton fabrics
Lucknow	Chikankari work
Sitapur	Cotton mats
Varanasi	Silk sarees, sarees, mixed fabrics, cut work items, dress materials, furnishing, stoles, scarves, gauze and leno fabrics, brocades

Source: Textile Weaving Prosperity (2018)

Among the abovementioned cities of Uttar Pradesh, the Varanasi Handloom sector dominates in producing the best quality silk fabrics, particularly sarees, and this sector contributes 90-95% to silk saree production in Uttar Pradesh (Textile weaving prosperity, 2018). According to Naik et al. (2023), the sarees manufactured in Varanasi are famous in India and other countries because of their exquisite craftsmanship and timeless designs.

1.3 Handloom sector in Varanasi

Varanasi, or Banaras, one of the oldest living cities in the world, holds special significance as the ultimate pilgrimage destination for large populations in India and abroad as well. Situated on the Ganges' banks and between the rivers Varuna and Assi, which flow into the Ganga, Varanasi is also known by its other ancient name, Kashi. It is renowned as the "City of Light" due to the presence of one of the twelve "Jyotirlingas" here. The city is steeped in traditional classical culture, glorified by myth and legend, and sanctified by religion, attracting a large number of pilgrims and worshippers from around the world. Varanasi has also earned fame for its rich tapestry of music, arts, crafts, education, and handicraft/handloom since ancient times (Ansari, 2016).

Varanasi is a world-famous center for brocade and Zari works and is an internationally leading silk saree-producing center in India. The art of brocade and Zari has a long tradition in the region's cultural history (Faisal, 2016). Early accounts by Ralph Fitch, a merchant from London, describe Varanasi as a blooming part of the cotton textile sector. The invention of Varanasi brocade and Zari textiles dates back to the early 19th century. In the 16th century, weavers from Gujarat migrated to Uttar Pradesh, contributing to the development of silk brocade weaving in Varanasi during the 17th century and its perfection in the 19th century. The Mughal period in the 14th century witnessed the excellent practice of silver and gold threads, with Varanasi being well-known for producing

Zari turbans for the Mughals. Historical references mention the use of Hiranya (cloth of gold) during Rig Vedic times, similar to the present-day brocade of Varanasi. In the post-Vedic period, silk cloth (Koseyya) was embroidered with gold, and elephants were adorned with golden trappings (Faisal, 2016). Similarly, sarees have been produced with gold, silver, and copper zari and are still in the market for use on various occasions like national celebrations, family functions, poojas (an occasion of special worship), etc.

Banarasi sarees are historically acclaimed as the finest sarees in India, celebrated for their gold and silver brocade or zari, fine silk, and opulent embroidery. Crafted from finely woven silk, these sarees feature intricate designs, making them relatively heavy due to the ornate engravings. These are characterized by Mughal pattern designs, heavy gold threadwork, compact weaving, micro-designed figures, metallic visual effects, pallus, jaal (net-like patterns), and mina work (a form of enamel work). Creating a single saree can take a period from five days to one month and sometimes up to six months, depending on the intricacy of the designs and patterns (Ansari, 2016).

This sector experienced significant growth from 1881 to 1961, with weavers as a percentage of the city's total population increasing fivefold during this period (Wood, 2014). However, Varanasi's weaving sector underwent profound change and contraction in later years. Handloom production significantly declined due to factors such as competition from power-loom weaving, higher tariffs on imported silk fabric, increased competition from Chinese imports, rising prices for raw silk thread, changes in fashion preferences and role of middle man leading to reduced demand for traditional Banarasi saree (Wood, 2014)

Varanasi Handloom sector of India has its own identity for its silk saree and has been providing lively hood to weavers for ages. The Varanasi handloom sector produces different types of saree like “Jamdani, Jangla, Jamawar, Tanchoi, Cutwork, Butidar, Katan,

Organza, Georgette, Shattir” (Faisal, 2016). The Varanasi saree's traditional weaving style and design are the most vibrant aspects of the Varanasi cultural habitat formed by three main structures of weavers.

1.3.1 Structure of Varanasi weavers

1.3.1.1 Independent Weaver (IW)

Independent weavers are those who weave the fabric independently. Such weavers own the loom for the weaving of fabric after purchasing raw materials from the local market for their design and color combinations. They take the help of family members for weaving and sell the finished product in the local market or to traders.

1.3.1.2 Master Weavers (MW)

Master Weavers (MW) are like an entrepreneur who will hire other weavers on the basis of wages. MW will supply the raw material to the weaver and collect the woven products from the working weaver, and they sell to traders or customers.

1.3.1.3 Cooperative-society weavers (CW)

A group of weavers establish a society and work for it. Some weavers are chosen for the administrative role to handle marketing and raw material procurement from the supplier. The cooperative society weavers will procure raw materials in bulk amounts at less cost and distribute them among themselves. The woven fabric was collected and sold directly to the customers.

The handloom sector holds a significant place in India's cultural and economic landscape. Despite its cultural significance and artisanal value, the handloom sector encounters many challenges, making it difficult to sustain itself amid the forces of modernization and mechanization. These problems encompass a wide range of issues,

spanning from economic and technological obstacles to social and environmental concerns. So, problems and challenges faced by the handloom sector in various parts of India were identified by many researchers and are presented in section 1.4

1.4 Problems associated with the handloom sector

Available literature reveals that the handloom sector is facing a myriad of problems, ranging from business, technical, and logistics to ergonomic challenges. These problems are leading to vulnerable conditions for weaving households and weavers. Researchers, journalists, and other stakeholders, such as government agencies and NGOs, have studied these problems in different regions of India and highlighted that weaver clusters have faced various challenges that impact almost every dimension of their business. It is evident that these pre-existing problems have been exacerbated, first by demonetization, second by the introduction of the Goods and Services Tax (GST), and then by the pandemic in India and specifically in the case city. The following sections present these problems in some Asian countries, especially India and the case city Varanasi, through a literature survey.

Niranjana and Vinayan (2001) studied the various regions of Andhra Pradesh under the Government of India Planning Commission. The study highlighted needs in the handloom sector, such as i) securing adequate quantities of good-quality yarn at reasonable prices, ii) addressing the gap between supply and demand for hank yarn, and iv) resolving yarn shortages and steep prices. Additionally, they identified credit problems, market decline, and migration of weavers due to factors such as low wages, poor living and working conditions, decreased demand, and health problems.

Kumudha and Rizwana (2013) conducted a study on consumer awareness about handloom products with special reference to the Erode District and showed that the

weavers were using inadequate marketing techniques and were unaware of the governments' cash rebate schemes.

In their research study, Boruah and Kaur (2015) analyzed the economic conditions of weavers working under cooperative societies in the state of Assam, India, and recognized the problems with this sector as obsolete technologies, inadequate working capital, and weak marketing. Rao and Rao (2015) collected data from primary and secondary sources in Andhra Pradesh, revealing challenges faced by handloom weavers. These challenges included shortages and non-availability of raw materials, rising input costs, lack of technology development, limited market information, inadequate product feature awareness, insufficient promotion and advertisement, improper management of handloom logistics, lack of working capital, poor management, unfair practices of power looms, and failures in implementing government schemes.

Tanusree (2015) also conducted a study to assess the situation decline of traditional handloom weavers in Uttar Pradesh, India. She identified several reasons behind the decline in handloom weaving, including a shift towards the power loom under the influence of production systems and capitalist control, power loom competition, rising yarn prices, wage system problems, and labor issues. She also specified that the weavers did not sustain their lives with handlooms because of such a problem. She added that with a deceiving trend, the handloom sector needs immediate care and attention. Varghese and Salim (2015) conducted a study state of India handloom sector in Kerala, identifying several problems and challenges, such as rising prices of cotton hank yarn and dyes, competition from power looms, low wages, job insecurity, political and governmental interference, bureaucratic tendencies, corruption affecting autonomous functioning, delays in payment of wages,

financial crises, marketing problems, a lack of skilled laborers, and healthcare challenges for weavers.

Datta (2018) highlighted that workplaces are congested with unfavorable conditions such as high temperatures, humidity, poor illumination, and high noise levels. These conditions expose workers to various health risks, leading to impaired health. The lack of proper healthcare facilities and medication also contributes to migration from the handloom sector. Another study by Shamitha and Balasubramanian (2018) conducted a study on the socio-economic conditions of 37 weavers' cooperative handloom society in the Kannur district of Kerala. Their research revealed that the handloom sector encountered three main types of problems: i) Input-related problems like delays in the supply of yarn, poor quality of raw materials, high production costs, inadequate yarn supply, and insufficient looms; ii) Weaver-related problems, such as the aging workforce, a lack of skilled weavers, inactive members, inadequate training, limited knowledge about modern techniques, and issues of wages; and iii) Marketing-related problems involving a lack of customer relationship management, an inadequate understanding of customer preferences, a dearth of intensive distribution, insufficiently attractive promotional strategies, and competition from mechanized sectors such as mills and power looms. They specified that weaver's social and economic condition was jeopardized even with various government schemes. They added that weavers' conditions become more vulnerable due to weak organizational structure, low wages, poor infrastructure, decentralized looms, poor marketing, etc.

Mukesh (2019) highlighted a serious problem of weavers' migration to other work sectors. In his study related to the Maheswar handloom of MP state of India, he identified that there was no development in the issues of methods and equipment, i.e., looms and

other equipment of weaving, forcing weavers to work on time-consuming and labor-intensive tasks on traditional methods. He highlighted that the weavers, working under such conditions of hard work, suffered a lot of health problems like Musculo Skeletal Disorders (MSD), leading to a loss of interest in weavers in the sector. As a result, weavers started to migrate to other sectors of work, such as power looms, shoe making, etc. He emphasized the requirement of the new method developments with ergonomic design of weaving/looms/workstations. A similar study by Sarkar and Mukhopadhyay (2019) showed that the handloom sector size and weavers in West Bengal were decreasing due to 1) a fall in demand and fewer options for selling, 2) a switch of weavers to other professions and 3) loss of interest of the new weaver's generation in handloom sector. They also mentioned that the adoption of modern techniques was significantly poor among the people of this cluster.

Uddin et al. (2023) studied the reasons for the migration of weavers in the Sirajganj district of Bangladesh. They considered four independent variables, namely i) psychological factors, ii) health hazard factors, iii) financial factors, and iv) non-financial factors, and tried to determine their effect on migration/ switching of wavers through the Structural Equation Modelling (SEM) approach. Their findings revealed that switching weavers from the handloom industry to other sectors was mainly due to health hazards and non-finical aspects.

It is evident from the above discussion that the handloom sector is facing a lot of problems/challenges. These challenges range from the input side to the customer side through production/operation and logistics issues. Raw materials' availability, price, and quantity lead to the problem of high lead time and delayed supply of final products at high cost. As mentioned earlier, the weaving houses/weavers are quite adamant about upgrading

for partial/full automation, and they are continuing their operations using old traditional methods. This approach forces long working hours of labor or repetitive tasks, leading to MSD. Besides this, the new generation is also losing their interest in the profession and rapidly switching to other professions due to i) job insecurity, ii) switching to other professions, iii) poor living standards of weavers, and iv) health issues.

Production and operations are being hampered due to i) inadequate working capital ii) credit-related problems, iii) awareness about government schemes, iv) the gap between supply and demand of yarns and other raw materials like silk, v) an aging workforce etc., so the handloom sector is meeting market demand at a lower rate than power loom sector. Besides this competition in the power loom sector, weavers are unable to work as per the market requirement due to i) a lack of understanding of customer preferences, ii) a lack of infrastructure to sell their product directly, iii) limited market information, iv) credit problem v) lack of correct marketing vi) lack of customer relationship/direct contact, Vii) lack of proper logistics and viii) lack of modern marketing/sales techniques. All such problems include poor demand for handloom products, migration of weavers to other sectors, and poor living conditions. Most researchers have specified the urgent case of such a long handloom sector in India by organizing the sector through government interventions. The case city, Varanasi, is no longer different from these clusters of weavers in India and is facing similar problems. The following section discusses such problems, additionally and specifically, of Varanasi.

1.5 Current state of Varanasi handloom sector

Like many other traditional weaving sectors in India, Varanasi's handloom industry faces many problems. Though it has a rich past and is important to our culture and history, there are several reasons why things are tough for the weavers in Varanasi: the Reduction of weavers' size, health issues, the working environment, etc. Aggarwal (2003) stated that there were two lakh handloom weavers in the Varanasi handloom sector, while Wood (2014) observed that 1, 00,794 weavers were engaged in handloom weaving in Varanasi District. As per the Handloom Census of 2021, the number of weavers in the Varanasi district is 51,217 (Handloom census, 2021), which shows a significant decrease in the number of weavers. Even though this sector employs men and women with a constant turnover as the handloom output, weavers are leaving this profession (Das, 2021). Many newspapers have also mentioned the reasons for this reduction. One such news article due to Anand (2021) published in "The Citizen" on December 02, 2021, presents some interviews with weavers. In such an interview (Anand,2021), Mr. Rizwan, a weaver, explained, "*The younger generation says they would prefer selling shoes over this job. In other jobs, at least they know that they will get the right price for their product.*" In another interview published in a news article (Sabah, 2023) in "The Wire," Mr. Mahmood said, "*If a pure silk Banarasi sari sells for Rs 40,000 in the market, weavers like me at the bottom of the chain would only get Rs 2,000 to 3,000 out of this. We're barely able to earn Rs 10,000 a month now. Nobody from the new generation" (including his own children) wants to enter this line of work.*". It clearly shows that the handloom sector in Varanasi is shrinking in terms of the number of weavers, hampering its operations drastically. Weavers are not able to earn good profits from their laborious weaving work. Poor earnings and living standards are other reasons for the weaver's migration. Varanasi's handloom sector

is facing the acute problem of a new generation of skilled weavers. Poor earnings of weavers are being affected by every dimension of the current business model.

Another significant challenge pertains to sales and marketing. Ahmed and Sheereen (2022) revealed that 46.1 percent of weavers in Varanasi sell their products in the local market, while 43.3 percent sell to the master weaver. A study on the Varanasi weavers by Ansari (2016) illustrates that, despite their adeptness in employing traditional techniques, materials, and designs, they struggle to compete internationally due to a lack of crucial market information. This scarcity diminishes their demand over time and exposes them to exploitation by intermediaries, such as middlemen/brokers known as Gaddidars. These middlemen play a pivotal role in setting prices, purchasing products from weavers at minimal rates, and then reselling them to buyers at exorbitant prices through direct contact. Besides this, customers are getting fake saris and handloom products that are pretending to be handloom produce. In an interview published in “The Citizen” (Anand, 2021), Mr Pandey, a weaver, said, “*General customers would not understand if the sari has been prepared by the powerloom or handloom. Only a person who understands the concept and has studied the differences between the two really well would be able to differentiate between the two*”. Additionally, the lack of access to information about evolving trends and customers' fashion preferences hampers their ability to adapt their products to market demands, leading to financial losses (Ansari, 2016). Varanasi's handloom sector is facing issues i) establishing direct contact with customers, ii) a mechanism to differentiate handloom produce from power loom produce, and iii) incorporating the customer preferences, so they are losing a major chunk of profit.

Singh and Naik (2010) reported dire socioeconomic conditions faced by handloom weavers in Banaras. They highlighted concerns about the minimal wages weavers earn

despite long working hours. A similar study by Nupur (2018) on Varanasi handloom weavers further emphasizes the insufficiency of their wages for sustaining livelihoods in present economic conditions. Consequently, cases of malnutrition and suicide among marginalized weavers due to debt under Grihasthas (Master weavers) have become prevalent, prompting many to seek alternative occupations.

According to the study by Verma and Mishra (2018), the decline in demand for handloom products in Varanasi is attributed to other factors, including the high cost of raw materials, slow production, cheaper production of similar products on power looms, and a lack of adequate export facilities. Additionally, there has been no significant increase in the export of handloom products over the last five years (HPEC, 2022). Nupur's (2018) research highlights the weavers' limited knowledge of machinery and markets and their reliance on local suppliers, resulting in inflated costs and procurement delays. Lastly, their limited understanding of raw material markets makes them susceptible to exploitation by local suppliers who charge exorbitant rates for materials. Singh and Naik (2010) specifically identified various problems related to electricity, production (including shortages of raw materials, price hikes, instability, and transportation) and government incentives.

In the Varanasi handloom sector, pit looms are primarily used for weaving, with frame looms also being employed additionally for this purpose (Singh and Kumar, 2018). Weaving sarees on handlooms is a labor-intensive task, taking an average of 3-6 months per saree (Verma and Mishra, 2018). Such repetitive work requiring high concentration often leads to various body-related disorders. Many weavers sit on wooden planks without any back support, leading to Musculoskeletal Disorder (MSD) pains. Furthermore, numerous weaving houses persist in using old traditional looms and resist automation due

to economic constraints, skill levels, and knowledge limitations (Siddiqui, 2021). The Varanasi handloom sector is largely informal, with workers enduring long hours. Work-related musculoskeletal disorders (WMSDs) are among the costliest occupational disorders, as they significantly impact workers' health and productivity. As discussed earlier, such health issues also initiate the migration of weavers to other professions.

It can be seen that weavers lack awareness about the market, raw materials, current approaches to marketing and sales, customer preference etc. Anand (2021), in his published news article published in 'The Citizen,' reported, "*Since most of these looms function from home, a lot of women are engaged in this industry. Additionally, women's literacy in Uttar Pradesh paints a very sad and appalling picture across religions and castes. As a result, most working people do not even know about these schemes, and availing them is almost impossible.*". He, very similar to other researchers, has specified that weavers were not aware of the government schemes, so they did not benefit from these.

In conclusion, the Varanasi handloom industry grapples with significant challenges spanning business, technical, logistics, and ergonomic domains. The discussion above underscores researchers' identification of the problems and challenges confronting weavers in the Indian context. Literature surveys from 2001 to 2023, as presented in sections 1.4 and 1.5, clearly show that there has been no improvement in the condition of weavers facing similar kinds of problems over the years. So, a notable gap exists in research concerning the specific challenges encountered by different types of weavers. In this research, an effort has been made to identify various challenges faced by the weavers, not as a whole community but independently independent weavers, Master Weavers, and Cooperative society weavers in Varanasi. It was learned that the problems were identified for the weavers as a whole in earlier research. No efforts are visible in the literature survey

that has identified problems/challenges of weavers structure-wise, i.e., independent weavers, Master Weavers, and Cooperative society weavers. These challenges were identified and ranked to learn structure-specific problems to address issues like

- i) to increase the earnings of the weavers or weaving houses to uplift their living standards,
- ii) to reduce the migration of the weavers to other professions and
- iii) grabbing/converting customers to handloom products.

There is an urgent need for concerted efforts to support the industry and enhance the livelihoods of its artisans (as presented through the literature survey in sections 1.4 and 1.5). Through this research, an effort has been made to identify the issues faced by various categories of weavers in Varanasi and develop approaches/strategies to mitigate these challenges effectively.

1.6 Motivation

For generations, the Indian handloom sector, a crucial part of our society with its deep cultural tradition and skilled craftsmanship and the source of income for millions of Indian weavers, has been facing a variety of problems that threaten its continued existence and survival. From sections 1.4 and 1.5, it is clear that the weavers are facing many types of problems/challenges, and these problems have continuously escalated over the years. The number of weavers is decreasing with time due to poor earnings, low living standards, and health issues, so weavers are forced to leave this profession. A preliminary survey of weavers has also revealed the same. So, this research is motivated by the current state of the Varanasi handloom sector and its weavers, and it seeks to preserve and revitalize this handloom sector by analyzing the challenges encountered by handloom weavers.

With a focus on shrinking the size of the handloom sector in terms of weavers due to poor earnings and loss in business, an effort has been made to develop some strategies to manage the operations of the handloom sector of Varanasi in order to increase the customer base, to provide direct sales, to provide genuine handloom products, and incorporate modern tools and techniques in their operations. In conclusion, studying the handloom sector is a means of helping to preserve a rich cultural tradition, solving socioeconomic concerns, and recognizing the ingenuity of weavers. This research focuses on fostering a greater appreciation for the handloom sector and contributing to its growth and sustainability.

Such an effort will form a foundation for the development of effective and long-term strategies to aid these weavers and their communities. In this effort, the challenges for each weaver's structure have been identified and ranked. By analyzing these challenges/issues experienced by weavers, weavers' firm survival and expansion can be ensured by providing solutions to establish improved working conditions and increased market access. This can positively affect the socioeconomic progress of weavers in the handloom sector. Based on such results, top problems have been worked out, and various objectives have been formed. The next section details the objectives of this research work.

1.7 Objectives

In the tough market competition due to power loom, the handloom sector is facing problems with profitability, so the number of weavers is reducing yearly. Weaving houses like independent weavers face a tough time for their livelihood. Many problems are causing these conditions, significantly reducing handloom sector weavers. This thesis aims to

comprehensively investigate the challenges and opportunities the handloom sector faces. The study aims to identify the factors contributing to the sector's struggles, such as business issues, financial constraints, workers-related problems, technological limitations, government constraints, and networking and marketing issues. As a step forward, various challenges causing problems (especially weavers-related) in this sector were identified. The prioritized challenges surfaced many problems with this industry when a case city was studied. Accordingly, the following research objectives were identified for Varanasi Handloom weavers. Objective 1 i.e., prioritization of challenges, has specified the rest of the objective that will improve the health of this sector and the wealth of the weavers.

1. Identification and prioritization of the challenges of Handloom weavers
2. Understanding the customers' requirements and establishing strategies to fulfill their requirements
3. Modelling of Barrier in the Adoption of Omnichannel Marketing
4. Barriers to the adoption of augmented reality business model in the handloom sector
5. Facility locations planning for the handloom sector
6. Authentication of genuine handloom product
7. Study of work-related musculoskeletal disorders and seat design for handloom weavers.

Additionally, the thesis aims to propose effective strategies and interventions to revitalize the handloom sector and empower the weavers. This work provides the framework for the weavers, cooperative societies/NGOs, and government agencies to work together for improvements, as highlighted in this work.

1.8 Thesis Organization

Overall, the organization of this thesis is shown in the form of a diagram, as depicted in Figure 1.8. The main thread of this thesis revolves around addressing challenges faced by this sector for the problems of profitability and reduced workers, and so enhancing the handloom sector's competitiveness through a systematic approach. It begins with an introduction in Chapter 1, which outlines the research gaps and objectives. Chapter 2 delves into the literature survey to provide a foundation for understanding the sector. In Chapter 3, the challenges faced by handloom weavers like independent weavers, master weavers, and cooperative society weavers are identified and analyzed using data collected, with a focus on prioritizing these challenges through the Analytic Hierarchy Process (AHP). This chapter identifies the lack of customer understanding as one of the major barriers. Chapter 4 then explores strategies to meet customer requirements by using the Quality Function Deployment (QFD) and AHP methodology. This chapter shows that developing online marketing and sales, strategic location, and certification of handloom products were identified as one strategy to meet the customer's requirements. So, the next chapters 5 and 6 explore the barriers for the implementation of online marketing and sales by studying the omnichannel and augmented reality. Whereas chapter 7 investigates customer requirements for "genuine handloom products" and proposes approaches using QFD and in Chapter 8 discusses Facility location planning to meet customer requirements by employing the k-mean and elbow method. Simultaneously, this thesis also addresses the issue of poor health of weavers, in Chapter 9 shifts focus to the health of weavers, particularly musculoskeletal disorders, and proposes solutions such as ergonomically designed seating. Finally, Chapter 10 consolidates the research findings, discusses limitations, and suggests avenues for future research, thereby completing the overarching narrative of enhancing the handloom sector's sustainability and viability.

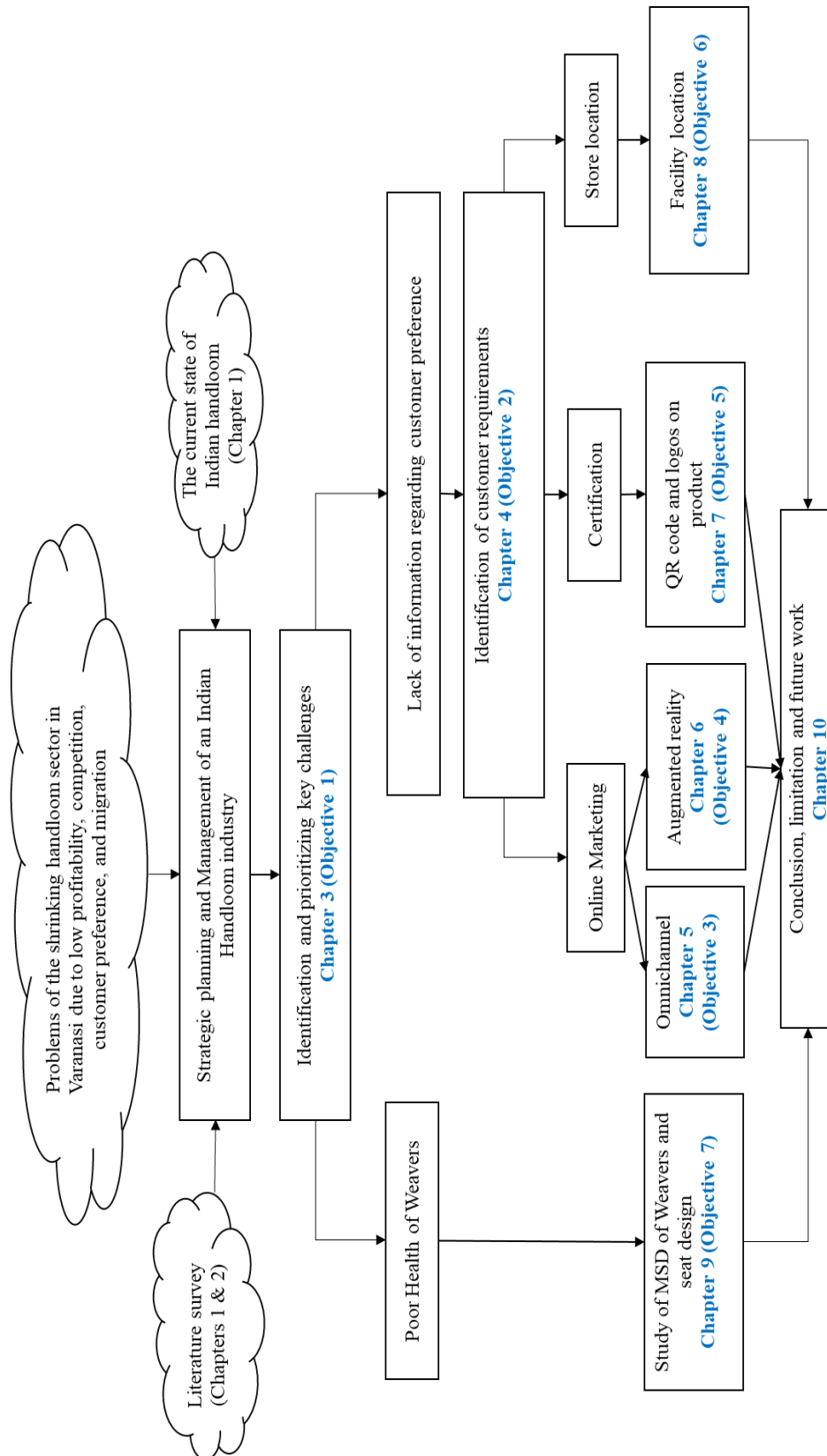


Figure 1.8: Organization of thesis

