Review Article

From Ancient Threads to Colonial Commerce: The Evolution of India's Silk Industry from Mythical Origins to Independence

ABSTRACT

Silk production, or sericulture, has a rich history that is frequently eclipsed by its modern applications. Sericulture began in ancient China approximately 3000 BC and this was a well held secret until it spread to Korea, India and eventually the West through a variety of causes, including royal intrigue and missionary endeavours. By the Han Dynasty, silk had evolved from a luxury item to a valuable economic asset, impacting trade and culture throughout Asia and Europe. India's silk industry, as documented in ancient scriptures, progressed from early wild silk production in the Himalayan foothills to sophisticated mulberry sericulture by the 2nd century BCE. The Mughal dynasty improved Indian silk traditions by incorporating several weaving techniques and nurturing a thriving business in Kashmir and Bengal.From 1612 to 1858, the East India Company capitalised on Bengal's silk potential by building trading centres and using Piedmontese reeling technology to improve quality. Despite initial hurdles, Bengal silk became a major export commodity, but colonial policies and technological shifts eventually led to its demise. Silk output fell dramatically after independence due to a variety of economic and geopolitical issues. This article investigates the growth of India's silk industry, focussing on Bengal's key role and examines the effects of colonial control, technological advancements and the sector's trajectory up to Independence.

Keywords:(Sericulture, Bombyx mori, Silk Road, Bengal Silk, Piedmontese Technology, East India Company, Silk Trade, Artisanal Weaving, Colonial Impact, Mulberry Cultivation).

1. INTRODUCTION

The Roman historian Pliny the Elder, writing in 70 BC, emphasised the secrecy surrounding silk manufacture in his Natural History, adding, "Silk was obtained by removing the down from the leaves with the help of water.Among the several commercial silkworm species, *Bombyx mori* is the most extensively studied and frequently employed. This moth, which has been domesticated so extensively that it may no longer exist in the wild, is the only member of its family, Bombycidae. Silk, a fine and lustrous fiber manufactured by silkworms for spinning cocoons, is thought to have originated in China about the fourth millennium BCE and has remained mostly limited to the region until the first millennium BCE (Liangyun, 1988, Vainker, 2004). While the Chinese silkworm Bombyx mori was introduced to India in the second and third century BCE, literary evidence indicate that tussah silk manufacture began in the Himalayan foothills as early as 1300-1400 BCE (Mookherjee, 1919; Federico, 1997). Recent archaeological discoveries from the Indus Valley Civilisation have pushed the origins of Indian silk back to 2450-2000 BCE, exposing artefacts such as silk strand necklaces and bangles, as well as insights into native silk moth species such as Antheraea (Ball, 2009; Good *et al*., 2009).

The Indian silk industry, enriched by the artisanal skills of the Parsis from Gujarat, who brought brocade weaving expertise and real pearls, flourished across various regions including Lahore, Agra, Varanasi, Murshidabad, Gujarat, Malwa and South India.

ORIGIN OF SILK - LEGEND OF LADY HSI-LING-SHIH

Once upon a time, in ancient China around 3000 BC, Queen Hsi-Ling, the wife of Emperor Huang-Di, was intrigued by silk production. One day, as she enjoyed tea under her favourite mulberry tree, something fell into her cup. When she looked closely, she found delicate threads from a silkworm's cocoon. Inspired, she used these threads to weave an exquisite pattern on her loom. This discovery led to widespread celebration in China (Liangyun, 1988).By 139 B.C, the Silk Road was established, connecting China to the Mediterranean and facilitating the exchange of silk and other goods (Good *et a*l., 2009). Despite early Roman misconceptions about silk's origins, the Chinese closely guarded the secret of sericulture (Federico, 1997). Silk production later reached Korea around 200 B.C. through Chinese immigrants and by the 5th century B.C., extended to several Chinese provinces (Vainker, 2004). Silk's significance grew, becoming a form of currency and a key economic element (Ball, 2009).Silk soon became highly valued, initially reserved for the emperor and his family, and top officials. The emperor wore white silk inside the palace and yellow silk outside. Over time, silk became more accessible and its uses expanded beyond clothing to include musical instruments, fishing lines, bowstrings and even paper (Good *et al*., 2009).By the Han Dynasty, silk was used not only as a luxury item but also as currency and for paying taxes. It was so integral to the economy that its value was often compared to gold, and silk was used in trade with other countries (Vainker, 2004).Archaeological finds support the ancient origins of sericulture. A half-silkworm cocoon dated to between 2600 and 2300 BC was discovered in Shanxi Province, and other artifacts like silk threads and fabric fragments from around 3000 BC were found in Zhejiang Province (Ball, 2009; Mookherjee, 1919). These discoveries highlight the early development of silk production in China, which eventually spread worldwide (Federico, 1997). Today, silk production blends ancient techniques with modern technology. China and India remain leading producers, with China significantly increasing its output since the late 1970s. The evolution of sericulture reflects both historical developments and contemporary innovations in silk production.When silk was first discovered, it was reserved exclusively for the use of the ruler. It was permitted only to the emperor, his close relations and the very highest of his dignitaries. Gradually the various classes of society began wearing tunics of silk and silk came into more general use. As well as being used for clothing and decoration, silk was quite quickly put to industrial use by the Chinese. This was something which happened in the West only in modern times. Silk, indeed, rapidly became one of the principal elements of the Chinese economyDuring the Han Dynasty, silk as absolute value in itself. Farmers paid their taxes in grain and silk. Silk began to be used for paying civil servants and rewarding subjects for outstanding services. Values were calculated in lengths of silk as they had been calculated in pounds of gold. Before long, it was to become a currency used in trade with foreign countries. This use of silk continued during the Tang dynasty as well. It is possible that this added importance was the result of a major increase in production. It found its way so thoroughly into the Chinese language that 230 of the 5,000 most common characters of the mandarin "alphabet" have silk as their "key".

A SECRET OUT TO THE WORLD

In spite of their Chinese secrecy, however, they destined to lose their monopoly on silk production. Sericulture reached Korea around 200 BC, when waves of Chinese immigrants arrived there. Silk reached the West through a number of different channels. Shortly after AD 300, sericulture travelled westward and the cultivation of the silkworm was established in India.It is also said that in AD 440, a prince of Khotan (today's Hetian)-a kingdom on the rim of Taklamakan desert-courted and won a Chinese princess. The princess smuggled out silkworm eggs by hiding them in her voluminous hairpiece. This was scant solace to the silk-hungry people of the West, for Khotan kept the secret too. Why share it with the westerners and kill a good market? Then around AD 550, two Nestorian monks appeared at the Byzantine Emperor Justinian's court with silkworm eggs hid in their hollow bamboo staves. Under their supervision the eggs hatched into worms, and the worms spun cocoons. Byzantium was in the silk business at last. The Byzantine church and state created imperial workshops, monopolizing production and keeping the secret to themselves. This allowed a silk industry to be established in the Middle East, undercutting the market for ordinary-grade Chinese silk. However high-quality silk textiles, woven in China especially for the Middle Eastern market, continued to bring high prices in the West and trade along the Silk Road therefore continued as before. By the sixth century the Persians, too, had mastered the art of silk weaving, developing their own rich patterns and techniques. It was only in the 13th century-the time of the Second Crusades-that Italy began silk production with the introduction of 2000 skilled silk weavers from Constantinople. Eventually silk production became widespread in Europe.

History of Silk Manufacturing in India till 1612

The earliest mentions of silk in Indian texts, such as the Rig Veda (c. 1500 BCE) and epics like the Ramayana and Mahabharata(c. 200 BCE -700 BCE), suggest that silk, particularly wild silks like Muga, Eri and Tasar, was known in India long before the advent of mulberry silkworm cultivation (Dutta & Nanavaty, 2007). The Rig Veda references "urna," often interpreted as a form of silk, while the Manusmriti describes garments made from silk. The Mahabharata details silk garments gifted to King Yudhishthira and mentions the use of silk in luxury items during that period.Historians speculate that sericulture began in the sub-Himalayan regions along the Brahmaputra and Ganges rivers. Mookherjee (1919) suggested that the domestication of sericulture occurred in the Himalayan foothills, with Aryans discovering the silkworms

there. Meanwhile, some believe that mulberry sericulture might have entered India *via* overland routes from China around 140 BCE through Khotan (Ray, 1995). By the early Christian era, silk had gained prominence in India, as evidenced by Banabhatta's writings about King Harshavardhana's (AD 606-648) lavish use of silk for decorating his palace.

During the medieval period (800 AD -1800 AD), silk production flourished as a livelihood in regions like Kashmir, Bengal and Mysore, receiving significant patronage under the Mughal regime (1526 AD -1857 AD). The writings of medieval historians such as Mirza Haider (1499-1551) in his Tarikh-i-Rashidi and the Ain-i-Akbari from Akbar's court frequently mention the silk industry, with Kashmiri silks being highly valued.Emperor Akbar, in AD 1572, facilitated the migration of Gujarati silk weavers to his royal workshops in Lahore, Agra and Fatehpur Sikri, integrating diverse weaving techniques and fostering innovation. This led to the creation of exquisite fabrics like the latifabuti, a blend of Persian and Indian designs. During the 14th and 15th centuries, silk exports from Kashmir and Bengal to Europe were undertaken by Moors, though Bengal silk did not make a significant impact on the European market until the 16th century. Sultan Hussain Shah's initiatives in Bengal led to the commercial production of silk, but Dutch and English companies faced challenges in trading Bengal silk due to insufficient market penetration and competition (Prakash, 1985).

The British East India Company, established in India in 1612, recognized the potential of the Indian silk trade. It set up trade centres in Surat and Masulipatnam and established a silk filature in Patna. Major silk trading hubs like Kassimbazar and Murshidabad in Bengal became prominent under British influence. In Gujarat, silk merchants known as dadanis acted as intermediaries between rural producers and exporters, helping to manage the supply chain effectively (Chaudhury, 1995).By the mid-17th century, the Bengal silk industry began to flourish, driven by both domestic and Gujarati traders who managed the silk trade between Bengal and major markets. This period saw an increased connection between North Indian and Bengal economies through inter-regional silk trade. The British East India Company's efforts to exploit Bengal's silk potential included the establishment of permanent silk factories in Baulia, Kumarkhali, Kassimbazar, and other locations.

The East India Company, initially less successful than Dutch competitors, later outperformed them by investing heavily in Bengal silk. They introduced Piedmontese reeling technology in 1769 to address quality issues, leading to significant improvements in silk production. This technological advancement allowed Bengal silk to compete more effectively in international markets, especially when Mediterranean and Persian silks faced disruptions.By the late 17th century, Bengal silk gained recognition in Europe for its quality and cost-effectiveness. The Dutch merchant'sintroduction of Bengal silk to the Japanese market marked a significant expansion of its reach. Despite initial European scepticism, by the 1690s, Bengal silk became a major export commodity, with Bengal silk accounting for a substantial portion of Dutch exports.Balakrishna (1924) noted the significant growth in Bengal silk trade from 1680-81 to 1684-85, highlighting the unprecedented quantities procured during this period, which remained unmatched until the Battle of Plassey in 1757. Additionally, the French Company recognized Bengal silk's quality; Bernier's correspondence from the 1660s suggested that Bengal silk could rival Lebanese or Syrian silk with minor improvements (Indes Orientales: Correspondence General, 1666-1676). Despite this, French traders did not achieve the same level of access to the Bengal silk market as their Dutch and English counterparts during the pre-colonial era.

Indian Artisanal Silk Industry during Company Rule (1612-1858)

The English East India Company (EEIC), which arrived in India in 1612, significantly altered the landscape of silk trade and manufacturing. The period from 1612 to 1757 marked the company's efforts to establish a foothold in the Indian silk industry, with major competitors being Dutch and French companies. After pivotal battles like Plassey (1757) and Buxar (1764), the EEIC effectively became the ruler of the Bengal Presidency, a status it maintained until the British Crown took over in 1858. This period saw substantial changes in the artisanal silk sector, particularly in Bengal.During the early colonial period, from the sixteenth century until the adoption of Piedmontese technology in 1769, Bengal's raw silk production was a peasant-driven activity. Artisans, predominantly poor farmers, used rudimentary methods and lacked capital, leading to inefficiencies and quality issues. Silk was reeled either by family labour or by local reelers, with raw silk being processed in local manufactories (Mukherji, 1903; Williamson, 1775). The Bengal silk industry faced several challenges. Maratha invasions (1740), the Bengal Famine (1768-69) and the devastating floods of 1787 severely impacted silk production (Dimock & Gupta, 1965). Capital insufficiency exacerbated exploitation by middlemen, such as the dadni merchants, and limited artisanal autonomy (Davini, 2008). Additionally, lack of quality control during the Mughal and Nawabi periods left artisans struggling with inconsistent silk quality (Dutta, 2000).The introduction of Piedmontese technology by the EEIC in 1769 aimed to improve silk production but faced obstacles. The Bengal Famine had decimated the population, creating labour shortages that rendered the new technology ineffective in the short term. However, from 1789 to 1822, Bengal's population grew significantly, which eventually supported the silk industry's recovery (Bose, 1993). Despite this, artisans remained at a disadvantage due to high interest rates charged by village money-lenders, furthering their exploitation (WBSA, BoR, 1791).Hutkova (2015) highlights that deficiencies in production organization, rather than

the technology itself, were primarily responsible for the industry's struggles. The new technology was well-suited to the available resources, but the lack of efficient management practices undermined its potential success.

History of Indian Silk Industry during the Colonial Period (1858-1947)

Following the Indian Rebellion of 1857 and the transfer of power from the East India Company to the British Crown, the Indian silk industry entered a new phase under British rule. Although the shift towards a market economy had begun earlier, it gained momentum post-1850 as European colonies, including India, became key suppliers of raw materials for industrialization (Roy, 2000). By 1860, silk weaving was largely a household operation, with men as weavers, women handling winding and sizing and children assisting. However, the industry saw a shift with the mobility of capital and labouras workers migrated from rural areas to trade centres like Burhanpur and Surat.

Despite this growth, the price of Bengal silk began to fall in 1873-74, leading to a decline in the industry. While Mysore's sericulture, revitalized under TippuSultan in the 18th century with foreign expertise and improved technology, initially thrived, it too faced challenges. By the late 19th and early 20th centuries, the Indian silk industry struggled due to diseases, competition from imported silk and rayon and the Great Depression. A temporary boost occurred during World War II due to demand for silk parachutes, but the industry faced significant challenges moving forward (Hanumappaand Erappa, 1988; Navanty, 1990; National Commission of Agriculture, 1976).

Bengal Silk Trade in Pre-Independent Period

The practice of sericulture in Bengal likely began in the fifteenth century, though concrete evidence is scarce (Guha, 2003). Walsh (1902) notes that while the exact origins remain unclear, the silk industry in Bengal was ancient. The East India Company (EEIC) quickly recognized the significance of Bengal's silk, as early as 1612, when Sir Thomas Roe presented Bengal silk garments to Jahangir in an effort to secure trade rights. Though Roe's mission secured permission to establish a factory in Surat, it did not extend to Bengal. Richard Hughes of the Patna Factory reported in 1620 that Bengal silk was abundant and significantly cheaper than other Indian silk, particularly highlighting Murshidabad for its superior quality (Chaudhury, 1975).Bengal silk, also known as “Ganges Silk,” was renowned in distant markets as early as the thirteenth century. The EEIC began extensive silk trading in Bengal in 1651, following a Farman from Prince Shah Suja. The rural production process involved mulberry cultivation, silkworm rearing and yarn reeling, with peasants selling raw silk to local weavers. The Pundra caste, known for sericulture, played a key role in Malda, Rajshahiand Murshidabad (Guha, 2003).

The EEIC established several factories-Hugli in 1651, Kassimbazar in 1658 and Malda in 1680-to facilitate trade (Chaudhury, 1975). By 1671, the Company prohibited its servants from dealing in Chinese silk to boost its Bengal silk monopoly. The silk trade thrived, with Bengal silk being the cheapest and most profitable compared to Persian and Chinese silk (Chaudhury, 1975). However, from 1742-1751, Maratha invasions severely disrupted production. Despite these setbacks, Bengal silk continued to attract European traders until the mid-18th century, when imports from China began to outpace those from Bengal due to ongoing conflicts and instability (Ghosal, 1966).

Impact of Piedmontese (Filature) Technology on Bengal Silk

The Piedmontese technology, introduced to Bengal in 1769, aimed to address significant quality issues in Bengal’s raw silk. The existing Bengali reeling process resulted in uneven silk filaments, affecting the roundness and lightness necessary for high-quality thrown silk (Carlo, 1981). To rectify these deficiencies, the East India Company (EEIC) engaged Italian, French, and English experts to train local artisans in using the Piedmontese reeling machines and managing the filature process (Report on Silk, 1836). The first filature was established in Bengal in 1770, with the initial shipment of silk reaching England by 1772. However, it took about fifty years for the EEIC to fully transition to this new technology.The Piedmontese filature system revolutionized Bengal's silk production and marketing but faced resistance. Traditional Bengali artisans preferred their methods, and the transition led to friction due to conflicting interests (Mukhopadhyay, 1995). Under the old system, peasants had control over silk quality and production speed, influenced by market demands and cocoon quality. By the 1790s, commercialization forced peasants to sell cocoons at low prices, creating dependency on the Company’s agents and reducing their production costs (Bose, 1993).

Economic pressures and external factors further impacted silk production. For instance, the war between France and America and rice shortages in Northern India led many mulberry cultivators to switch to rice cultivation (Millburn, 1813). By 1803, despite a drop in raw silk quality from private traders, Bengal’s silk exports to England increased, reaching around 150 bales per year. The EEIC, facing European market fluctuations, had to adapt to these changing conditions (Millburn,

1813).The political economy of the British government significantly influenced the East India Company's (EEIC) persistence in Bengal's silk industry. Despite the introduction of Piedmontese technology improving the reeling process, Bengal silk remained substandard. Nonetheless, the British demand for raw silk surged with the Industrial Revolution. Thomas Lombe's success in Derby spurred the establishment of several silk mills across Britain, creating a high demand for raw silk (Simkin, 1997). By 1793, new mills were opened by figures like George Courtauld, further increasing demand.The Continental System (1806-1807) by Napoleon, which cut off Italian silk imports to Britain, briefly revived Bengal's silk trade. During this period, Bengal's silk production centres, including Kasimbazar and Malda, thrived, with notable advances provided to local cultivators (Buchanan, 1928; Roy, 2014).However, the Charter Act of 1833 mandated the EEIC's withdrawal from silk trade by 1835, leading to a decline in Bengal's silk industry. Despite private traders continuing the silk business, Bengal's silk industry suffered as market forces shifted. By the early 20th century, domestic competition from Kashmir and Mysore, coupled with the rise of Chinese and Japanese silk, eroded Bengal's market share. Mulberry cultivation in Bengal dropped from 54,000 hectares in 1896 to just 4,000 hectares by 1937. Post-Partition in 1947, West Bengal inherited less than 10% of the region's former mulberry area, resulting in a dramatic decrease in silk production (Anstey, 1952).

4. CONCLUSION

Silk manufacture in India has a complex history that includes ancient practices, colonial exploitation, and technological advancements. Silk manufacture in India evolved dramatically over time, beginning with the Indus Valley Civilisation and the Himalayan foothills. The introduction of Chinese sericulture practices, as well as the formation of a strong silk industry in Mughal Empire provinces such as Bengal, emphasise its historical relevance. The British East India Company's advent into the Indian silk trade was a watershed moment, fuelled by both scientific breakthroughs, such as Piedmontese reeling techniques, and economic policies that suited colonial interests. While these advances originally enhanced output, they also led to considerable hurdles, including quality issues and market volatility, exacerbated by global rivalry and shifting commerce.By the early 20th century, the decline of Bengal's silk industry was a result of a confluence of factors including competition from other regions and global market shifts. Despite temporary revivals, the post-Independence period saw a drastic reduction in silk production in West Bengal. The evolution of India's silk industry underscores the interplay between tradition, technological change and colonial influence, shaping its trajectory into the modern era.

CONSENT (WHERE EVER APPLICABLE)

Authors may use the following wordings for this section: "All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal."

ETHICAL APPROVAL

This article does not contain any studies with human participants or animals performed by any of the authors

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