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# "THREADS OF PROSPERITY": A HOLISTIC VIEW OF THE HANDLOOM INDUSTRY IN ASSAM

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**ABSTRACT**
The handloom industry boasts a rich history, an age-old practice deeply rooted in human existence. India's handloom heritage is particularly renowned and has a deep cultural significance, especially in the northeastern regions where weaving once influenced bride selection criteria in ancient times. The eight states of North-East India are celebrated for their unique handloom creations, deeply interwoven with their cultural heritage and everyday life.
Assam, in particular, stands out with 10.9 lakh weaver households out of the 26.73 lakh in the region. An impressive 92% of the handloom workforce in Assam is comprised of women, highlighting their crucial role in this industry. This significant female participation highlights the handloom sector as a vital source of empowerment and economic opportunity for women, making it an essential aspect of Assam's socio-economic landscape. The industry's mainly rural-centered nature has fostered development and economic stability in these areas, providing a sustainable livelihood for many families.
Despite its significant contributions, handloom weaving is often considered a secondary occupation, typically following agriculture as the primary source of livelihood. This dual role is crucial for rural households, enabling them to diversify their income sources and thus provide financial flexibility and stability. In regions where agricultural yields are subject to seasonal fluctuations and uncertainties, handloom weaving serves as a vital supplementary income stream.
By supporting rural households in this way, the handloom industry not only preserves traditional crafts and cultural heritage but also plays a critical role in sustaining the rural economy. The dual engagement in agriculture and weaving reflects the adaptability and resourcefulness of these communities, allowing them to thrive despite the challenges posed by an unpredictable agricultural sector.
This study aims to enlighten the handloom industry's contribution to both the status of women and the overall economic fabric of the state and the country. It provides a comprehensive analysis of production, the demographics of weavers, and the industry's impact on the state. By examining production patterns and workforce trends over recent years, the study underscores the enduring importance of the handloom industry while exploring its evolving dynamics.

**Keywords:** Handloom, Women empowerment, Socio-Economic, Weavers, Rural

## INTRODUCTION

The textile industry in India stands as an essential part of the nation's economy, with traditional sectors such as handloom and hand embroidery playing vital roles. Together, these sectors contribute over 75% to India's total textile production, serving as custodians of the country's rich cultural heritage. They are instrumental in supporting millions of artisans and safeguarding diverse, traditional crafting techniques, emphasizing the significance of old-aged practices within India's textile landscape (Jain, 2022).
Moreover, handloom serves as a crucial pillar for enhancing the economic livelihoods of rural families. These sectors offer accessible income opportunities with minimal initial investment, proving dynamic, particularly during agricultural off-seasons when farming yields are lower. This optimizes the use of the available workforce within the household, ensuring that all members can contribute economically throughout the year. In essence, the combination of agriculture and handloom weaving creates a more resilient economic model for rural

communities, enhancing their overall financial security and quality of life. By acting as a financial safety net, the handloom industry aids rural households in reducing the financial challenges posed by agricultural seasonality, thereby contributing significantly to the economic strength of rural communities (Raju, 2014).

In the northeastern region of India, notably in Assam, the handloom industry has deep social influence, particularly among women. Women assume predominant roles as producers and traders of handloom products, with weaving skills inseparably linked to social practices, including marriage. In certain Manipuri communities, expertise in weaving historically determined marital eligibility, making skilled weavers highly desirable as potential brides. This cultural tradition underscores the substantial social and economic impact of the handloom sector on women's lives in the Northeast, highlighting its role in empowering women by uplifting their social status and providing them with valuable economic opportunities (Devi, 2013).

Thus, beyond its economic contributions and cultural preservation efforts, the traditional textile sector in India, especially in Assam and the Northeast, catalyses women's empowerment. It not only strengthens rural economies but also fosters social advancement by integrating traditional practices with contemporary socio-economic dynamics. The traditional designs of Assam's handloom products reflect the region's history and cultural values, highlighting Assam's continuing creative legacy.

## REVIEW OF THE LITERATURE

Singh & Gautam, (2019) said that with an impressive 38% growth, the Indian handloom industry underwent substantial expansion, particularly during the 2011-12 fiscal year, marking a golden era for the sector. Throughout this period, the industry not only sustained an upward line but also reached extraordinary heights, achieving an impressive export figure of USD 554 million, a remarkable 60% increase from the previous year. The sustained growth in exports translated into increased job opportunities, enhanced livelihoods, and strengthened the socio-economic fabric of communities involved in handloom weaving.

Jhamb,(2023) stated India's textile industry is distinctive for its small-scale, non-integrated businesses specializing in spinning, weaving, finishing, and garment making. This sector is vital to the Indian economy, contributing 2.3% to GDP, 7% to industrial production, and 12% to export earnings, while employing over 21% of the workforce. Notably, India is the world's second-largest silk producer and supplies 95% of the world's handwoven fabrics, underscoring its significant role in global textile production.

Sharma, Kashyap, and Devi (2017) highlighted that the handloom industry is a key employment source for many in India, mainly in rural regions. The growing participation of North Eastern states in this sector is especially significant. Overall, the handloom industry stands as an important embodiment of India's cultural heritage, sustained by rural weavers nationwide. The Indian handloom sector has grown and expanded significantly, securing a distinct position in the global export market. According to the Annual Report 2016–17 by the Ministry of Textiles, Government of India, 95% of Indian handloom fabric is distributed to over 125 countries worldwide.

Dutta (2019) mentioned that the North Eastern Region of India stands as a vital repository of handloom skills, with the area collectively housing 16.86 lakh of the total 27.83 lakh handloom units across the country. This concentration highlights the region's central role in preserving and proceeding with India's handloom traditions. In Assam, handloom weaving is deeply woven into the fabric of socio-economic life, having been a significant aspect since time immemorial. The loom in Assam is more than a mere tool for weaving; it is a prized possession, representing a

way of life and cultural heritage. The craft is integral to the identity and daily existence of the people, reflecting their connection to tradition and their commitment to preserving these age-old practices.

Kalita (2019) highlighted that the weaving industry represents a timeless and integral aspect of Assam's rich cultural heritage. In Assam, weaving is predominantly an art mastered and practiced by women across all castes and communities. This ancient craft, as old as human civilization itself, has endured through the ages, preserved by the seamless transfer of skills from one generation to the next. Women in Assam have played a crucial role in sustaining and evolving this tradition, ensuring its continuation and relevance in contemporary times.

Aggarwal et al, (2016)remarked Handloom weaving is one of Assam's oldest and most significant cottage industries, crucial to the state's cultural and economic fabric. Assam produces 99% of India's Muga silk and 63% of its Eri silk. Renowned handloom products like the Gamocha, Mekhela Chaddar, and Laichampi symbolize Assam's rich heritage. Weaving in Assam dates back to the 11$^{th}$ century, initiated by King Dharma Pal of the Pala dynasty, who established a weaving community in Saulkuchi.

Premsundar & Kannan, (2013) mentioned that in India, the issue of women's empowerment needs to be particularly emphasized in the non-formal sectors, where women constitute a significant portion of the workforce. One such sector is the handloom industry, a traditional craft that has been passed down through generations. However, with the advent of industrialization, the rise of the power loom industry, and the Khadi movement, the handloom sector and its weavers have experienced a marked decline in status and economic viability. These developments have adversely affected the livelihoods of many women who rely on handloom weaving, underscoring the need for focused efforts to revitalize this sector and support the empowerment of women within it.

## OBJECTIVES

The study seeks to highlight the current state and potential future of handloom weaving in Assam, revealing the complicated dynamics and deep social implications of this traditional craft. This study aims to provide a comprehensive understanding of Assam's handloom industry by focusing on two primary objectives:

1. To analyse the production scenario of handloom in the state.
2. To assess the social impact of the handloom industry and gender roles.

## METHODOLOGY

This paper extensively utilizes secondary data sourced from published research papers, credible websites, the Statistical Handbook of Assam (2009-2023), and the 3rd and 4th editions of the All-India Handloom Census. Secondary data offers advantages including accessibility, cost-effectiveness, and a broad spectrum of information. The All-India Handloom Census is particularly valuable as it provides comprehensive data on production, employment, distribution, and challenges within the handloom sector. By synthesizing data from diverse sources, the paper aims to investigate a specific research area within the handloom industry.

## DATA ANALYSIS AND INTERPRETATION

### *Production*

Handloom weaving is deeply deep-rooted in India's cultural heritage and is often seen as the soul of the nation's cultural identity. With a rich history spanning centuries, this traditional cottage industry showcases a long-standing tradition of excellence. It has been integral to India's cultural

heritage, supporting countless artisans and their families while preserving age-old craftsmanship and contributing to sustainable livelihoods.

Assam has gained international recognition for its handloom products, which have been awarded Geographical Indication (GI) tags as recognized by the Intellectual Property India, Office of the Government of India. This recognition not only highlights the unique cultural heritage of Assam but also promotes the economic value of its traditional crafts. One of the most notable products is Muga silk, which was recognized as a protected Geographical Indication (GI) in 2007. In 2014, Muga silk was further distinguished with a GI logo for trademark purposes, enhancing its global branding and market presence. Another significant handloom product from Assam is the 'gamosa,' renowned for its traditionally woven fabric featuring a distinctive red border and intricate floral motifs. The 'gamosa' has also been awarded Geographical Indication (GI) recognition, preserving its cultural significance and ensuring its authenticity. Recently, the traditional textiles woven by Mishing women using backstrap looms are a testament to their exceptional skill and artistry. These textiles include a variety of products such as shawls, stoles, scarves, and other woven items. Each piece reflects the rich textile heritage of Assam and provides a source of livelihood for the artisans, thereby contributing to the preservation and continuation of these traditional crafts.

**TABLE 1.1-: Share of Production for Major Handloom Fabrics-Assam**

| Major Handloom Fabrics | Share of overall production in India | Ranking of overall production in India |
|---|---|---|
| Saree | **7.8%** | **4th** |
| Shawls, Mekhla Chadder, Loi, stole, scarf, muffler | **77.4%** | **1st** |
| Angavastram, dhoti, sarong, lungi | **42.6%** | **1st** |
| Towel, napkin, duster, gamcha | **72.4%** | **1st** |
| Durries, rugs, mats | **12.7%** | **2nd** |
| Dress material, suiting, shirting, long cloth | **23.6%** | **1st** |
| Bedsheet, furnishings, blankets | **26.8%** | **1st** |
| All others, including surgical bandages | **27.5%** | **1st** |

Source: Fourth All India Handloom Census 2019 – 20

Assam plays a crucial role in India's textile industry, particularly renowned for its expertise in both traditional and practical fabric categories. The state's prominence is evident from Table 1.1 showing substantial production shares and top rankings across multiple fabric types, underscoring its significant contribution to the industry. Despite its leadership in several areas, Assam still holds untapped potential for further development, particularly in enhancing saree and floor-covering production.

Moreover, Assam boasts a vibrant tradition of handloom weaving, producing a wide array of textiles such as sarees, shawls, Mekhla Chadder, and gamchas. This rich diversity highlights the state's cultural heritage and economic diversity. Comparing Assam's agricultural products with its handloom articles underscores the complementary roles these sectors play in supporting the state's economy. Handloom weaving not only preserves traditional

craftsmanship but also provides crucial livelihoods, contributing to the socio-economic fabric of Assam.

Assam is a significant contributor to India's agricultural sector, producing a diverse range of crops such as tea, rice, jute, and various fruits and vegetables. This agricultural output supports both local demand and national exports. Further, the emphasis on rural industries aligns with the broader economic landscape of India, where besides the agricultural sector, which is the backbone of the Indian economy, providing the highest employment, the handloom industry emerges as the second-largest income-generating activity in the country (Handique, 2016).

Assam's economy thrives on two pivotal sectors, handloom production and agriculture. Handloom weaving, renowned for its diverse textile offerings like sarees and shawls, sustains a substantial artisan workforce, particularly in rural areas. Meanwhile, the state's agricultural output, dominated by crops such as rice and tea, contributes significantly to its economic landscape. A comparative analysis between these sectors reveals their respective economic impacts and workforce engagements, emphasizing the need for balanced development strategies that support both traditional industries and modern agricultural practices. This approach ensures sustainable growth, cultural preservation, and continued economic resilience for Assam.

**TABLE 1.2-: Share of production of major agricultural products-Assam**

| **Major Agricultural Products** | **Share of overall production in India** | **Ranking of overall production in India** |
|---|---|---|
| Rice | **4.30%** | **10th** |
| Rapeseed & Mustard | **1.80%** | **8th** |
| Jute & Mesta | **8.33%** | **3rd** |
| Potato | **1.82%** | **7th** |
| Coconut | **1.01%** | **9th** |

Source: Agricultural Statistics 2021

The comparison between the handloom industry and the agricultural sector in Assam reveals a stark contrast in production shares and national rankings. The production contributions of Assam's handloom and agricultural sectors show markedly different patterns in the handloom industry, Assam exhibits substantial dominance across multiple fabric categories, often securing the top position. This indicates a high level of specialization and expertise in handloom production, making it a cornerstone of Assam's economic identity. Assam is a leading contributor to India's handloom fabrics, excelling in nearly all categories except for Sarees and Durries, rugs, and mats. The state accounts for over 70% of the country's output in Shawls, Mekhla Chadder, Loi, stoles, scarves, mufflers, towels, napkins, dusters, and gamchas. Furthermore, Assam consistently ranks among the top five states in various handloom fabric categories.

Conversely, Assam's agricultural sector demonstrates a more modest performance, with lower production shares and rankings across key agricultural products. The highest rank achieved is 3rd for Jute & Mesta, while other products rank between 7th and 10th, reflecting a less dominant role in the national agricultural landscape. As indicated in Table 1.2, Assam

ranks within the top ten states for only five agricultural product categories. Additionally, the state's overall share of national agricultural production does not exceed 10%.

The integration of handloom weaving with agriculture ensures that families are not solely dependent on the vagaries of farming. During off-seasons or periods of poor agricultural output, weaving offers a reliable alternative for generating income, thereby helping to cushion the economic impact of agricultural downturns. This additional source of revenue is especially important for mitigating the financial risks associated with farming, such as crop failure due to adverse weather conditions, pests, or market price volatility.

To gain a more comprehensive understanding of the handloom production scenario in Assam, it is beneficial to analyse the graph that depicts the production levels over the years, complemented by a linear trendline. Such a visual representation will elucidate the various trends and fluctuations in production, providing a clearer and more detailed picture of the sector's growth route.

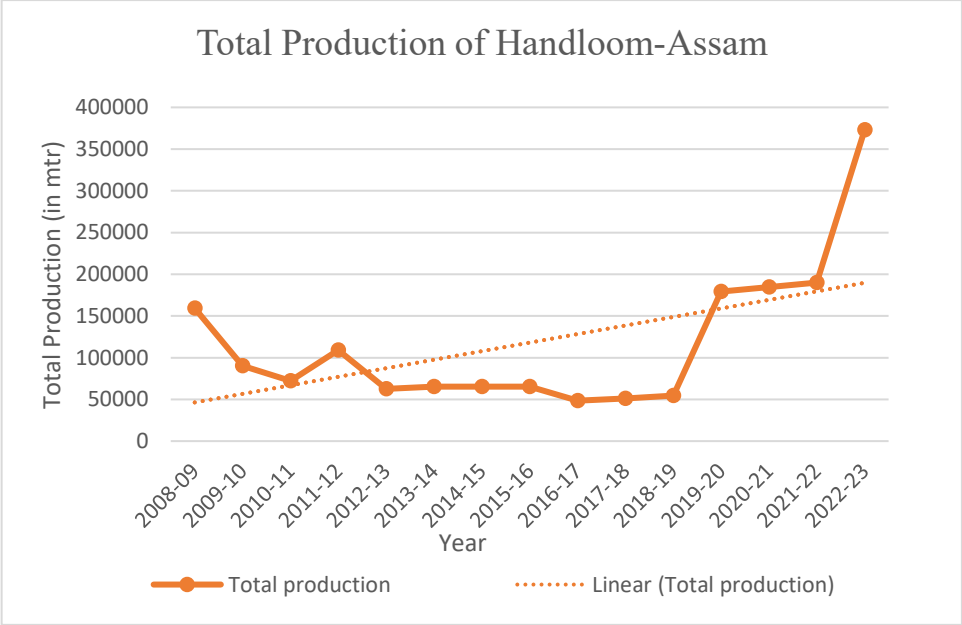



Fig 1.1: Year Wise Total Production of Handloom-Assam

TABLE 1.3-: **Statistical Summary of Handloom Production- Assam (2008-09 to 2022-23)**

| Count | **15 Years** |
|---|---|
| Mean | 1,18,038 meters |
| Standard Deviation | 87,725 meters |
| Minimum | 48,449 meters (2016-17) |
| Maximum | 3,73,033 meters (2022-23 |

The data provided outlines the total handloom production in Assam over 15 years, from 2008-09 to 2022-23. The trends and notable points from this data are summarised as

**Analysis of Handloom Production in Assam (2008-09 to 2022-23)**

- Early Years (2008-09 to 2011-12)
  - 2008-09: The production was at its peak with 159,133.03 meters.
  - 2009-10: There was a significant drop to 90,389.23 metres.

- 2010-11: Production continued to decline to 72,168.58 metres.
- 2011-12: The production saw a recovery, increasing to 109,201.39 metres.

❖ Mid Period (2012-13 to 2018-19)
- 2012-13 to 2015-16: The production fluctuated around a lower range, averaging around 65,000 meters, with the lowest at 48,449 meters in 2016-17.
- 2016-17 to 2018-19: There was a gradual increase from 48,449 units in 2016-17 to 54,499 meters in 2018-19.

❖ Recent Years (2019-20 to 2022-23)
- 2019-20: Production saw a significant jump to 179,268.32 metres.
- 2020-21: Continued growth to 184,571.54 metres.
- 2021-22: Further increase to 189,921 metres.
- 2022-23: A substantial surge in production to 373,033.34 meters, more than double the previous year's production.

***The trend analysis of the data highlights:***
- ***Initial Decline***: There is a notable decline in handloom production from 2008-09 (159,133.03) to 2017-18 (51,202). This steady decline indicates challenges in the handloom sector during this period.
- ***Stability and Slight Increase***: Between 2015-16 and 2017-18, production levels were relatively stable at around 65,000. This period suggests a plateau before further decline.
- ***Significant Recovery and Growth***: Starting from 2018-19, there is a sharp and consistent increase in production each year. The most dramatic increase is observed in the last two years (2021-22 and 2022-23), where production more than doubled, reaching a peak of 373,033.34 in 2022-23.
- ***Notable Spike in 2011-12***: There was a spike in production in 2011-12 when the production increased to 109,201.39. This spike stands out in the context of the general decline and suggests a temporary boost or intervention during this year.

TABLE 1.4-: **Growth Rate of Handloom Production -Assam**

| Year | Growth Rate | Year | Growth Rate |
|---|---|---|---|
| 2008-09 | - | 2016-17 | (25.88) ▽ |
| 2009-10 | (43.20) ▽ | 2017-18 | 5.68 △ |
| 2010-11 | (20.16) ▽ | 2018-19 | 6.44 △ |
| 2011-12 | 51.31 △ | 2019-20 | 228.94 △ |
| 2012-13 | (42.59) ▽ | 2020-21 | 2.96 △ |
| 2013-14 | 4.18 △ | 2021-22 | 2.90 △ |
| 2014-15 | 0.07 △ | 2022-23 | 96.42 △ |
| 2015-16 | 0.00* | | |

Source: Statistical Handbook of Assam (2009-2023)

**** Indicates indifference or constant growth***
***▽ Indicates a negative growth rate***

△ ***Indicates a positive growth rate***

***The growth rate analysis of the data highlights:***

- ***Initial Decline (2008-09 to 2010-11)***
  - 2008-09 to 2009-10: The total production decreased dramatically from 159,133.03 meters to 90,389.23 meters, marking a significant growth rate decline of -43.20%. This sharp drop might be attributed to economic downturns, operational inefficiencies, or external market shocks.
  - 2009-10 to 2010-11: The downward trend continued with production falling to 72,168.58 meters, translating to a growth rate of -20.16%. While the rate of decline slowed, the industry was still struggling to stabilize.

- ***Recovery Phase (2010-11 to 2011-12)***
  - 2010-11 to 2011-12: There was a robust recovery with production surging to 109,201.39 meters, indicating a growth rate of 51.31%. This significant increase suggests improvements in market conditions, operational efficiency, or perhaps recovery from previous economic downturns.

- ***Fluctuation Period (2011-12 to 2018-19)***
  - 2011-12 to 2012-13: The production again fell sharply to 62,694.98 meters, with a growth rate of -42.59%. This volatility indicates continued instability in production processes or market demand.
  - 2012-13 to 2013-14: A slight recovery occurred, with production rising to 65,314.19 meters and a growth rate of 4.18%, suggesting minor improvements or stabilization.
  - 2013-14 to 2014-15: Production remained almost constant at 65,362.29 meters with a negligible growth rate of 0.07%, indicating a period of stability.
  - 2014-15 to 2015-16: Production did not change, resulting in a 0.00% growth rate. This plateau indicates no significant changes in production capabilities or demand.
  - 2015-16 to 2016-17: Another decline occurred, with production dropping to 48,449 meters and a growth rate of -25.88%. This suggests renewed challenges or external factors negatively impacting production.
  - 2016-17 to 2017-18: Production saw a modest increase to 51,202 meters, with a growth rate of 5.68%. This indicates a slow recovery or improvements in production efficiency.
  - 2017-18 to 2018-19**:** Continued modest growth brought production to 54,499 meters, with a growth rate of 6.44%, signalling further stabilization.

- ***Significant Surge (2018-19 to 2022-23)***
  - 2018-19 to 2019-20: A dramatic surge in production to 179,268.32 meters resulted in a growth rate of 228.94%. This unprecedented increase could be due to significant advancements in technology, policy changes, or a substantial rise in market demand.
  - 2019-20 to 2020-21: Production continued to grow, reaching 184,571.54 meters with a growth rate of 2.96%. This steady growth suggests consolidation and sustained positive momentum.
  - 2020-21 to 2021-22: The production increased to 189,921 meters, with a similar growth rate of 2.90%, indicating ongoing stability and incremental growth.

- 2021-22 to 2022-23: Another substantial increase saw production reach 373,033.34 meters, with a growth rate of 96.42%. This indicates a major positive shift, possibly driven by further technological advancements, significant market expansions, or enhanced production capabilities.

The growth rate analysis reveals a highly dynamic production environment characterized by significant fluctuations. The initial years experienced steep declines, followed by periods of recovery and stability. The most notable trends include the substantial recovery in 2011-12 and the dramatic increase in production from 2018-19 to 2019-20 and again in 2021-22 to 2022-23. These trends suggest that while the industry faced considerable challenges in the early years, it has shown remarkable resilience and capability to achieve significant growth in recent years

***Regression Analysis***

| | |
|---|---|
| Multiple R | 0.521996671 |
| R Square | 0.272480524 |
| Adjusted R Square | 0.216517487 |
| Standard Error | 77649.57959 |

***Regression Statistics***

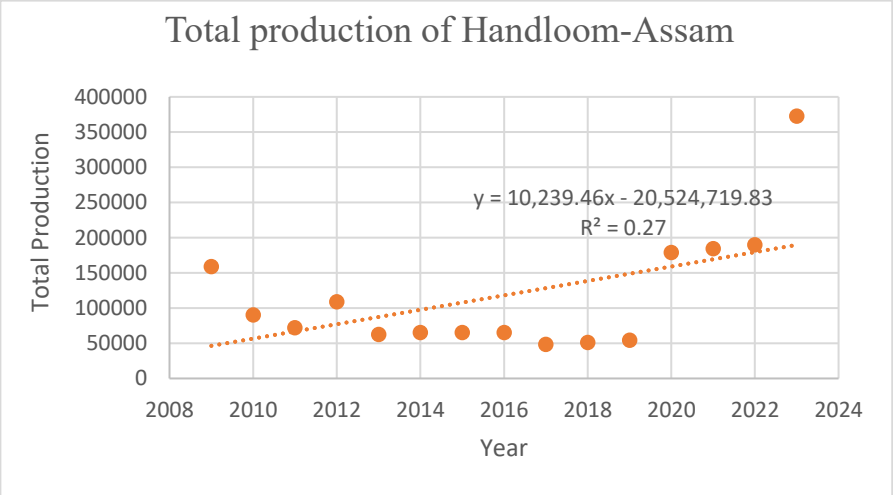



Fig 1.2: Total Production of Handloom in Assam (Regression)

The equation of the trendline is given as: y=10,239.46x−2,05,24,719.83

Where,

- **10,239.46**: This is the slope of the trendline. It represents the average change in the total production for each additional year.
- **x**: This is the year
- **-2,05,24,719.83**: This is the y-intercept. It represents the point where the trendline crosses the y-axis when the year is zero.

***Interpretation of the Trendline Equation:***

- For each additional year, the total production increases by an average of 10,239.46 units.
- The large negative intercept suggests the trendline would intersect the y-axis far below zero, which does not have a direct practical meaning since the production value cannot be negative. This intercept is an artifact of the regression calculation.

***Analysis of the Trendline Equation:***

- **Moderate Fit**: An $R^2$value of 0.27 suggests a weak to moderate fit of the trendline to the data points, indicating that the year alone does not strongly predict the total production.
- **Production Variability**: The scatter of the data points shows a high variability in total production over the years.

***Regression Metrics Analysis:***

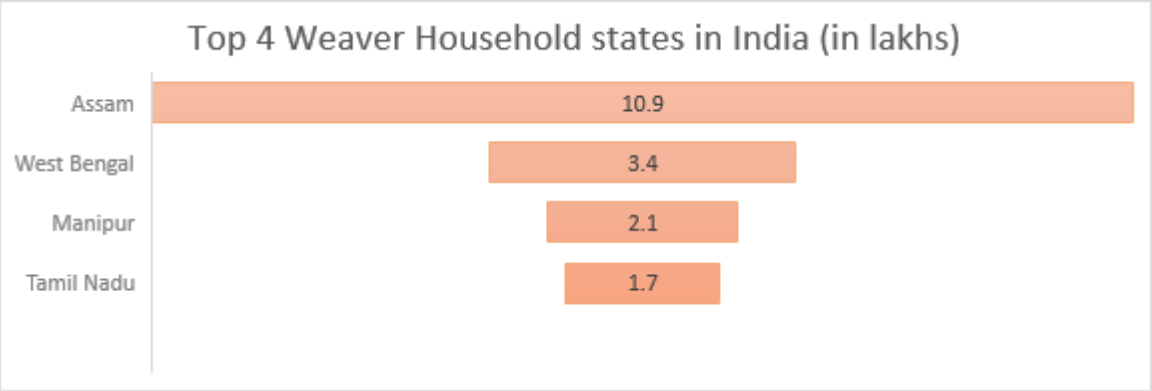
- **Multiple R (Correlation Coefficient**): A value of 0.522 indicates a moderate positive correlation between the two variables. It means there is a moderate tendency for the total production to increase as the year increases, but the relationship is not very strong.
- **$R^2$ (Coefficient of Determination):** An $R^2$ of 0.272 means that approximately 27.2% of the variability in total production can be explained by the year. This suggests that while there is some relationship between the year and total production, a significant portion (72.8%) of the variability is due to other factors not included in the model.
- **Adjusted $R^2$:** Adjusted $R^2$ of 0.217, confirms that the model's explanatory power is relatively low, taking into account the number of predictors and the sample size. This value is slightly lower than the R Square, indicating a small penalty for the inclusion of the predictor.
- **Standard Error:** A Standard Error of 77,649.58 indicates that the actual total production values typically deviate from the predicted values by around 77,649.58 units. This relatively large standard error suggests a considerable amount of unexplained variation in total production values, which aligns with the low $R^2$ value.

The correlation coefficient between the year and total production indicates a moderate positive relationship, implying that as the years progress, there tends to be an increase in total production, suggesting some level of association between these variables. However, when considering the R Square and Adjusted R Square values, it becomes clear that the year alone explains only a small proportion of the overall variability observed in total production. This means that while there is a trend of increasing production over time, many other factors beyond just the year significantly influence total production levels.

Moreover, the large standard error in the model suggests that there is considerable unexplained variability in the data. This indicates that the model based solely on the year does not predict total production values with high precision. The presence of substantial deviations between actual and predicted values further underscores the model's limitations in accurately forecasting total production.

***Handloom Workers***

The handloom industry stands as a cornerstone of India's rich cultural heritage and diverse economy, with weaving practices deeply embedded in the social and economic fabric of several states. Among the multitude of weavers across the nation, Assam emerges as a significant player, highlighting its pivotal role in this traditional industry. According to the Fourth All India Handloom Census 2019-2020, the total number of weavers enumerated across India stands at 26,73,891. Following Figure 2.1 remarkably, four states—Assam, West Bengal, Manipur, and Tamil Nadu—account for a substantial proportion of these weavers, collectively representing 18 lakh weaver households.




Source: Fourth All India Handloom Census 2019-20

Fig 2.1: Distribution of Weaver Households in India

The handloom industry is a vital part of India's cultural and economic heritage, with Assam playing a prominent role. According to the Fourth All India Handloom Census 2019-2020, Assam has 10.9 lakh weaver households, leading the nation in this sector. Weaving is integral to life in Assam, especially in rural areas, and is crucial to the state's cultural identity, with women being key preservers of this tradition. Recent data, however, shows a decline in the overall number of handloom workers and significant changes in gender distribution from 2009-10 to 2019-20. Analysing these trends, as highlighted in Table 2.1, is essential to understand their impact on rural development, gender dynamics, and the future sustainability of Assam's handloom industry.

TABLE 2.1-: **Assam's Handloom Worker Distribution**

| **Tenure** | **2009-10** | | | **2019-20** | | | |
|---|---|---|---|---|---|---|---|
| **Location** | **Male** | **Female** | **Total** | **Male** | **Female** | **Transgender** | **Total** |
| Urban | 158 | 24,566 | 24,724 | 1361 | 15,993 | 4 | 17,358 |
| Rural | 15,253 | 14,43,887 | 14,59,140 | 1,02,728 | 11,63,514 | 281 | 12,66,523 |
| Total | 15,411 | 1468453 | 1483864 | 104089 | 1179507 | 285 | 1283881 |

Source: Fourth All India Handloom Census 2019 – 2020

***Interpretation of the Worker's Distribution:***

- Urban areas:
  - The total number of handloom workers in urban areas decreased significantly from 24,724 in 2009-10 to 17,358 in 2019-20.
  - The number of male workers increased from 158 to 1,361.
  - The number of female workers decreased from 24,566 to 15,993.
  - Transgender workers were not accounted for in 2009-10, but 4 were recorded in 2019-20.

- Rural areas:
  - The total number of handloom workers in rural areas also decreased, from 14,59,140 in 2009-10 to 12,66,523 in 2019-20.
  - The number of male workers increased substantially from 15,253 to 1,02,728.
  - The number of female workers decreased from 14,43,887 to 11,63,514.
  - Transgender workers were not accounted for in 2009-10, but 281 were recorded in 2019-20.

- Overall
  - The overall number of handloom workers decreased from 14,83,864 in 2009-10 to 12,83,881 in 2019-20.
  - The number of male workers increased significantly from 15,411 to 1,04,089.
  - The number of female workers decreased from 14,68,453 to 11,79,507.
  - 285 transgender workers were recorded in 2019-20.

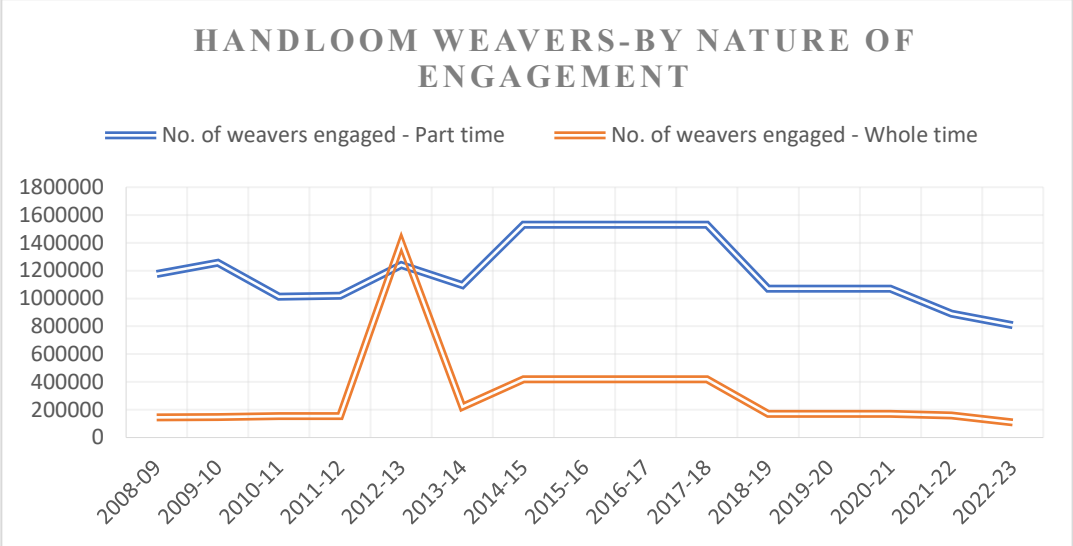
***Analysis of the Worker's Distribution:***

- **Shift in Gender Distribution**: There is a notable increase in the number of male handloom workers from 2009-10 to 2019-20 in both urban and rural areas. The number of female workers has decreased in both urban and rural areas over the same period. The inclusion of transgender workers in 2019-20 shows an acknowledgment of this group's participation in the handloom industry, which was not recorded in 2009-10.
- **Urban vs. Rural Distribution**: Both urban and rural areas saw a decrease in the total number of handloom workers. The decline is more pronounced in urban areas (29.7% decrease) compared to rural areas (13.2% decrease)**.**

The handloom industry is a significant sector in many countries, providing employment to millions and preserving traditional craftsmanship. An important aspect of this industry is the gender distribution of its workforce, which reveals critical insights into the socioeconomic dynamics and cultural practices associated with handloom work. Gender roles in the handloom industry often reflect broader societal norms and can vary widely across different regions. In many communities, handloom work is a traditional occupation passed down through generations, with women often balancing this work alongside household responsibilities.

The handloom industry plays a vital role in generating employment, offering opportunities for both full-time and part-time workers. This highlights the handloom sector's significant contributions to the job market, analysing the distribution and engagement of workers based on data from the last two handloom censuses. Through this interpretation, a clearer

understanding of the employment dynamics within this traditional yet essential industry is made.




Source: Statistical Handbook of Assam (2009-2023)

Fig:2.2- Distribution of Handloom workers by nature of engagement

***Interpretation of the Worker's Distribution:***

- Total Number of Weavers:
  - The total number of weavers engaged saw a peak in the years 2014-15 to 2017-18, with the highest recorded number being 1,948,834.
  - There was a significant drop in the total number of weavers starting from 2018-19 onwards, reaching the lowest in 2022-23 at 918,758.
- Part-time Weavers:
  - The number of part-time weavers fluctuated, peaking at 1,536,073 in 2014-15, which remained consistent until 2017-18.
  - Post-2017-18, the number of part-time weavers drastically decreased, hitting a low of 807,729 in 2022-23.
- Whole-time Weavers:
  - The number of whole-time weavers increased steadily from 145,908 in 2008-09 to 418,761 in 2014-15, maintaining this number until 2017-18.
  - After 2017-18, the number of whole-time weavers reduced significantly to 170,976 in 2018-19 and remained stable for a few years before further dropping to 108,939 in 2022-23.

***Analysis of the Worker's Distribution:***

- **2008-09 to 2010-11:** There was a gradual increase in both part-time and whole-time weavers, resulting in an overall increase in the total number of weavers.
- **2011-12:** A slight dip in part-time weavers but compensated by a marginal increase in whole-time weavers, keeping the total relatively stable.
- **2012-13 to 2013-14:** Significant increase in the total number of weavers, mainly driven by the rise in part-time weavers.
- **2014-15 to 2017-18:** Marked by the highest engagement of weavers, with part-time and whole-time numbers both at their peak.

- **2018-19 to 2020-21:** Sharp decline in both categories of weavers, resulting in a lower total number of weavers.
- **2021-22 to 2022-23:** Continued decline, with part-time and whole-time weaver numbers falling to their lowest in the given period.

The data on weavers from 2008-09 to 2022-23 shows significant fluctuations. The total number of weavers peaked between 2014-15 and 2017-18, reaching 1,948,834, driven by high engagement in both part-time and full-time roles. However, a sharp decline occurred from 2018-19 onwards, with numbers dropping to 918,758 in 2022-23. This decline suggests potential issues such as economic factors, policy changes, or shifts in industry demand.

TABLE 2.2-: **Efficiency of Handloom production -Assam**

| Year | Number of workers per meter of production |
|---|---|
| 2008-09 | 8 |
| 2009-10 | 16 |
| 2010-11 | 16 |
| 2011-12 | 11 |
| 2012-13 | 26 |
| 2013-14 | 20 |
| 2014-15 | 30 |
| 2015-16 | 30 |
| 2016-17 | 40 |
| 2017-18 | 38 |
| 2018-19 | 23 |
| 2019-20 | 7 |
| 2020-21 | 7 |
| 2021-22 | 6 |
| 2022-23 | 2 |

Source: Statistical Handbook of Assam (2009-2023)

***Interpretation of Efficiency(Workers per Unit of Production):***

The efficiency measure provided is the number of workers required to produce 1 unit of output i.e 1meter.This ratio varies widely from a low of 2.46 workers per unit (in the most efficient scenario) to a high of 40.22 workers per unit (in less efficient scenarios).Lower ratios indicate higher efficiency, meaning fewer workers are required to produce each unit of output. Higher ratios suggest lower efficiency.

***Efficiency Analysis of the Worker's:***

- **Initial Period (2008-09 to 2011-12)**:
  - In 2008-09, the industry saw an initial efficiency with 8 workers per meter of production.
  - However, the number of workers required doubled to 16 in both 2009-10 and 2010-11, indicating a period of reduced efficiency.
  - In 2011-12, there was a significant improvement with the number of workers dropping to 11 per meter.

- **Mid Period (2012-13 to2017-18):**
  - Efficiency saw another decline in 2012-13, with 26 workers per meter, peaking at 30 workers in both 2014-15 and 2015-16.
  - The number of workers required continued to rise, reaching a high of 40 in 2016-17 and slightly improving to 38 in 2017-18. This period marked the least efficient phase in the industry.
- **Recent Period (2018-19 to 2022-23):**
  - A marked improvement began in 2018-19, with the number of workers per meter dropping to 23.
  - By 2019-20 and 2020-21, the industry saw a substantial leap in efficiency, with only 7 workers needed per meter.
  - This trend continued in 2021-22, further reducing the requirement to 6 workers per meter.
  - The most significant improvement was observed in 2022-23, with only 2 workers required per meter of production.

Over the years there has been a decline in the number of weavers in the handloom sector in both the full-time and part-time workers, which may be due to the intense competition from the power loom textile industries, which leads to wage discrimination and reduced profit margins. This stiff competition puts pressure on traditional textile producers, forcing them to lower wages to stay competitive. As a result, their retention ratio declines, creating a challenging environment for sustaining their employees (Pande & Arif, 2023).

Other major problems in the handloom sector, include a shortage of raw materials, insufficient working capital, the accumulation of large inventories, and difficulties in marketing handloom products. One of the primary issues is pricing. The prices set by handloom societies for their fabrics only account for direct expenses, such as the cost of raw materials and wages. However, they do not include indirect expenses, or overheads, which significantly impact the overall profitability of handloom products. This pricing strategy hampers the financial sustainability of the handloom industry, making it difficult for artisans to achieve adequate profit margins (Gurumoorthy & Rengachary, 2002).

Despite a decline in the number of handloom weavers, the industry has achieved a significant increase in production levels and a notable improvement in efficiency. This phenomenon, where fewer weavers can produce more fabric, highlights the transformative changes within the handloom sector. The fourth handloom census marked a turning point for the industry. Since then, efficiency has significantly improved, reducing the number of weavers needed to fewer than 10 per meter of fabric. The trend of increased efficiency culminated in 2022-23, when the industry achieved its highest efficiency, requiring only 2 weavers per meter of fabric.

The handloom sector has seen a notable increase in efficiency due to several key factors. Technological advancements, such as the adoption of modern looms and automation, have streamlined the weaving process. Enhanced training programs and continuous skill upgradation have equipped weavers with better techniques, boosting productivity.

Investments in infrastructure, including well-equipped weaving centres and access to high-quality raw materials, have further supported this efficiency. Additionally, government schemes and improved market linkages have provided financial, technical, and marketing support, fostering a conducive environment for higher productivity (Singh & Srivastava,2019). As a result, despite a decline in the number of weavers, overall production levels have

increased, leading to enhanced profitability, better job quality, higher earnings for weavers, and increased market competitiveness against power loom and mechanized textile industries.
The handloom sector has shown remarkable resilience and adaptability in the face of declining workforce numbers. Through technological advancements, skill development, infrastructure investments, and supportive policies, the industry has significantly improved efficiency and production levels. These developments ensure the sustainability of handloom production, enhance its profitability and secure a bright future for this traditional craft. The handloom sector's ability to produce more fabric with fewer weavers demonstrates its potential for continued growth and success in the modern textile market.

## DISCUSSION

The Indian handloom sector, particularly in Assam, has traversed a remarkable journey marked by resilience, cultural significance, and economic vitality. The handloom industry's expansion and global recognition underscore its pivotal role in preserving heritage, fostering socio-economic development, and showcasing India's rich textile legacy to the world.

### *Production: Workers*

### *Production*

The production trends over the years provide insights into the sector's challenges and triumphs. Despite facing initial declines, the handloom production in Assam witnessed a notable recovery and substantial growth in recent years, particularly doubling in the last two years. This resurgence signifies resilience and adaptability within the sector, potentially fuelled by strategic interventions and increased market demand. The spike in production in 2011-12 stands out amidst the general decline, indicating temporary boosts or interventions that could be further explored for sustained growth. Overall, the trajectory of handloom production in Assam reflects a story of revival, innovation, and renewed global relevance, positioning the state as a beacon of India's rich textile heritage on the global stage.
This comparative analysis underscores Assam's prominent position in India's handloom industry, marked by significant contributions and top rankings in various fabric categories. In contrast, the state's agricultural sector shows a more moderate impact, with limited production shares and lower national rankings. These disparities highlight the importance of the handloom industry in Assam's economy and suggest potential areas for growth and development in agriculture to achieve a more balanced economic profile.

### *Rural Centric*

The handloom industry in the northeastern region of India has traditionally been centred in rural areas, particularly in Assam. Here, the majority of handloom weavers are situated in these rural settings, creating significant opportunities for rural development. The industry's rural focus has meant that it has not yet undergone extensive urbanization. As a result, the traditional methods and processes of weaving have remained largely untouched by mechanization, allowing for the preservation of time-honoured weaving techniques and cultural heritage. This enduring practice not only supports the livelihood of rural communities but also maintains the rich artisanal legacy of the region.

### *Gender Equality*

The handloom industry is predominantly female-oriented, significantly contributing to women's employment and empowerment across India. According to the Fourth All India Handloom Census, women make up approximately 72% of the workforce in this sector nationwide. This high percentage underscores the vital role that women play in sustaining and advancing the handloom industry. In Assam, the representation of women in the handloom

workforce is even more pronounced, with women constituting 92% of those employed in the sector.

***Women empowerment***

This significant employment opportunity empowers women to showcase their talent and contribute substantially to household income. By participating in the handloom industry, women not only enhance their financial independence but also achieve greater decision-making authority within their families and the broader community. This empowerment fosters a shift towards gender equality, strengthening women's roles in both the domestic and societal spheres.

***Employment***

Agriculture stands as the largest employment sector in the country, yet it is often hindered by seasonality and other uncontrollable factors that impact production. In this context, the handloom industry plays a crucial role in providing stable employment, particularly for rural populations who frequently face a scarcity of job opportunities. The handloom sector has emerged as the second-largest employment generator in the country, offering a reliable source of income and livelihood for many. By complementing the agricultural sector, handloom work helps to mitigate the effects of seasonal employment gaps and enhances economic stability in rural areas.

***Secondary Source of Income***

Handloom weaving is often pursued as a part-time activity by women, who balance it with household chores, generating crucial supplementary income, especially valuable during economic downturns.

Typically intended for domestic use rather than commercialization, this practice saves families the money they would otherwise spend on market goods, effectively increasing their income indirectly. Additionally, it preserves traditional skills and cultural heritage, providing high-quality, customized textiles. With proper support and resources, there is significant potential to expand this into a viable business, further enhancing its economic impact on families and communities.

## CONCLUSION

In conclusion, the Indian handloom sector, particularly in Assam, represents a powerful narrative of resilience, cultural preservation, and economic significance. The sector's journey reflects its ability to adapt and thrive, as evidenced by the notable recovery and growth in production in recent years. This revival is a testament to the strategic interventions and increasing market demand that have revitalized the industry, positioning Assam as a key player in showcasing India's rich textile heritage globally.

The sector's rural focus has preserved traditional weaving techniques and cultural heritage, providing substantial development opportunities for rural communities. This rural-centric model not only supports the livelihood of these communities but also maintains the artisanal legacy of the region. The prominence of women in the handloom workforce, particularly in Assam, highlights the industry's role in empowering women, promoting gender equality, and enhancing their financial independence and decision-making authority.

Employment in the handloom sector complements the agricultural sector by providing stable job opportunities and mitigating the effects of seasonal employment gaps, thereby enhancing economic stability in rural areas. As a significant source of income, handloom weaving, often pursued as a part-time activity by women, generates supplementary income and preserves traditional skills. With adequate support and resources, there is potential for further

expansion, transforming this practice into a viable business that can significantly impact families and communities economically.
Overall, the handloom industry's contributions to socio-economic development, cultural preservation, and gender equality underscore its pivotal role in India's economic landscape and heritage, with Assam standing out as a beacon of this rich textile tradition.

**Compliance with Ethical Standards**
This research was conducted in accordance with all applicable ethical guidelines. Informed consent was obtained from all participants involved in the study. The study did not involve any experiments with animals or clinical trials involving human subjects.

**Competing Interests**
The authors declare that they have no competing interests or conflicts of interest relevant to the content of this article.

**Research Data Policy and Data Availability Statements**
This study is based entirely on secondary data derived from previously published academic literature, government reports, and publicly accessible databases. All sources are appropriately cited within the manuscript. No new data were generated or analyzed during the course of this research. As such, data availability is not applicable.

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