Consumption Expenditure Inequality and Handloom Sector in Northeast India

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Abstract

Handloom is the most widely established cottage industry in North East India (NE) and is widely spread throughout the region. It employs a large, skilled and unskilled workforce, mainly women workers in the North East. In the current era of commercialization, the handloom sector is also changing, and many women are embracing weaving as a profession. The activity they performed during their leisure time has now been transformed into an 8-hour job. Across India, including the Northeast, there has been a general trend of increasing inequality in consumption expenditure, particularly following the implementation of economic reforms. This is evident in rural and urban areas, with non-food expenditures being more unevenly distributed and contributing significantly to overall inequality (Sen & Das, 2018; Subramanian & Jayaraj, 2015). The handloom sector is a crucial source of employment in Northeast India, with the region accounting for over 65% of the country's total handloom households. It provides livelihoods to many rural populations, especially women, who dominate the weaving occupation in this region (Devi, 2014; Goswami et al., 2017). Despite the decline in handloom weaver households in other parts of India, Northeast India has seen an increase, highlighting its importance in the local economy (Devi, 2014). This paper aspires to investigate the impact of various dimensions of the handloom sector in the Northeastern states on consumption expenditure inequality, as well as its magnitude. The Fourth All-India Handloom Census 2019-20 revealed that 31.45 lakh households in India are engaged in handloom activities, an increase from 27.83 lakh in the previous census. Rural and urban areas categorize the data and factors, such as religion and household types. The Household Consumption Expenditure Survey (HCES) measures spending and reports inequality through the Gini coefficient. This paper examines how different Handloom census indicators affect the Gini coefficient. The analysis draws on data from the Fourth All India Handloom Census 2019-20 and the Household Consumption Expenditure Survey (HCES) 2022-23. The HCES obtained the Gini coefficient to measure inequality in consumption expenditure.

Information on the handloom industry in northeast India was also sourced from the Ministry of Textiles' Census report. Multiple linear regression models were developed to achieve the paper's objectives, predicting the value of a variable based on several others. The Northeast region is emerging as a key player in the handloom sector, but women weavers face challenges from manual looms and market competition, including threats from imported materials.

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Published: 23/06/2025

Designers should focus on handloom products to support this craft. In a patrilineal society, weaving empowers women, yet weak organizations hinder their rights. Mobilizing weaver groups can improve access to government schemes and markets. Sustainable cooperatives and full-time work in handloom production can enhance women's economic participation and improve their livelihoods.

Keywords: MPCE, Gini Coefficient, Northeast India, handloom sector, Income Inequality, Women Empowerment

JEL Classification: D63, E24, F63, J16, O17

Introduction

Handloom Textiles comprise a timeless facet of India's rich cultural heritage. As an economic activity, the handloom sector is next only to agriculture in providing people's livelihoods. The characteristics of art and craft present in Indian handlooms make it a promising sector for the upper echelons of the market, both domestically and globally. However, the sector is beset with multifaceted problems, such as obsolete technologies, a disorganized production system, low productivity, inadequate working capital, a traditional product range, weak marketing links, overall stagnation of production process and sales, and, above all, competition from the mill sector. As a result of effective government intervention through financial aid and the implementation of various developmental and welfare schemes, the handloom sector has overcome some disadvantages. As a result of these measures, the production of handloom fabrics increased to 7,585 million square meters during 2001-2002, from 500 million square meters in the early fifties. This sector accounts for 18.4% of the total cloth produced in the country (excluding clothes made of wool, silk, and hand-spun yarn). The handloom industry provides substantial employment opportunities in India, particularly in rural areas. According to the Fourth All India Handloom Census, there are over 3 million weavers and allied workers in the handloom sector, most of whom belong to economically weaker sections of society. Many women rely on handloom weaving as their primary source of income, helping to support their families and communities. Unlike large-scale, mechanised textile production, the handloom sector is labour-intensive, securing more employment opportunities, particularly in regions where the scope of industrial development is limited. It also promotes sustainable economic growth by fostering decentralized production processes through eco-friendly methods. The focus on natural dyes and organic materials, such as cotton, silk, and wool, adds to the industry's environmentally conscious nature.

Handloom is the most widely established cottage industry in North East India (NE) and is widely spread throughout the region. It employs a large, skilled and unskilled workforce, which, in the North East, mainly consists of women workers. In the current era of commercialization, the handloom sector is also changing, and many women are embracing weaving as a profession. The activity they performed during their leisure time has now been transformed into an 8-hour job. However, the workstation design remains unaltered despite the increased weaving time spent on the loom. In the NE region, women dominate the weaving occupation. However, in other states, such as Uttar Pradesh, Andhra Pradesh, Tamil Nadu, West Bengal, Odisha, Haryana, and Karnataka, males play a significant role in weaving, while

women are involved in the pre-weaving process. The women weavers of the NE region perform multiple roles as handloom producers and traders of handloom products. As there are no cloth mills or many powerlooms in the region, weavers put in their strict labour by working manually. In earning an income, they preserve culture and heritage by laboriously producing traditional clothing. The essential role of women in handlooms in industrially backward States of the NE region is worth studying. Handlooms are a traditional occupation, and women find it convenient and safe to work in these settings. The region has contributed a significant share to the handloom sector in terms of the number of looms employed or owned. When the number of handloom weaver households declines in India, the region increased from the first (14.6 lakh) to the third (15.1 lakh) census. However, the sector is not progressing as expected. The income from handlooms and their contribution to the household economy is less than in other States. It is dominated mainly by domestic production and part-time weaving. Various social and cultural aspects, demographic profiles, production, employment, market structures, technology, and skills are analyzed to understand the present condition of handlooms. The factors contributing to the promotion of the handloom sector have been identified, enabling mobilization to support it as a viable livelihood activity.

The monthly per capita consumption expenditure (MPCE) in the North East region has increased significantly compared to prior surveys, with some states experiencing substantial rises in both rural and urban areas. While the overall trend of MPCE of the country is optimistic, but there are evident disparities in MPCE across the northeastern states, with Sikkim reporting the highest figures. The gap between urban and rural MPCE in North East India is narrowing, with urban areas experiencing faster growth in consumption expenditure. According to the Household Consumption Expenditure Survey (HCES) 2022-23, the average Monthly Per Capita Consumption Expenditure (MPCE) in North East India is significantly higher than the national average, with states like Sikkim showing exceptionally high figures in both rural and urban areas. However, specific data for each state within the region may vary depending on the source.

This paper strives to investigate the influence of various dimensions of the handloom census on consumption expenditure inequality.

Literature Review

The handloom industry in India holds a distinguished position in the country's cultural legacy and economic upgradation, boasting a rich historical lineage spanning several centuries (Mishra & Mohapatra, 2020). The handloom industry has substantially contributed to the country's socio-economic scenario(Saini, 2023). Formulating policies and implementing interventions to enhance the overall welfare of handloom workers is of significant importance in heightening the socio-economic conditions of these workers (Chinnu & Sheeba, 2021). The whole literature review can be categorised into the following categories:-

1) **Historical Significance of the Handloom Industry**: It is evident from history that handloom weaving has been a crucial component of the livelihoods of rural and semi-urban populations, preserving the nation's diverse textile heritage (Mishra & Mohapatra, 2019; Shrivastava, 2020). The intricate, elaborate designs and vibrant

colors of Indian handloom fabrics demonstrate the skill and creativity of the weavers (Abhyankar, 2023). The rich legacy of India's handloom sector spans multiple epochs, serving as a testament to the nation's vibrant cultural heritage (Sreenivas & Suman, 2016; Kumar et al., 2022). These artisans have perfected their craft through exceptional quality and artistry over numerous generations. The handcrafted textiles fulfill the economic needs of numerous artisans while also carrying notable cultural and symbolic value. It also represents the pride and identity of India's diverse communities (Anil et al., 2023). This traditional sector has socio-economic effects nationwide (Nair & N, 2022).

2) **Economic Contribution:** The handloom sector in India holds significant economic importance (Vyshnavi & Nair,2017). Handloom weaving, a traditional craft in India, has been a substantial source of employment for countless individuals, particularly those residing in rural areas, for many centuries (Sreenivas & Suman, 2016). The sector makes a significant contribution to the country's Gross Domestic Product (GDP) and is vital in preserving India's diverse and culturally significant heritage (Nair & Chandramana, 2020). According to the Ministry of Finance (2022), it is notable to acknowledge that handloom products demonstrate a substantial degree of demand, both in the domestic market of India and on the global platform, and the increased demand has significantly contributed to the enhancement of India's export earnings and the rise of its foreign exchange reserves. The industry is the country's most extensive unorganized economic activity and is a substantial source of non-agricultural employment in rural areas (Datta & Agrawal, 2018; Amutha, 2021). The sector's contribution to the nation's GDP, as well as its role in generating income and forming employment opportunities, particularly in rural areas, further highlights its socioeconomic significance (Prathap & Naidu, 2015; Debbarma & Murugesan, 2022).

3) **Socioeconomic Challenges:** Despite its historical and economic importance, the handloom sector faces various socioeconomic challenges (K. & Sindhu, 2023). The industry's lack of modernization and technological advancements is one such challenge that hinders its global market competitiveness (Amaravathi & Balanagalakshmi, 2022; Balakrishnan, 2020; Eknath, 2023). The handloom sector also struggles with limited access to credit and financial support, making it difficult for weavers to invest in their businesses and improve their livelihoods (Sharma et al., 2021; Majumdar et al., 2017; Rama, 2021; Bag & Behera, 2020; Bari et al., 2015; Bhat & Choure, 2014; Jain & Gera, 2017). A comprehensive understanding of the socio-economic conditions within the sector is necessary to mitigate these challenges, enabling organizations to recognize and address the specific challenges they face more effectively (Mishra & Mohapatra, 2019). This knowledge stimulates the development of targeted strategies and interventions to improve socio-economic conditions and drive positive change within the sector (Samadhiya & Agrawal, 2022).

4) **Government Initiatives:** Recognizing the significance of the handloom sector, the Indian government has implemented policies and initiatives to boost and advance this traditional craft (Shrivastava, 2020). According to the annual report of the Ministry of

Textiles (2023), these programs aim to provide financial assistance, develop the necessary skills, and establish market connections. Financial support includes microloans and grants, which serve as valuable tools for entrepreneurs seeking to commence as well as extend their business ventures (Singh & Kumar, 2016). These provisions enable individuals to secure the necessary funds to sustain and prosper their enterprises. Skill development programmes aim to train individuals from various fields, such as technology, art, and craftsmanship, equipping participants with the necessary knowledge and essential tools to succeed in today's highly competitive marketplace (Mahalingam & Balakrishnan, 2020; Rachappa & Naik, 2017). It is crucial to acknowledge that market linkages play a key role in promoting the connection between producers and potential buyers (Kumar et al., 2021; Khatoon, 2016). Such a connection permits producers to effectively sell their products and services at fair prices, thereby contributing to the establishment of sustainable livelihoods. The analysis of the effectiveness of these policies and their impact on handloom workers is a crucial component of this inclusivity. (Mishra & Mohapatra, 2019). Policymakers can identify specific areas that require enhancement and subsequently make well-informed decisions to optimise the overall effectiveness of these initiatives through a comprehensive analysis of the results derived from skill development programmes and market ties.

This literature review is an in-depth foundational work for understanding the socio-economic circumstances of handloom workers in India and the substantial challenges they encounter within their chosen occupation. This study provides an in-depth analysis of scholarly papers, research papers, and case studies to gain a comprehensive understanding of the handloom sector. This literature evidences demonstrate the living conditions, income levels, and social status of handloom workers. It underscores the complexity and diversity of challenges faced within this sector.

Objectives of the study

1) To quantify linear dependence of consumption expenditure-based Gini coefficient on different dimensions of Fourth All India Handloom Census, 2019-20, which are gender, religion, caste, Antodaya Card holding, Households type, Income from all Sources, Income from Handloom related activities, Debt procurement, Loan procurement sources, Average Household size, Yarn usage, Major Source of sales, Membership type.
2) To make an intercomparison of the impact of all the dimensions of the Fourth All India Handloom Census, 2019-20, as mentioned above, on the expenditure-based Gini coefficient.

Data collection

The analysis draws on data from the Fourth All India Handloom Census 2019-20 and the Household Consumption Expenditure Survey (HCES) 2022-23. The HCES obtained the Gini coefficient to measure inequality in consumption expenditure. Information on the handloom industry in northeast India was also sourced from the Ministry of Textiles' Census at both ports.

Both HCES and Census are presented at both rural and urban granularities. The analysis was conducted on the entire dataset, regardless of its location.

Research Methodology

The analysis depends on simple linear regression models. A simple linear regression aims to forecast the value of a dependent variable based on an independent variable. The greater the linear relationship between the independent and dependent variables, the more precise the prediction will be. This goes along with the fact that the more significant the proportion of the dependent variable's variance that the independent variable can explain, the more accurate the prediction. Undisguisable, the relationship between the variables can be displayed in a scatter plot. The more prominent the linear relationship between the dependent and independent variables, the better the data points represent on a straight line.

The following equation can describe the regression line:

$$\hat{y} = bx + a + \in$$

Here, $\hat{y}$ is estimated dependent variable

b is the gradient of the straight line

x is the independent variable

a is the point of intersection with the y-axis

$\in$ is the residual or error parameter

The regression coefficient b can have different signs, which can be elucidated as follows

- $b > 0$: positive correlation between x and y (the greater x, the greater y)
- $b < 0$: negative correlation between x and y (the greater x, the smaller y)
- $b = 0$: There is no correlation between x and y

Analysis and interpretation

Linear regression has been utilized in the analysis. Thir will beteen linear models have been developed on different dimensions of the Fourth All India Handloom Census, 2019-20, which are gender, religion, caste, Antodaya Card holding, Household type, Income from all Sources, Income from handloom-related activities, Debt procurement, Loan procurement sources, Average Household size, Yarn usage, Major Source of sales, and Membership type. It is desirable to have a negative coefficient on the Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.0308	-0.017253	-0.004426	0.021665	0.031323	
Coefficients:					

	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.2424000000	0.0080280000	30.1930000000	0.0000000000	***
Male_Weavers	-0.0000027800	0.0000012970	-2.1440000000	0.0552000000	.
Male_Allied_Weavers	0.0000062480	0.0000040400	1.5460000000	0.1503000000	
Female_Weavers	-0.0000002276	0.0000001799	-1.2660000000	0.2318000000	
Female_Allied_Weavers	0.0000016390	0.0000013350	1.2280000000	0.2452000000	
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Residual standard error: 0.02539 on 11 degrees of freedom					
Multiple R-squared: 0.3957, Adjusted R-squared: 0.176					
F-statistic: 1.801 on 4 and 11 DF, p-value: 0.1989					

Table 1

Table 1 represents the impact of gender-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.029916	-0.007144	-0.000821	0.009231	0.035499	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.2470000000	0.0066720000	37.0180000000	0.0000000000	***
Handloom_Worker_Households_Under_Muslim_Religion	-0.0000018260	0.0000006168	-2.9600000000	0.0130000000	*

Handloom_Worker_Households_Under_Jain_Religion	0.0070380000	0.0023490000	2.9960000000	0.0122000000	*
Handloom_Worker_Households_Under_Buddhist_Religion	-0.0000163600	0.0000063400	-2.5800000000	0.0256000000	*
Handloom_Worker_Households_Under_Zoroastrian_Religion	-0.0046630000	0.0022800000	-2.0450000000	0.0655000000	.
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02189 on 11 degrees of freedom					
Multiple R-squared: 0.5508, Adjusted R-squared: 0.3874					
F-statistic: 3.372 on 4 and 11 DF, p-value: 0.0494					

Table 2

Table 2 represents the impact of religion-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.032392	-0.022022	-0.005824	0.024905	0.042962	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.2428000000	0.0071180000	34.1170000000	0.0000000000	***
Scheduled_Caste_Handloom_Worker_Households	-0.0000002042	0.0000001395	-1.4640000000	0.1650000000	
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02696 on 14 degrees of freedom					
Multiple R-squared: 0.1327, Adjusted R-squared: 0.07076					
F-statistic: 2.142 on 1 and 14 DF, p-value: 0.1654					

Table 3

Table 3 represents the impact of caste-related variables on the MPCE-based Gini coefficient.

Residuals:					

Min	1Q	Median	3Q	Max	
-0.035058	-0.019691	-0.006147	0.02395	0.041848	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.2438000000	0.0072520000	33.6200000000	0.0000000000	***
Handloom_Worker_Households_With_No_Antodaya_Card	-0.0000000535	0.0000000347	-1.5400000000	0.1460000000	
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Residual standard error: 0.02677 on 14 degrees of freedom					
Multiple R-squared: 0.1449, Adjusted R-squared: 0.08384					
F-statistic: 2.373 on 1 and 14 DF, p-value: 0.1458					

Table 4

Table 4 represents the impact of Antodaya Card holding-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.035438	-0.014511	0.000976	0.014109	0.031413	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.2430000000	.0086160000	28.2030000000	0.0000000000	***
Handloom_Worker_Households_Residing_In_A_Kuchha_House	-0.0000038210	0.0000018650	-2.0480000000	0.0652000000	.

Handloom_Worker_Households_Residing_In_A_Pucca_House	-0.0000053200	0.0000035440	-1.5010000000	0.1615000000	
Handloom_Worker_Households_With_Own_Residency	0.0000035120	0.0000018360	1.9130000000	0.0821000000	.
Handloom_Worker_Households_With_Rented_Residency	0.0000073540	0.0000057980	1.2680000000	0.2309000000	
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02456 on 11 degrees of freedom					
Multiple R-squared: 0.4344, Adjusted R-squared: 0.2288					
F-statistic: 2.112 on 4 and 11 DF, p-value: 0.1475					

Table 5

Table 5 represents the impact of the household type-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.037267	-0.009827	-0.001147	0.014795	0.033612	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.2527000000	0.0074650000	33.8480000000	0.0000000000	***
Handloom_Households_With_Income_From_All_Sources_Between_15001___20000_Rupees	0.0000295500	0.0000161300	1.8310000000	0.0942000000	.
Handloom_Households_With_Income_From_All_Sources_Between_25001_50000_Rupees	-0.0005347000	0.0002262000	-2.3640000000	0.0376000000	*
Handloom_Households_With_Income_From_All_Sources_Between_50000_100000_Rupees	0.0017810000	0.0006892000	2.5840000000	0.0254000000	*

Handloom_Households_With_Income_From_All_Sources_Above_100000	-0.002407000000	0.001121000000	-2.147000000000	0.054900000000	.
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02378 on 11 degrees of freedom					
Multiple R-squared: 0.4701, Adjusted R-squared: 0.2774					
F-statistic: 2.439 on 4 and 11 DF, p-value: 0.1091					

Table 6

Table 6 represents the impact of Income from all Sources-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.032338	-0.020593	0.002103	0.02023	0.028901	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.2463000000	0.0071070000	34.664000000	0.0000000000	***
Handloom_Households_With_Income_From_Handloom_Related_Activities_Between_5001_10000_Rupees	-0.0000034650	0.0000014950	-2.317000000	0.0390000000	*
Handloom_Households_With_Income_From_Handloom_Related_Activities_Between_15001_20000_Rupees	0.0006044000	0.0002990000	2.022000000	0.0661000000	.
Handloom_Households_With_Income_From_Handloom_Related_Activities_Between_50000_100000_Rupees	-0.0221000000	0.0116600000	-1.895000000	0.0824000000	.

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02454 on 12 degrees of freedom					
Multiple R-squared: 0.3844, Adjusted R-squared: 0.2305					
F-statistic: 2.498 on 3 and 12 DF, p-value: 0.1093					

Table 7

Table 7 represents the impact of Income from handloom-related activities on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.033731	-0.017222	-0.004266	0.020019	0.037269	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.247700000	0.006951000	35.640000000	0.000000000	***
Handloom_Households_In_Debt_Due_To_Handloom_Business_And_Other_Purposes	-0.000132900	0.000054690	-2.430000000	0.029100000	*
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02428 on 14 degrees of freedom					
Multiple R-squared: 0.2967, Adjusted R-squared: 0.2465					
F-statistic: 5.906 on 1 and 14 DF, p-value: 0.02913					

Table 8

Table 8 represents the impact of Debt procurement-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.036345	-0.018448	-0.000942	0.016349	0.033349	

Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.245000000	0.0072660000	33.718000000	0.0000000000	***
Handloom_Households_That_Took_Loan_From_Commercial_Banks	-0.001478000	0.0010590000	-1.396000000	0.1900000000	
Handloom_Households_That_Took_Loan_From_Friends_Or_Relatives	-0.000161500	0.0000981400	-1.646000000	0.1280000000	
Handloom_Households_That_Took_Loan_From_Government	-0.000131100	0.0000738900	-1.775000000	0.1040000000	
Handloom_Households_That_Took_Loan_From_Other_Sources	0.005875000	0.0041840000	1.404000000	0.1880000000	
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02535 on 11 degrees of freedom					
Multiple R-squared: 0.3978, Adjusted R-squared: 0.1789					
F-statistic: 1.817 on 4 and 11 DF, p-value: 0.1959					

Table 9

Table 9 represents the impact of Loan procurement sources-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.035899	-0.022023	-0.007899	0.028195	0.046101	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.2354034000	0.0502765000	4.6820000000	0.0003530000	***
Average_Household_Size	0.0008739000	0.0106140000	0.0820000000	0.9355420000	

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02895 on 14 degrees of freedom					
Multiple R-squared: 0.000484, Adjusted R-squared: -0.07091					
F-statistic: 0.00678 on 1 and 14 DF, p-value: 0.9355					

Table 10

Table 10 represents the impact of Average Household size-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.032675	-0.007401	-0.000033	0.00723	0.02543	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.2476000000	0.0082940000	29.8490000000	0.0000000938	***
Handloom_Households_Using_Yarn_Of_Type_Cotton_Above_80	-0.0000259900	0.0000116000	-2.2410000000	0.0663000000	.
Handloom_Households_Using_Yarn_Of_Type_Viscose_Blends	0.0006198000	0.0002355000	2.6320000000	0.0390000000	*
Handloom_Households_Using_Yarn_Of_Type_Muga_Silk	0.0000406300	0.0000167900	2.4210000000	0.0518000000	.
Handloom_Households_Using_Yarn_Of_Type_Eric_Silk	-0.0001576000	0.0000583400	-2.7020000000	0.0355000000	*
Handloom_Households_Using_Yarn_Of_Type_Tussar_Silk	0.0002605000	0.0001148000	2.2690000000	0.0637000000	.
Handloom_Households_Using_Yarn_Of_Type_Wool	0.0000049520	0.0000016160	3.0650000000	0.0221000000	*
Handloom_Households_Using_Yarn_Of_Type_Acrylic_Wool	-0.0000359400	0.0000157800	-2.2770000000	0.0630000000	.
Handloom_Households_Using_Polyester_Blends	0.0000247500	0.0000121800	2.0320000000	0.0884000000	.

Handloom_Households_Using_Yarn_Of_Type_Jute	-0.000176500	0.0000539100	-3.2750000000	0.0169000000	*
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02236 on 6 degrees of freedom					
Multiple R-squared: 0.7445, Adjusted R-squared: 0.3612					
F-statistic: 1.942 on 9 and 6 DF, p-value: 0.216					

Table 11

Table 11 represents the impact of Yarn usage-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.025868	-0.015221	-0.001803	0.01729	0.028663	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.25340000000	0.0062120000	40.799000000000	0.0000000000000	***
Handloom_Households_Reporting_Major_Source_Of_Sales_For_Their_Major_Products_Is_Local_Market	0.0000006266	0.0000003303	1.897000000000	0.0821600000	.
Handloom_Households_Reporting_Major_Source_Of_Sales_For_Their_Major_Products_Is_Co_Operative_Society	-0.0000833400	0.0000240900	-3.460000000000	0.0047100000	**
Handloom_Households_Reporting_Major_Source_Of_Sales_For_Their_Major_Products_Is_Other_Sources	-0.0000038560	0.0000024630	-1.565000000000	0.1435400000	
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02047 on 12 degrees of freedom					

Multiple R-squared: 0.5717, Adjusted R-squared: 0.4646		
F-statistic: 5.338 on 3 and 12 DF, p-value: 0.0144		

Table 12

Table 12 represents the impact of the Major Source of sales-related variables on the MPCE-based Gini coefficient.

Residuals:					
Min	1Q	Median	3Q	Max	
-0.036804	-0.015952	-0.005638	0.009595	0.044459	
Coefficients:					
	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	0.238800000	0.007207000	33.12800000	0.0000000000	***
Handloom_Households_As_Members_Of_Any_Co_Operative_Society	0.0000139100	0.0000089490	1.5540000	0.1440000	
Handloom_Households_As_Members_Of_Producer_Company	-0.0000242600	0.0000148800	-1.6300000	0.1270000	
Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					
Residual standard error: 0.02601 on 13 degrees of freedom					
Multiple R-squared: 0.2505, Adjusted R-squared: 0.1352					
F-statistic: 2.173 on 2 and 13 DF, p-value: 0.1534					

Table 13

Table 13 represents the impact of Membership type-related variables on the MPCE-based Gini coefficient.

Findings and conclusions of the study

In the analysis, we constructed 13 linear regression models to quantify the impacts of different dimensions of the variables from the handloom census survey on the consumption expenditure-based inequality parameter, specifically the Gini coefficient. We want these impacts to be negative. But, concerning tables 1 to 13, it is found that: -

1) Male Weavers and Female Weavers Have an Adverse impact on the MPCE-based Gini coefficient of North East India. However, male allied weavers and female allied weavers contribute to the increase in the MPCE-based Gini coefficient of North East India.
2) The participation of Muslim, Buddhist, and Zoroastrian Handloom Workers decreases the MPCE-based Gini coefficient of North East India.
3) The participation of Scheduled Caste Handloom Workers decreases the MPCE-based Gini coefficient.
4) Handloom Workers who do not hold Antodaya Cards contribute to Northeast India's MPCE-based Gini coefficient decrement.
5) Handloom Workers residing in kuchha and pucca houses contribute to Northeast India's MPCE-based Gini coefficient decrement.
6) Handloom households with income from all sources in the slab of ₹ 250,000 and above, along with 100,000 houses, contribute to Northeast India's MPCE-based Gini coefficient decrement.
7) Handloom households with income from handloom-related activities in the slabs of 5001-10000 and 50000-100000 contribute to Northeast India's MPCE-based Gini coefficient decrement.
8) 1) If a household involved in the handloom industry takes a loan for the Handloom Business and other purposes from Commercial banks, Friends or relatives, or Government departments, it will contribute to Northeast India's MPCE-based Gini coefficient decrement.
9) The average household size of handloom households cannot explain the variation in Northeast India's MPCE-based Gini coefficient.
10) For yarn, using Cotton above 80s, Eric silk, Acrylic Wool, and Jute in the production process will contribute to Northeast India's MPCE-based Gini coefficient decrement.
11) Handloom households in Northeast India can sell their products in local markets, master weaver groups, co-operative societies, organised fairs or exhibitions, export markets, e-commerce platforms, and other sources. They will contribute to Northeast India's MPCE-based Gini coefficient decrement if they opt for co-operative societies and other sources.
12) More handloom households' memberships in producer companies will contribute to a decrease in Northeast India's MPCE-based Gini coefficient.

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