Empowering Rural Artisans through Cluster Development

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Abstract: MSMEs have become one of the most vibrant sectors of the Indian economy, driving industrial growth and development. These enterprises have also contributed to the industrialization of backward and rural areas. In the north-eastern region of India, thousands of small and rural household industries operate within village communities and among different caste groups. These industries depend on local resources and the traditional skills of the rural population. Rural household industries have been a sustainable source of livelihood for the people of this region. Rural artisans play a vital role in preserving traditional crafts and boosting the regional economy which are crucial to a community's economic stability. The cluster development strategy has become a prominent paradigm for fostering sustainable livelihoods among the tactics used to improve the performance of such businesses. This research examines the socio-economic impact of cluster development on rural artisans to earn a sustainable living. The cluster development technique is becoming more and more popular as a way to help Micro, Small and Medium enterprises (MSMEs) become more innovative, productive, and competitive. Clusters provide knowledge exchange, common infrastructure, and group activities by bringing comparable enterprises together in close proximity, which can result in economies of scale and scope. The findings demonstrate that cluster-based development has a positive impact on the socio-economic development of the rural artisans.

Keywords: Cluster, Sustainability, Rural, Artisans, Development, MSME

1. Introduction:

1.1 Background:

Micro, Small and Medium Enterprises (MSMEs) have played a leading role in promoting stable regional development and economic growth worldwide. In many countries, especially in developing and emerging economies, MSMEs constitute the backbone of employment generation and industrial diversification. At present, MSMEs are the largest employment generators, with at least forty-five percent of the workforce in half of the high-income economies (Rawat, et al., 2017).In the Indian context, MSMEs not only play a pivotal role in employment creation and entrepreneurial

development but also contribute substantially to exports, innovation, and the industrialization of backward and rural areas (Rabha, 2020).In many developing countries small and households' industries are dominating the industrial clusters. In India, there are a number of industrial clusters which have evolved over a long period of time. These include artisanal, traditional, and modern industries. Most of the clusters were established naturally as traditional activities of local communities (NCEUS, 2009; Das & Das, 2011).Particularly in the North-eastern region of India, a large number of rural household industries operate within village communities, depending on traditional skills and locally available resources of the rural population. These industries have been a sustainable source of livelihood for the people of this region.

Despite various policy interventions by both central and state governments, the rural industries in the north-eastern states are not performing up to the mark. To revitalize and modernize these industries, the Government of India adopted the cluster development approach (Das & Das, 2011).In the Eleventh Plan (2007-12), the Indian government aimed to augment the nation's industrial development with an emphasis on inclusive growth through the application of cluster development, which has recently emerged as an essential tool for the development of MSMEs worldwide.

Clusters are 'geographic concentration of interconnected companies and institutions in a particular field. They include suppliers of specialized inputs such as components, machinery, and services, and providers of specialized infrastructure (Porter 1998). The rural artisan cluster which is defined as, 'geographically concentrated household units producing handicraft/handloom products, often belong to a traditional community, producing the long-established products for generations and the skill of centuries old' (Das & Das, 2011). In India, particularly the handloom and handicraft clusters have taken center stage in the nation's cluster environment, emphasizing the necessity of a development strategy for the socially and economically vulnerable groups (Ramswamy & Kumar, 2015).As per the Handloom Census (2010), around 10% of handloom households belong to Scheduled Castes (SCs), 22% to Scheduled Tribes (STs), and 41% to Other Backward Classes (OBCs), most of whom reside in rural areas (NCAER, 2010; Ramswamy & Kumar, 2015).

Recognizing the potential of traditional industries in sustaining rural livelihoods, the Government of India launched the Scheme of Fund for Regeneration of Traditional Industries (SFURTI). The scheme aims to recognize the talent, creativity, enterprise of hard work of rural Artisan in a variety of fields, ranging from food products to handicraft; leather products, to ayurvedic medicines and to make the Traditional Industries more productive, profitable and capable for generating sustained employment for traditional industry Artisans and subsequently empower and convert them as self-governing entrepreneurs (MSME Annual Report, 2023-24).

1.2 Research problem:

In India, particularly in rural and traditional sectors, artisans play a vital role in enhancing household economic stability and preserving traditional crafts and cultural

practices. While the cluster development approach is widely recognised as an effective strategy for enhancing the productivity and competitiveness of MSMEs, most research has primarily focused on economic outputs, institutional frameworks, and general impacts on enterprise growth. However, comprehensive studies examining the effects of cluster-based interventions on the social well-being, economic empowerment, and sustainable livelihoods of rural artisans remain limited.

1.3 Objective of the study:

To assess the socio-economic impact of cluster development on rural artisans

1.4 Significance of the study:

In the context of inclusive and sustainable rural development in India, this study is highly relevant. This study highlights the impact of cluster development on the socio-economic transformation of rural artisans under the SFURTI scheme, focusing on the Dimoria Handloom Cluster.

It emphasizes how focused interventions can improve skill development, social empowerment, income generation, and production capacity among rural artisans.

The study provides a deeper understanding of how cluster-based strategies can encourage equitable growth, preserve cultural heritage, and strengthen rural India's socioeconomic infrastructure.Additionally, the study contributes to the broader goal of rural economic development and cultural heritage preservation, emphasizing the importance of government support and global market integration in empowering artisans and sustaining traditional industries.

2. Review of literature:

The existing literature has been reviewed and presented as follows:

2.1 Review of literature based on conceptual and theoretical background:

The concept of industrial clusters has evolved significantly over time, beginning with Marshall (1920), who introduced the idea of localization economies to explain why certain industries tend to concentrate geographically. However, However, over-concentration might result in congestion and high living expenses, which could eventually cause some industry dispersion. Building on this foundation, Porter (1990) reconceptualized national competitiveness by focusing on innovation, productivity, and continuous industry upgrading rather than traditional factors like labor costs or resource endowments. Rosenfeld, (1995) extended Porter's framework to emphasize the role of clusters in regional economic development, highlighting characteristics such as geographical proximity, specialization, and collaboration. Similarly, Schmitz and Nadvi, (1999) stated the benefits of clustering for small and medium-sized enterprises (SMEs), especially in developing countries, emphasizing how clusters help SMEs overcome growth barriers and enhance their competitiveness in remote markets. Belleflamme et al., (2000) also derived ideas from both Alfred Marshall and Michael Porter and

emphasized that, despite globalization, local factors like shared knowledge,reduced costs and competitiveness remain crucial in determining firm locations. However, Martin and Sunley, (2003) offered a more critical perspective, arguing that while cluster theory has gained popularity among policymakers, it often suffers from conceptual ambiguity and a lack of empirical rigor. Thus, a more conservative implementation of cluster theory is needed, with an emphasis on evidence-based decision-making rather than over generalizing the benefits of geographical proximity.

2.2 Review of literature based on empirical studies:

Over the past two decades, cluster development has emerged as a strategic tool for promoting entrepreneurship, fostering rural development, and expanding MSMEs. Clustering helped both big and small firms by promoting capital accumulation and lowering barriers to entry, but it did not result in better working conditions because wages remained low and child and informal labour were still common. Mitra et al., (2009), while studying the Shantipur Handloom Cluster in West Bengal under the Integrated Handloom Cluster Development Scheme (IHCDS), emphasized the preservation of traditional skills and the importance of institutional support, infrastructure, and innovative design in overcoming challenges such as outdated technology and inadequate marketing.

Das & Das (2011) examined cluster development initiatives in Northeast India, concluding that cluster works as a vehicle for rural poverty alleviation, rural income generation and regional economic development. Sharma and Talukdar (2013) further advocated for the use of data mining technologies to effectively identify potential village industry clusters, emphasising that industries in a cluster become highly competitive, ensuring institutional stability, complementarily, and collective action.

Ramswamy & Kumar (2015), in their study on the Thenzawl Handloom Cluster of Mizoram, found that 98 percent of the weavers were the main income-generating people in their family. The researchers further, highlighted problems faced by the cluster regarding raw materials, an inadequate number of looms, marketing, finance, etc. Das (2015), found that Cluster development helps in reducing poverty by creating income and employment opportunities for marginalized groups, especially in rural areas. Khataniar (2017), while examining the Barpeta Cane and Bamboo Craft Cluster highlights the continued use of traditional and non-mechanized production methods, though some artisans are adapting to changing buyer demands by creating new designs.

In addition to these studies, Roy (2014) found that the Bell Metal Industry in Sarthebari faces significant challenges, including difficulties in procuring raw materials, insufficient financial support, lack of training, inadequate transportation, and limited marketing opportunities. Additionally, artisans struggle with basic necessities such as drinking water and sanitation, resulting in health issues for workers and their families.

Similarly, Mapdar (2011) explains the status of the handloom clusters in India and tried to assess the challenges being faced and strategies for cluster development in Shantipur Handloom clusters. Inadequate raw materials, poor infrastructural conditions, regular credit from bank without collateral security, dyeing related problems, health problems, technology, etc are some of the major challenges faced by the weavers, master weavers and designers of the cluster.

Baporikar (2017) emphasized the growing significance of clusters in the globalized world as clustering helps in fostering entrepreneurship by establishing supportive environments with shared resources, knowledge spillovers, and external linkages. In a study, Rabha (2020) while studying the Umden Eri Cluster in Meghalaya found that cluster interventions under MSE-CDP has helped increased employment and income, and improved the quality of life among artisans.

Mahendran et al., (2020) highlighted how cluster development initiatives of the Government of India, like MSE-CDP and SFURTI helped in improved marketing, infrastructure, and skill development among SMEs in rural India. Bera & Laha (2020) examined inter-state differences in MSME cluster performance and found that the performances of MSME clusters in southern, western and north western states are better as compared to cluster in eastern, central and extreme northern states. In a recent study, Sailo & Laldinliana, (2024), examined the role of master weavers in Mizoram's Thenzawl cluster, highlighting their contributions to skill preservation, employment, and market access. Strong market connections and business skills enable them to prosper in spite of challenges such as debt collection, costly yarn prices, and the lack of government support.

Although a number of studies have examined how effectively cluster development contributes towards improving MSME performance and regional economic growth, there is limited research specifically examining its role in promoting sustainable livelihoods among rural artisans, particularly in the traditional sectors of Assam. Thus, this study stands as an attempt to bridge the gap that existed in the previous literatures.

3. Research Methodology:

3.1 Area of data collection:

The study is conducted in the Dimoria Handloom Cluster, a rural cluster located in Assam, India. This cluster consists of artisans primarily engaged in handloom weaving, who have been supported through the Scheme of Fund for Regeneration of Traditional Industries (SFURTI) with skill development, infrastructural support, and financial interventions. The Dimoria Handloom Cluster comprising of 550 registered artisans became functional in the year 2019-20.

3.2 Research Design:

The study is descriptive and analytical, where the data are analysed using quantitative techniques. The analysis is mainly based on primary data collected from the rural artisans.

3.3 Data collection method:

Primary Data has been collected through questionnaires, interview schedules and telephonic interviews.

3.4 Sample size:

Slovin's formula is used to calculate the appropriate sample size for a survey or study, especially when the population size is known and a specific margin of error is desired. The Dimoria Cluster has a population of 550 of the targeted respondents. Therefore, Slovin's formula was applied to determine the appropriate sample size. Using Slovin's formula for sample size determination:

$$n = \frac{N}{1+N(e)2}$$

where:
n = sample size
N = population size (550)
e = margin of error (commonly 0.05 for a 95% confidence level)

$$n = \frac{550}{1+550\ (0.05)2}$$
$$= \frac{550}{1+1.375}$$
$$= \frac{550}{2.375}$$
$$= 231.57\ (232\text{approx.})$$

Thus, a sample size of 232 is valid at a 5% margin of error with a 95% confidence level. This size ensures sufficient statistical power to detect meaningful patterns and relationships while also managing time and resource constraints. The sample represents approximately 42.18% of the total population, which is notably higher than typical minimum thresholds in social science research, reinforcing the reliability of the findings.

3.5 Hypothesis:

The following hypotheses were formulated for the purpose of the study:
H_{01}: There is no significant difference in the production units of rural artisans before and after the cluster-based intervention
H_{02}: There is no significant difference in the number of products sold before and after the cluster-based intervention among rural artisans

H_{03}: There is no significant difference in asset ownership among rural artisans before and after the cluster-based intervention under the SFURTI scheme
H_{03a}: There is no significant difference in TV possessed among rural artisans before and after the cluster-based intervention under the SFURTI scheme
H_{03b}: There is no significant difference in cycle owned among rural artisans before and after the cluster-based intervention under the SFURTI scheme
H_{03c}: There is no significant difference in two-wheeler owned among rural artisans before and after the cluster-based intervention under the SFURTI scheme
H_{03d}: There is no significant difference in mobile phone owned among rural artisans before and after the cluster-based intervention under the SFURTI scheme

3.6 Analysis Technique:

The data was collected and analysed using a paired t-test to test the hypotheses outlined in Section 3.5. This test evaluates whether the mean difference between two related groups is statistically significant. It is commonly applied in cases involving "before-and-after" measurements on the same subjects or when comparing two different treatments on the same individuals. The analysis was conducted using SPSS version 22.

4. Findings & Discussion:

The data collected for the study were analysed and is discussed in this section

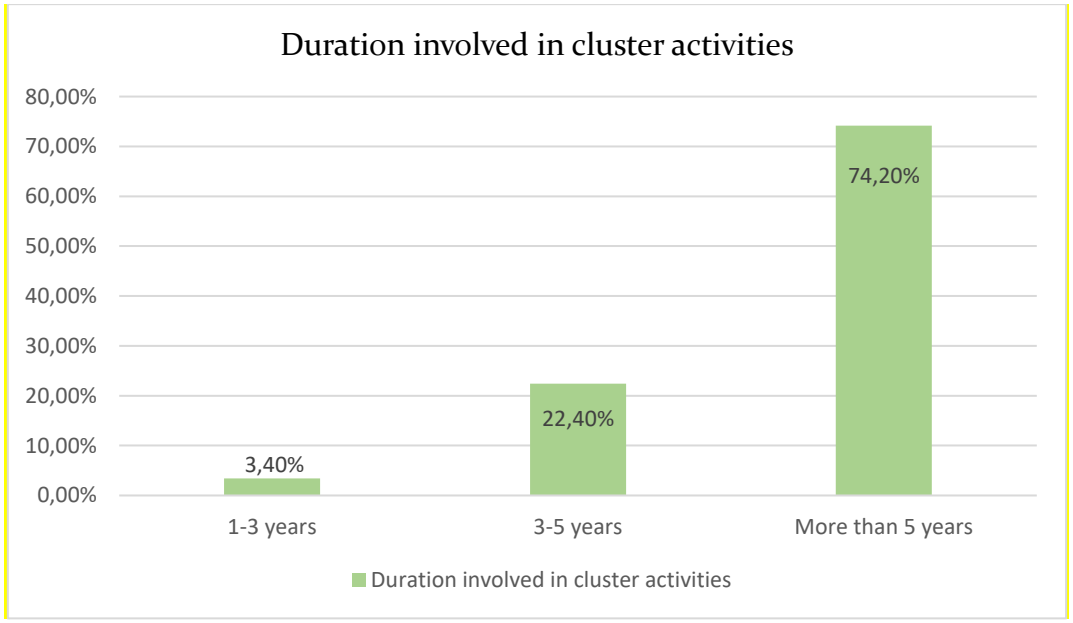

Fig 1: Duration the respondents were involved in cluster activities

The distribution of respondents based on the duration of their involvement in cluster activities reveals that a significant majority, 74.20%, have participated for more than 5 years (Fig. 1). This group forms the core of the study population. 22.40% of the artisans have reported activity for 3-5 years, indicating a significant portion with long-term participation. When it comes to evaluating the long-term effectiveness of such

initiatives, such a trend is essential. More sustained behavioural changes, enhanced skill retention, and socioeconomic outcomes are often associated with long-term participation (Li et al., 2022).

The least number of respondents i.e. 3.40% had enrolled in the past 1 to 3 years, and this implies that recent participants represent a small percentage of the sample. This pattern implies that the majority of respondents were adequately exposed to the intervention, making the validity of the findings on its long-term influence on livelihoods even stronger. These results are supported by previous research demonstrating that among artisans in the informal economy, long-term involvement with community-based production systems often leads to greater income diversification and long-run resilience (Matsumoto & Ishiwatari, 2024).

Table 1: Descriptive statistics of the demographic data of the respondents

Category	Sub-category	Percent
Economic Status	APL	2.2
	BPL	97.8
	Total	100.0
Marital Status	Married	64.7
	Never Married	4.7
	Widowed	30.6
	Total	100.0
Education	Illiterate	6.8
	Below HSLC	66.4
	HSLC	12.9
	HS	9.1
	Graduate	4.7
	Total	100.0

The descriptive statistics of the demographic data of the respondents were analysed and presented in Table 1. It can be observed from the table that majority of the respondents (97.8%) belong to the Below Poverty Line (BPL) category, while only 2.2 % of them are Above Poverty Line (APL) indicating that the respondents come mainly from economically weaker section with limited financial resources. Moreover, most of the respondents are married (64.7%) followed by widowed i.e., 30.6%. In case of educational qualification of the respondents, it is observed that a significant portion of them have education below HSLC (66.4%), while only 12.9% of them completed HSLC, 9.1 % studied up to HS and 4.7% of the respondents are graduates. Among the respondents, 6.8% of them are illiterate.

To test the hypothesis H_{01}: There is no significant difference in the production in units of rural artisans before and after the cluster-based intervention, a paired t-test was

conducted between Pre-Intervention production (in units) &Post-Intervention production (in units)

Table 2: Paired Samples Correlations of Pre-Intervention production in units &Post-Intervention production in units

	N	Correlation	Sig.
Pre-Intervention production in units &Post-Intervention production in units	232	.582	.000

Table 3: Paired t-test results for Pre-Intervention production in units &Post-Intervention production in units.

Paired Samples Test								
	Paired Differences					T	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre-Intervention production in units &Post-Intervention production in units	-20.078	7.686	0.505	-21.072	-19.083	-39.791	231	.000

Tables 2 and 3 show the paired t-test results for examining whether cluster-based interventions have led to measurable improvements in the production output of rural artisans, aligning with the study's objective of assessing their contribution to sustainable livelihoods. The results show a strong positive correlation between pre-intervention and post-intervention production levels, indicating that production trends remained consistent across individuals while shifting in magnitude. As the p-value is less than 0.05, therefore, the null hypothesis, $H_{01,}$ is rejected. The paired samples t-test reveals a statistically significant increase in production post-intervention. The negative mean difference suggests that the post-intervention production levels were higher than the pre-intervention levels. These findings provide strong empirical support that the cluster-based interventions significantly enhanced the production capacity of rural artisans, contributing to their economic sustainability.

The strong positive correlation between pre-intervention and post-intervention production levels suggests that while individual production trends remained internally consistent, the magnitude of production increased uniformly. This outcome aligns with existing literature emphasizing the role of collective enterprise structures in increasing productivity among informal rural workers. Cluster-based models often facilitate shared infrastructure, coordinated input procurement, skill enhancement, and improved market access, all of which contribute to output expansion (Aydemir, 2024; Ketels & Memedovic, 2008). The ability to produce more output often translates into higher sales and, in turn, more consistent income, allowing artisans to invest in raw materials, tools, or even diversify their product lines.

To test the hypothesis H_{02}: There is no significant difference in the number of products sold before and after the cluster-based intervention among rural artisans, a paired t-test was conducted between Pre-Intervention products sold &Post-Intervention products sold.

Table 4: Paired Samples Correlations Products sold Pre-Intervention & Products sold Post-Intervention

	N	Correlation	Sig.
Products sold Pre-Intervention & Products sold Post-Intervention	232	.542	.000

Table 5: Paired t-test results for Pre-Intervention & Products sold Post-Intervention

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Products sold Pre-Intervention & Products sold Post-Intervention	-8.582	4.733	.311	-9.194	-7.970	-27.619	231	.000

To evaluate the impact of cluster-based interventions on the livelihood of rural artisans, the study compared the number of products sold before and after the intervention. The correlation coefficient between pre- and post-intervention sales is 0.542 (Table 4), indicating a strong positive linear relationship. Participants who sold more before the intervention also tended to sell more afterward. The paired samples t-test shows a statistically significant increase in the number of products sold following the intervention, with a mean increase of 8.582 units. As the p-value is less than 0.05 (Table 5), therefore, the null hypothesis, H_{02}, is rejected. The 95% confidence interval

for the difference ranges from -9.194 to -7.970, confirming that the increase is not due to chance. These results strongly suggest that cluster-based interventions led to significant improvement in sustainable livelihoods by developing the marketing techniques used by the rural artisans. Sharma, (2024), observed that access to resources and better support systems significantly boost sales and promote the small businesses of the artisans. Cluster-based development facilitates this by creating a supportive atmosphere for promoting skill development (Wolman & Hincapie, 2015). Further, cluster interventions often incorporate capacity-building components such as training in product development, pricing strategies, and customer interaction, which are vital in enhancing artisans' business insight (Subramanyam, 2025).

To test the hypothesis H_{03}: There is no significant difference in asset ownership among rural artisans before and after the cluster-based intervention under the SFURTI scheme, a paired t-test was conducted between assets owned Pre-Intervention & assets owned Post-intervention.

The following are the sub-hypotheses tested to test this hypothesis:

H_{03a}: There is no significant difference in TV possessed among rural artisans before and after the cluster-based intervention under the SFURTI scheme

H_{03b}: There is no significant difference in cycle owned among rural artisans before and after the cluster-based intervention under the SFURTI scheme

H_{03c}: There is no significant difference in two-wheeler owned among rural artisans before and after the cluster-based intervention under the SFURTI scheme

H_{03d}: There is no significant difference in mobile phone among rural artisans before and after the cluster-based intervention under the SFURTI scheme

Table 6: Paired Samples Correlations of assets owned Pre-Intervention & Post-Intervention

		N	Correlation	Sig.
Pair 1	Pre-Intervention TV possessed &Post-Intervention TV possessed	232	.727	.000
Pair 2	Pre-Intervention Cycle owned &Post-Intervention Cycle owned	232	.647	.000
Pair 3	Pre-Intervention Two-wheeler owned & Post-Intervention Two-wheeler owned	232	.512	.000
Pair 4	Pre-Intervention Mobile Phone owned &Post-Intervention Mobile Phone owned	232	.618	.000

Table 7: Paired t-test results of assets owned Pre-Intervention & Post-Intervention

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Intervention TV possessed & Post-Intervention TV possessed	-.155	.363	.024	-.202	-.108	-6.514	231	.000
Pair 2	Pre-Intervention Cycle owned& Post-Intervention Cycle owned	-.207	.406	.027	-.259	-.154	-7.763	231	.000
Pair 3	Pre-Intervention Two-wheeler owned& Post-Intervention Two-wheeler owned	-.103	.305	.020	-.143	-.064	-5.163	231	.000
Pair 4	Pre-Intervention Mobile phone owned& Post-Intervention Mobile phone owned	-.112	.316	.021	-.153	-.071	-5.400	231	.000

To assess the extent to which cluster-based interventions under the SFURTI scheme contributed to socio economic development of the rural artisans, changes in asset ownership before and after the intervention were analysed. The paired t-test results of the assets owned pre-intervention and post-intervention are shown in Tables 6 and 7. The results from the paired samples t-tests demonstrate statistically significant increases across all four types of assets measured, namely television, cycle, two-wheeler and mobile phone. The ownership of cycle among the rural artisans increased moderately (mean difference =0.207 (t (231) =7.763, $p < .001$), while increase in two-wheeler possession was marginal(mean difference = 0.103 (t (231) = 5.163, $p < .001$).There were also significant improvements in the possession of TV (mean difference = 0.155) and mobile phone (mean difference = 0.112)all statistically significant at $p< .001$.The acquisition of mobile phones and televisions reflects increased access to information and connectivity, which are recognized as key enablers of economic participation and agency in rural settings (Bhavnani et al., 2008).The observed increase in cycle ownership is consistent with the literature showing that cycle is the most affordable form of transport available to low-income households (Arora, 2013). Also, increase in two-wheeler possession among rural consumers, although marginal, aligns

with studies documenting increase in the demand for two wheelers due to its resistance and balance in Indian rural roads (Venela, 2009).

Correlation coefficients between pre- and post-intervention ownership of assets varied from .512 to .727, reflecting moderate to strong positive relationships, which indicate that, although pre-intervention assets affected post-intervention ownership, significant change was experienced as a result of the intervention. This is similar to the findings of Quandt, (2018), where the researchers stated that long-term improvements in livelihoods tend to be due to enabling households to accumulate physical and financial assets. These results validate that asset gain did significantly increase with the cluster-based intervention, indicating the program did contribute to improving material well-being and livelihood protection for rural artisans.

5. Conclusion & Recommendations:

The study emphasizes the importance of cluster development as a strategic toolin transforming the socio-economic conditions of rural artisans by providing them with access to better infrastructure, skill development, and financial stability with a focus on the Dimoria Handloom Cluster under SFURTI intervention. Supporting and assisting rural artisans is essential since they make up a significant percentage of the unorganized sector. Some of the challenges that artisans face is limited infrastructure, restricted access to the market, low bargaining power, and limited institutional support. An initiative that addresses these issues is cluster development intervention, like SFURTI. This kind of cluster growth aids in fostering an environment that is conducive to skill development.

The study found that following the SFURTI scheme's cluster development intervention, rural artisans' asset ownership, sales, and production capacity increased. Long-term involvement in cluster-based activities was also found to improve the rural artisans' quality of life.

Based on the results of the study, it is recommended that to ensure the long-term impact of cluster-based interventions, such programs should encourage continued participation of artisans in cluster activities. This can be achieved by integrating financial literacy initiatives and improving access to resources so as to enhance their socio-economic conditions. Furthermore, strengthening educational and skill development training under cluster development can serve as an effective tool for sustainable economic growth and inclusive rural transformation.

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