

Geographical Indication (GI) Tags and Silk Handloom Weavers

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Abstract

Geographical Indication (GI) protection provides a means of recognizing traditional products whose identity is linked to a specific geographical region. Although Arani Silk has received GI recognition, empirical evidence concerning how handloom weavers perceive the benefits and barriers associated with such protection remains limited. This study investigates the perceived benefits and barriers of GI tagging among Arani silk handloom weavers and examines the factors associated with these perceptions. Primary data were obtained from 200 silk handloom weavers in Arani Taluk, Tiruvannamalai, Tamil Nadu, through structured questionnaire. The study follows a descriptive research design and applies descriptive statistics and multiple regression analysis to the collected data. The results indicate that production incentives, stakeholder collaboration, protection from counterfeit products and preservation of cultural heritage contributes significantly to the perceived benefits of GI tagging. In contrast, limited awareness, inadequate institutional support and market – related difficulties emerge as important barriers to deriving greater benefits from GI protection. The study extends existing evidence by examining both the perceived benefits and barriers of GI protection from the perspective of GI – tagged silk handloom weavers. The findings provide useful implications for policymakers, handloom development agencies, cooperative societies and other stakeholders in strengthening awareness, institutional mechanisms and market – oriented interventions for the sustainable development of the traditional silk handloom sector.

Keywords: Geographical Indication (GI) Tags, Handloom Weavers, Multiple Regression Analysis, Perceived Barriers, Perceived Benefits, Silk.

Introduction

Geographical Indications (GIs) are used to distinguish products whose quality, reputation or other characteristics are closely connected with their place of origin. In India, the legal framework for GI protection is provided by the Geographical Indications of Goods (Registration and Protection) Act, 1999 and the corresponding Rules, 2002, which came into effect in 2003 (1). The GI framework provides legal protection against unauthorized use of geographical product identities and imitation. At the international level, GIs are recognized within the intellectual property framework under the Paris Convention, the Lisbon Agreement and Articles 22 – 24 of the TRIPS Agreement (2). The Geneva Act of the Lisbon Agreement subsequently extended and strengthened the international framework governing appellations of origin and geographical indications (3). The relevance of GI protection is particularly evident in the handloom sector, where product identity is frequently rooted in region –

specific craftsmanship, traditional weaving practices, indigenous knowledge and cultural heritage. Recognition under the GI framework can help communicate product authenticity to consumers, differentiate genuine products from imitations and strengthen the market identity of traditional textiles. Such recognition may also contribute to the economic sustainability of artisan communities by improving the visibility and perceived distinctiveness of their products. GI recognition can therefore strengthen product authenticity, improve market recognition, distinguish genuine products from imitations and support the livelihoods of artisans. Several institutional initiatives have also been introduced to support traditional production and improve market opportunities. These include SFURTI, which focuses on the regeneration and development of traditional industries; ODOP, which promotes district – specific products; and ONDC, which provides opportunities for digitally

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enabled market access. Together, such initiatives can contribute to strengthening the competitiveness, sustainability and market reach of traditional products (4-6). India has also demonstrated its commitment to GI protection through the Geographical Indications of Goods (Registration and Protection) Act, 1999, implemented on 15 September 2003 (1). The expansion of GI registration in India reflects growing institutional recognition of products associated with specific geographical regions.

Darjeeling Tea was the first GI application registered in India, with the application filed in 2003 (1). The registered GI portfolio subsequently expanded to include products from diverse categories, such as handlooms, handicrafts, agricultural products, food products and manufactured goods (7). Figure 1 illustrates the distribution of registered GI products across major categories, while Figure 2 presents the GI registration and protection framework.

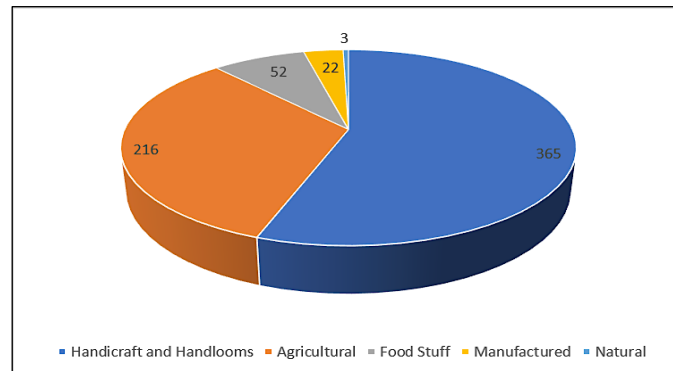


Figure 1: Total Number of GI Registered Products from Diverse Categories

Figure 1 highlights the substantial representation of handcraft and handloom products within India's GI system. However, registration alone may not ensure that producers are able to realise the expected economic and market benefits. The registered GI handloom products span several Indian states and reflect the diversity of India's

textile traditions. Table 1 presents the registered GI handloom products, including their state, registration date and registered organization. Arani Silk is among the GI-registered handloom products of Tamil Nadu and represents the distinctive weaving tradition of the Arani cluster.



Figure 2: Geographical Indication Flowchart (1)

Figure 2 explains the institutional process through which products associated with a specific geographical origin obtain GI protection. It provides an overview of the registration and protection mechanism and highlights the relevance of formal GI recognition to traditional products.

Details of Geographical Indications Registered Handloom Products

GI registration covers a wide range of traditional handloom products representing the diverse textile heritage of different regions of India. Selected examples of GI – registered handloom

products from different states are presented in Table 1 to illustrate this geographical and product diversity. Among these, Arani Silk from Tamil Nadu is particularly relevant to the present study.

The selected products demonstrate the geographical diversity of GI – protected handloom textiles in India. Tamil Nadu has several GI – recognised handloom products, including Kancheepuram Silk and Arani Silk. The GI recognition of Arani Silk provides the context for examining the perceived benefits and barriers associated with GI tagging among silk handloom weavers in Arani Taluk.

Table 1: Selected GI – registered Handloom Products in India (7)

State	Selected GI Handloom Product	Registration Year
Andhra Pradesh	Uppada Jamdani Sarees	2009
Assam	Muga Silk of Assam	2007
Gujarat	Patan Patola	2013
Karnataka	Ilkal Sarees	2007
Kerala	Balaramapuram Sarees and Fine Cotton Fabrics	2010
Maharashtra	Paithani Sarees and Fabrics	2010
Odisha	Orissa Ikat	2006
Tamil Nadu	Kancheepuram Silk	2005
	Arani Silk	2008

The literature identifies several potential benefits of GI protection for traditional handloom products. GI tags can communicate product quality and cultural value to consumers, strengthen product distinctiveness and protect artisans' intellectual property rights (8). However, limited awareness among producers and local communities may prevent them from fully utilizing the socio-economic benefits associated with GI registration (9). Greater awareness and appropriate legal protection can improve market access and income opportunities for producers (10). GI recognition may also support rural livelihoods, premium markets and producer–consumer linkages through digital platforms (11). Thus, awareness and effective legal and institutional mechanisms are important for realizing the potential benefits of GI protection (8, 9, 12).

Despite these benefits, several barriers affect the recognition and effective utilization of GI-tagged handloom products. GI-tagged handloom products face challenges from counterfeit products and imitations, which can erode the market share and perceived value of authentic handloom products (11). Competition and limited market recognition further constrain the potential of GI products (10, 13). Previous research has also highlighted

difficulties associated with international competition and the effectiveness of GI protection as a promotional mechanism (14). Studies on traditional handicrafts have emphasized the need for effective mechanisms to safeguard traditional knowledge and cultural heritage, while inadequate awareness of intellectual property rights, poor markets and insufficient government support remain important constraints (15). GI protection is also closely connected with the preservation of traditional knowledge and the collective interests of communities associated with traditional products. Existing research suggests that GIs can help safeguard knowledge-based products while simultaneously addressing cultural and socio-economic concerns affecting local communities (16). A systematic review of GI literature identified higher prices, market access and preservation of cultural identity among the major potential benefits for producers, while inefficient institutions, organizational problems, power asymmetry and unequal distribution of value can limit these benefits (17). From a legal perspective, author examined the additional protection available under Section 22 (2) of the GI Act and highlighted the importance of the legal framework in determining the scope and effectiveness of GI

protection in India (18). Studies examining the Indian GI landscape have also highlighted the expanding range of GI-registered agricultural and handicraft products and the need for stronger institutional support to promote indigenous products and their producers (19). However, the existence of a legal GI framework does not necessarily ensure effective protection for authorized users. The study identified weak legal protection and weak institutional positions of GI users as important factors limiting the realization of their rights (20). Similarly, the study observed that several GI-registered products in India continue to face challenges related to quality control, enforcement, genericide and inadequate protection, indicating that GI registration alone does not guarantee commercial success (21). The sustainability dimension of GI protection has also received attention. The author emphasized that GIs can contribute to economic, social, cultural and environmental sustainability when they are effectively established and managed through participatory and collective approaches (22). In the Indian context, the realization of GI-related benefits depends not only on legal enforcement but also on effective marketing and promotional activities, which may be difficult for stakeholders operating within resource-constrained environments (23). The study of the Indian handloom sector similarly emphasized challenges in implementing GI protection, including quality maintenance, supply-chain organization, equitable distribution of benefits, stakeholder coordination and market access (24).

Although previous studies have examined the legal, economic, cultural and policy dimensions of GIs, empirical research focusing specifically on the perceptions and experiences of silk handloom weavers remains limited. Existing literature has largely addressed GI protection at the macro level, including rural development, market protection and legal mechanisms, while comparatively less attention has been given to weavers' awareness, perceived benefits and barriers. In particular, limited evidence is available on whether GI registration is perceived by silk handloom weavers as improving recognition, market opportunities, protection against imitation, cultural preservation and economic prospects. This local-level evidence is important for identifying the gap between GI

policy objectives and their practical realization among producers. The present study therefore examines the perceived benefits and perceived barriers of GI tags among silk handloom weavers in Arani, Tamil Nadu. Using primary survey data and multiple regression analysis, the study identifies the factors that significantly influence weavers' perceptions of GI-tagged silk handloom products. This study provides an empirical examination of both the perceived benefits and perceived barriers associated with Geographical Indication (GI) tags among Arani silk handloom weavers using primary survey data and multiple regression analysis. Unlike previous studies, which have predominantly focused on legal, economic, or policy dimensions of GI protection, the present study identifies the key factors that significantly influence weavers' perceptions of GI tags. By generating context-specific evidence from one of India's prominent GI-registered silk weaving clusters, the study provides local – level empirical evidence on the factors shaping perceptions of GI effectiveness. The findings provide valuable guidance for policymakers, handloom development agencies and cooperative societies in designing targeted interventions to strengthen GI awareness, enhance institutional support and promote the sustainable development of the traditional silk handloom sector.

Methodology

Research Problem

Although Geographical Indication (GI) tags are gaining recognition as a mechanism for traditional product protection and value-add, a significant number of silk handloom weavers are not aware of and/or unsure of the benefits that they can derive from their use. While the process of GI registration aims to promote cultural heritage, the importance and awareness of the benefits of GI among weavers seem to be restricted to some extent. Inadequate awareness, institutional support, market access and strong enforcement are other obstacles that are affecting the realization of the expected outcomes such as increased income, brand recognition and protection from imitation. The situation highlights the importance of studying Perceived Benefits and Barriers of GI Tags Among Silk Handloom Weavers to overcome the policy intention-ground situation gap.

Study Area

The study was carried out in the silk handloom weaving cluster of Arani in Tiruvannamalai district of Tamil Nadu, India (approximate GPS coordinates 12.67° N, 79.28° E). Arani is a renowned weaving centre for the production of silk sarees characterized by distinctive designs and craftsmanship. The town is known for its renowned weaving industry, which employs thousands of artisans involved in various stages of silk production, making it an integral part of the town's local economy. Although the sector is historically and culturally important, it is grappling with challenges of modernisation, market competition and limited awareness of the benefits associated with GI recognition, making Arani a perfect setting to explore the perceived benefits and barriers associated with the process of GI tagging among silk handloom weavers.

Statistical Treatment of the Data

In this study, descriptive statistics were used to summarize the demographic characteristics and their perceptions of the benefits and barriers associated with Geographical Indication (GI)-tag. Frequencies and percentages were used for categorical characteristics, while mean values and standard deviations were used to summarize the responses to the study variables. The items measuring perceived benefits and barriers were assessed using a five-point Likert scale. Multiple regression analysis was subsequently employed to determine which perceived benefit and barrier factors were associated with the respective overall benefit and barrier measures. The F – statistic was used to assess the significance of each regression model, while R^2 indicated the proportion of variance explained by the predictors. Statistical significance was assessed at the 5% level ($p < 0.05$). The analysis was conducted using IBM SPSS

Statistics for Windows, Version 20.0 (IBM Corp., Armonk, NY, USA).

Research Question

What are the perceived benefits and barriers of Geographical Indication (GI) tag among handloom weavers?

Research Hypothesis

H₀₁: There is no significant relationship between the overall benefit towards GI tagged silk handloom sarees and perceived benefits.

H₀₂: There is no significant relationship between the overall barriers towards GI tagged silk handloom sarees and perceived barriers.

Data Source and Analysis

The analysis was based on both Primary and Secondary sources. Primary information was obtained directly from the respondents using a structured questionnaire. The questionnaire adopted the Five-point Likert Scale ranging from strongly disagree to strongly agree to measure the perceived benefits and perceived barriers to the use of Geographical Indication (GI) tag. Supplementary information and contextual background were drawn from secondary data from government reports, official documents from the GI registry, newspapers, academic journals and relevant internet articles. The primary responses were coded and subjected to multiple regression analysis to examine the relationship between the specified independent variables and the respective dependent variables.

Results

The empirical findings are presented and interpreted in this section. The analysis was conducted using IBM SPSS Statistics for Windows Version 20.0 (IBM Corp., Armonk, NY, USA). Multiple regression analysis was employed to examine the factors associated with respondents' perceived benefits and perceived barriers.

Table 2: Distribution of Respondent Characteristics and Research Variables

Variables	Category	Frequency	Percentage (%)
Gender	Male	114	57.0
	Female	86	43.0
	Total	200	100
Age	Below 30	28	14.0
	30 – 40 years	52	26.0
	40 – 50 years	64	32.0
	Above 50 years	56	28.0
	Total	200	100
Education	Illiterate	20	10.0
	Middle School	55	27.5

Employment status	High School	80	40.0
	Diploma in Handloom	9	4.5
	Graduate	36	18.0
	Total	200	100
	Independent	153	76.5
	Cooperative Society	23	11.5
	Master Weaver	24	12.0
	Total	200	100

There are 200 respondents in Table 2, wherein 57% are male and 43% are female. Out of the total respondents, 32% are in age group 40-50 years and 28% are above 50 years. 40% of the respondents have completed High school, whereas 27.5% completed Middle school and of the whole sample only 18% are Graduates. 76.5% of the total respondents are independent weavers, 12% are master weavers and 11.5% belong to a cooperative society.

Perceived Benefits and Barriers of GI Tags

Perceived Benefits

The perception of silk handloom weavers towards the Geographical Indication (GI) tag is influenced by several factors related to the benefits of Geographical Indication (GI) tagging. The variables

like increase visibility of products (PB1), promote higher returns on investment (PB2), Incentives to improve production (PB3), higher quality products (PB4), easy market access (PB5), higher prices (PB6), encouraging collaboration (PB7), preservation of cultural identity (PB8), protect against counterfeits (PB9), access to knowledge (PB10), reduction of information asymmetry (PB11), cultural preservation (PB12) are the twelve independent variables and overall benefit towards GI-tagged silk handloom products is the one dependent variable. Tables 3-5 present the regression results for "Perceived Benefits". The following null hypothesis was tested for this analysis.

H₀₁: There is no significant relationship between the overall benefit towards GI tagged silk handloom sarees and perceived benefits

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the estimates
1	0.809	0.654	0.632	0.64878

Note: Predictors (Constant) = Perceived Benefits (PB1, PB2, PB3, PB4, PB5, PB6, PB7, PB8, PB9, PB10, PB11, PB12), Dependent Variable = Overall benefits towards GI – tagged silk handloom products, R = Multiple Correlation Coefficient, R Square= Coefficient of Determination, Std. Error = Standard Error of the Estimate.

Table 4: ANOVA

Model	Sum of squares	df	Mean Square	F	Sig.
Regression	148.883	13	12.407	29.476	0.000
Residual	78.712	187	0.421		
Total	227.595	200			

Note: Dependent Variable = Overall benefits towards GI – tagged silk handloom products, Predictors (Constant) = Perceived Benefits, df = Degrees of Freedom, F = F – Statistic, Sig. = Significance (p-value).

Table 5: Standardized Regression Co-efficient Statistics

Model	Unstandardized Co-efficient		Standardized Co-efficient Beta	t	Sig.
	B	Standard Error			
(Constant)	0.842	0.177	-----	4.746	0.000
Increase Visibility of Products (PB 1)	0.091	0.081	0.103	1.127	0.261
Higher Returns (PB 2)	0.046	0.070	0.055	0.655	0.513
Incentives to raise Production (PB 3)	0.163	0.065	0.159	2.501	0.013
Higher quality Products (PB 4)	0.058	0.053	0.063	1.090	0.277
Market Access (PB 5)	-0.206	0.061	-0.244	-3.353	0.001
Higher Prices (PB 6)	-0.106	0.069	-0.105	-1.524	0.129
Encouraging Collaborations (PB 7)	0.221	0.058	0.239	3.820	0.000
Preservation of cultural identity (PB8)	0.073	0.096	0.090	0.760	0.448
Protect against counterfeits (PB9)	0.308	0.053	0.412	5.839	0.000
Access to Knowledge (PB 10)	0.044	0.087	0.055	0.505	0.614
Low-information asymmetry (PB 11)	-0.063	0.084	-0.067	-0.747	0.456
Cultural Preservation (PB 12)	0.209	0.096	0.251	2.173	0.031

Note: Dependent Variable = Overall benefits towards GI – tagged silk handloom products, B = Unstandardized Regression Coefficient, Beta = Standardized Regression Coefficient, t = t – Statistic, Sig. = Significance (p-value), PB = Perceived Benefits.

Multiple regression analysis was performed to examine the influence of perceived benefit factors on the overall benefits of GI-tagged silk handloom products. The regression model for perceived benefits was statistically significant ($F = 29.476$, $p < 0.001$), indicating a good model fit. The R^2 value of 0.654 shows that the independent variables explained 65.4% of the variation in the overall benefits of GI-tagged silk handloom products. Among the predictors, incentives to improve production, easy market access, encouraging collaboration, protection against counterfeits and cultural preservation had a statistically significant associations with the overall perceived benefits ($p < 0.05$), leading to the rejection of the null hypothesis for these variables. In contrast, increase in product visibility, higher returns on investment, higher quality products, higher prices, preservation of cultural identity, access to knowledge and reduction of information asymmetry did not show a statistically significant relationship with the overall benefits ($p > 0.05$). Accordingly, the null hypothesis was rejected for the significant variables, indicating that they did not significantly influence the perceived overall benefits of GI-tagged silk handloom products.

Perceived Barriers

The perception of handloom weavers towards the Geographical Indication (GI) tag is influenced by several factors related to the barriers of GI. The variables like Lack of awareness regarding GI benefits (PBA1), Consumers' preference for price over quality (PBA2), Non – conformity and malpractices inside the territory (PBA3), Unavailability of enough skilled manpower (PBA4), Inability to adhere to quality standards (PBA5), Bureaucracy and red-tapism (PBA6), Absence of guidance and facilitation (PBA7), Lack of unity among the producers (PBA8), Importance of GI is unfelt (PBA9), Narrow price difference / Absence of premium price (PBA10), Absence of a separate market (PBA11) and Absence of incentives for production and conservation (PBA12) are the twelve independent variables and Overall barriers towards GI-tagged Silk handloom products is the one dependent variable. Tables 6-8 present the regression results for "Perceived Barriers". The following null hypothesis was tested for this analysis.

H₀₂: There is no significant relationship between the overall barriers towards GI tagged silk handloom sarees and perceived barriers.

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimates
1	0.836	0.699	0.680	0.41365

Note: Predictors (Constant) = Perceived Barriers (PBA1, PBA2, PBA3, PBA4, PBA5, PBA6, PBA7, PBA8, PBA9, PBA10, PBA11, PBA12), Dependent Variable = Overall barriers towards GI – tagged silk handloom products, R = Multiple Correlation Coefficient, R Square= Coefficient of Determination, Std. Error = Standard Error of the Estimate.

Table 7: ANOVA

Model	Sum of squares	df	Mean Square	F	Sig.
Regression	74.483	13	6.207	36.274	0.000
Residual	31.997	187	0.171		
Total	106.480	200			

Note: Dependent Variable = Overall barriers towards GI – tagged silk handloom products, Predictors (Constant) = Perceived Barriers, df = Degrees of Freedom, F = F – Statistic, Sig = Significance.

Table 8: Standardized Regression Co-efficient Statistics

Model	Unstandardized Co- efficient		Standardized Co-efficient Beta	t	Sig.
	B	Standard Error	Beta		
(Constant)	2.100	0.243	----	8.627	0.000
No awareness GI (PBA1)	-0.078	0.037	-0.153	-2.128	0.035
Price over quality (PBA2)	0.233	0.063	0.283	3.705	0.000
Malpractices inside territory (PBA3)	0.039	0.042	0.058	0.912	0.363
No skilled manpower (PBA4)	-0.039	0.048	-0.047	-0.802	0.423
Lack of quality (PBA5)	-0.077	0.055	-0.094	-1.406	0.161
Bureaucracy (PBA6)	0.393	0.048	0.700	8.219	0.000
No guidance (PBA7)	-0.054	0.046	-0.086	-1.170	0.244

No unity among-producers (PBA8)	0.045	0.042	0.058	1.091	0.276
GI is unfelt (PBA9)	0.267	0.040	0.451	6.699	0.000
Price-Difference (PBA10)	-0.316	0.068	-0.448	-4.655	0.000
No separate market (PBA11)	-0.298	0.047	-0.391	-6.405	0.000
Absence of incentives (PBA12)	0.299	0.047	0.450	6.325	0.000

Note: B = Unstandardized Regression Coefficient, Beta = Standardized Regression Coefficient, t = t-Statistic, Sig. = Significance, PBA = Perceived Barriers.

Multiple regression analysis was conducted to examine the influence of perceived barrier factors on the overall barriers toward GI-tagged silk handloom products. The regression model was statistically significant ($F = 36.274$, $p < 0.001$), indicating a good model fit. The R^2 value of 0.699 indicates that the independent variables explained 69.9% of the variation in the overall barriers toward GI-tagged silk handloom products. Among the predictors, lack of awareness about the benefits of GI, consumers' preference for price over quality, bureaucracy and red-tapism, unfelt importance of GI, narrow price difference/absence of premium price, absence of a separate market and absence of incentives for production and conservation showed statistically significant relationships with the overall perceived barriers ($p < 0.05$). Therefore, the null hypothesis was rejected for these variables. However, non-conformity and malpractices within the territory, unavailability of skilled manpower, inability to adhere to quality standards, absence of guidance and facilitation and lack of unity among producers were not statistically significant ($p > 0.05$). Hence, the null hypothesis was not rejected for these variables, indicating that they did not significantly influence the overall perceived barriers toward GI-tagged silk handloom products.

Discussion

The regression findings of the study demonstrate that the perceived benefits and barriers associated with Geographical Indication (GI) tags significantly influence the overall perception of GI-tagged silk handloom products among weavers. The perceived - benefit model explained 65.4% of the variance in perceived benefits and 69.9% indicating considerable explanatory power for the selected variables. These findings suggest that GI tags are valued not only for their economic advantages but also for their role in protecting traditional knowledge and promoting sustainable livelihoods.

Among the perceived benefits, protection against counterfeits, encouraging collaboration among producers, cultural preservation, easy market

access and production incentives emerged as significant predictors of the overall benefits of GI-tagged silk handloom products. These results are consistent with previous studies, which reported that GI protection strengthens product authenticity, safeguards traditional craftsmanship, enhances collective action among producers and creates market differentiation, thereby improving the competitiveness of traditional products (17, 22, 25, 26). The significant contribution of cultural preservation also supports the view that GIs serve as instruments for protecting intangible cultural heritage while generating economic value for artisan communities (14).

However, variables such as product visibility, higher returns on investment, higher quality products, premium pricing, preservation of cultural identity, access to knowledge and reduction of information asymmetry did not significantly influence the perceived overall benefits. This finding suggests that although GI registration provides legal recognition, its market potential may not be fully realized unless accompanied by effective promotion, consumer awareness, branding and institutional support. Similar observations have been highlighted in studies that the economic benefits of GIs are often constrained by weak marketing strategies, inadequate producer awareness and limited value-chain coordination (25, 27).

Regarding perceived barriers, bureaucracy and red-tapism was the most powerful predictor, followed by the unfelt importance of GI, absence of production and conservation incentives, consumers' preference for price over quality, lack of awareness of GI benefits, absence of a separate market and absence of premium pricing. These findings indicate that institutional and market-related constraints continue to hinder the effective utilization of GI tags by silk handloom weavers. Previous research similarly reported that weak legal protection, complex institutional mechanisms, inadequate government support, limited market access and insufficient financial incentives can reduce the effectiveness of GI protection and

restrict the commercial success of GI products (20, 21, 23, 24, 26).

Conversely, non-conformity within the production territory, shortage of skilled manpower, difficulty in maintaining quality standards, lack of guidance and facilitation and lack of unity among producers were not statistically significant predictors. This may indicate that although these issues exist within the handloom sector, they are relatively less influential than institutional and market-related barriers in shaping weavers' perceptions. Similar studies have found that gaps in policy implementation and weak market mechanisms affect GI effectiveness more than production - related constraints (25).

Overall, the study confirms that the effectiveness of GI protection depends on legal protection but also on strengthening institutional responsiveness, improving producer awareness, simplifying administrative procedures, enhancing market access and creating consumer awareness regarding authentic GI products. These findings reinforce the argument that GI protection should be integrated with producer capacity building, branding initiatives and supportive public policies to maximize its socio-economic benefits for traditional handloom communities and contribute to sustainable rural development.

Conclusion

This study examined the perceived benefits and barriers of Geographical Indication (GI) tags among silk handloom weavers and provided empirical evidence on the factors influencing their overall perception of GI-tagged silk handloom products. The multiple regression results revealed that the proposed models were statistically significant, explaining 65.4% of the variance in the perceived overall benefits and 69.9% of the variance in the perceived overall barriers. These findings indicate that the selected variables effectively explain weavers' perceptions regarding the usefulness and challenges of GI-tagged products.

The study identified protection against counterfeits, encouraging collaboration among producers, cultural preservation, easy market access and incentives to improve production as significant determinants of the perceived benefits of GI tags. These findings suggest that GI protection extends beyond legal recognition by promoting

product authenticity, preserving traditional craftsmanship, strengthening collective action and creating market opportunities for silk handloom products. However, variables such as increased product visibility, higher returns on investment, premium pricing, higher product quality, access to knowledge, preservation of cultural identity and reduction of information asymmetry were not found to significantly influence the perceived overall benefits, indicating that the economic potential of GI tags has not yet been fully realised. The analysis of perceived barriers revealed that bureaucracy and red-tapism, consumers' preference for price over quality, the unfelt importance of GI, lack of awareness about GI benefits, absence of premium pricing, absence of a separate market and absence of incentives for production and conservation significantly constrained the effective utilisation of GI tags. In contrast, factors such as non-conformity within the production territory, shortage of skilled manpower, inability to maintain quality standards, lack of guidance and facilitation and lack of unity among producers did not significantly influence the overall perceived barriers. These findings indicate that institutional, administrative and market-related constraints pose greater challenges than production-related issues in maximising the benefits of GI protection.

This study demonstrates three important contributions to the existing literature. First, it provides empirical evidence on both the perceived benefits and barriers of GI tags from the perspective of silk handloom weavers, a dimension that has received comparatively limited attention in previous research. Second, it identifies the key factors that significantly influence weavers' perceptions through multiple regression analysis, thereby offering a quantitative understanding of the determinants of GI effectiveness at the grassroots level. Third, this research advances to the growing body of literature on Geographical Indications by demonstrating that the success of GI protection depends not only on legal registration but also on effective institutional support, market development, producer awareness and coordinated stakeholder participation.

The findings have important policy implications. Government agencies, GI registries, handloom development departments, cooperative societies and producer associations should strengthen

awareness programmes, simplify administrative procedures, provide production incentives, establish dedicated markets for GI products and undertake sustained branding and consumer awareness campaigns. Strengthening institutional support and improving market linkages can improve the economic and cultural value of GI-tagged silk handloom products while contributing to the sustainable livelihoods of traditional weaving communities.

Limitations

The study has certain limitations. It was confined to silk handloom weavers in the selected study area and the findings may not be assumed to represent all GI-registered handlooms or handicraft producers in India. The study employed on cross-sectional, perception-based data collected through a structured questionnaire, which capture respondents' views at the time of data collection and do not permit assessment of changes over time. Furthermore, only the selected benefit and barrier variables were examined and other institutional, technological, or market factors may also influence perceptions of GI effectiveness. Future research may extend the analysis to other GI-tagged handloom and handicraft products across different regions of India using larger samples across different GI clusters. Comparative studies between GI-registered and non-GI products, longitudinal research to assess changes in producer perceptions over time and the application of advanced analytical techniques such as Structural Equation Modelling (SEM), mediation, or moderation analysis could provide deeper insights into the mechanisms through which GI protection contributes to producer empowerment, market competitiveness and sustainable rural development.

Abbreviations

ODOP: One District One Product, ONDC: Open Network for Digital Commerce, SFURTI: Scheme of Fund for Regeneration of Traditional Industries, WTO: World Trade Organization.

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Author contributions

All the authors contributed to this paper, each equally.

Conflict of Interest

The authors state that they have no competing financial or personal interests that could have influenced the results or the interpretation of the data reported in this paper.

Data Availability

Data will be made available on request from the corresponding author. Due to privacy or ethical restrictions, the data are not publicly available.

Declaration of Artificial Intelligence (AI) Assistance

The authors acknowledge the use of generative AI (ChatGPT) to assist in the paraphrasing of certain parts of the manuscript. All content generated through AI was critically reviewed, edited and verified by the authors to ensure accuracy, originality and compliance with academic standards. The authors take full responsibility for the integrity and validity of the manuscript.

Ethics Approval

Not Applicable.

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